

Our Ocean Backyard — *Santa Cruz Sentinel* columns by Gary Griggs, Director, Institute of Marine Sciences, UC Santa Cruz.

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Aquatic Aliens



Chinese Mitten Crab.

While the marine life growing on the section of dock carried from Japan to the Oregon coast recently brought attention to the issue of foreign aquatic species invading our shoreline, this wasn't a new event.

In California, introduced terrestrial plants have surrounded us for well over a century. Many of these were intentionally brought from Central America, Asia and Europe and today are integral parts of our state's agricultural economy- citrus, avocados, olives, figs and artichokes, to name just a few. Then there are the others, so invasive and ubiquitous that perhaps some residents are probably unaware that they were introduced from somewhere else: Scotch and French broom, acacia, eucalyptus, pampas grass, ice plant, poison hemlock and thistles, to name some examples from the Monterey Bay region.

There are a few foreign marine species that are actually being considered for introduction because of their perceived benefits. Asian oysters, for example, are better at filtering out water pollutants than native oysters. They also withstand disease better and grow faster than the natives. Biologists are currently considering introducing the oysters into Chesapeake Bay to help restore stocks and remove pollutants.

More commonly, however, invasive or exotic species become problematic because they typically grow fast, reproduce rapidly, have the ability to disperse widely, and

displace or outcompete the native populations, whether flora or fauna. They may also prey or become parasitic on native species, can transmit diseases, or may even impact human health.

Some examples of the direct impacts of these invaders include clogging of navigable shipping channels and canals, damaging crops, and reducing commercial or sport fishing populations of fish and shellfish. Damage can be extensive with estimated losses and control costs for all invasive species in California, terrestrial and marine, being about \$3 billion annually.

A few of the aquatic bad guys include *Caulerpa*, the New Zealand mudsnail, and the Chinese mitten crab.

In June of 2000, several divers went for what they thought was a routine swim through the eelgrass bed in Agua Hedionda Lagoon in northern San Diego County. Working on a restoration project, they were swimming transects, measuring the extent of the eelgrass bed and noting new shoots. Then one of the divers came face- to-face with a large patch of unusually green, beautiful feathery seaweed. This strange plant would later be identified as the first confirmed North American siting of what has been called “the killer algae”, or *Caulerpa*, which has also invaded the Mediterranean.

While not a combative “killer” in the true sense of the word, this renegade aquarium plant grows rapidly and can form a smothering blanket over mud, sand, or rock, severely reducing native populations of seaweeds and seagrasses. This invasive weed can take over the natural eelgrass beds, which provide habitat for lobsters, flatfish and bass, threatening their populations. It also can spread or grow up to ten times as fast as the native seagrass.

To date it has been found in only this one lagoon in San Diego County but also in Huntington Harbor in Orange County. Eradication efforts are underway through a process of covering the *Caulerpa* with tarps and attempting to chlorinate the affected areas.

The New Zealand mudsnail is native to fresh waters of New Zealand and was first discovered in the Owens River of eastern California in 2000. While there has been little research done on its potential impact, it is believed that their populations can become very dense, thereby reducing populations of other invertebrates, which could have a significant impact on trout fisheries.

In 1998 in a small Palo Alto creek that flows into South San Francisco Bay, a 10-year girl old discovered a small creature that could have been out of a science fiction horror movie. It looked like a large tarantula but with hairy claws and long spiny legs protruding from a dark shell.

North of Sacramento near Rio Linda, a 13-year old boy found similar creatures about the same time in a drainage canal, and began catching them in buckets to show his friends. Two years earlier, in 1996, biologists found 45 of these exotic crabs trapped on fish screens at water pumps in the Sacramento delta. In 1998 they returned and found 25,000 caught on the screens in a single day.

The creature, the Chinese mitten crab, has turned thousands of miles of California waterways and canal into a bad movie. These crabs have shown up nearly everywhere in central California, from Alviso to San Francisco to Sacramento and as far east as Roseville in the Sierra foothills.

The mitten crab, named after the dense patches of hair on its claws that resemble mittens, is native to the coastal rivers and estuaries of China. It spread through Europe in the early part of the last century and apparently was first discovered in California in 1993 in San Francisco Bay.

It isn't clear whether these crabs came in ballast waters or were illegally introduced. The latter is believed highly likely, as there is a lucrative market for them in China where they sell for \$10 to \$20 apiece, prized because the crab ovaries are believed to provide magical powers after being consumed.

Imports and sales were banned in California by the Department of Fish and Game after it was learned that live crabs were being sold in both Los Angeles and San Francisco. The species can carry a lung fluke, and instead of bestowing magical powers, they can cause symptoms very much like tuberculosis that an infect anyone eating raw or incompletely cooked crabs.

The population has exploded and has presented California with some serious problems. These hairy crabs a variety of bottom dwelling animals, from shrimp to young shad, and potentially eggs and juveniles of salmon and sturgeon. The crabs burrow into stream banks and levees, which can accelerate erosion and reduce levee stability and safety. They have repeatedly clogged water intake structures in large numbers.

Because of the environmental and economic impacts that invasive species are having on California's coastal and fresh water environments, a number of measures are being developed and employed in efforts to reduce the spread and contain the damage. Treating ballast water is one way in which these aquatic hitchhikers can potentially be controlled, but unfortunately, there is a long road ahead simply because of the large number of species that have already become established in the state's inland waters.