



Atlantic States Marine Fisheries Commission

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MEMORANDUM

TO: Horseshoe Crab Plan Development Team
FROM: Horseshoe Crab Advisory Panel
DATE: July 22, 2022
SUBJECT: Advisory Panel Input on Biomedical Mortality and Best Management Practices

Background

In October 2021, the Board assigned the Plan Development Team (PDT) with the following task: review the threshold for biomedical mortality to develop biological based options for the threshold and to develop options for action when the threshold is exceeded; also, review the best management practices (BMPs) for handling biomedical catch and suggest options for updating and implementing BMPs. The PDT requested that the Horseshoe Crab Advisory Panel (AP) meet to discuss this task and provide input to the PDT regarding the biomedical mortality threshold and BMPs.

The AP met on July 11, 2022 to review the task and provide comments to the PDT. A summary of the AP's discussion and is summarized below. These comments represent the opinions of individual advisors and do not represent a consensus opinion.

Advisory Panel Attendance: Brett Hoffmeister (ACC), Allen Bergeson (Lonza), George Topping (commercial for biomed Lonza), Christina Lecker (Fuji Wako), Benjie Swan, Walker Golder (Audubon, Coastal Land Trust), Nora Blair (CRL), David Meservey (Fisherman Dealer)

Public: Ben Levitan (Earth Justice), Kristoffer Whitney (RIT, NSF research)

AP Comments on Biomedical Mortality

Regarding the current estimates of biomedical mortality, Allen commented that the 15% mortality rate that is assumed for crabs that are bled was originally based on studies that used practices that are completely different from the true practices of the industry. He believes the mortality associated with the biomedical process is actually much lower, closer to 5%. He also noted that during the last assessment the data showed that the biomedical crabs had better survival rates than crabs not processed by the biomedical industry; this is because the biomedical labs take care not to bleed crabs that are unhealthy. A paper by Dave Smith (2020) estimates better mortality for bled crabs than control crabs. Regarding the 57,500 crab mortality threshold, Allen said this number was arbitrary when it was established. Efforts have replenished HSC in last few years.

Nora Blair echoed the statements related to the biomedical mortality rate and feels 15% is an overestimate. She also agreed with the TC in their decision to not recommend a biologically-based mortality threshold.

Walker Golder commented that the claims that biomedical mortality is lower than currently estimated do not address or explain why egg density in the Delaware Bay is low compared to what it was years ago. It used to be that egg density was 50,000 per square meter on the beaches in May. He is concerned that there are no signs of increasing egg density in the Bay regardless of the trawl survey trends, noting

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that the shorebirds need eggs to survive, and other species need them too. In addition, he has concerns about the post-handling mortality and impacts of bleeding on horseshoe crabs. He would also like to see more research on the impact of post-spawning capture, because spawning is energetically intensive; post-spawning capture at a time when crabs may be trying to replenish energy supplies and body condition could be contributing to mortality. Similarly, there seems to be minimal information on physiological effects on the adult crabs that are bled. He is also concerned about the release of the crabs after bleeding, specifically about whether the crabs are displaced from their habitat and spawning areas, and not being released close enough to where they are collected.

Allen Burgenson responded to these concerns, first stating that he believes the timing of the shorebirds and the peak egg density of horseshoe crabs are out of sync. Regarding replacement of crabs collected for Lonza, the collection location coordinates are taken and recorded, and also the release coordinates, which allows them to return the crabs within a small area near where they were collected.

AP Comments on Biomedical Best Management Practices

The AP members discussed and provided some thoughts on the BMPs, as well as current practices in the biomedical industry. They also reviewed each of the BMPs from the 2011 document, and provided a few suggested changes.

Walker Golder noted concerns that in general, the language in the BMPs is too vague, and that the BMPs should be coastwide mandates instead of recommendations or state requirements. He would like to see BMPs that are more prescriptive and take into consideration the geographic variability and other variables from capture to release, because the current language leaves it open to interpretation of the individual. For example he asked if a specific tow time for trawls could be required rather than recommended.

