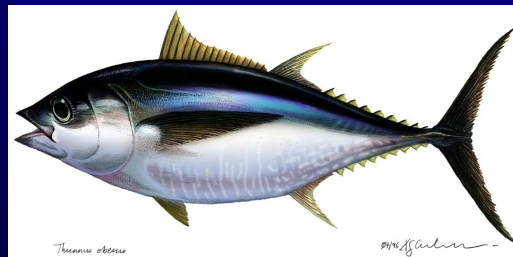


Species composition of tuna catches taken by purse seiners

IOTC-2008-WPM-05

By Alain Fonteneau, EU IRD scientist

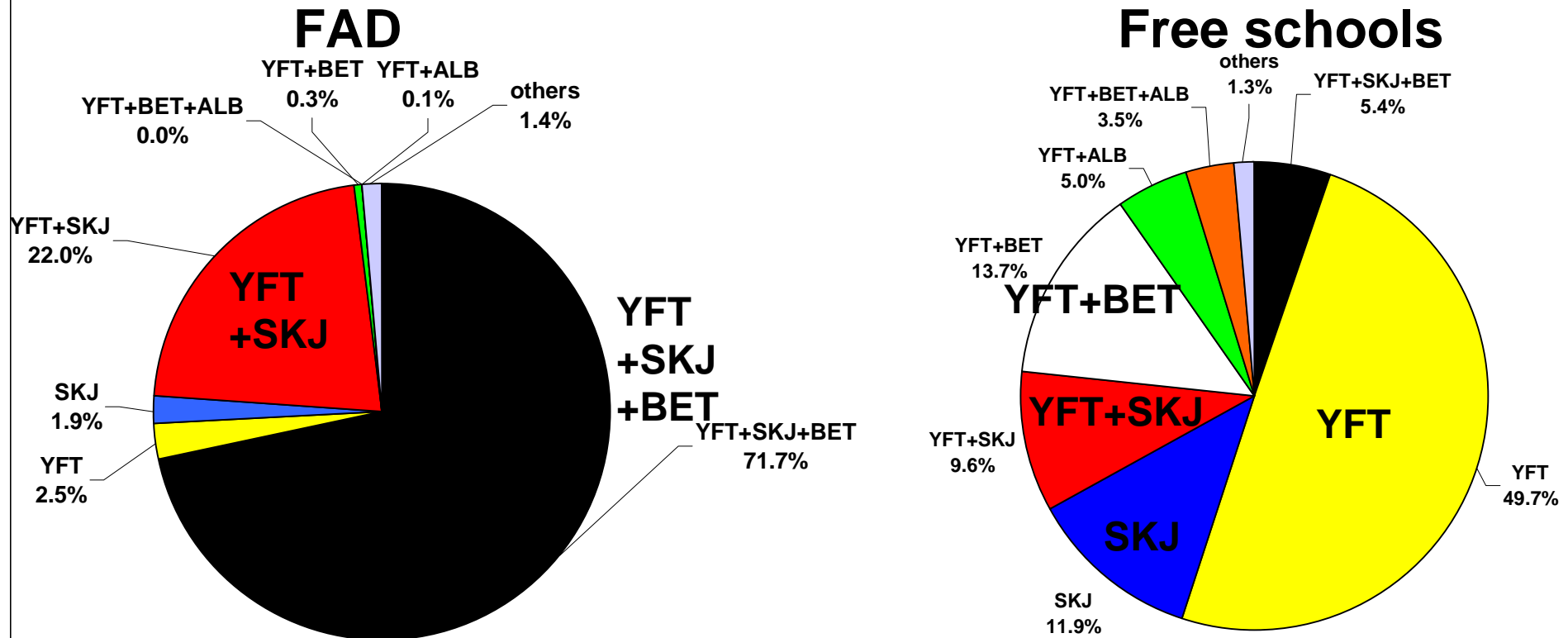


Port sampling has been routinely used in the IOTC area since the early eighties to correct species composition of PS catches

