

Small scale tuna tagging undertaken from Lakshadweep, India during 2005-06: A preliminary report

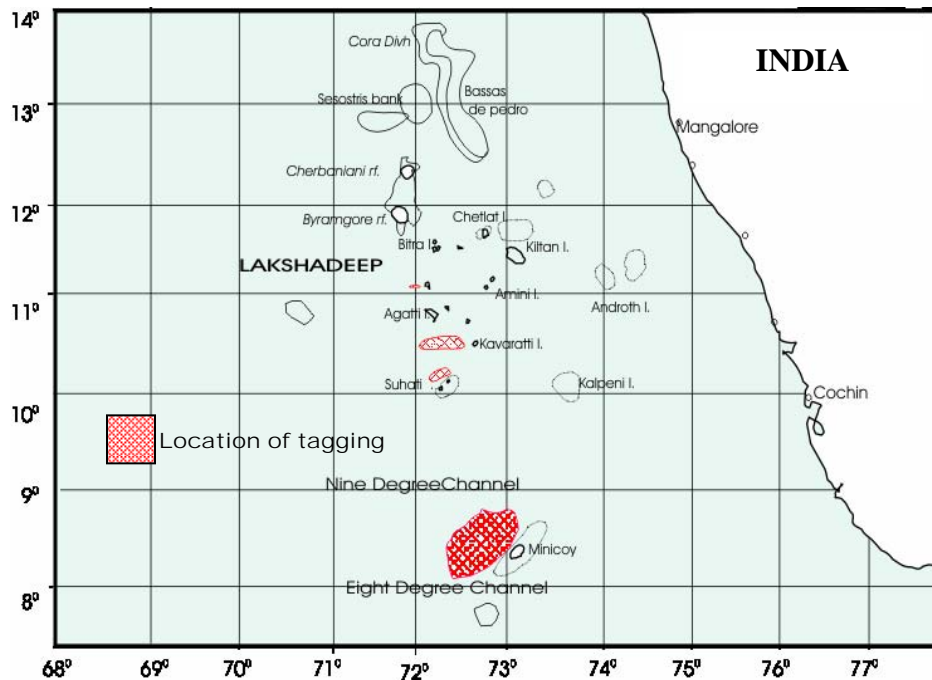
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Introduction

The IOTC sponsored small-scale tuna tagging in Lakshadweep islands located between lat. 08-12° N and Long.72-74° E in the Arabian Sea was launched during March 2005. The project envisaged tagging 5000 tunas from four different platforms viz., pole and line, troll line, hand line and longline vessels. The project was implemented in two phases, the first phase during March -April 2005 and the second phase during November 2005 - February 2006. Out of the target of 5000 tunas a total of 4958 tunas are successfully tagged and released so far. Since the tagging is carried out on an opportunistic basis, maximum tunas released are skipjack (SKJ) while yellowfin tunas (YFT) formed a small portion of the release.

2. Tagging locations

Tagging was carried out from three islands viz., Minicoy, Agtti and Suhali.



3. Launching of the Project

The first phase of the project was launched from Minicoy island on 23rd March 2005 and the second phase tagging was launched from Kavaratti island during November 2005. During the first phase, tagging was done from Minicoy Island whereas the second phase tagging was carried out from Minicoy, Agatti and Suhali islands. However the maximum releases were made from Suhali Island, which is uninhabited.

4. Tagging platform

The main tagging platform used from the Lakshadweep Islands was pole and line boats. A limited number of tags were released from troll line gear also. The PL boats are of 25-30 feet OAL, locally built using wooden planks and hard wood. The boats are powered by diesel engines of 30-40 HP. The baitfish tanks are located forward of the engine and is a wooden box with partition in the middle. The fishing gear used are bamboo poles of 5-7 feet long with fishing lines of nylon/monofilament. The hooks are barbless and locally made.



35 feet long Pole and Line fishing boat operating in Minicoy Island

5. Bait fishing

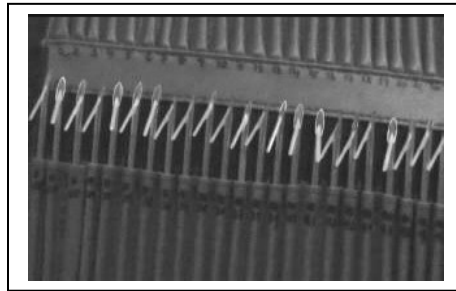
Bait fishing is conducted by the fishermen on daily basis in the lagoons during early morning hours while proceeding to the fishing grounds. The gear used are rectangular nets of 60x3m size. The bait fish species caught from the lagoons are mainly Caesionids (*Spratelloides delicatulus* and *S. gracilis*) and Apononids(*Archamia lineolatus*).

