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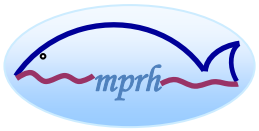


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# Comparison between the composition of the by-product of the purse seiners and catch of multi-gear small vessels landed in Madagascar in 2013

**FOURTH WORKING PARTY ON NERITIC TUNAS**

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ABSTRACT

Two types of fishery fishing on different zone, landing their products in Madagascar were compared. The first landed their product at Antsiranana Harbor to provide the *PFOI*. These are the purse seiners operating in the Mozambique Channel, targeting tropical tunas and mainly the skipjack tuna. Among the landed bycatch, not admissible at the *PFOI*, the by-products are delivered in the local market. The quantity landed was measured and the specific composition of these byproducts were followed by the *USTA*.

The second landed their product in Toamasina to provide local markets. These are small artisanal vessels using multi-gear in the eastern facade of Madagascar. Total catch of 2013 was collected.

Two neritic tuna species are identified in the composition of by-product of the year 2013 such as the Frigate tuna (5%) and Wahoo (1%). Small boats also recorded two neritic tuna species such as narrow-barred spanish mackerel (7%) and Wahoo (5%).

Frigate tuna could be caught by purse seiners with tropical tunas in the Mozambique Channel and narrow-barred spanish mackerel is caught in the eastern facade near the coast. The Wahoo is present in more or less extensive areas but with an affinity of the neritic zone.

## 1. Introduction

Madagascar has a continental shelf, synonym of a neritic zone of about 32,600 square nautical miles. The continental shelf of the west façade is wider, with a slight slope extends to a distance of 30-60 nautical miles. At the eastern façade is narrower (3-5 nautical miles).

Several fisheries targeting tuna in neritic zones meet in Madagascar, unfortunately most of their catch are unknown, especially the traditional fisheries catches.

Operating in the Mozambique Channel, some purse seiners land their product at the Antsiranana harbor. Among the products landed, there are the by-products, which are a part of their by-catch.

Small vessels of 8m and 11m, multi-gear but mainly use longline fishing operate in the eastern façade of Madagascar. They target pelagic and demersal fish. Their fishing is limited by the autonomy of their fleet.

This document provides a comparison between the by-product of purse seiners and catch of small vessels. The comparison concerns the catch rate of neritic tunas for each fishery. Of such analyzes give an overview on the status of the fishery for neritic tunas and constitute technical elements for the political decision-making in management of tuna resources.

## 2. Method

The specific composition of two types of fishery was compared. For purse seiners, the specific composition of by-product was analyzed. The main target of this fishery is the skipjack tunas. USTA hires non-permanent investigators to collect the information of the by-product including neritic species. They estimate the quantity of each species or group of species into the by-product. Data are entered into a database and this information subject of this document is extracted from this database.

For the small fishing vessels operating at the eastern facade of Madagascar, the annual catch report in 2013 has been received and analyzed.

From these data, the following table was obtained.

| Fishery (f) | species | | | | | |
|---|---|---|---|---|---|---|
| | $Sp_1$ | $Sp_2$ | $Sp_2$ | $Sp_4$ | … | $Sp_n$ |
| PS (by-products) | W $Sp_1$ | W $Sp_2$ | W $Sp_3$ | W $Sp_4$ | … | W $Sp_n$ |
| Small baots | W $Sp_1$ | W $Sp_2$ | W $Sp_3$ | W $Sp_4$ | … | W $Sp_n$ |

Spi : Species i

PS : purse seine

$W_{Spi}$: weight of the species or group of species num i

The specific composition is expressed in catch rates of each species for each fishery from the following operation:

Catch rate of the species i, for the fishery f = (total weight of the species i for the fishery f /sum of the total weight of total catch for fishery f) x 100

