WITEK: COUNTING FISH (from page 19)

Because of that, MRIP estimates of seldom-encountered species are notoriously unreliable, while its estimates of commonly-encountered species are reasonably precise. Such precision is measured by the "percent standard error" of the estimate; according to NOAA

"This value indicates how far the point estimate is likely to deviate from the actual population value, expressed as a percentage of that estimate. The lower the [percent standard error], the more precise the estimate."

Thus, when MRIP estimates that about 21.8 million black sea bass were caught in the Mid-Atlantic region last year, and notes that such estimate has a percent standard error of just 7.6, fisheries managers can place their faith in that number, knowingly that while it's not perfectly precise, it is precise enough for management purposes. Regional regulations based on any such estimate are likely to work reasonably well.

On the other hand, managers would be foolish to use MRIP's estimate of just 485 southern flounder being caught in the Mid-Atlantic in 2019, for that estimate has a percent standard error of 101, which renders it completely worthless.

Since error can cut in either direction, it is entirely possible that the 485 southern flounder was a gross over-estimation of the number of fish caught; samplers may have come across just a single angler, who had a single flounder in possession, but that fish later grew into 485 individuals through the interpolation process used to create the estimates—even though it was the only southern flounder caught in the entire region. At the same time, it is just—and perhaps more—possible that the number of southern flounder caught in the region stretched well into the thousands, but MRIP surveyors just didn't come across enough anglers who caught such fish to document the trend.

The fact that, over the past decade, the number of southern flounder reportedly caught in the region varied widely, from well over 5,000 (PSE=69.6) in 2018 to -0- (no PSE calculated) in five separate years illustrates that issue very well, although the fact that 9 of the 10 estimates were under 500 suggests that the number of flounder actually caught is probably very low.

So it's clear that for the MRIP to provide in accurate estimate, not only must a reasonable number of anglers be sampled, but those anglers must encounter a reasonable number of the species in question.

To show how that works, we need to take another look at the **Mid-Atlantic black sea bass catch in 2019**.

As noted earlier, fishery managers could use the 2019 annual catch estimate to come up with some reasonably effective black sea bass regulations. But the Mid-Atlantic Fishery Management Council and the Atlantic States Marine Fisheries Commission, which jointly manage black sea bass in the region, have decided to **manage the fish on a regional basis**, establishing the states between Maine and New York, New Jersey, and Delaware through Virginia (actually, through North Carolina, but that state hosts two different black sea bass stocks, making its reported figures difficult to work with) as separate regions for regulatory purposes.

But that isn't quite all, for even within a region (except, obviously, for New Jersey), the states don't have to adopt the same management measures, but instead may establish supposedly "**conservation equivalent**" rules, based on MRIP but different from those of other states in the region, if the ASMFC agrees to let them do so.

But the black sea bass catch estimates, on a state-by-state level, no longer have a percent standard error of just 7.6, instead, just among the Mid-Atlantic states, the error associated with state-level estimates ranges from a still-reasonable 10.9 in New York to a borderline unreliable 38.9 in Maryland, with the other states mired in the mid- to high teens.

That's still not too bad, but any regulations based on such estimates will necessarily have a lower chance of success than those based on the regional estimate, because they embrace a smaller population and so inherently increase the likelihood of error.

But the states don't stop there. Of the Mid-Atlantic states, two, New York and New Jersey, also have different regulations depending on the time of year (MRIP estimates are broken down into two-month waves, with Wave 1 including January and February, Wave 2 March and April, etc.).

When we break things down to that level, we find New York percent standard error ranging from 16.3 in July/August, when the most people are on the water, to 27.6 in November/December, when most boats have already been taken out of the water for the winter. New Jersey shows an even greater spread, from 18.6 in May/June to a dismal 43.2 in November/December. In both cases, such PSE's represent another step away from the accuracy of black sea bass data on an annual level, 10.9 and 13.0, respectively.

So, again, regulations that change during the year are less likely to succeed than those that remain consistent throughout the year; however, such changing regulations shouldn't impact the accuracy of stock assessments, as there recreational catch can be estimated on an annual, coastwide basis.

So whether the MRIP works as well as it should depends, in part, on why fish are being counted. Annual, coastwide estimates with low PSEs work well in the assessment process, but state-level estimates may not be good enough to adopt effective regulations that are not consistent throughout the year.

The bottom line is that accurate recreational catch estimates are an important part of the fishery management process. But the accuracy of such estimates isn't merely dependent upon the MRIP survey process. It also depends on how estimates are used.

To the extent that estimates are used in ways that don't maximize their precision, such estimates will continue, at times, to lead managers astray.

Charles Witek, from Greenwich CT, has spent over 50 years on the water, and is a well-known author and blogger. Witek said, "I have realized that without strong fisheries laws and effective conservation measures, the future of salt water fishing, and America's living marine resources, is dim."