

Oyster census finds billions of bivalves, but most aren't big

By Karl Blankenship

The Bay's oyster population may have been devastated by disease, but it is in no jeopardy of disappearing — there are still billions of the bivalves in the Chesapeake, according to preliminary results from the first-ever oyster census.

The oyster count, being carried out by scientists in both Virginia and Maryland, is necessary for the Bay Program to gauge progress toward its Chesapeake 2000 agreement goal of attaining a tenfold oyster increase by 2010.

"When the commitment came out, we knew we needed some idea of where the population stands now," said Derek Orner, of the National Oceanic and Atmospheric Administration's Chesapeake Bay Office, which is funding the work along with the EPA's Bay Program Office. "We have to have something to measure against."

Indeed, while there is more than a century of harvest records for Chesapeake oysters, no one has ever measured the overall population, so there was no way of knowing whether the goal was ever met.

But coming up with a reliable population estimate turns out to be no easy task. And the effort — expected to be completed next year — is yielding some surprises.

For example, the James River appears to produce more oysters than the entire state of Maryland — they just happen to be small oysters that don't live long before they are eaten by predators or fall victim to the diseases MSX and Dermo.

"All the talk and misery about oyster populations drastically declining is because there are not any market-size oysters," said Steve Jordan, director of the Sarbanes Cooperative Oxford Laboratory, a joint operation of the Maryland Department of Natural Resources and NOAA.

In Maryland, Jordan and his colleagues estimate there are between 700 million and 1.6 billion oysters. But the 700 million figure is derived from harvest data and long-term monitoring programs that target harvest areas.

That figure is almost certainly an undercount because it leaves out sizable areas where oysters are not harvested, Jordan said. "We think we are probably low in that estimate," he said.

When scientists attempted to estimate oyster populations based on the amount of available habitat — including many areas that are not harvested, or have marginal habitat — they come up with a figure more than twice as large, about 1.6 billion.

But, Jordan added, "those estimates are based on such small data sets that we don't have much confidence in them, either." The correct Maryland number, Jordan said, is probably in the range of 1 billion to 1.2 billion oysters.

In Virginia, by contrast, scientists are wrestling with numbers which reach into the hundreds of billions of oysters.

Scientists from the Virginia Institute of Marine Science in recent years have painstakingly surveyed, using tongs, small areas in the James River, and actually counted individual oysters.

That gives them an index that can be extrapolated to oyster bars with a high degree of accuracy. Nonetheless, the work has produced what sounds like a highly inaccurate population range for the years 1993-2000: anywhere from 8.68 billion to 598 billion, according to Roger Mann, the VIMS

scientist leading the effort.

The huge range, he said, reflects the fact that the James River typically has high “spat sets” — oyster larvae that successfully latch onto a solid substrate and begin to grow — and in some years it has spectacular spat sets.

Surveys done after those spat sets have hugely inflated counts. “You can get thousands of spat, but they only have the biomass of a couple of big oysters,” Mann said.

By contrast, Maryland typically has small spat sets, but somewhat better survival. That means it have fewer, but bigger, oysters.

Estimates for the large amounts of historic oyster grounds in the rest of the Virginia are even more problematic. Scientists had to use information from dredge surveys, where an open dredge is hauled across the bottom. But dredges bounce, and the amount of oysters collected in a dredge haul can vary widely.

So, scientists start with an uncertain number, then have to multiply it across the amount of potential habitat. Because oyster habitat was never precisely mapped, that number is also uncertain — and the amount of potential habitat is almost certainly overestimated in historic records. Further, many of those oysters, like those in the James, are also small.

“Typically, what happens in places like the James is you get lots and lots of very small oysters,” Mann said. “In Maryland, you tend to get a lower number of much larger oysters. So if you just use the number, it looks as though there are more oysters in Virginia than there are in Maryland. But if you look at the actual biomass, which is a product of the number times the average size, then the number goes exactly in the opposite direction.”

In the next year, scientists in both states are looking to refine their estimates to reduce the amount of uncertainty. They are working to account for bivalves grown as part of “oyster gardening” projects on private docks, as well as at larger restoration efforts.

Also, they need to agree on how “big” an oyster needs must be in order to get counted. “If you count them at the right time of the year, you can get a tenfold increase anytime you want,” Mann said. “But that is cheating.”

A lot of the young oysters, he noted, die in the first month. “Once we compare adult numbers, the numbers in the two states will tend to approach each other,” Mann predicted.

Likewise, the scientists need to figure out how to account for the large amount of hatchery-reared oysters that Maryland plans to start using in restoration efforts — a figure expected to reach 100 million a year. As in the James, those numbers could greatly inflate figures depending when they are counted.

Eventually, the scientists will likely use two indicators to measure oyster stock. The population count, which provides useful information about the number of oysters and population trends, and the “biomass,” which would reflect not only the numbers of oysters, but also their size.

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