

A Proposal for:
Shrimp Skimmer Tow Time Tracking Mobile Application

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Summary

Market demand for sustainable seafood products has placed increased pressure on the shrimp fleet to demonstrate that they are avoiding negative impacts on the environment. The skimmer fleet, specifically, has been the subject of significant criticism over potential impacts to threatened and endangered sea turtles if tow time requirements are not strictly followed. To address this concern, Gulf United for Lasting Fisheries and Mississippi Commercial Fisheries United propose the creation of a tow time mobile app that would assist vessel operators in demonstrating compliance with tow time regulations that protect endangered and threatened species. A tow time app could have additional benefits, such as analyzing fuel efficiency and catch per unit effort (CPUE), providing warnings for known obstructions, and maximizing shrimp quality by operating under optimal tow times.

Background

The skimmer trawl fishery of the northern Gulf of Mexico (i.e. Louisiana, Mississippi, and Alabama) occurs in nearshore/inshore state waters, targeting brown and white shrimp. Shrimp trawl fisheries are known to interact with sea turtle populations in both the Gulf of Mexico and South Atlantic. All species of sea turtles that are found in Gulf waters are listed as either endangered or threatened under the Endangered Species Act. While some shrimp trawl vessels are required to pull Turtle Excluder Devices (TEDs) to allow turtles to escape from shrimp nets, skimmer trawls are exempt from TED requirements if they comply with alternative tow time restrictions (55 minutes from April 1-October 31 and 75 minutes from November 1-March 31). This exemption was granted under the assumption that, due to design and operational limitations, skimmer trawl bags are typically retrieved at shorter intervals that are not fatal to sea turtles captured in the net.

Additionally, there is a paucity of data on fishing effort for state-licensed vessels. Federally permitted shrimp vessels in the Gulf are required to carry electronic logbooks (ELBs). Although ELBs are typically capable of tracking fishing effort through differentiation of vessel speed, they cannot track fishing effort for skimmer trawls because vessels do not need to change speed when retrieving the net. Furthermore, federally mandated ELBs provide information directly to management, and fishers must request their data for personal use. State agencies have no requirements for ELBs or vessel monitoring system (VMS) devices and only capture data on the number of trips/days fished and fishing area by statistical zone through trip ticket reporting.

Due to the increase in the size of the skimmer fleet in recent years and the difficulty of enforcing tow times through traditional enforcement methods, the Gulf shrimp skimmer fleet has experienced significant criticism over potential impacts to endangered sea turtles if tow times are not strictly followed. Market demand for sustainable seafood products and transparency in product origin has placed pressure on the shrimp fleet to provide documentation of sustainable practices that reduce negative impacts on the environment, including non-target and endangered species. Meeting this demand requires new use of technologies to aid the fishing industry in providing information necessary to compete in the marketplace. Utilization of a mobile app could provide much higher resolution fishing data, allowing for tracking of tow times to measure fishing effort and provide more detailed information on location fished. This app would create a voluntary self-reporting structure for fishermen to document tow time activities and compliance with current regulations. Fishermen would have the ability to

maintain the data directly and determine use of that data within their supply chain, for research, and for other activities voluntarily.

Mobile Application Development

Purpose: The primary benefit of a tow time app is the ability to demonstrate adherence to legal tow time limits through creation of an ELB tool for skimmer trawl vessels. A mobile app could provide additional industry benefits, including tracking fuel efficiency, effort, productivity, and shrimp quality information. Through GPS tracking of tow locations, vessel owners can better analyze productive fishing grounds and CPUE. Additionally, tracking tow times can provide information to buyers regarding the quality and handling of shrimp, as shrimp quality decreases as tow times increase and shrimp are dragged in the net for longer periods. This tool could be utilized on otter trawls as well as skimmers to track tow times for quality purposes.

Display and Functions:

- Home screen (Figure 1): Home screen provides branding and access to the suite of app functions.



Figure 1: Home screen



Figure 2: Timer

- Timer (Figure 2): During trip, the captain hits 'tow' when cod end is lowered into the water and 'end' when cod end is retrieved. The timer provides a five-minute warning prior to the end of the legal tow time (55 minutes from April 1-October 31 and 75 minutes from November 1-March 31).
- Track (Figure 3): GPS tracking begins when captain hits 'start' as vessel leaves the dock and stops when captain hits 'stop' upon returning to the dock (function not pictured). Active fishing is recorded between when the captain hits 'tow' and 'end' on the timer function. The GPS map is saved with color differentiation showing active fishing track versus track when the vessel is not actively fishing.

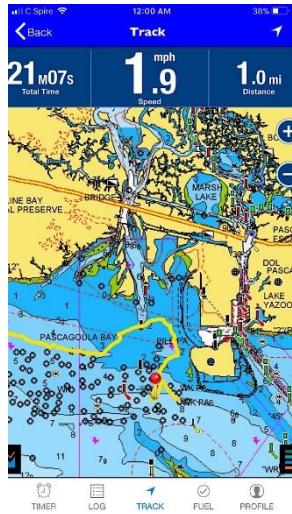


Figure 3: Track

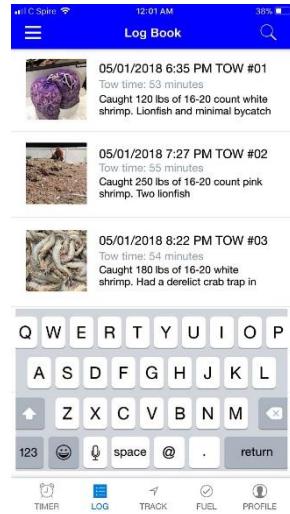


Figure 4: Log

- Log (Figure 4): Tow times are automatically populated into a log, in which captains can also record catch information (e.g. weight and size of target species, bycatch). The log information could also be shared with buyers (through email or a buyer user profile) to provide information on quality and sustainability practices. The log could also auto-calculate other useful metrics, including the active fishing time versus total trip and catch rate (total catch per active fishing time).
- Fuel (Figure 5): Captain enters fuel level upon leaving and returning to the dock and price of fuel, and the app calculates the total fuel consumption, fuel efficiency (based GPS distance travelled), and fuel cost of the trip.

Figure 5: Fuel

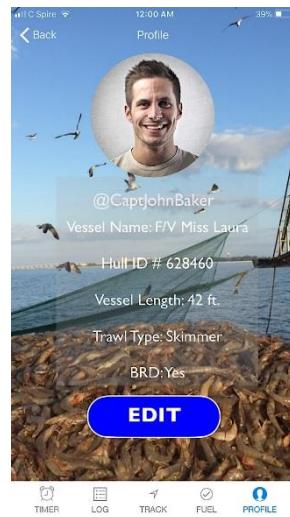


Figure 6: Profile

- Profile (Figure 6): Captain can create a profile with vessel information, such as vessel name, gear type, and use of bycatch reduction devices (BRDs) and TEDs, which can be shared with buyers with access to the vessel's tow time log.

- Other/Add-on features:
 - App connects with a pressure-based sensor that can detect when the cod end is in the water and the vessel is actively fishing, which provides more reliable data but adds cost.
 - GPS coordinates of known obstructions can be input into the app, allowing the app to provide an alarm if the vessel is approaching an obstruction while towing.