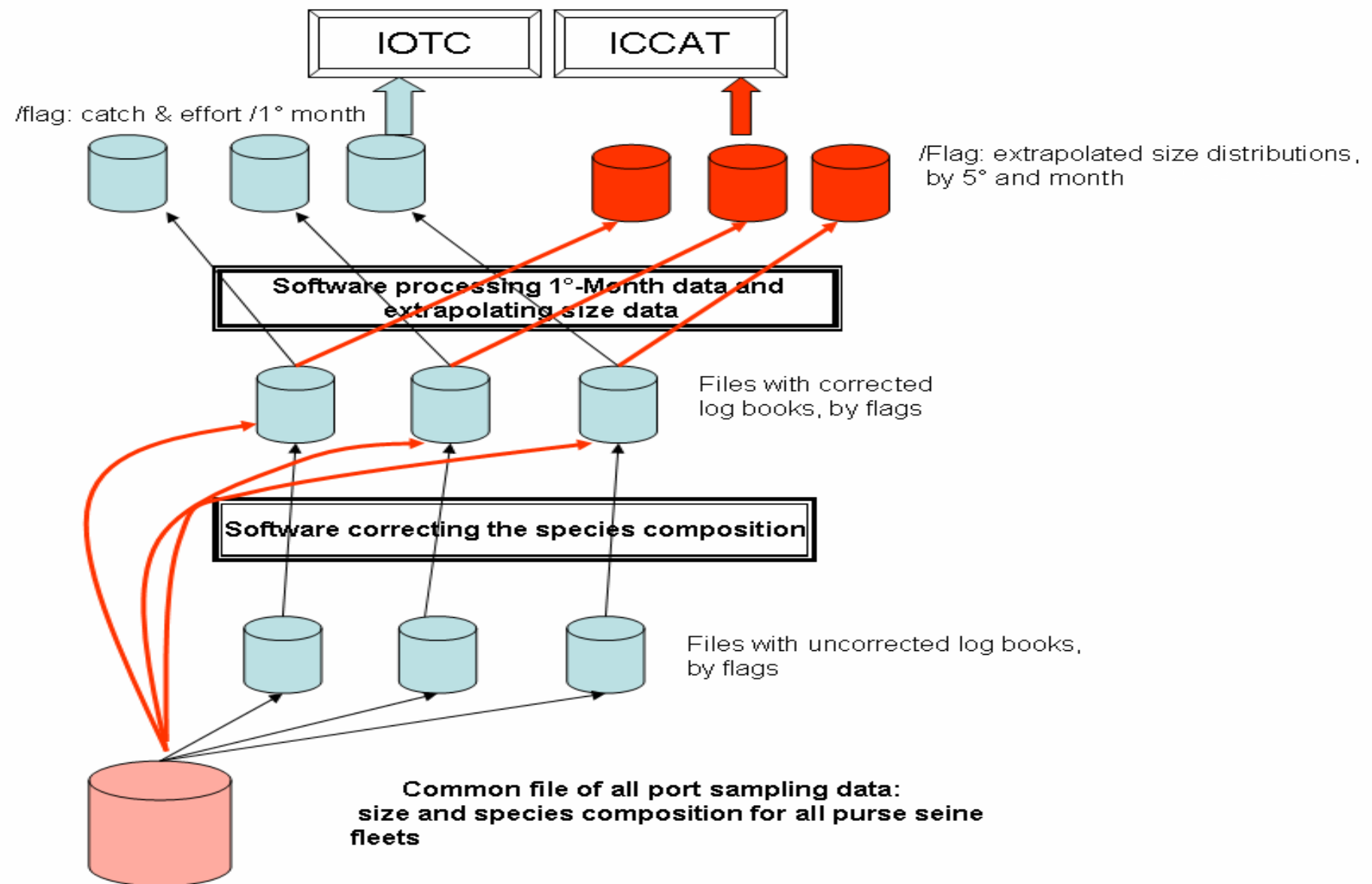
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- large samples of about 500 fishes each one, with a rigorous counting of all the skipjack that are counted (only 50 SKJ measured), all other tuna species being measured.
- A need to have good log book data, with a precise identification of sets associations, and a good identification of wells where each set has been stored
- A permanent difficulty to identify small bigeye from small yellowfin even when they are frozen and in "bad shape"
- A need to select randomly each fish, giving to each fish an equal opportunity to be sampled, independently of its sizes or its facility to measure it
- A need to permanently control the validity of size and species done in each port
- A routine data processing correcting the species composition of all fleets independently of the flags: same file of sizes & species composition being used for all fleets
- The corrected statistics are the only ones released to IOTC & used by scientists

