



Progress Report: Evaluating fishing pots as an alternative fishing gear to gillnets in Bahía Samborombon, Argentina 11-25-14

Summary

A trial to compare fishing pots as an alternative fishing gear to gillnets is being conducted at Bahía Samborombon. Five artisanal fishermen have been collaborating using gillnets and experimental folding fishing pots simultaneously. In general terms, then results to date indicate that fishing pots are effective at catching commercial fish in the area, and have low numbers of discards. These results presented herein are still only at the early stages of the trial, and many more deployments will be necessary to achieve a comparative analysis with gillnets.

Introduction

The Franciscana dolphin (*Pontoporia blainvillei*) is currently the most threatened cetacean in the South Western Atlantic Ocean due to bycatch in coastal gillnets along its entire distribution in Argentina, Uruguay and Brazil. Among potential fishing gear modifications to reduce this threat to dolphins, pingers have shown to be effective (Bordino et al 2002, 2004), but many questions remain regarding their practical use by fishermen. For example, only recently have we begun investigating the potential negative effects from habituation and habitat exclusion, both previously identified as possible consequences for using pingers. Additionally, there are challenges associated with implementation of pingers in the local artisanal fishery having to do with the high cost and proper use of these devices. In parallel with studies we are undertaking to examine these questions, we are also investigating other potential bycatch mitigation tools, particularly the use of alternative gears that are less threatening to species prone to high levels of bycatch in the Bahía Samborombon (Figure 1). It has been estimated that the annual mortality of Franciscana dolphins from bycatch in this area is about 400 individuals, a level that is unsustainable for the resident population. Also, the local artisanal gillnet fishery has bycatch of Leatherback, Loggerhead, and Green sea turtles, and occasionally of Burmeister's porpoise (*Phocoena spinnipinnis*).

The main objective of this project is to investigate the effectiveness of experimental fishing pots in the area as a direct way to mitigate the current dolphin bycatch by reducing the gillnet effort without reducing the economic potential of the fishery. The idea for testing this alternative gear originated from a local fisherman.

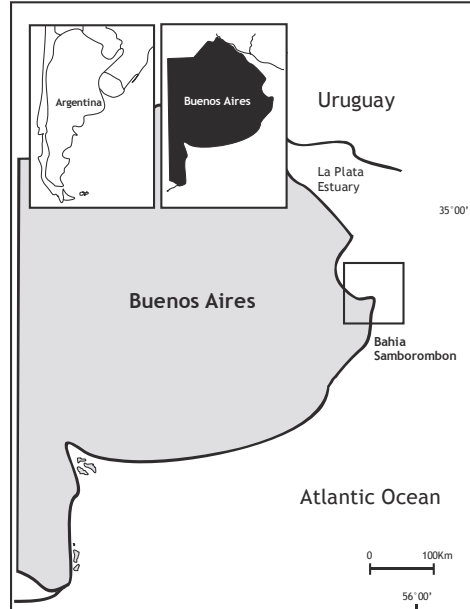


Figure 1. Location of Bahía Samborombon

Methodology

Five fishermen simultaneously used standard gillnets and experimental fishing pots. Gillnets used in the trial were similar to those commonly fished in the study area, and made by the same manufacturer with standardized rigging and mesh size (120mm). Three fishermen operated inside the bay, and another two just to its south. Each fisherman used 3 strings of 100m length, and 4 folding fishing pots during each deployment. The pots were designed especially for this experiment by the National Institute for Fisheries Development (*Instituto Nacional de Desarrollo Pesquero [INIDEP]*). Gillnet strings were placed in close proximity (approximately 100m apart) from each other, and fishing pots were deployed at approximately 50m from both ends of a gillnet string (Figure 2). Each fishing pot was baited with Brazilian menhaden mixed with anchovy, since during preliminary sets Conger eel bait did not yield sufficient catch levels. Fishing boats carried independent observers throughout the course of the trial. The geographic positions, depth, soak time, biomass of fish caught by each fishing gear, and environmental conditions were recorded. After hauling, the daily catch from fishing pots and gillnets were separated by species and weighed. Discards of commercial fish in unsellable condition and non-commercial fish species were also recorded. For commercial species, fish were measured, and the quality of catch graded into four classes: 1) Fish in perfect condition (red gills) or alive, 2) Fish in good condition (pink gills) but dead, 3) Fish partially deteriorated by predation, and 4) Fish in bad condition (grey gills) that may or may not have been depredated. Fish graded as class 3 and 4 were considered discards. Fishing yield was evaluated as fish catch-per-unit-effort (CPUE_{fish}). The effect of soak time on fishing pots

was analyzed using the $CPUE_{fish}$ values. Preliminary data analysis was conducted considering independence among fishing gear deployments assuming constant catch-per-unit-effort.

