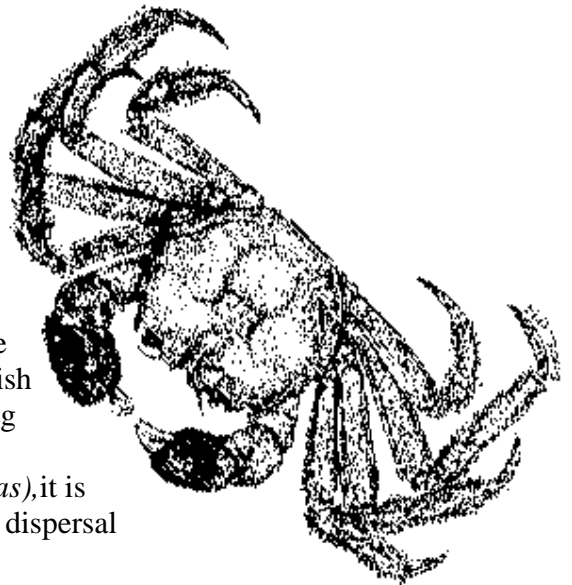


Chinese Mitten Crab

What is the Chinese mitten crab?

The Chinese mitten crab (*Eriocheir sinensis*) is a burrowing crab whose native distribution is the coastal rivers and estuaries of the Yellow Sea in Korea and China. It has recently become established on the west coast of the U.S. in the San Francisco Bay/Delta watershed in California, posing a potential threat to native invertebrates and to the ecological structure of freshwater and brackish estuarine communities, as well as disrupting some fish and shrimping operations. Although not currently present in the Pacific Northwest, scientists predict that, like the European green crab (*Carcinus maenas*), it is likely to arrive in Oregon and Washington eventually through larval dispersal or intentional release.



What does the crab look like and where does it live?

A single male Japanese mitten crab (*Eriocheir japonica*) was caught in the Columbia River, Oregon in 1998. The species is very similar to the Chinese mitten crab currently found in California, and its presence was most likely the result of someone's attempt to introduce it to the watershed.

The main identifying features of the mitten crab are the dense patches of hairs on the white-tipped claws of larger juveniles and adults, hence the name mitten crab. The claws are equal in size, the shell (carapace) has four spines on either side, and reaches a width of approximately 3 inches (80 mm). The legs of the adult crab are generally more than twice as long as the width of the carapace. A catadromous species, the adults migrate downstream to reproduce in the brackish waters of estuaries. The females carry 250,000 to 1 million eggs until hatching, and both sexes die soon after reproduction. After a 1-2 month period as planktonic larvae, the small juvenile crabs settle out in salt or brackish water in late spring, then migrate, often long distances, to freshwater to rear. In China's Yangtze River, mitten crabs have been reported 800 miles upstream from the Yellow Sea.

Note: It is **illegal** to import eggs or live specimens of any species of mitten crab (genus *Eriocheir*) to the United States under the Federal Lacey Act. It is also illegal to import, transport, or possess live Chinese mitten crabs in California, Washington, and Oregon.

Mitten crabs are omnivores, eating both plants and animals. Juveniles eat primarily vegetation. As they mature, the crabs increasingly prey upon animals, especially small invertebrates including worms and clams. In California, adult crabs have become a major nuisance to anglers, taking a variety of baits ranging from ghost shrimp to shad. Predatory fishes, including sturgeon, striped bass and channel catfish, as well as bullfrogs, raccoons, river otters and wading birds may prey upon the crab.

Mitten crabs are adept walkers on land, and if blocked by dams, weirs or other obstructions during their migration, move readily across banks or levees to bypass them. In Germany, large numbers of mitten crabs left the water at night when they encountered an obstruction, and occasionally wandered the streets and entered houses. In California, mitten crabs have been found on roads and airport runways, in parking lots, yards and swimming pools.

A successful invader

The Chinese mitten crab has a long history as an invader. The crab was accidentally introduced to Germany in the early 1900s. In the 1920s and 1930s, the population exploded and the crabs rapidly expanded their distribution to many northern European rivers and estuaries. Most recently, the River Thames in England has experienced a population explosion of the crabs.

In 1992, commercial shrimp trawlers in southern San Francisco Bay collected the first mitten crabs on the West Coast. Since then, the mitten crab has spread rapidly, established in the San Francisco Bay, and spread to river areas upstream of the Delta. The most probable mechanism of introduction to the estuary was deliberate

release to establish a fishery (in Asia, the mitten crab is a delicacy and crabs have been imported live illegally to markets in Los Angeles and San Francisco) or accidental release via ballast water.

Mitten crab population control has been attempted but there is little available information on the results. Mitten crab populations decreased in Europe in the late 1940s, coinciding with an increase in water pollution. Possibly this pollution caused a decrease in prey abundance.

Why should we be worried?

An expanding mitten crab population poses several ecological, economic and human health threats. The mitten crab may have a profound effect on biological communities through predation and competition, and could change the structure of fresh and brackish water benthic invertebrate communities in areas they invade. Also of concern is potential predation on salmonid and sturgeon eggs and juveniles. In tidal areas, mitten crabs burrow into banks for protection from predators and desiccation during low tides. This burrowing activity may increase erosion and instability of levees and riverbanks. Mitten crabs, a host for the Oriental lung fluke, are also a human health concern. In addition, mitten crabs often inhabit areas that may contain high levels of contaminants. Bioaccumulation of contaminants could be transferred to predators, including humans.

In Europe, the most widely reported economic impact of mitten crabs has been damage to commercial fishing nets and to the catch when the crabs are caught in high numbers. In San Francisco Bay, removing the crabs from the nets has been time-consuming and costly to shrimp trawlers (one trawler has reported catching over 200 crabs in a single tow several times), damaging or killing the catch. Another significant problem in California has been the impact on diversion and fish salvage facilities. Mitten crabs have clogged pumps, screens, and intakes and have damaged and killed fish at salvage facilities associated with water diversions. With the declines in salmon and trout populations, any further disruption or damage to fish passage is a major concern.

The mitten crab poses a potential human health threat. It is an intermediate host for the Oriental lung fluke, and mammals, including humans, can become infested by eating raw or poorly cooked mitten crabs. However, neither the lung fluke nor any of the freshwater snails that serve as the primary intermediate host for the fluke in Asia have been found in the Pacific Northwest or California.

What other information is available on mitten crabs?

More information about the mitten crab, including an identification guide, can be found on California Department of Fish and Game's Central Valley Bay-Delta Branch web site at <http://www.delta.dfg.ca.gov> under the Biological Resources section, or at the San Francisco Estuary Institute website, <http://www.sfei.org/invasions.html>.

For general information on non-indigenous species, contact the Pacific Northwest Marine Invasive Species Team (MIST): Paul Heimowitz, Oregon Sea Grant, 503-722-6718 or Nancy Lerner, Washington Sea Grant Program, 206-616-8403. Or visit the Washington Sea Grant Program web site at <http://www.wsg.washington.edu>.

If you find a mitten crab:

- In Washington, contact Scott Smith, Washington Department of Fish & Wildlife, 360-902-2724.
- In Oregon, contact Larry Cooper, Oregon Department of Fish and Wildlife, 503-872-5260 ext. 5347.
- In California, contact your nearest California Fish & Game office.

