

NON-INDIGENOUS AQUATIC SPECIES OF CONCERN FOR ALASKA

Fact Sheet 2

Chinese Mitten Crab

Eriocheir sinensis

BIOLOGY & PHYSIOLOGY

Physical Description: The main identifying features of the Chinese Mitten Crab are the dense patches of hairs on the white-tipped claws of larger juveniles and adults. The claws are of equal size. The shell (carapace) has four spines on either side, is somewhat round in shape, and reaches a width of approximately four inches. The legs of the adult crab are generally twice the length of the shell. The shell color is grayish green to dark brown with two pairs of pale spots.

Nutrition Requirements: The Chinese Mitten Crab is omnivorous, consuming a wide variety of plant and animal materials.



Photo by: The Natural History Museum of London

Reproduction: The Chinese Mitten Crab reaches sexual maturity in its fourth or fifth year. During the summer months, this crab will begin migrating from fresh water streams towards the sea. Male crabs are the first to arrive in the estuaries and once the females arrive, mating begins. After mating, the females will continue to migrate seaward, over-wintering in deeper water before returning to brackish water in the spring to hatch their eggs. The eggs are spawned on a substance excreted by the female which will harden and hold the eggs to the abdominal limbs. Throughout the winter, the females remain in deep waters while the eggs slowly develop. A single female crab can produce from 250,000 to over 1 million eggs depending on the size of the female. The female will return to shallow brackish waters in the spring to spawn its eggs.

Lifecycle Stages: The Chinese Mitten Crab begins its life cycle as an estuarine pelagic larva. At this stage, it will settle to the bottom of an estuary and begin migrating to freshwater streams. It may spend one to several years in the stream before returning to the coast to breed. This crab may cover hundreds of kilometers during its migrations, rapidly spreading throughout a new ecosystem. Larval development is similar to that in most marine grapsid species, where there is normally a prezoa stage, five zoeal stages, and a megalopa stage. The larval development of the Chinese Mitten Crab shows variability in the number of its larval instars, sometimes passing through an additional zoea stage. This may be related to unfavorable environmental conditions. During most of the larval stages, except the first zoeal stage and the megalopa stage, the Chinese Mitten Crab has very little tolerance for low salinities. During the first zoeal stage and megalopa stage, the larvae continually leave and re-enter estuarine habitats, whereas the larvae of intermediate stages (zoea II-V) develop in coastal marine waters. Thus, adaptation to freshwater environments is restricted in the mitten crab to its benthic juvenile and adult life-cycle stages.

Habitat: The Chinese Mitten Crab spends most of its life in fresh water but migrates to the sea to breed. These crabs prefer hard bottom surfaces and areas covered with submerged plants.

DISPERSAL POTENTIAL

Historical and Current Introduction/Spread: The Chinese Mitten Crab is native to the coastal and estuarine ecosystems of China and North Korea. It was first recorded in the San Francisco Bay in 1992 and was most likely introduced by either ballast water or as an intentional introduction to establish a food source. This crab is presently well established throughout the San Francisco Bay, the Sacramento-San Joaquin Delta, and the main stems of the

major rivers and tributaries that flow into the estuary. Between 1992 and 1998, the distribution of the Chinese Mitten Crab in the San Francisco estuaries and tributaries increased rapidly. It is very likely that the crab will eventually spread throughout California. Although not currently present in the Pacific Northwest, scientists predict that, like the European green crab, the Chinese Mitten Crab is likely to arrive in Oregon, Washington and even British Columbia through shipping or intentional release. The crab is not currently present in Alaska.

Dispersal Methods: The spread of the Chinese Mitten Crab occurs through ballast water, deliberate releases by humans, dredging, ocean currents, and by recreational/commercial boating activities. Once introduced to a new location, the crab will migrate to surrounding areas on its own.

IMPACTS AND CONTROL

General Impacts: Chinese Mitten Crabs are proficient burrowers, digging burrows in muddy banks of streams and marsh channels. In soft river banks, they form horizontal and vertical tunnels, which can cause dike walls to rupture and river banks to collapse. This crab is also known to interfere with a variety of commercial and recreational fishing activities, such as stealing bait from fishing lines. The crab is a bottom feeder, and as a result, it can accumulate biotoxins, such as mercury, within its tissues. This may raise health concerns for both humans and wildlife that use the crab as a prey source. This crab's feeding behavior contributes to a decrease in vegetation in agriculture fields and/or natural habitats. Fish in fish salvage or fish passage operations face increased mortality due to the presence of mitten crab in the facilities. Water diversion/industrial use activities are subject to interference due to crabs blocking or clogging systems. Recreational and commercial fishing are subject to interference and reductions in opportunities and efficiencies due to blocking or clogging of traps and nets, bait stealing and/or damage to gear or catch. The impacts of predation, competition, habitat alteration and/or foodweb disturbance on biotic populations lead to a decrease in biotic populations and/or biodiversity, and a change in the community structure.

Management Information: Control measures for the Chinese Mitten Crab include trapping and preventing its spread by human activities. Once established, chemical control is not a viable option due to the Chinese Mitten Crab's ability to disperse widely and quickly. Much more research is needed to determine effective biological control measures for the crab.

Key Notes: The Chinese Mitten Crab is capable of emerging from water and crossing dry land to enter new river systems. It is illegal to carry or transport live Chinese Mitten Crabs in California, Oregon and Washington. It is also illegal to import eggs or live specimens of any species of Chinese Mitten Crab to the United States under the Federal Lacey Act.

What can you do? If you catch a Chinese Mitten Crab:

1. Do not release it!
2. Note the location and date.
3. Keep the entire carcass, freeze if necessary.
4. Call the Alaska Department of Fish and Game at (907) 465-6109.

For information about how the State of Alaska is addressing the potential threat of this species through the State of Alaska Aquatic Nuisance Species Management Plan, please contact: Bob Piorkowski at the Alaska Department of Fish and Game, 907-465-6109 or Robert_Piorkowski@fishgame.state.ak.us.