



Tagging of yellowfin tuna by CMFRI team

India joins top successful countries involved in Pop-up Satellite Tagging of Yellowfin Tuna - A pioneering effort

Pop-up X-tag was used on yellowfin tuna (*Thunnus albacares*) for the first time in Indian waters by the Central Marine Fisheries Research Institute during December 2011 to February 2012. A total of 15 tags were used in two phases along the Bay of Bengal and the Arabian Sea with the Pop-up time ranging from 4 months to a year. Tagging was done in the Bay of Bengal Region from Visakhapatnam where eight tags were used and along the Arabian Sea seven tags were used off Lakshadweep Islands. The tagging programme is funded by INCOIS under the project entitled "Satellite Telemetry studies on Migration patterns of Tunas in Indian Seas" (SATTUNA). With this achievement India joins **the elite group of countries engaged in satellite tracking of yellowfin tuna**. Earlier reports on Pop-up tagging of yellowfin tuna are only from the Gulf of Mexico using Pop-up satellite archival tags during 2009

Migratory movements of yellowfin tuna (*Thunnus albacares*) in oceanic waters near

and away from Indian waters remain untested and exchange rates are still unidentified. Tagging studies have been carried out to study the growth and migration of marine fishes. However, conventional

First instance of tracking *Thunnus albacares* with Pop-up Satellite Tags (PSAT) in Indian waters

archival tags used have a number of disadvantages with very poor recovery rates and limited data on habitat and environment. The "Pop-up" tags have been developed to avoid such problems and also to increase the probability of data recovery. These tags are attached externally and have a release mechanism that causes the tag to detach from the fish at a predetermined time and "pop-up" to the sea surface where the data

can be recovered via the ARGOS system aboard polar-orbiting NOAA satellites. The first-generation Pop-up tags provided only limited data: more of migratory data and less environmental data. These tags therefore provide fisheries-independent measure of the straight-line distance traveled from the point of tagging. More recently Pop-up tags have become available and its positions as determined by ARGOS which enables temperature, depth and ambient daylight that can be reduced (e.g. as time-at-depth and time-at-temperature histograms and profile-depth temperature data) on board the tag before data transmission.

Tuna mainly the bluefin tunas have been tracked using the Pop-up tags in the Atlantic Mediterranean and Australian waters. The large size and weight of the original tags and the high cost of the tags were the major limiting factor for tagging smaller migrating fishes. With the development of the x-tags, smaller bluefin tuna, marlin, and yellowfin tuna too can be tagged. The high cost of



Tuna with Pop-up Satellite Tag ready for release

tags (PSAT) still makes large scale tagging of fishes with satellite tags a challenging proposition.

A good scope of fishery for the yellowfin tuna is existing in the Indian waters. To manage the stock and to fish the stocks at a sustainable level, information regarding its migratory patterns, movement for feeding, breeding, its diving characteristics, reasons for the fish to remain within a depth zone and to know whether the tuna available in our waters belongs to the same stock or migrating from neighboring countries are essential, but hardly known. It is in this context that CMFRI took up the challenging task of tracking yellowfin tuna with pop-up tags. The pioneering work carried out by the Institute has placed the country on par with few other countries of the world that have been successful in using the pop up tags to track marine fishes.



Tagging of yellowfin tuna with Pop-up Satellite Tag



Close-up of tagging of Yellowfin tuna



Tagged yellowfin tuna released in to the sea



Instruments used for tagging