Manifest Destiny – Clam Style

By Bert Bartleson

"Manifest Destiny" was one of the concepts taught to me during American History in high school. It was the inevitability of American settlers during the nineteenth century marching across the entire continent to the Pacific Ocean. In the world of introduced mollusk species, it seems that some successful invaders will expand their territory until they run out of unoccupied space or reach some physical barrier, much like the settlers reaching the Pacific Ocean.

The "purple varnish clam [PVC] or Purple Mahogany-clam", *Nuttallia obscurata* (Reeve, 1847) seems to be one of these very successful introduced species. They are native in Japan, Korea and possibly China. They usually live quite high in the intertidal zone so don't directly compete for food with the native littlenecks, Manila clams, butter clams and horse clams that all prefer lower tidal levels on our local beaches. It is likely that they were released with ballast water near Vancouver, B.C., Canada waters about 1990. They were first observed during August 1991 by Robert Forsythe. A report was published in 1993 in the Dredgings. The clams spread southward to Boundary Bay and Birch Bay in Whatcom County and into the San Juan Islands quite quickly. They also spread rapidly to the North in the Strait of Georgia.

Bert Bartleson photo

The reason for this rapid spread wasn't immediately known. But in 2006 a paper by Dudas and Dower helped to explain why. They studied the larval period that the veliger stage of the clam was still in the water column. They found that the PVC was able to stay in the water column for 3-4 weeks and maybe as long as 8 weeks. During that extended time the potential travel in the currents was significant. A map showing currents from Vancouver also helps explain the current distribution. Water would head North from Vancouver up the Georgia Strait and then turn South through the San Juan islands and out the Strait of Juan de Fuca to the Pacific Ocean. Once there it would travel North up the West coast of Vancouver Island. However about 3/4th of the way up the coast it would turn and head South along the Washington Coast and into Oregon nearly as far South as the California border.

The first shells of PVC's in my collection were collected by the county health department from Skagit County at Clayton Beach in May 2003 during PSP monitoring. I have other shells that I collected at Pillar Point in Clallam County in May 26, 2005 and in Boundary Bay B.C. on June 12, 2006. The distribution of the clams continued expanding further South into Puget Sound and Hood Canal. In addition, the PVC's are established in Willapa Bay and in Oregon at Siletz Bay and near Florence. I was expecting them to eventually occur in the entirety of Puget Sound. Therefore, I wasn't too surprised when I found dead shells and live clams at Tolmie State Park in Thurston County during low tides on 19 May 2018. Tolmie State Park is near the Pierce County line and the Nisqually Reach. They had been reported to me last year by the beach naturalists working there, although I hadn't seen them during an April 2017 trip there myself. This is the first report of PVC's in Thurston County to my knowledge.

I will check further into South Puget Sound and see how long it takes them to reach every corner of the many narrow bays near Olympia. My belief is that they will reach their "manifest destiny" here in Olympia at West Bay of Budd Inlet about 2020.

I reviewed I-Naturalist reports for 3 locations in Oregon, 16 in Washington and 23 in B.C., Canada which were identified as locations for PVC's. In addition, there are two observations from South Korea. All had photos and I concurred with the identification in all cases except one. The earliest observations of PVC's were in 2006 on this program. Most of the observations posted occurred during the past three years. The one photo that I questioned the identification for was from central California and appeared to be *Nuttallia nuttallia* (Conrad, 1837). It is a related but distinct species and is native to California and South to Baja California, Mexico (latitude 38.3 North to 24.6 North).

References:

Dudas, SA and Dower, JF. 2006. "Reproductive ecology and dispersal potential of varnish calm *Nuttallia obscurata*, recent invader in the Northeast Pacific Ocean". Marine Ecology Progress Series V320: 195-205.

Mills, CE. (2002). *Nuttallia obscurata*, the purple varnish clam or the purple mahogany-clam. Last accessed at http://faculty.washington.edu/cemills/Nuttallia.html on 2018-6-10.

"Purple Mahogany Clam". *iNaturalist*. Last accessed at https://www.inaturalist.org/taxa/430211-Nuttallia-obscurata on 2018-6-10.