Reviews on tuna tagging experiments in the eastern-central Indian Ocean for 30 years (1980-2009) and its future prospect

What are the effective tagging methods there?

Tom Nishida
National Research Institute of Far Seas Fisheries
(NRIFSF)

Before the main talk….

Some comparison (Maldives)

20 years..

Past (1989) vs. now(2009)

[from personal experience]

Some example: Comparison (Maldives)
20 yrs: past（1989) vs. now(2009)

IPTP
(Sakurai)

Tagging with
Richard Shomura
(US NMFS Hawaii
Office DG)
[One month]

IOTC
(Anganuzzi)

Tagging with
Riyaz Jauharee
(Maldives MRC
Chief scientist)
[one week]

Some example: Comparison (Maldives)
20 yrs: past（1989) vs. now(2009)

-BOATS-

5-10 t, 10m, engine(out)
(7 crews) (no roof)

20 t, 20m, engine(in)
(15 crews)

Some example: Comparison (Maldives)
20 yrs: past（1989) vs. now(2009)

-DAILY SCHEDULE-

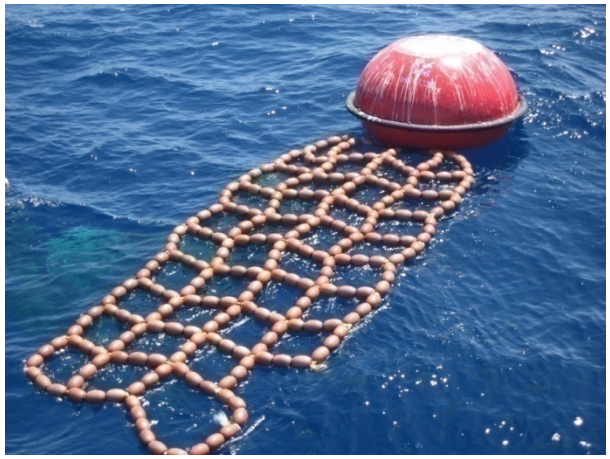
,	1989	2009
Previous night		Leave port Put Light ON
3-5 AM	Leave port	Live baits
5-7 AM	Live baits	
7-noon	Catch	
Afternoon	Unload catch	

Daily trip

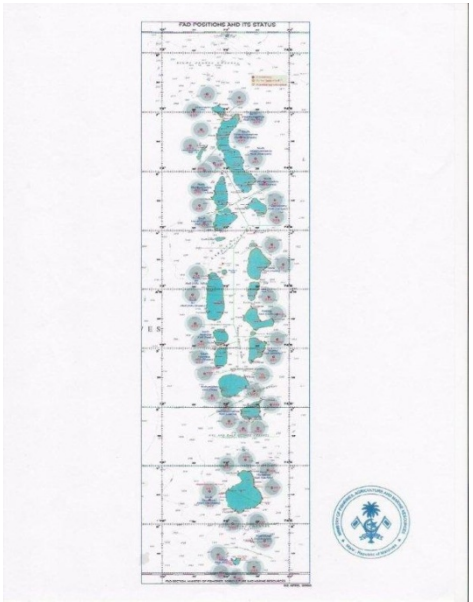
5 days trip

Some example: Comparison (Maldives)
20 yrs: past（1989) vs. now(2009)

-FADS-



No FADS
Free school
(search birds)
or
Log school
(search logs)



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Some example: Comparison (Maldives)
20 yrs: past（1989) vs. now(2009)

-FISHING METHODS-

No change (P&L, live baits + water splash)

One more important change in general….

Some example: Comparison (Maldives)
20 yrs: past（1989) vs. now(2009)
- SHIHAM ADAM-

Hafitz
(MRS: former DG)

Jr Res assit (MRS)
High school grad

Director (MRC)
PhD

Now the main talk..

- At the occasion of this **third IOTC tagging workshop** on the small scale tagging programs
- also for **the 3 decadal tagging activities i**n the eastern and central Indian Ocean
- **reviews and future prospects for the tagging experiments are made.**

Reviews

The first tuna tagging experiment
in the eastern-central Indian Ocean

1980 by the Nippon maru

JAMARC

Japan Marine Resources Research Center

(**ended in 2006 after New Nippon maru**)

Why ended in 2006?

