Evaluating post-harvest survival based on claw removal technique in the western Atlantic stone crab fishery, and engaging fisher networks to implement best practices

Evaluar la supervivencia poscosecha basada en la técnica de extracción de pinzas en la pesquería de cangrejo moro del Atlántico occidental e involucrar a las redes de pescadores para implementar las mejores practices

Évaluer la survie après capture sur la base de la technique de retrait des pinces dans la pêcherie de crabe de pierre de l'Atlantique Ouest et impliquer les réseaux de pêcheurs pour mettre en œuvre les meilleures pratiques

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EXTENDED ABSTRACT

Commercial and recreational stone crab (*Menippe mercenaria*) fisheries primarily occur along the Gulf of Mexico and Atlantic coasts of the southeastern United States and the northeastern Caribbean. This unique claw-only fishery operates under the premise that harvested crabs that are returned to the ocean alive may survive to generate their claws and potentially re-enter the fishery, however a wide range of survival rates casts doubt onto the true sustainability of this fishery. In addition, anecdotal evidence indicates that recapture rates in the fishery are low, despite previous research that has shown that lab-based capture (using baited traps in large tanks before and after claw removal) is repeatable and largely unaffected by a lack of claws for individuals that survive the harvest process.

We worked with commercial stone crab fishers in The Bahamas to conduct a lab experiment to test two different methods of claw removal- the traditional and most commonly used method against a new induced autotomy (self-removal) method- and found a 28% increase in survival (up to 92% survival throughout the study) when using the new method, compared to the typical method of claw removal (64% survival throughout the study). Most notably, our results suggest that our new method of claw removal significantly increases post-release survival of stone crabs independent of harvester experience and number of claws removed, meaning it could be implemented into commercial or recreational fisheries with similar outcomes. Additionally, this provides more evidence that the low recapture rates of de-clawed crabs reported in The Bahamas may be due to high mortality as opposed to a behavioral avoidance of traps after the harvest process.

Following the experiment, which was conducted with a commercial stone crabber, we ran a series of training workshops for other commercial and recreational harvesters and fishery managers in The Bahamas to discuss best practices, the feasibility of implementation, and tool design to facilitate this new claw removal method. The meetings were co-led by the research team and the commercial fisher that conducted the data collection during the experiment. After co-designing messaging and communications materials using Bahamian dialect, we used the snowball technique to share information and invitations prior to the meetings, engaging with new and existing fisher networks and relationships to build trust and promote involvement in the information sharing and trialing of the new technique. Dialogue and feedback from the meetings has fed into the next iteration of study design as we continue to work to improve the sustainability of the stone crab fishery.

KEYWORDS: stone crab fishery, post-harvest survival, fisher networks ,best practices