Proposed experimental designs for estimation of tag shedding and reporting rates from the EPOTTP during 2019-2020

Kurt Schaefer and Daniel Fuller

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ESTIMATION OF TAG SHEDDING RATES

INTRODUCTION

- Double tagging experiments will be conducted during the EPOTTP to obtain estimates of tag shedding rates to incorporate in analyses of tag recovery data to account for tag losses from fish from the time of tagging and release until recovery.
- Not accounting for tag shedding can lead to biases in estimates of important parameters derived from tag-recapture data, including exploitation and natural mortality rates.
- Type-1 shedding is defined as immediate tag shedding following release, as a result of improper tag attachment. Type-2 shedding is defined as the loss of a tag or both tags over a period of time after the fish has been tagged and released.
- A maximum likelihood approach was used for parameter estimation of Type-1 and Type-2 shedding with data from skipjack tagging experiments in the WCPO and IO (Hampton, 1997; Adam and Kirkwood, 2001). A Bayesian model approach was used for parameter estimation of shedding rates with tagging data for SKJ, YFT, and BET from the IO (Gaertner and Hallier, 2015).

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EXPERIMENTAL DESGIN FOR ESTIMATION OF TAG SHEDDING RATES

- 1,000 tunas will be double tagged (500 SKJ, 250 YFT, and 250 BET), by each tagger during each of the three EPOTTP tagging cruises during 2019-2020.
- The tags used will be the same plastic dart tags (PDTs) manufactured by Hallprint, Australia, used throughout the EPOTTP.
- The first tag to be inserted on the left side, at an acute angle adjacent to the second dorsal fin so the barb passes under the fin and through the pterygiophores. The second tag to be inserted about 1-2 cm posterior to the first on the right side using the same technique. Consecutively numbered pairs of tags will be used; even numbers inserted on the left side and odd numbers on the right.
- Double tagging of tunas will not commence until each tagger has tagged and released a minimum of 1,000 tunas.

ESTIMATION OF TAG REPORTING RATES

INTRODUCTION

- Tag seeding experiments will be conducted aboard tuna purse-seine vessels during the EPOTTP to obtain estimates of tag reporting rates by purse-seine fleets, to account for tags not reported from recaptured tagged fish loaded into wells of purse-seine vessels.
- Tag seeding experiments will also enable evaluations of the accuracy, or the error rates, associated with tag recapture information including vessel name, well number, species, and size.
- Estimates of tag reporting rates from purse-seine, as well as longline fleets, are very important so as to incorporate those parameters in the analyses of tag recovery data, because unknown reporting rates can lead to biases in estimates of important parameters derived from tag-recapture data including exploitation and natural mortality rates.
- It is not feasible to conduct tag seeding experiments aboard longline vessels to directly estimate reporting rates, but this rate can be estimated indirectly by comparing the rates of tags returned from longline fleets as a function of the total catch of tuna by size, area, and time. Schaefer and Fuller (2009) estimated indirectly a 10% reporting rate for tagged BET caught by longliners in the EPO, and Caruthers et al. (2014) estimated indirectly a 5% reporting rate for tagged BET and YFT by longliners in the IO.