*No **skiff boats in New Nippon maru***

Without skiff boats

difficult to capture fish for tagging without damage

Why ended in 2006?

When the new Nippon maru launched JAMARC staff tried to catch ***fish by a small dip net from the PS nets***

fish caught were ***too weak and not possible to tag.***

Then IPTP tagging

- 1990 funded by Japan
- 1993-1995 funded by World Bank

Then the current EIO & CIO tagging:(2003-2004) and (2005-2009)

- SEAFDEC (2003-2004)
- JAMARC (2003-2005)
- NRIFSF (2004) : No 2 Taikei maru
- **India (Lakshadweep) (2005)**
- **Indonesia (Sumatra) (2005-2007)**
- **Maldives (2007-2009)**
- **India (Andaman) (2008)**

Self Fund (IOTC tag)

Funded by JAPAN to IOTC

Table 1

Summary of the activities of the tagging experiments for 30 years (1980-2009) in the eastern and central Indian Ocean

(numbers indicate no of fish tagged and released. Some are rough figures)

Table 1 Summary of the activities of the tagging experiments for 30 years (1980-2009) in the eastern and central Indian Ocean (numbers indicate no of fish tagged and released. Some are rough figures)

year	AGENCY	Note	Activities (a)-(c) & (f) (2005-2009) funded by JAPAN (US$ 0.95 mil) (d) (1990) funded by JAPAN (US$ 0.20 mil?) (e) (1993-1995) funded by World Bank (US$ 0.40 mil?)					
			SEAFDEC	Based on the Japanese domestic budgets				
				JAMARC Nippon -maru(*)	NRIFSF (Taikei maru 2)	(a) India (Andaman)	(b) Indonesia (Sumatra)	(c) India (Lakshadweep)	Maldives
1980	IPTP			100					
1981				37					
1982				299					
1983				318					
1984				422					
1985				221					
1986				769					
1987				1,201					
1988				1,043					
1989				1,832					
1990				3,233					(d) 9,941 (6 months)
1991				1,980					
1992				1,713					
1993				1,901					(e)
1994				1,130					7,777
1995				1,816					(8 months)
1996	IOTC			970					
1997				626					
1998				399					
1999				384					
2000				325					
2001				(?)					
2002				(?)					
2003			1,000 (2 months)	(?)					
2004		Tsunami (EIO) (Dec)	1,400 (1 month)	(?)	601 (1 month) (Feb-Mar)				
2005		MoU		(?)		Cancelled due to Tsunami	→	4,958 (4 months)	
2006		[1st WS] Dipole:cold SST (EIO)		No tagging activities by new Nippon maru (**)			0 (1 month) (no tags due to cold SST)		
2007		Earth -quake (Sumatra)					726 (2 months) (affected by earthquake)		(f) 9,000 (2 months)
2008		[2nd WS] (May)				1,332 (2 months)	Canceled as not effective boats are available.		(f) 5,000 (3 months)
2009		[3rd WS] (May)				2nd WS did not recommend			(f) 6,000 (2 months)
No of fish tagged & released and total=68,444)			2,400	20,719	601	1,322	726	4,958	37,718
Total months			3	42	1	2	3	4	21
= (a)/(b) Ave no fish/mo a in the Indian Ocean			800	493	601	661	242	1,240	1,796
			Eastern IO					Central IO	
Overall average of fish tagged & released /mo			577					1,518	

(*) For some years, fish were tagged and released in the western Indian Ocean. It is assumed that the tagging

Table 1

- Since 1980 various tagging activities have been implemented in last 30 years (1980-2009)

- In 30 years more than 68,000 fish were tagged and released.

Effectiveness

- Tagging in the CIO is roughly **3 times more effective** than in the EIO

  （in terms of number of tagged and released fish, i.e., 577 fish/mo in the EIO vs. 1,518 in the CIO in average）

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Why CIO is more effective?

