



## Ministry of Fisheries – Marine Biosecurity

### *ACTION PLAN FOR UNWANTED SPECIES*



#### **Asian Clam (*Potamocorbula amurensis*)**

Photo courtesy of United States Geological Survey

#### Summary

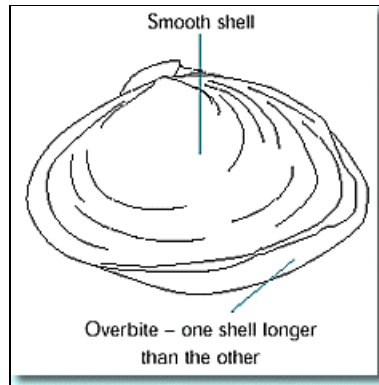
The Asian clam (*Potamocorbula amurensis*) is an invasive species that was introduced accidentally to San Francisco Bay, where it has caused major ecological changes. The Asian clam can survive in both salt water and fresh water. Because of this, there is a significant risk of introducing it to New Zealand, particularly in fresh ballast water (which is not required to be exchanged enroute).

The Ministry of Fisheries is taking the following steps to decrease the risk of the Asian clam establishing in New Zealand:

- Reducing the risk of the Asian clam arriving in New Zealand by amending the ballast water Import Health Standard
- Increasing the chances of detecting the Asian clam if it arrives by determining *P. amurensis* unwanted and notifiable; targeting this species in the national surveillance programme; and disseminating information on the Asian clam to the public
- Increasing our understanding of the Asian clam and how to respond to an incursion.

## Description

The Asian clam is a filter-feeding bivalve 0.5-3.1 cm in length. It ranges in colour from white, to tan or yellow and has a smooth, unsculptured shell. One of the valves is slightly longer than the other, causing the clam to have a slight overbite.



*Potamocorbula amurensis*

## Biology

The Asian clam is a benthic suspension feeder consuming large quantities of a range of plankton, including bacterioplankton, phytoplankton, and zooplankton (copepods). Over half of the shell is usually exposed above the substrate.

There is little information available on the reproduction or growth of this species.

## Distribution

The Asian clam is native to China, Japan and Korea, and has been introduced to San Francisco Bay, California.

The Asian clam usually occurs in subtidal areas and is found in estuarine to freshwater habitats on all substrate types. It tolerates a wide range of salinities from <1 to 33‰. Experiments have demonstrated that this species is also highly resistant to changes in salinity.

The Asian clam has been recorded in water temperatures from 8-23°C in San Francisco Bay. Its native range encompasses tropical to cold temperate waters.

## Vectors

The larvae of Asian clam can be translocated in ballast water, while the adults can be transported in fishing equipment.

## Impacts

Arriving in the San Francisco Estuary by ballast water and first collected in 1986, by 1988 the Asian clam reached and has since sustained average densities exceeding 2,000/m<sup>2</sup>.



**A dense mat of *P. amurensis***

Photo courtesy of United States Geological Survey

High densities of Asian clams may be controlling phytoplankton populations in the northern reaches of San Francisco Estuary. Since the appearance of the clam, the summer diatom bloom in San Francisco Estuary has not occurred, presumably because of increased filter feeding by this new invader. It has been estimated that the Asian clam population in the northern reaches of the estuary can filter the entire water column over the channels more than once per day and over the shallows almost 13 times per day. This rate of filtration exceeds the phytoplankton's specific growth rate and approaches or exceeds the bacterioplankton's specific growth rate.

Further, the Asian clam feeds at multiple levels in the food chain, consuming bacterioplankton, phytoplankton, and zooplankton (e.g. copepods), and this may substantially reduce copepod populations both by depletion of the copepods' phytoplankton food source and by direct predation. In San Francisco Estuary, it appears that this behaviour is placing extreme pressure on the copepod-eating native opossum shrimp and the mysid-eating juvenile striped bass.

The movements and behaviour of the Asian clam appear to significantly disturb surface sediment layers. This has the potential to change benthic dynamics by

destabilising substrates, changing suspended sediments loads, and changing the redox balance of the sediment surface.

## Action Plan

The Ministry of Fisheries is taking the following steps to decrease the risk of the Asian clam establishing in New Zealand:

- Reducing the risk of the Asian clam arriving in New Zealand by amending the ballast water Import Health Standard (IHS). The IHS will be amended either by not allowing discharge of fresh ballast water or by adding areas where the Asian clam is present to Annex 1 (ballast water from areas in Annex 1 of the IHS cannot be discharged into New Zealand waters under any circumstances)
- Increasing the chances of detecting the Asian clam if it arrives by determining *P. amurensis* unwanted and notifiable (declaring an organism to be notifiable places a duty on any person who becomes aware of the presence of the organism in a new place to notify the Chief Technical Officer); targeting this species in the national surveillance programme; and disseminating information on the clam to the public
- Increasing our understanding of this species and how to respond to an incursion by developing a risk profile and an incursion response plan.

## What you can do:

Please do not bring the Asian clam into New Zealand for any purpose. Report any suspected sightings of the Asian clam to the Ministry of Fisheries.

## Contact Details

For further information on this action plan or any marine biosecurity issue please contact:

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