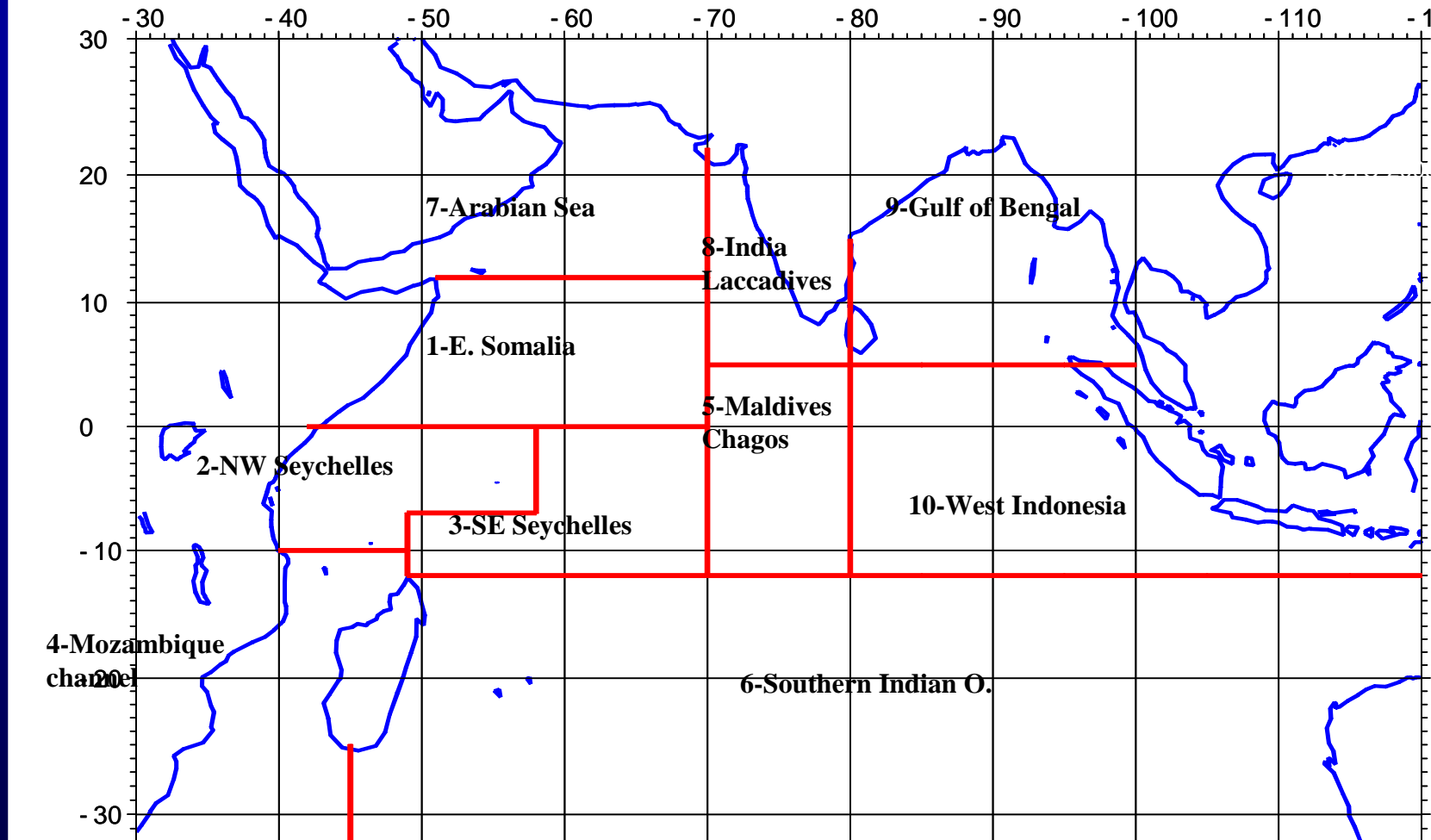
Species sampling showing the real species composition of tuna schools, its complexity & time and space variability?