$R_{Spi} = (\mathbf{WSpi}/\sum_{i=1}^{n} \mathbf{WSpi})\mathbf{x\ 100}$

$R_{Spi}$: Catch rate of the species i, for the fishery f

**WSpi** : total weight of the species i for the fishery f

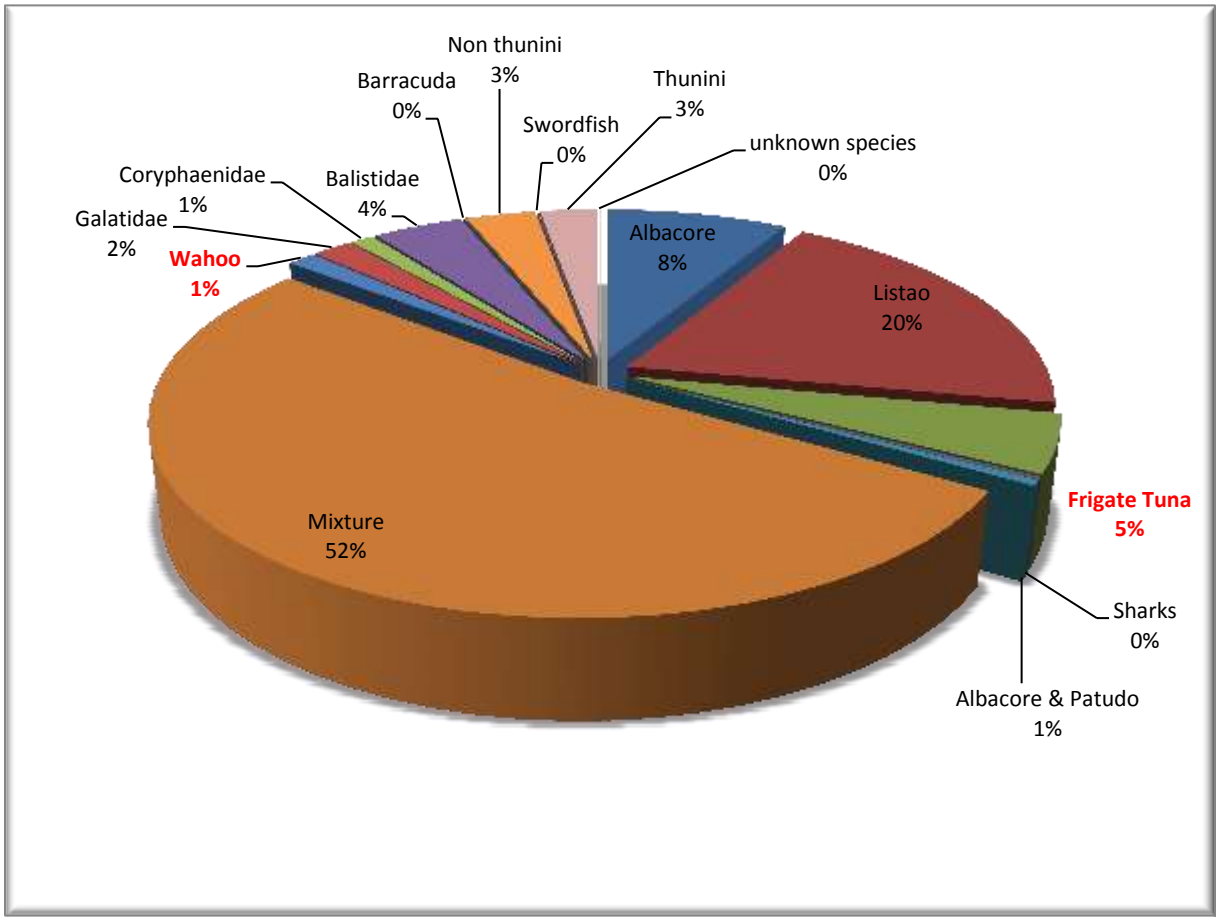
$\sum_{i=1}^{n} \mathbf{WSpi}$ : sum of the total weight of the catch for the fishery f

## 3. Results:

### *3.1. Species composition of by-product of purse seiner*

For purse seiners, the following chart shows the species composition of by-product.