6. Tagging methodology

The tagging team constituted of a tagger, a fish holder and a recorder. The crewmembers assisted in passing on the fish to the holder. Plastic dart tags and stainless steel applicators manufactured by Hallprint of Australia were used. Tags in the applicators were arranged in tag magazines and each tag magazine could hold 50 tags in 50 pockets stitched in rows. The tag series AA 7001 to 12000 (5000 tags) was used in this project. The tagging time was brought down to less than 15 seconds once the team gained experience.



Tagging processes



Tag magazine

7. Tag release

7.1. First phase tag release

The first phase of tagging cum training exercise extended from 23-3-2005 to 9-4-2005 by undertaking 22 boat cruises in 10 days operation. During this period a total of 1147 tunas consisting of 88 YFT and 1059 SKJ were tagged and released.

7.2 Second phase tag release (First leg)

The second phase tag release was carried out from Minicoy and Agatti islands. Two teams of Scientists (7 members) participated in the exercise in Minicoy while one team (3 members) operated in Agatti. The activity in Minicoy extended from 24-11-05 to 10-12-05 engaging two boats on hire basis. In all 11 trips were made by these two boats but the total release from Minicoy was only 162 tunas. In Agatti the tagging was undertaken from 30-11-05 to 8-12-05. Only one boat was engaged for the operation and total 7 boat cruises were conducted. The total number of tunas tagged from Agatti is 864 of which 834 were SKJ and 30 YFT. Among these, three YFT and one SKJ caught by troll line were also tagged. The total tunas released from Minicoy and Agatti during the second phase (first leg) is thus 1016.

7.3. Second phase tag release (second leg)

The tag release exercise during the second leg of the second phase was planned from Kavaratti and Agatti. However due to the fishing conditions prevailed both the teams moved to Suhali island during 3rd week of February and accomplished the remaining target during 21st to 28th February 2006. Camping in

Suhali island the team succeeded in tagging 2785 tunas (5 YFT and 2780 SKJ). Out of these, 7 tunas tagged were caught on the troll line.

7.4. Summary of tag release

Following is the summary of tag release accomplished from Lakshadweep.

Phase	Location	Period	Tagging days	Boat days	Fish tagged		
					YFT	SKJ	Total
I	Minicoy	23-3-05 to 9-4-05	10	22	88	1059	1147
II (1)	Minicoy	24-11-05 to 10-12-05	8	11	41	121	162
	Agatti	30-11-05 to 8-12-05	7	7	30	834	864*
II (2)	Suhali	21-2-06 to 28-2-06	5	10	5	2780	2785*
Total			30	50	164	4794	4958

*Includes release of tuna from troll line: 4 from Agatti and 7 from Suhali

8. Size distribution of tagged tunas

The Fork length (FL) of the yellowfin tuna tagged during the entire tagging exercise was in the range of 25-67 cm, with about 90% of the fish being in the range of 31-50 cm length(Fig.1). More than 45% of the skipjack tagged were of the length group of 46-50 cm. Fork length of this species was in the range of 20-67 cm (Fig. 2).

Fig. 1 Length frequency of yellowfin tuna

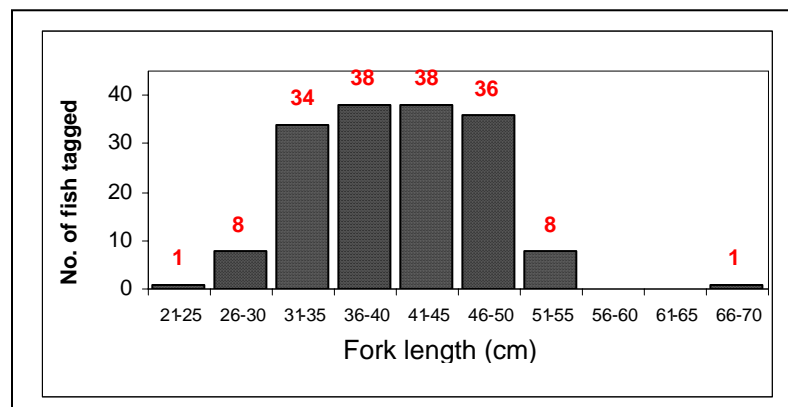
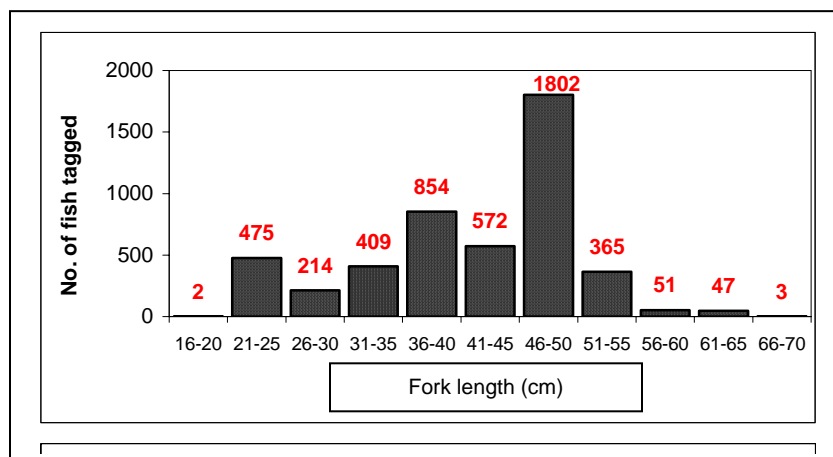


