Further Investigations into the decline in neritic tuna (*Euthynnus affinis* and *Auxis thazard*) catches from 2010 to 2013 in the Maldives

By: Mohamed Ahusan
M. Shiham Adam

Marine Research Centre
Ministry of Fisheries and Agriculture
Male', Republic of Maldives

Abstract

Two species of neritic tunas, kawakawa (KAW) and frigate tuna (FRI) are commonly caught in the Maldives. Despite inter-annual fluctuations, nominal catch of neritic tunas has seen a general rise from 1970 – 2009. However, this increase has not been in par with the rise in catch of skipjack and yellowfin tuna, resulting in their declined contribution to the national catch. Recent years (2010 – 2013), saw declines in the order of 84% for frigate tuna and 67% for kawakawa, despite the Indian Ocean catches of both species observing an increasing trend. Because the decline in Maldives catches coincided with the introduction of the logbook reporting system, Ahusan (2014) hypothesized that under/non-reporting of neritic catch could be a factor in the observed trend. This paper aimed at investigating further, the observed declines using a qualitative approach. The results showed that a segment of the PL fleet, fitting a general description, in the northern atolls do not comply with the logbook based catch and effort data collection system. Since the traditional system of reporting from island office is being discontinued, MoFA relies on the export oriented tuna purchase data to complete the national catch records. As a result, landings from vessels that sell their catch to the domestic markets and not the exporters, are excluded from national statistics. Such vessels are predominant in the North of the country where purchase of tuna for export is relatively minor compared to the South. It is also the north of the country that contributes higher to national catch of neritic tunas compared to the south. Decline in effort (36% during 2009-2012) coupled with non-reporting from the said segment of the fleet would explain the observed trend in catches. Prevalence of the characteristic vessels that do not report logbook data will need to be established in order to obtain an estimate of non-reporting.

Introduction

Two species of neritic tunas, kawakawa (*Eythynnus affinis*) (KAW) and frigate tuna (*Auxis thazard*) (FRI) are commonly caught in the Maldives pole-and-line tuna fishery. Small amounts of neritic tuna are still caught on trolling vessel that operate within out outer edges of the atolls. Nevertheless, neritic catches have remained a minor component of the pole-and-line tuna catch. Despite inter-annual fluctuations, the nominal catch of the two species has seen a general rise from 1970 – 2009 (Figure 1). However, this increase has not been in par with the rise in catch of the two main tuna species, skipjack and yellowfin tuna, resulting in a declining contribution over the years. Recent years (2010 – 2013), saw significant

drops in catch of the two species (Figure 1), amounting to 84% for frigate tuna and 67% for kawakawa. At the same time, the Indian Ocean catches remained on an upward trend (Figure 3 and Figure 3).

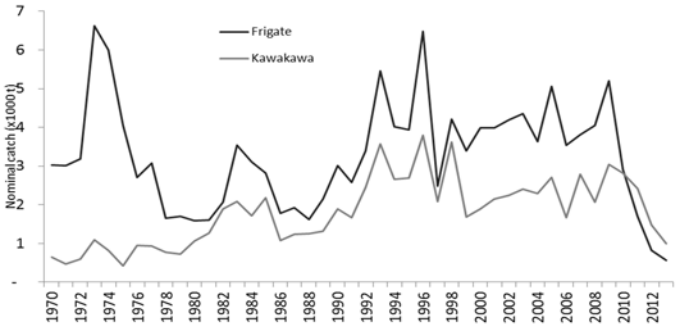

Figure 1. Nominal catch of kawakawa and frigate tuna (1970-2013)

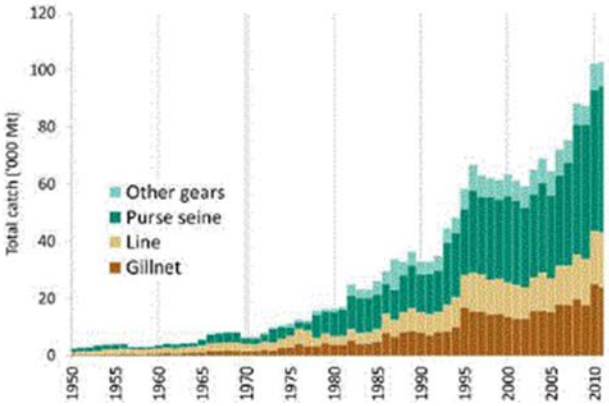

Figure 3. Indian Ocean frigate tuna catch (1950 - 2012). Source: WPNT 2014.