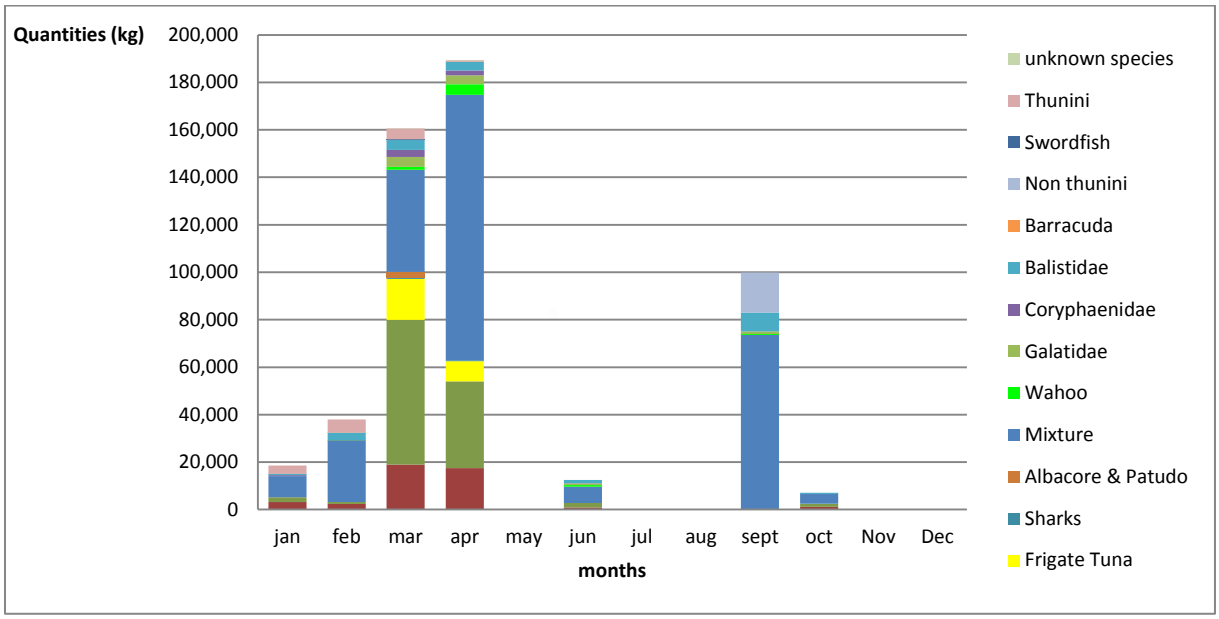
*Figure 1: Species composition of by-products landed*



This graph shows that the mixture of tuna unidentifiable predominates with a percentage of 52% followed by the Skipjack and yellowfin with the percentage respectively 20% and 8%. For neritic tuna species, Frigate tuna and Wahoo are shown in the composition of by-product which are delivered to the local market with percentage by 5% and 1%.