- In the EIO densities of tuna schools are much less (not highly aggregated) comparing to those in CIO.
- Similar observation has been experienced in Japanese PS fisheries.
- **This suggests that the tagging in the EIO is less cost & time effective than those in the CIO.**

Live bait and boats
(see Pictures on page 5)

In the CIO (Maldives and Lakshadweep, India), **live baits** for the tagging experiments are more abundant than in the EIO (Sumatra, Indonesia and Andaman, India).

Live bait and boats
(see Pictures on page 5)

Furthermore, in the EIO, tagging activities have been limited due to **the limited capacity of the bait tank** in the boats used for the tagging. In the CIO, boats have **large bait tanks** to implement tagging effectively.

Live bait and boats
(see Pictures on page 5)

. An additional critical problem in the EIO is that **suitable tagging boats were not available locally**, thus boats need to be brought from other areas. **This is another factor to limit the tagging activities in the EIO.**

Vessels used in the tagging activities in the EIO and CIO

SMALL BOATS (LESS THAN 50 G. TONS)	LARGE BOATS (MORE THAN 300 G. TONS)
	
2 boats used in the tagging in Andaman	No 2 Taikei maru used in the eastern IO tagging
	
KM Mandala 02 used in the Sumatra tagging	R/V SEAFEC used in the tagging in the EIO.
	
Mas dhoni used for the Maldive tagging	Nippon maru used for the tagging in the IO

Natural disasters

- In the past 5 years in the EIO, there have been **occasional natural disasters** such as Tsunami, earthquakes and domination of the cold waters due to the Indian Dipole phenomena that **seriously affected and limited the tagging activities**

Natural disasters

- On the other hand, in the CIO, such natural disasters have been **relatively less** thus tagging activities were not affected seriously.

Future prospect
Tagging area

Based on the reviews, it is clearly understood that tagging experiments are **not suitable in coastal waters in the EIO** due to many negative factors (effectiveness : less fish, natural disaster, lack of live baits and suitable boats).

Future prospect
Tagging area

Thus, the future the tagging activities need to concentrated **more in the CIO.**

Future prospect
Tagging area

- However **the tagging in the EIO is still needed** to have the global picture of the migration of tuna, stock structure and other relevant and important issues.

Future prospect
Tagging area

- To implement this objective, we also **need the tagging in the EIO** in the future using the **large RV** such as **Nippon maru, SEAFDEC** etc or charter boats such as **No 2 Taikei maru** in the past

Future prospect
Tagging area

- because tagging by these **large RV are more effective t**han those in the local boats used in Sumatra and Andaman.

- When large boats are used it was suggested that **milkfish was effective** alternative baits if common live baits were not available.

Data base

- In the WIO more than **160,000n fish** are tagged. Together with about **70,000 fish** from EIO, total more than **230,000 fish** have been tagged and released.

Happy moment :End of the 5yrs EIO+CIO tagging P/J

right after some 70,000th tagged fish released in 30 years !

Morning of April 30, 2009, Central Maldives

Data base

- For this important information taking a lot of funds, man powers and time, we need to build **the effective global tagging database** for the future.

- Fortunately **IOTC Secretariat** is now working hard on this task and hope that it is available soon

Future activities (funding)

- Looking at the global situation of the funding for the tagging activities in the Atlantic, the Pacific and the Indian Ocean, there are **10-20 years cycles** needed for RFMO to get the funds

Future activities (funding)

- But once we made the good database, analyses and recommendations and if we realize the importance of the tagging and need to resume the activities, **we may be able to speed up** the 10-15 years cycle and may need to start searching the funds in 5-10 years later.

Finally thanks for great contributions

IOTC (esp. for Million)

MRC (Maldives)

CSIRO (Australia)

FSI (India)

RCCF (Indonesia)

Asakawa (temp staff, NRIFSF)

Special thanks to MRC to host this 3rd workshop

epologue

1989 vs. 2009

Additional comparisons….

Some example: Comparison (Maldives)
20 yrs: past（1989) vs. now(2009)

-FOODS-

ONLY [Rice + SKJ Gel] (Congee?)

More dishes & varieties

Some improvement ?: Comparison (Maldives)
20 yrs: past（1989) vs. now(2009)
-personal experience -

Tied to the boat main post (safety)

free