Fig. 2 Length frequency of skipjack tuna



9. Tag release expenditure

Different schemes of payment for tag release were opted during the two phases of tagging. The expenditure incurred towards tag release per fish works out to Rs.64/- (about 1.5 US dollar). Other item of expenditure directly related to tag release is purchase of equipments locally amounting to Rs. 50318/- (1170 US dollar).

10. Publicity

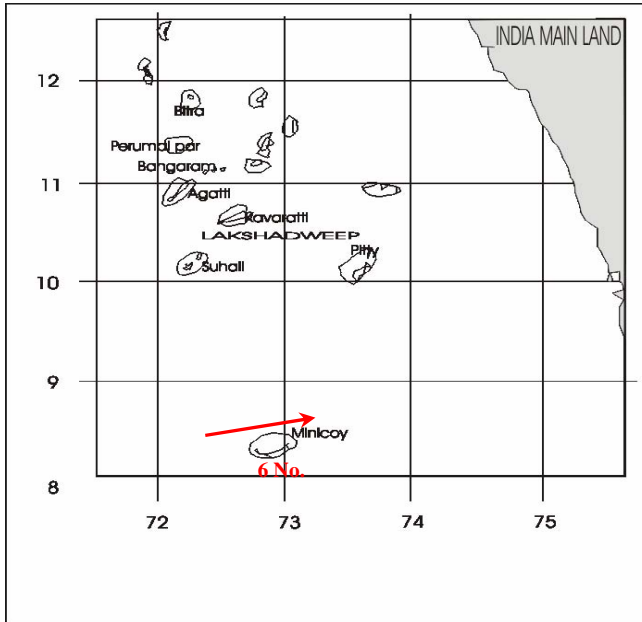
Wide publicity was given for the project in the Islands as well as in the maritime states of India through print media. Posters were designed and printed in eight local languages and displayed in important places where fishing related activities are taking place. Meetings with fishermen and those engaged in fish processing were conducted to create awareness about reporting of the recaptured tunas. Publicity was also given through other print media like local newspaper, journals, reports, All India Radio, Television etc.

11. Tag recovery

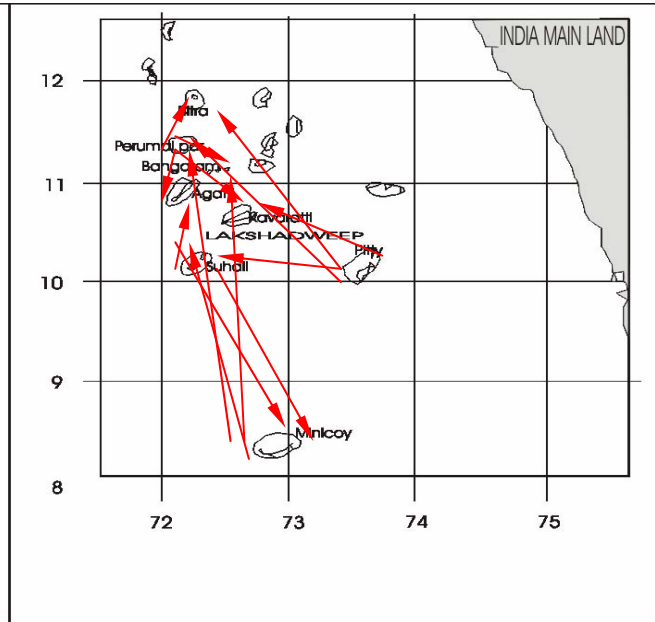
The total recapture reported from different islands including Maldives and Seychelles are 223 tunas (4.5%) consisting of 7 yellowfin and 216 skipjack tunas. However 38 recoveries are with incomplete information. Recapture in Lakshadweep is reported from 8 islands, viz., Minicoy, Bangaram, Agatti, Kavaratti, Perumalpar, Suhali, Bitra, and Pitty (Fig.3).

