

Fumbling the numbers on summer flounder

by CHARLES WITEK

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."



The way things are supposed to go, fisheries managers compile their data. Then they wade through the numbers, and with the information provide, adopt a policy for managing the relevant fishery.

I've long said that if you clear your mind, and let the numbers do the talking, they'll tell you just what to do.

However, there are folks out there who want to turn things upside down. Instead of creating a policy based on the data, they try to create data that supports their favorite policy, whether or not it makes sense to anyone else.

We saw that recently with summer flounder.

Just last week, an article appeared in *The Fisherman* titled "A Case for Change in Fluke Management." It was written by someone named Tom Smith who, according to information accompanying the article, is a corporate numbers-cruncher, but seems to lack any training or experience in the science of fisheries management.

It's telling that the piece was subtitled, "New and exciting data could indicate that NOAA Fisheries efforts to save the summer flounder fishery may actually be contributing to the recent decline, an argument that could bear fruit in [Save the Summer Flounder Fishery Fund's] ongoing efforts," since Mr. Smith is apparently a devotee of one of the newer fads in summer flounder management, the notion, promoted by the aforementioned Save the Summer Flounder Fishery Fund, that a decline in the summer flounder biomass is directly attributable to higher size limits that focus recreational harvest on female fish, and thus cause the female spawning stock to shrink below sustainable levels.

Mr. Smith had already advanced that position in a comment letter that he sent to the Atlantic States Marine Fisheries Commission earlier this year, when he wrote, with regard to proposed 2017 regulations

"...So if we were to maintain a 5 fish limit similar to '16 but change the mix, establish a slot limit of maybe three smaller fish combined with 2 fish at the existing 18" limit. Give breeders a few more years to help the overall biomass..."

In such comments, he didn't mention how reducing the minimum size for three of the fish in his proposed 5-fish bag limit - and thus make it easier for anglers to find legal-sized fish - would help reduce 2017 landings by 41% compared to landings in 2016, as ASMFC was then attempting to do, without radically shortening the summer flounder season.

Such omission suggests that Mr. Smith either overlooked that critical issue, which is somewhat troubling, or didn't fully understand the implications of the proposal that he was submitting, which is even more troubling, given that he is writing magazine articles on fisheries management.

However, his comments do suggest that in writing the recent article for *The Fisherman*, he was attempting to justify a position

that he already held, rather than trying to analyze available data in order to discover the proper management policy.

Such supposition is supported by the fact that the premise of the article is highly dependent on a variable that Mr. Smith refers to either as "SSB recruitment strength" or "reproductive strength".

Such variable, which Mr. Smith seems to have created solely to support his argument, is apparently derived by dividing the annual recruitment of summer flounder, expressed in numbers of Year-1 fish, by the size of the spawning stock biomass, expressed in metric tons.

Mr. Smith notes that, "The [resulting] graph shows that the reproductive strength of the summer flounder SSB has been decimated over the last 20 years or so. The ratio peaked in 1993 [when the SSB was well below the "overfished" threshold] at ~3,243 [Year 1] fish per metric ton of SSB and reached its low in 2015 of ~644 [Year 1] fish per metric ton. That constitutes an approximately 80% decrease in recruitment strength, the result of which has been a 13-year decline in overall SSB because as recruitment strength declines the number of fish maturing to create a sustainable SSB declines as well."

While that conclusion may seem superficially attractive, in the end it merely serves as an illustration of why non-scientists who play with the data should always be aware of the statistician's warning that "Correlation does not imply causation."

Before making any attempt to draw a conclusion from seemingly related numbers, it's necessary to first make sure that there are no so-called "lurking variables" that might give rise to both sets of figures, and so create a false correlation.

For example, there may well be a correlation between people who go to sleep with their shoes on and those who awake with a headache. However the shoes have far less to do with their morning malaise than the fact that they went to bed stone drunk the night before, which is why they left their shoes on in the first place...

Mr. Smith fell victim to such false correlation. Simply because he has inadequate knowledge of fisheries science, he assumed that there was a straight-line relationship between the size of the spawning stock biomass and recruitment. In fact, no such simple relationship exists, and any stock/recruitment relationship that might occur is far more subtle.

To quote from *Fisheries Ecology and Management*, a standard fisheries biology text written by Carl J. Walters and Steven J.D. Martell, "Beverton and Holt [who developed the basic population model currently used to assess summer flounder, and many other species] examined early data on the relationship between parental spawning stock and subsequent recruitment, and data on the early mortality rates of juvenile fish. (to page 31)