The AP members representing the biomedical companies agreed that the BMPs were written this way because of the variation in the environment, collection methods, and facilities along the coast. Because there are different fishing practices in different states, for example hand harvest versus trawling, some of the BMPs would not be practicable in some areas and therefore could not be mandates. Similarly, they discussed that language like “appropriate” or “suitable” were used to describe issues like temperature and number of crabs in transport containers because these factors depend on the conditions specific to an area (e.g. the water temperature in South Carolina is different from that in Massachusetts). Therefore they agreed that broad restrictions or requirements across states would not make sense.

Brett Hoffmeister reminded the group that states have their own specific regulations to protect the spawning population of horseshoe crabs, like lunar closures. For example, in Maryland they do not collect crabs until after they spawn, after the second week of June. Walker Golder said all harvest and biomedical collections should be prohibited during the spawning period and during the period that horseshoe crabs are staging for spawning, including hand harvest.

In general, the biomedical representatives on the AP agreed that the industry is following the best management practices as if they are required (and in some states they are requirements) and making an effort to minimize mortality and stress of the crabs. It is in their best interest to keep mortality as low as possible. For Lonza, the BMPs are included in a contract with the fishermen and in their collection permit, and Maryland audits them for compliance with the BMPs.

Several AP members spoke favorably about the dual use of horseshoe crabs (bait crabs being used for biomedical before being returned to the bait market), saying it is an efficient use of the resource. Others said that it would not be possible in their state because there is no bait fishery.

The AP members suggested some specific changes to the BMPs, as follows:

- Under *Collection*, combine these two redundant bullets: “Sort out and return to the water individuals that do not appear to be healthy (damaged, slow movement, dull shell/old)” and “When possible, release juveniles or unhealthy individuals immediately and do not transport to the facility.”
- Under *Transport to Facility*, change “Maintain temperature between approximately ambient water temperature at time of collection and 10°F below ambient-water temperature” to “Maintain appropriate temperature to prevent temperature shock.” This addresses variation in temperatures along the coast and identifies the purpose of the practice.
- Under *Holding at Facility/Preparation for bleeding/Bleeding*, substitute the term “cell collection” for bleeding, and “collection” for harvest.
- Edit “Continue 30-year policy of not attempting to suction additional blood from the horseshoe crabs”
- Edit “Return to the water as soon as possible. If not being returned to the area of capture, ensure that conditions (~~salinity, water temperature, etc.~~) are similar to those found at the collection site”
 - Walker Golder raised a concern about the statement “If not being returned to the area of capture” because the BMPs indicate that the horseshoe crabs must be returned to the waters they were collected from.
- Under *Return to Sea*, clarify that it is a requirement to return the crabs to the sea.
 - The AP discussed whether it could be more specific how close they must be released to collection site. Walker Golder suggested the following language: “All crabs should be returned as close as possible to site of capture, in the same body of water, at a site with suitable local habitat and conditions, and not more than one mile from the site of capture”
 - A commercial harvesters noted that sometimes the state wants them to release the crabs some distance away from where they were collected to reduce the chance that recently released crabs would be picked up in another trawl.

General Comments

George Topping noted that he also works on the Virginia Tech Trawl Survey, and has seen a huge increase in the horseshoe crab population during the survey for crabs of all sizes. He commented that they now have to stay in shallower areas to avoid too many small crabs. To get a good number of mature crabs 15-20 years ago they had to tow for much longer than they do now. Everything that management has been doing has worked and it would not be fair to mess with something that is working. He suggests continuing the surveys and current management. Habitat in the Delaware Bay has changed with increased human population growth and land development, and that is a lot of the reason why crabs are not coming up on beaches anymore. He also said that the Board needs to study the impact on horseshoe crabs before building windmills in the horseshoe crab sanctuary.