Fig. 3. Tag recovery locations

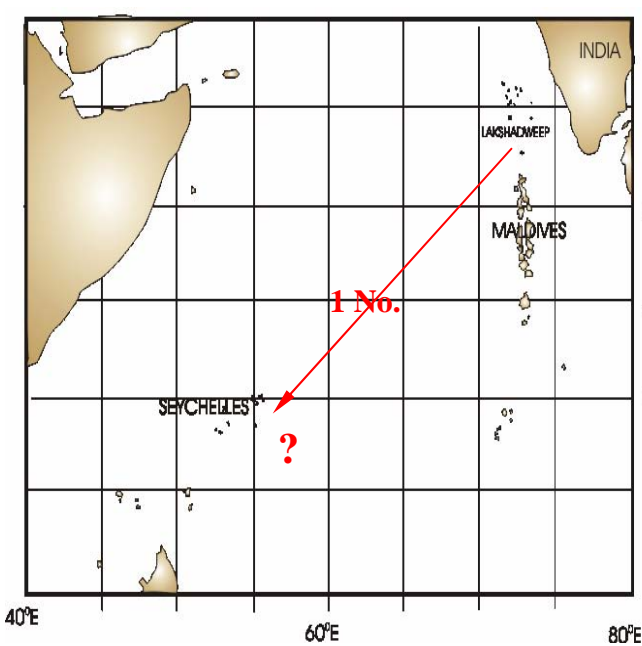
A. Local movements
Yellowfin tuna



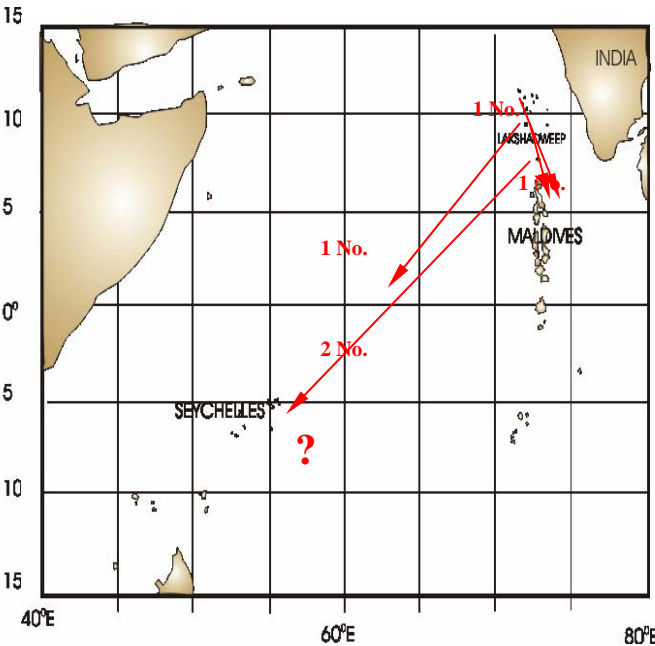
Skipjack tuna



B. Long range movements
Yellowfin tuna



Skipjack tuna



? Tag recovery from Cannery in Seychelles or purse seiner operating from Seychelles
Following is the island- wise details of the recapture.

Sl. No	Name of Island/country	No. of recovery	
		YFT	SKJ
1	Minicoy	6	9
2	Bangaram		7
3	Agatti		16
4	Kavaratti		30
5	Perumalpar		7
6	Suhali		126
7	Bitra		2
8	Pitty		9
9	Seychelles	1	3
10	Maldives		7

Four recaptured tunas consisting one yellowfin and three skipjack tunas were reported from Seychelles. The recapture in Lakshadweep and Maldives is exclusively by pole and line boats whereas in Seychelles these are caught by purse-seiners.

A preliminary analysis of the recapture data shows that time lag between release and recapture range from 1 to 375 days. An yellowfin released from Minicoy on 31-3-05 was caught by a Seychelles based purse seiner on 10-4-06. The skipjack tunas caught in Maldives were within a duration of 18 to 230 days. In Lakshadweep islands the recapture is reported between 1 and 305 days. The average monthly growth registered in respect of yellowfin is 2.5 cm for fish of 30-44 cm length. In certain cases there appears to be some discrepancies in the recording of the length related data probably as this is not collected by qualified personnel. The absence of facilities/ equipments might be the reason for inaccuracy in the data collection.

The migration pattern of both SKJ and YFT broadly indicate inter island and oceanic movement of both the species.

12. Discussion

The project is implemented successfully from Lakshadweep by releasing 4958 tunas. A small component is to be experimented from longline survey vessel of FSI for which necessary arrangements are being made. 10 Scientists from FSI were trained in tuna tagging by two experts whose services were provided by IOTC. Of the different platforms suggested for tag release PL boats are found to be the most suitable for tagging especially for large-scale tag release. A tag recovery of 4.5% is reported so far. The data on recapture gives preliminary indications on the movement pattern of both species and the growth rates.

Detailed analysis of the data for further inferences could be attempted on completion of the project.