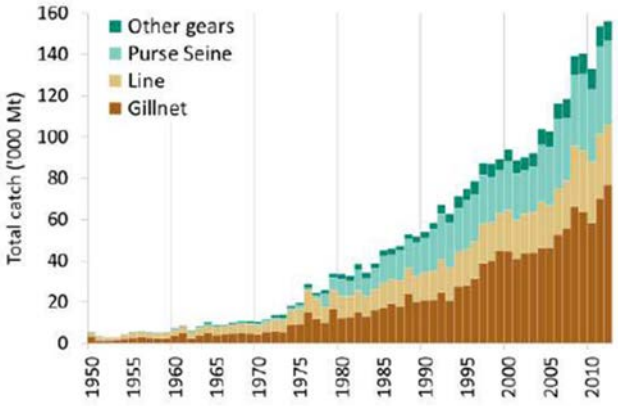

Figure 3. Indian Ocean kawakawa catch (1950 – 2012). Source: WPNT 2014

Ministry of Fisheries and Agriculture (MoFA) introduced the tuna fishery logbooks during 2010. The introduction was aimed at collecting comprehensive data needed for effective management of the fisheries. It would further serve to meet the data requirements from IOTC and facilitate compliance with EU IUU regulations. Since the introduction, the island office based data collection system is being gradually discontinued. Any non-reporting from the logbook system is accounted for using the export oriented tuna purchase data by the tuna exporting companies. As neritic tunas are not exported and hence are not widely purchased by the said companies, use of purchase data does not fully achieve the objective of completing the national statistics.

As the 2010 – 2013 decline coincided with the introduction of the fishery logbooks, Ahusan (2014) (WPNT04) hypothesized that under or non-reporting of neritic catches could be a factor in the observed trend. As a result, the WPNT in its Fourth Session, requested that Maldives undertake further investigations into the decline in reported catch of neritic species for the given period.

Methodology and data sources

This paper presents the findings of a survey conducted among vessel owners/master fishermen to assess the level of compliance within the pole-and-line tuna fishery, to the catch and effort data collection system. The survey further attempted to identify the causes for the possible non-provision of data. Information was collected from 20 vessels selected from throughout the country representing the different sizes, localities as well as operational patterns. Arbitrary division of the country into three regions (north, center and south) was used for a possible comparison. Locations of the commercial pole-and-line landing ports and localities of the vessels surveyed are presented in Figure 4**Error! Reference source not found.**.

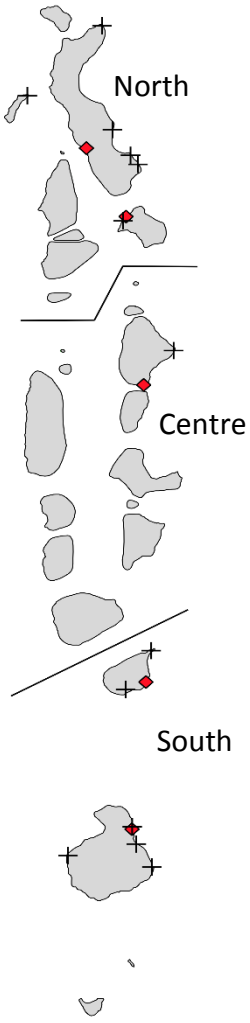

Figure 4. Map of Maldives. + shows the islands of respondents, red marker shows the locations of tuna landing ports.

Key findings

Key findings of the survey were:

1. A regional discrepancy in vessel characteristics and operations

   Northern region was dominated by small sized ageing vessels that mostly conducted daily trips and exclusively used PL. Main fishing grounds were anchored Fish Aggregating Devices (aFADs) and sold the catch to the home or nearby islands. Part of the catch was sometimes sold to the small scale tuna processors during high catches. Vessels from the central and southern regions were larger in length and is able to conduct multi-day fishery. Catches were mostly destined to Male' or the exporters.

2. Use of single or multi gear (PL and HL) were dependent on the size of the vessel and proximity to commercial landing port

   Handline caught yellowfin tuna need to be stored in ice to maintain quality. This storage method requires FRP boxes that are placed on the deck. Hence, HL-YFT fishery is not conducted in the small vessels that dominated the northern atolls. Furthermore, such vessels were unable to travel the distances to sell the catch to a commercial buyer. In contrast, most vessels in the central and southern atolls, are equipped for both fisheries (PL and HL).

3. Logbook compliance is prominent in the central and southern region

   Only 2 out of the seven vessels from the northern region reported to have a logbook (this does not represent reporting). This number increased to $^{6}/_{7}$ and $^{3}/_{6}$ in the central and southern atolls respectively. Vessels from the central and southern atolls were more compliant towards the data collection system. This was because these vessels sold their catch to exporters which required a fishing license. A condition of the annual license is that vessels provide logbook data to MoFA.