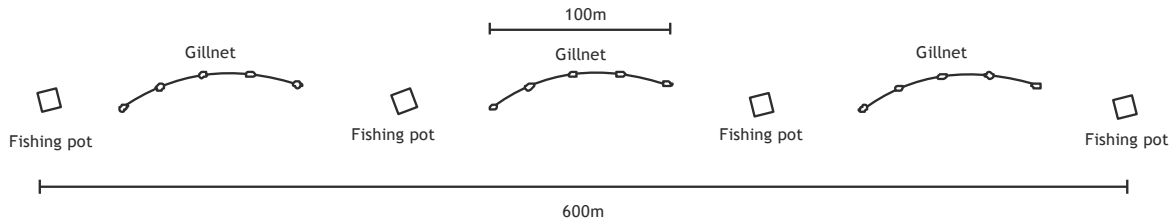


Figure 2. Experimental design of simultaneous deployments of gillnets and fishing pots used by each fishermen in Bahía Samborombon.

Preliminary results

Locations of gillnet and fishing pot deployments are shown in Figure 3. From July to September 2014, a total of 145 simultaneous deployments were completed, totaling 435 gillnet and 580 fishing pot sets. Of these, 242 gillnet sets and 323 fishing pot sets were deployed inside the bay. A summary of preliminary results is shown in Table 1. A total of eight fish species were caught with both fishing gear types, six of which were local commercial species. Gillnets had a more diverse catch than fishing pots (Figure 4). The proportion of juveniles (commercial species, only) in gillnets versus fishing pots was 3% and 9%, respectively. Eighty-nine percent of fish caught with fishing pots were graded as in perfect condition and alive, while the rest was graded as in good condition but dead. Twenty-one percent of fish caught with gillnets was graded as deteriorated by predation and in bad condition, and thus considered discards. Although some differences in catch occurrence were observed between fishing pots deployed inside and outside the bay, these will be analyzed in detail once the trial is completed by December 2014, as well as the selectivity observed by the fish length frequency in both fishing gears. Fishing pots showed a higher $CPUE_{fish}$ between 2-4hrs of being deployed, and lower $CPUE_{fish}$ with soak times than 4hrs (Figure 4). During this trial, 24 Franciscana dolphins were bycaught in the 17 gillnet sets, 37.5% of which were females. Based on body length, only 4 females were sexually mature. One female was pregnant, and another one was lactating. The $CPUE_{dolphins}$ was $0.008 \text{ km gillnet}^{-1} \text{ h}^{-1}$. All bycaught individuals were examined by necropsies, and tissue samples taken for contaminants, genetic and histopathology analysis. Only one Loggerhead sea turtle was bycaught during this trial (in a gillnet). The animal was released after being tagged.

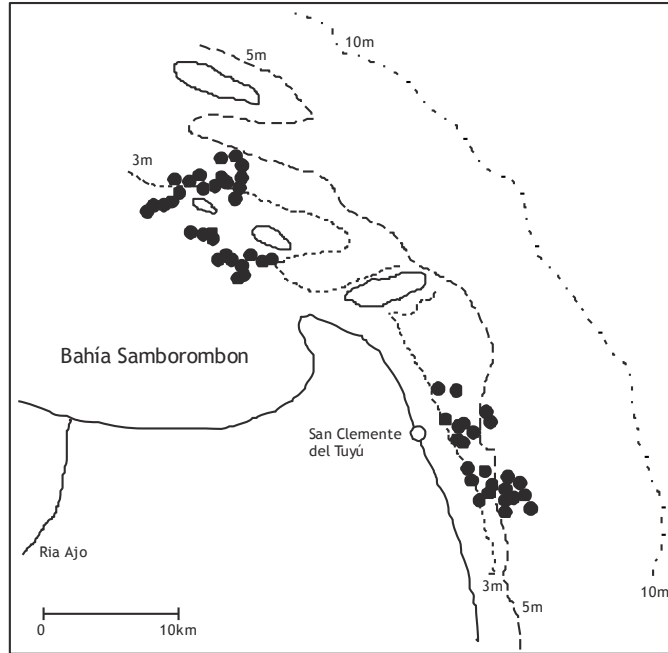


Figure 3. Distribution of gillnets and fishing pot deployments inside and outside the bay.

Table 1. Summary of preliminary trial results in Bahía Samborombon (June 3 to September 28, 2014). (Catch includes non-commercial species in both gears).