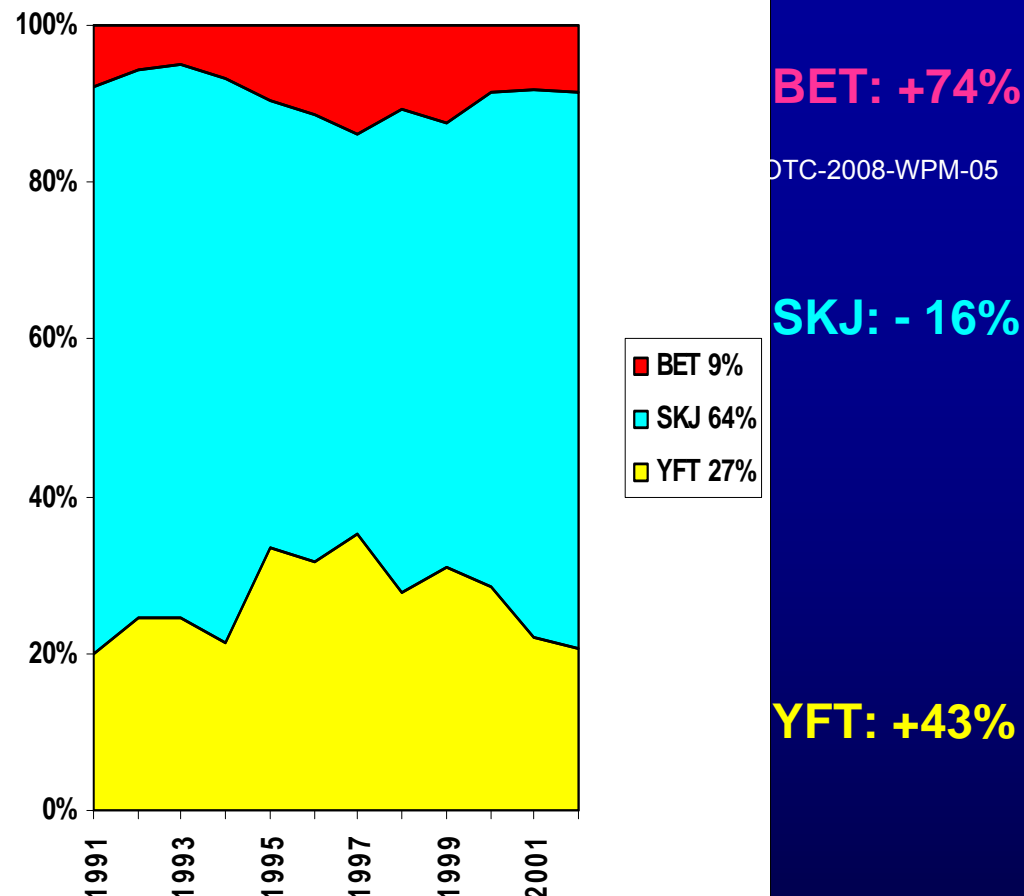
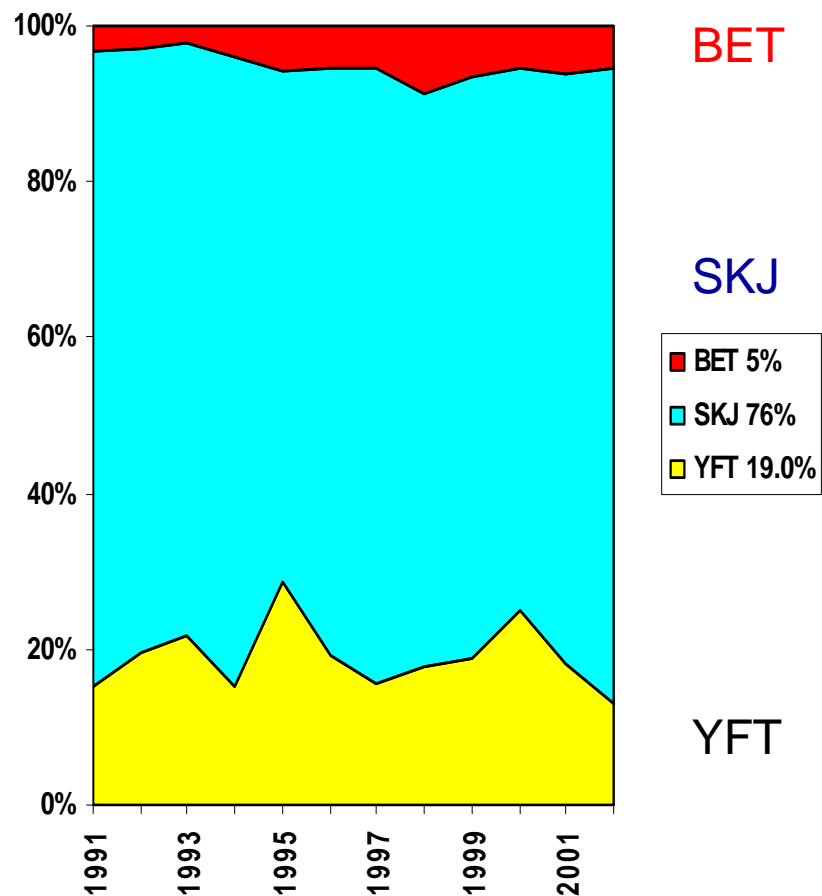
Average species composition of the FAD and Free schools samples and frequency of the various types of species composition observed in the Indian Ocean selected species samples (1990-2006)
(figure taken from Fonteneau et al 2007)



