The Indian Ocean Tuna Tagging Programme: a crucial step towards sustainability

Alejandro Anganuzzi IOTC Secretariat



Objective:

How the formulation of scientific advice, and the Tagging Programme in particular, constitute the first step of the IOTC process that aims at a sustainable utilization of the tuna resources.

What do we mean by sustainability?

- Sustainability is a dynamic process, a fragile balance of risks and benefits
- We want to maximize benefits while taking minimum risks over a very long time horizon
- Shared resources (such as tuna) complicated as there is multiplicity of management objectives and levels of risk aversion.
- But a basic starting point for common understanding



How do we manage a shared resource?

- Multiple ways, but for highly migratory species, Regional Fishery Management Organizations such as IOTC have provided a forum for multi-lateral joint management.
- Often controversial and misunderstood, but only way to gather all stakeholders:
- IOTC is composed of 31 Members States (19 of which are developing coastal States) and two Cooperating non-Contracting States.

Tunas as a highly migratory species in the ctoi Indian Ocean: the case from tagging







IOTC is one of five tuna RFMOs

- Promote conservation and optimum utilization of tuna stocks
- Promote sustainable development of fisheries



Current Members of IOTC

- Australia
- Belize
- China
- Comoros
- Eritrea
- EU
- France
- Guinea
- Iran
- India
- Indonesia
- Japan
- Kenya
- Korea
- Madagascar
- Maldives

- Malaysia
- Mauritius
- Mozambique
- Oman
- Pakistan
- Philippines
- Seychelles
- Sierra Leone
- Sri Lanka
- Sudan
- Tanzania
- Thailand
- UK
- Vanuatu
- Yemen

Cooperating parties: South Africa, Senegal



The IOTC process

- Step I : generating advice based on best available science
 - Information centralized and prepared at the Secretariat
 - Scientists as individuals gathered at Working Parties to conduct stock assessment and review analyses of the data
- Step II: decisions are made on the basis of the scientific advice
 - But also measures to combat IUU
 - Quota allocation and other measures
- Step III: Implementation and compliance
 - Domestic legislation modified as necessary
 - Reporting and monitoring as required

The structure of IOTC





Step I : generating advice based on best available science

- The Scientific Committee provides a service:
- Analyses data to advise on the situation of the stock
 - What is the size of the stock? (relative to its optimum level)
 - In which direction is going? (are we extracting too much)
- That is understanding both current size and productive potential
- The Scientific Committee also provides advise, as requested, on alternative management actions



The scientific challenge: What data is best?

- Direct surveys?
 - Acoustic
 - Aerial: LIDAR, direct visual
 - All impractical over such a large area
- Fishery data (essential anyway)
 - Catches, level of fishing effort, size distribution in the catch)
 - Highest percentage of artisanal catches
 - Unequal quality, outstanding issues concerning accuracy and precision
 - Historical trend not always informative about the productivity of the population
 - Outstanding issues concerning interpretation of trends in catch rates



Then...we have tagging..

Principle is simple:

- Suppose to tag 1000 fish and release in a pond with other fish
- Let them mix and take a sample of fish from the pond
- If there were 10,000 fish -> 10% will be tagged
- If there were 20,000 fish -> 5% will be tagged





Tagging as a preferred tool to improve tuna assessments

- Tagging programmes, if successful, provide data useful to answer the most important question: What is the current population size?
- In addition:

Better estimates of growth and other biological characteristics

Indication of **movements** (and possible stock structure)

Direct way to measure interactions between fisheries

 There have been large-scale tuna tagging programmes in all oceans, but for the Indian Ocean the IOTTP was the first large programme...why?



The Indian Ocean has its hidden challenges

- Not many boats of the required type and size
- No extensive bait resources
- No other tagging platforms work as well





The road to the large-scale programme

- First calls from the scientific community in 1980-1991
- Some smaller-scale experiments in Maldives in 1992-1993, supported by IPTP
- An initial experiment under the COI: PTR-II that showed the difficulties to be faced
- Further planning in 1993-95 through IPTP and Expert Consultations.
- Finally, IOTC starts operation in 1998, and soon a Working Party on Tagging is launched to seek funding and advance planning.
- Funding comes for small-scale tagging in Maldives, India, Indonesia, Mayotte in the early 2000's.



The road to the large-scale programme

- In 2001, the EU identifies funding for a large-scale component, the Regional Tuna Tagging Project (RTTP-IO)
- Mauritius and Seychelles request the project under the Commission de l'Océan Indien (COI)
- A partnership between COI and IOTC (as the Technical Supervisor) is established for the execution
- Target : tag 80,000 fish, mainly yellowfin and bigeye tunas, but also skipjack
- Objective:
 - Estimation of exploitation rate/population size
 - Estimation of fisheries interaction
 - Estimation of movement, growth, natural mortality



Putting the team together

- Programme Coordinator (in January 2005): Dr Jean-Pierre Hallier
- Technical Assistance team (in February-April 2005): supplied by McAllister Elliot & Partners
- Vessels (in April 2005): F/V Aita Fraxku and F/V Kermantxo
- Tagging Technicians (from May 2005): supplied by Capfish Ltd, and participating countries
- Staff of the IOTC Secretariat







Why was the IOTTP a success?

- Field operations finished in 2007, after 31 months.
- RTTP target releases : 80,000 fish, actual releases 167,000
- Adding small-scale projects, more than 200,000 fish tagged and released.
- Associated school technique, developed by the skippers of the tagging vessels, ensured a continuing stream of new fish for tagging
- Tagging away from the main area of operations of the fishery, resulted in long times at liberty, and better chances at the mixing



Why was the IOTTP a success? (cont)

- Extended focus on recovery efforts:
 - Most tags were recovered from platforms with estimable reporting rates.
 - Tag seeding from before the start of releases throughout the execution of the programme
 - Large number of tags seeded through cooperation with the fishing fleet
 - Adjustments to the recovery process done through the lessons of the tag seeding
 - But very low proportion of tags returned from longline fleets

 Also, the necessary dose of good luck (piracy had not peaked yet)

After the tagged fish have been recaptured and returned, what next: the data analyses

- The tagging data have been combined in computer models with other sources of data coming from the fishery (e.g. size-distribution and catch rates)
- But tagging data have been generated under more controlled conditions, providing a much better quality dataset.
- Assessments should continue to improve in the future, as we get a better understanding of the properties of the tagging data set.
- Tagging Symposium a push to develop more in-depth analyses



The bigger picture: formulating better management advice

- Better assessments should provide a basis for better advice, but that is only a step in the right direction.
- IOTC members adopted the principles of a precautionary approach at the last Session, but the scientific community needs to work with the fisheries managers to fully develop its application.
- Scientific advice needs to be delivered in a clear, concise and unequivocal manner

In summary: towards sustainability in the IOTC

- Step I: Science
 - Better assessments thanks to the tagging data
 - Moving towards full implementation of the precautionary approach
- Step II: Governance
 - Clear formulation of management objectives and acceptable risks
 - The difficult debate concerning allocation of fishing opportunities
- Step III: Implementation and Compliance:
 - Effective implementation by all member States
 - Capacity building



Thank you for your attention...