4. An overall positive compliance during the island office based reporting system

   Almost all participants reported a positive compliance to reporting during the island office based data collection system.

Discussions

The study showed the presence of a group of PL vessels that conducted single or a few day long trips from the home ports. Their predominant fishing grounds are the anchored FADs near the home islands and sell the catch to the home or neighboring island communities. As this does not require a fishing license, these vessels are able to operate without complying with the data collection system. Since the main fishing grounds are either aFADs or schools within or close to the atolls, kawakawa and frigate tuna are more commonly caught than the rest of the country. The two species are also known to be targeted during seasons of high abundance. As there does not exist an incentive or consequence to non-reporting of fishery data, voluntary reporting is low for these vessels. Several reasons contribute to the low reporting;

- **Logbook is more data intensive than what the fishermen are used to:** for example where the traditional system required only an enumeration of the crew as effort, the new logbooks require in addition, the start and end times of baiting and fishing, as well as locations for bait and fishing.
- **Completion of logbooks are an added burden:** incorporating the recording of logbook data into the daily routine of the master fishermen or vessel owner was challenging and so was given a low priority. Prior to introduction of the logbooks, an island office official would visit the landing site and the captain would give the information verbally. Or, the captain would visit the island office at his convenience and pass the information to the official.
- **Difficulties in delivering the log sheets to MoFA:** in the previous system, the captain or vessels owner was not burdened to deliver the fishery information to the Ministry.
- **Insufficient enforcement:** Issuance of the fishery license and the license database are the key tools in the enforcement of the logbook system. Vessels that are not in the system (i.e. did not require a license) are able to operate without consequences.

Non-reporting: how serious is it?

Logbooks provide some of the basic data required for fisheries assessment to inform effective management of the fisheries. This underscores the importance of effective implementation of such a

scheme. For a country whose fishermen are used to hundreds of years of open access and almost no record keeping, changing their perception and subsequently their behavior to comply with provision of data can be a challenge.

At inception of the logbook scheme, fishermen were incentivized by fuel subsidies and providing logbook data was made a prerequisite to claim for fuel subsidy funds. This was true for the years 2010, 2012 and 2013. As there is no such incentive at present, voluntary provision of logbook data is low among vessels.

Regulation on licensing of commercial fishing, fish processing for export and aquaculture (Fishery license regulation) requires vessels whose catch is destined for export to have a fishing license. It further conditions licensees to provide data on the licensed activities. As such, the key condition of the fishing license is the provision of catch and effort data through fishery logbooks. As MoFA uses the license database to ensure compliance to logbook provision, catch from vessels that do not obtain a fishery license is unaccounted for. Non-reporting fishery data is further exacerbated by the slow devolution of the island office based data collection system.

As frigate and kawakawa are predominantly caught using PL gear, declines in effort or reporting of catch could have significant consequences on the reported catch of both species. The impact will be most felt in the northern atolls whose contribution of neritic species to national landings is far greater than the south. Up to 36% decline in PL effort (2009-2012) (Ahusan, 2014) cannot be ignored as a possible cofactor in the observed trend in catch. A country wide estimate of non-reporting by vessels of similar characteristics could not be obtained.

Conclusion

Maldives introduced fishery logbooks as an alternative to the island based collection of catch and effort data in 2010. Since then, the national landing of the two main neritic tunas have shown significant declines. The study showed that the existing mechanism for enforcing compliance (i.e. conditioning the fishery license on provision of logbook data) is practical for vessels whose catch is destined for export. For those that do not require a fishery license, a mechanism needs to be setup to enforce the system.

Non-reporting logbook data was most prominent in the northern atolls, where the fleet mostly comprised of small vessels who did not require a fishing licenses. As the catch of these vessels were comparatively small, it is believed that it will not have a significant impact on reporting rates of skipjack and yellowfin tuna. However, a higher impact on that of neritic tunas is possible as these species have a higher abundance (Anderson et. al, 1998) and are targeted due to availability of marketing options. A decline in PL effort, the main gear for neritic tunas, coupled with non-reporting of catch by a segment of the fleet in the northern atolls, where the contribution of the species to the national catch is highest, explains the observed trends in catch of FRI and KAW in the years 2010 to 2013. Further assessments on the prevalence of such vessels are needed for an accurate estimate of the non-reported tunas.

References

Ahusan M., 2014. Investigations on the change in catch and effort data collection as a cause of decline in reported catch of kawakawa (*Euthynnus affinis*) and frigate tuna (*Auxis thazard*) from 2009 – 2012. WPNT04.

Anderson RC., Z.Waheed, M.S.Adam (1998). The Tuna Fishery Resources of the Maldives. Maldives Marine Research Bulletin 3: 180pp.