The monthly landings for 2013 are presented in the following graph

*Figure 2 : Intra-annual distribution of the landing composition species.*

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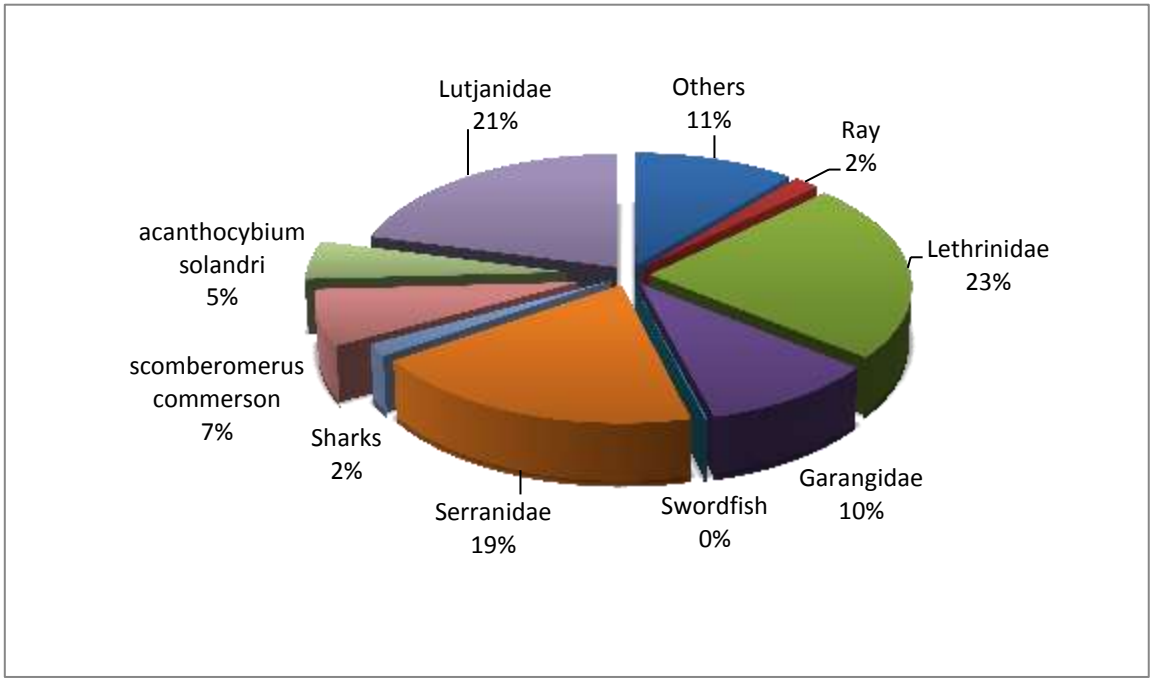
The quantities landed by purse seiners are abundant in march and april and september. And it is also, in march and april which has the highest amounts of neritic tuna landed.

### *3.2. Species composition of small vessels of 2013*

The report of small boats operating at the east façade does not give detail on monthly landings. The following graph shows the species composition of the whole catch in the year 2013

*Figure 3 : Species composition of small vessel catches*




The whole catch of the 13 small boats is 23,432 kilograms for the year 2013. The species composition of the catch is dominated by demersal species including Lethrinidae (23%), Lutjanidae (21%), and Serranidae (19%). However, two neritic tuna species are identified in the catch, such as narrow barred spanish mackerel and wahoo, with a catch rate 7% and 5% respectively. Other pelagic species such as the family Carangidae (10%) is also shown.

## 4. Discussions and conclusion

From a global view, catches of these two types of fisheries are different. Purse seiners target schools of tropical tunas in the Mozambique Channel and small boats target mainly the demersal fish in the eastern facade. The compositions of catches are different. The Frigate tuna and Wahoo are present in the by-product of purse seiners and narrow barred spanish mackerel and Wahoo are caught with demersal fish by the small vessels.

The landing period of the purse seiners in march and april is the period in which purse seiners operating in the Malagasy EEZ. It was also during this period that the two species of neritic tunas (Frigate tuna and Wahoo) are mostly present in by-product. That suppose that the catch landings at this period would be the catch in the Malagasy EEZ, including neritic tunas

Given that purse seiners operate beyond 20 nautical miles, the neritic tuna are caught a little farther from the coast of Madagascar. The catch rate of Frigate tuna is low considering the whole purse seine catch. In the by-product, 5% Frigate tuna and this proportion has a peak in March (11%), at which time operating in the Malagasy EEZ. It seems that the Frigate tuna are associated with tuna schools targeted by purse seine fishery and dominated by Skipjack.
Wahoo is even lower catch rates (1%) with a period of landing more or less spread.
Not being able to go further for fishing , the small boats operate in the Area not far from the coast in the East side . Wahoo and narrow barred spanish mackerel are in the composition of their capture (5% and 7% respectivelly). It seems that the narrow barred spanish mackerel are caught nearest the coast area.
Further studies on physico-chemical parameters, biological, hydrodynamic, and climate are needed to characterize this distribution. In addition, other information on other fisheries, including traditional fisheries using rudimentary equipment is needed for the more knowledge about the distribution of neritic tunas. In fact, many sites with many fishers around the coast of Madagascar in the fishery can catch neritic tunas such as angling trolling the net Jarifa and ZZ and longlines.
In fact, many sites with many fishers around the coast of Madagascar practice fishing that can catch neritic tunas such as trolling the *Jarifa* net, *ZZ* net and longline.