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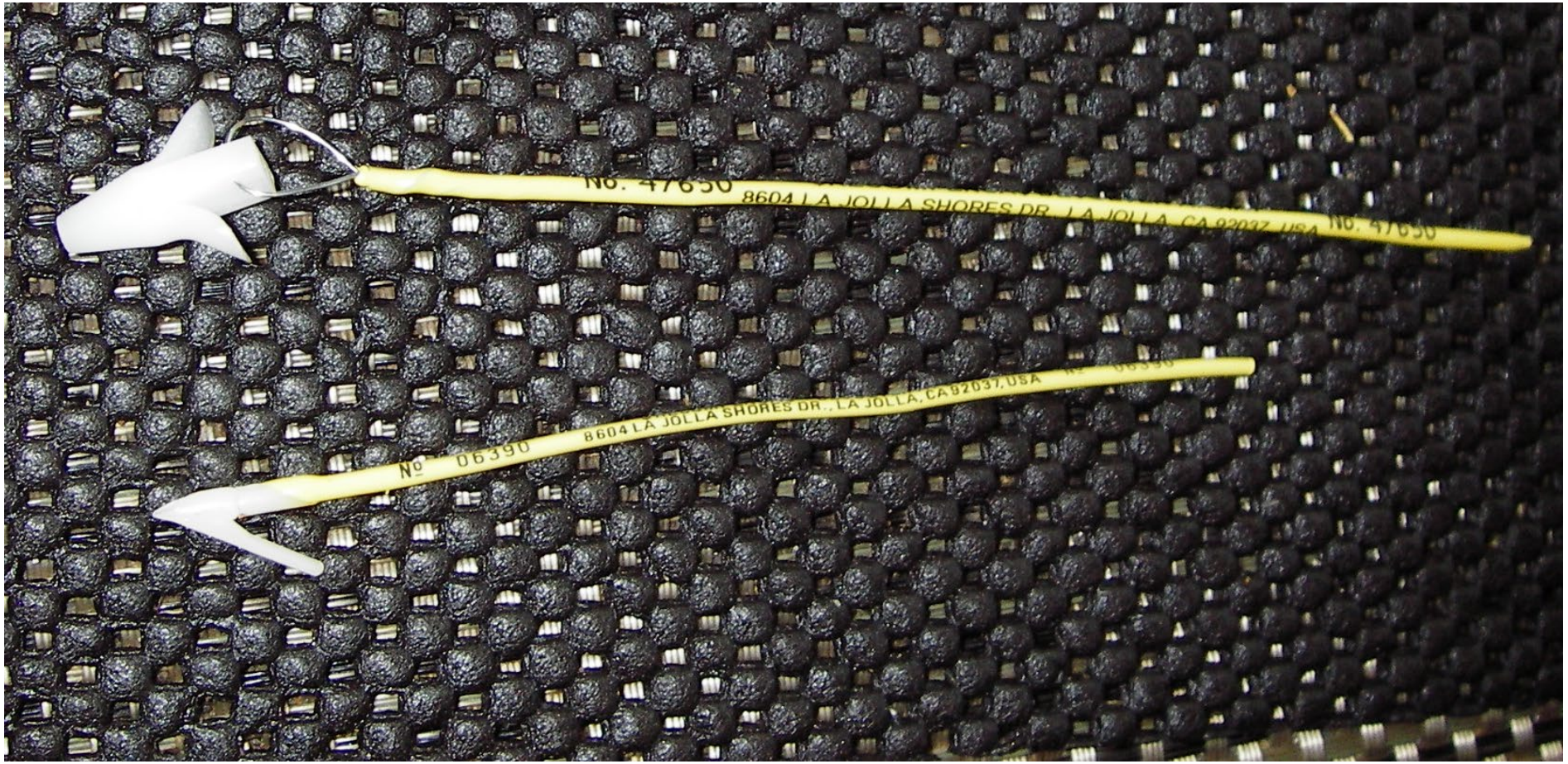
EXPERIMENTAL DESGIN FOR ESTIMATION OF TAG REPORTING RATES

- The experimental design and methodology to be used for the IATTC tag seeding experiments will replicate those of the SPC-OFP tag seeding program in the WCPO aboard purse-seine vessels, with some minor modifications.
- Two different tag types will be used in the tag seeding experiments. The same yellow plastic dart tags (PDTs) used for tagging and releasing live tunas, and yellow plastic intramuscular anchor (PIMA) tags. Retention rates of the PDTs will be compared to those of PIMA tags following attachment to dead tunas placed in wells, and enable best possible estimates of reporting rates.

EXPERIMENTAL DESGIN FOR ESTIMATION OF TAG REPORTING RATES

Tag Types to be used in reporting rate experiments. Top tag is the Plastic Intra-Muscular Tag, and the bottom is a Plastic Dart Tag



EXPERIMENTAL DESGIN FOR ESTIMATION OF TAG REPORTING RATES

- Tag seeding will be conducted by IATTC observers aboard purse-seine vessels operating in the EPO starting in March 2019 and continue through February 2021, for a duration of 24 months.
- During a purse-seine vessel trip an IATTC observer will be asked to deploy 30 tags on 25 tunas (a mixture of available sizes and specimens of SKJ, YFT, BET).
- From a purse-seine set 4 tunas would be tagged with a single tag, 2 with one tag type, and 2 with the other tag type, and one tuna doubled tagged with the two types of tags. That procedure would be repeated for a total of 5 sets during the trip.
- Tunas would be measured and tagged by the observer on the well deck. Before a set in which the observer intended to conduct tag seeding he would ask the deck boss to instruct crew to leave up to 10 fish of each species present in a designated location, and nearby the well into which the fish from that set were being loaded. Following completion of his duties above deck the observer would go to the well deck to measure and tag the tunas and then place in the well with the other fish from that set (as covertly as possible).
- Observers will be paid $50 extra per trip, whom appear to have completed the tag seeding process to our satisfaction following review of their tag seeding form and report.

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Questions