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Despite Losing its Mittens, a Chinese Mitten Crab Finds its Way to Connecticut

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Despite Losing its Mittens, A CHINESE MITTEN CRAB

“The crab looked nothing like any species I had ever seen in the Sound.”

By Nancy Balcom

There’s a familiar nursery tale about kittens losing their mittens, but I’ve never read one about a CRAB with mittens, lost or otherwise! Yet, this past summer a Chinese mitten crab was discovered in a fishway in the Mianus River in Greenwich, making its way up river towards fresh water. Although the crab was missing its front claws and therefore its “mittens,” Joseph Cassone suspected what it was and kept it so its identity could be confirmed. Cassone, a conservation assistant with the Town of Greenwich, was at the Mianus River fishway helping a camera crew get footage of juvenile eels for a documentary.

“In the resting pools of the fishway, we have 1-inch diameter PVC tubes we use to monitor for yellow phase [sexually-immature] eels moving through the fishway. I dumped out the tube into the net looking for eels and the crab popped out instead.” Cassone said.

“I did a double take when I saw it, because the pool was at the top of the fishway in fresh water

and the crab looked nothing like any species I had ever seen in the Sound.” Cassone reported his find to Connecticut Department of Energy and Environmental Protection (DEEP) fisheries staff, who then took custody of the crab.

Subsequently, the Smithsonian Environmental Research Center (SERC) in Edgewater, Maryland confirmed what we all believed, that the crab was indeed a Chinese mitten crab (*Eriocheir sinensis*), a native of western Korea and China. While this news of another non-native species introduction was unwelcome, it was not necessarily surprising. The SERC database indicates that more than 40 male and female Chinese mitten crabs have been reported in the Mid-Atlantic area since 2005 and in the Hudson River in New York since 2008. Both adult and juvenile crabs have been found, including females carrying eggs. An established invader species in Europe, the crab was discovered on the U.S. west coast in the early 1990s, where it became prevalent in some areas. However it’s hard to predict what



its presence will mean for East Coast freshwater and marine ecosystems, or to know what the resulting impact might be if a population does become established, based on what has happened there. James T. Carlton, director of the Williams-Mystic Program and an internationally-recognized expert on invasive species, recently

Finds its Way to Connecticut



Adult Chinese mitten crab, sporting characteristic "mittens" on front claws.
Photo Credit: California Department of Water Resources.

noted that Chinese mitten crabs once numbered in the 10s of millions in the San Francisco Bay area. Now adult crabs are inexplicably rare finds. For whatever reason, the adult crabs have largely disappeared from the Bay area where their migrations once caused tremendous economic and environmental damage.

So, how did a Chinese mitten crab end up in the Mianus River, or in the United States at all, for that matter? There are some likely pathways to consider. Given that it is a popular food item with a number of Asian cultures, live Chinese mitten crabs may have been intentionally imported and released into U.S. waters to

SO WHAT NOW?

One of the priority actions outlined in Connecticut's Aquatic Nuisance Species Management Plan, signed by former Governor Rell in 2007, is the development of an Early Detection - Rapid Response (EDRR) Plan. The DEEP, which holds the lead responsibility for implementing the management plan, worked with Connecticut Sea Grant and other members of a broad-based working group to develop a draft protocol for determining the State's response to reports of new introductions of non-native species. Given the limited resources available to address aquatic invasions, the protocol is expected to help the DEEP and its partners assess risks, determine whether action is necessary or even possible, and coordinate the response in whatever form it takes. The draft EDRR plan was completed in 2011; this discovery of the Chinese mitten crab provides an excellent opportunity to test how the new protocol works before it is formally adopted.

encourage its availability as food. Crab larvae may have been inadvertently released in discharged ballast water originating from Asian or European ports. Recognizing the ecological and economic harm this species posed, the Chinese mitten crab was listed as Injurious Wildlife under the Federal Lacey Act in 1989, making it illegal to

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import or export these crabs, or sell them in interstate commerce, without a permit. Unfortunately, not all live shipments of seafood are currently inspected due to the vast volume arriving daily. Federal regulation of ballast water discharges has been slower than anticipated in its shift from a voluntary to a mandatory expectation. This is because of the difficulty in coming to an agreement with the states and the global shipping industry on what standards can be or should be met, and how well they can be verified, with the treatment technologies that currently exist. It is also possible our Mianus River invader may have originated in or near the Hudson River and was somehow transported to and released into Greenwich-area waters.

Interestingly, this non-native invasive crab species is catadromous, meaning that the crab lives in fresh and salt water during different parts

of its life cycle. The crabs spawn or breed in salt water but live in fresh water. Juvenile crabs migrate in late summer or early fall to freshwater tributaries where they remain for two to five years. Mature adult crabs migrate back to the estuary in late winter or early spring to mate, spawn, and die. Each mature female crab can produce between 250,000 and 1 million eggs, which hatch in late spring or early summer. The mittenless Mianus River crab with its shell about 4 cm across was either a juvenile or sub-adult. Given where it was found, it had apparently been making its way upstream to fresh water when captured. How and when it lost its front claws and whether any companions were migrating with it are left to speculation. No other crabs have been caught to date.

This is not the first crab species to inhabit fresh waters of Connecticut. The Harris or white-

fingered mud crab (*Rhithropanopeus harrisi*) is a native species that can inhabit waters that are fully marine to fresh water, but seems to be most prevalent in low saline or brackish water. Ironically, an adult Harris mud crab could be confused with a juvenile Chinese mitten crab, as their identifying characteristics are very similar. For example, they both sport white-tipped claws and four spines on the sides of their shells. Neither have the setal bundles or “mittens”. However, the shell of an adult mud crab is only about 2 cm wide, compared to 8 cm for an adult mitten crab. The most distinguishing characteristic of adult Chinese mitten crabs are their furry or “mittened” claws. Including their legs, they can achieve a length of about 30 cm, similar in size to spider crabs inhabiting Long Island Sound.

“When I found the crab I was pretty sure it was a mitten crab based on its appearance and the fact that it was in freshwater, but I couldn’t be 100 percent positive since it did not have its claws... so I sent it along to DEEP staff to be further verified”, explained Cassone. Early detection is possible because of people just like Cassone, who recognize when they’ve seen something unusual and take steps to report it. This is how we’ve come to know that non-native, invasive species like the Asian shore crab (*Hemigrapsus sanguineus*) and the red algae, *Heterosiphonia japonica*, are now present in Long Island Sound.



Mianus mitten crab: The actual young specimen, lacking front claws, found heading upstream in a fishway heading upstream in the Mianus River. Photo by: Nancy Baloom, CTSG.