Conceptual organigram of the data processing of size and sampling composition of the EU purse seine data in the Atlantic and Indian oceans (since 1980)



- = Example of the areas used in the data processing and extrapolation of species samples of purse seiners in the Indian ocean
- = These areas were identified based on a statistical analysis of geographical heterogeneity in the species composition & sizes of samples
- = It is assumed that sizes and species composition are homogeneous within each quarter and area strata in each size categ of fishes caught



Log books

Species composition of FAD associated purse seine catches in the Indian Ocean, as recorded in the log books and after correction of their species composition. Large catches of small yellowfin and of small bigeye are always misclassified as skipjack in the log books and in the landing statistics. The same result has been observed each year in both the Atlantic and IO.

Port sampling

The effects of these species corrections on the stock assessment are:

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- Major effects for bigeye tunas, as they allow to « recover » large amount of small bigeye that were previously « hidden » in the skipjack catches.
- But also significant effects for yellowfin assessments: also producing a significant increase of small YFT catches
- Minor effects for skipjack assessment

Port Moresby 4th WCPFC Scientific Committee Meeting

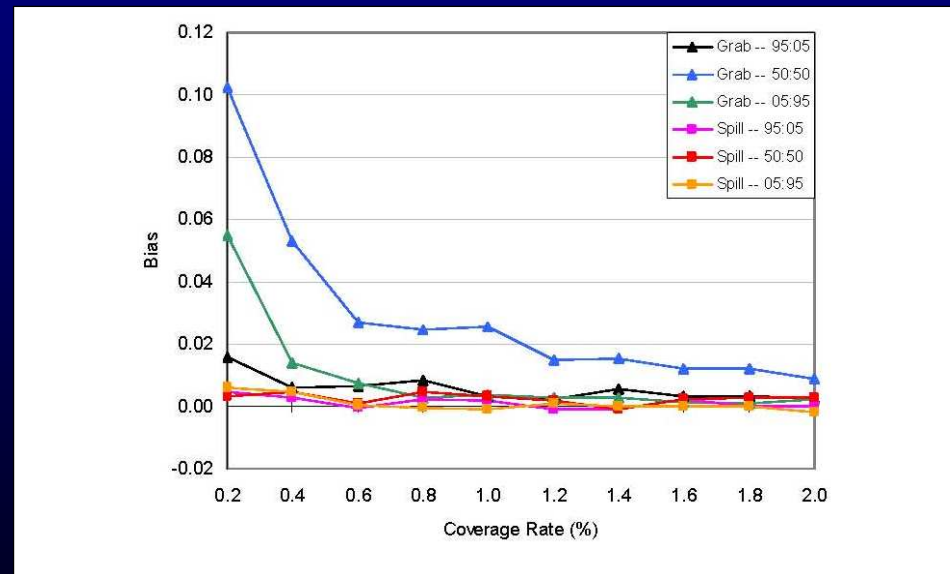
Do we have a “Grab” sampling bias in our PS sampling?