	Gillnets	Fishing pots
Number of sets	436	580
Fishing effort (m ² xhr, hr)	3047640	4678
Mean soak time (hr)	23.3	8.06
Total Catch (kg)	14287	10440
CPUE (Catch/FE)	0.0047	2.23

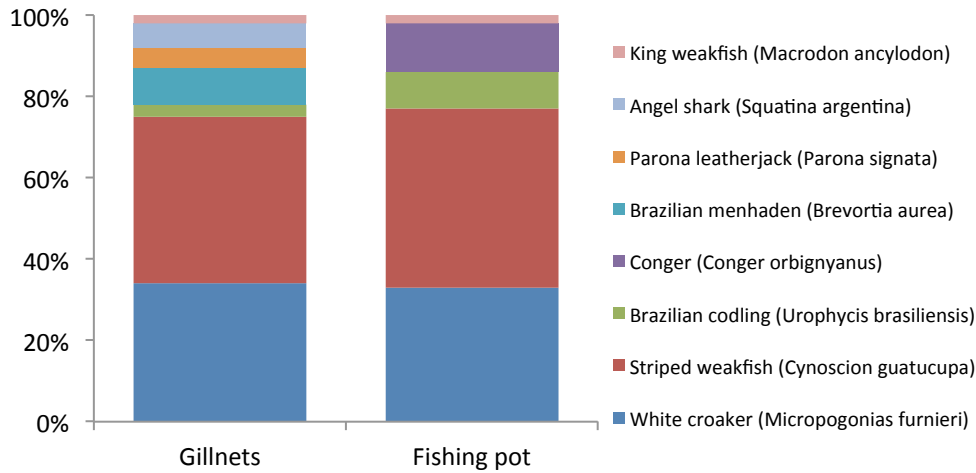


Figure 3. Occurrence of catch by species recorded in simultaneous gillnets and fishing pot sets in Bahía Samborombon (June 3 to September 28, 2014).

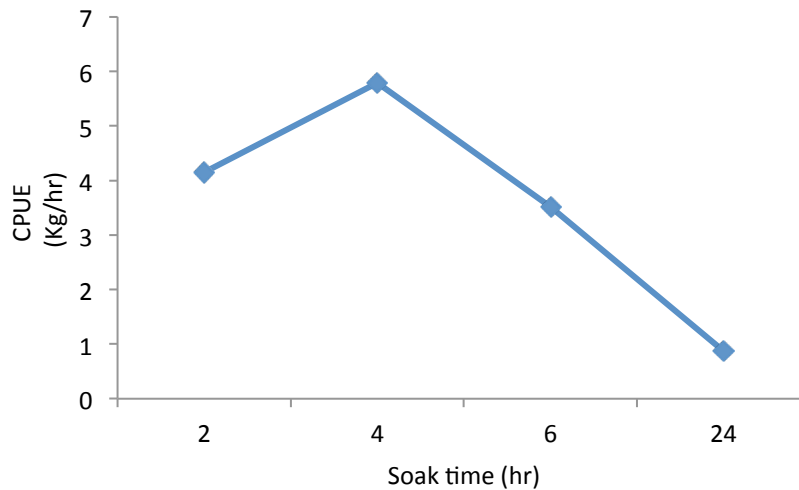


Figure 4. CPUE recorded with fishing pots in relation to soak time in Bahia Samborombon (June 3 to September 28, 2014).

Discussion

Although the trial is now active, low catches during previous months prevented the trial from starting earlier as planned because fishermen had no incentive to fish. The number of current active artisanal fishermen has decreased by 60% from the usual number of 50 active fishing boats due to the low abundance of commercial fish. This situation is evident by the low CPUE_{fish} recorded during this 3-months trial, which is about 50% of the historical fish catch rate in the area. This

reduction in fish catch has not been accompanied by an increase in the price of fish at local markets. Nevertheless, the high proportion of commercial fish in good condition in fishing pots might eventually result in higher returns in catch sales using this gear.

The CPUE *dolphins* was within the bycatch rate known for the species in gillnets within the study area, though lower than expected.

The Bahia Samborombon currently is under a time-area close for trawling activities, and it will likely remain in effect until the fishery is recovers. Meanwhile, more gillnetters will resume operations if fishing shows signs of profitability in the near term. This experiment will continue at least until December 2014 while gillnetters are active in the bay.



Experimental fishing pot designed by the INIDEP (Intituto Nacional de Investigacion y Desarrollo Pesquero, Argentina).



Brazilian codling caught in an experimental fishing pot.



Separating fish catch by species and fishing gear.



Franciscana dolphin juvenile male (SC01814) bycaught in gillnets.



Observer onboard recording data.



Loggerhead sea turtle bycaught during the trial and released after tagging.