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An SPC paper presented by Tim Lawson discusses the ***Structural bias in the Indian Ocean “Grab” sampling of PS landings***

.The grab sample bias analyzed and explored by Lawson’s simulations concludes that small samples tend to overestimate the quantities of small tunas, underestimating large tunas (large YFT and BET).

This bias is for instance well shown by the Lawson’s simulations of a 2 species sampling:

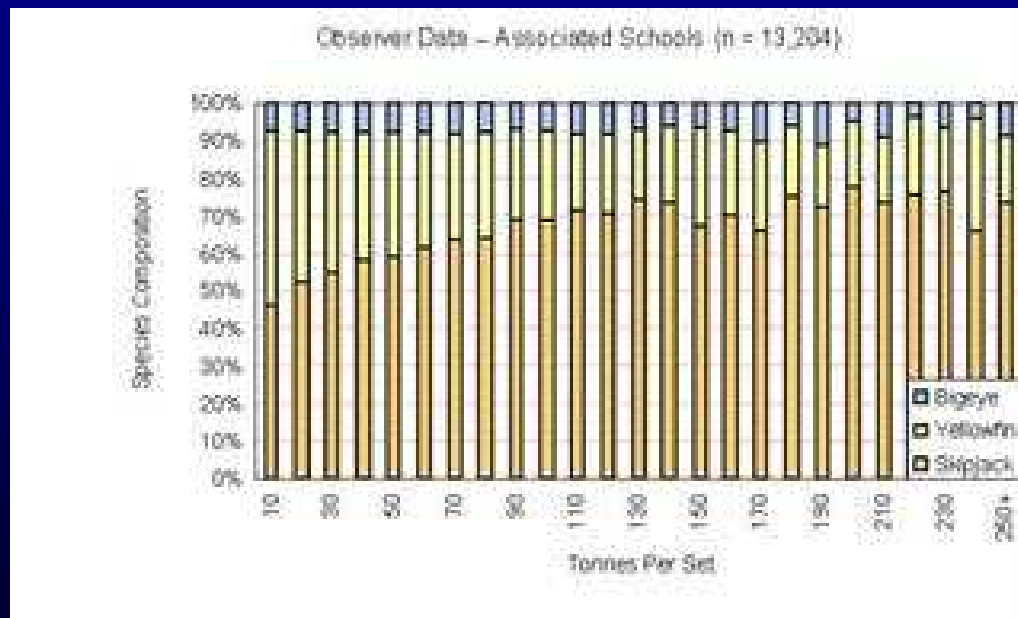


Bias of estimates of the proportion of SKJ in simulated sampling under “Grab” and “Spill” protocols

Species composition variable as a function of set sizes

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- Lawson's paper shows that the species composition is highly variable as a function of the school sizes, showing an increased proportion of SKJ for larger school sizes.



Potential tuna sorting in the wells?

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- A problem frequent in the Western Pacific, but never in the Indian Ocean

Conclusion:

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- These potential bias have not been studied in the IO Species sampling
- They should be studied and possibly corrected introducing a new modified sampling and/or data processing (better stratification)
- Observer data should be better connected to port sampling
- SPC is now recommending to do its species and size sampling using a bin sampling done on board during the fishing operations

- A need to organize a small « method WG' on the best sampling methods to use in the collection and data processing of PS data
- A WG to be held in 2009 with IOTC, ICCAT, SPC and WCPFC scientists