

Award Number: NA12NMF4540096

Award Period: [05/01/2012](#) - [04/30/2015](#)

Project Title: Age Validation of Monkfish

Report Type: Project Progress Report

Reporting Period: [11/01/2013](#) - [4/30/2014](#)

Report Due Date: [5/30/2014](#)

This research is a continuation of the 2011 Monkfish Research Set Aside project - Using Archival Tagging and Age Validation Efforts to Assess Monkfish Movement, Age Structure, and Growth - NA11NMF4540007.

Tasks Accomplished:

- Compensation fishing has been completed, 110 DAS were used out of the 129 DAS allocated for this project. All 129 days have been paid for.
- In the lab, two new monkfish were injected with the preferred chemical marker, fluorexon. Both are still alive and eating (Table 1).
- Three fish were injected in the field with the preferred chemical marker, fluorexon, then tagged and released as part of the 2013 Monk RSA project, award number NA13NMF4540091.
- Two tagged fish were recaptured during this time frame. One was at large for 126 days, and the other recent recapture (4/7/2014) has been at large for 537 days, the longest time at large to date, bringing the total of injected, tag returned fish to 13.
- The age structures for the fish that was at large 537 days were removed and prepared for image analysis. The chemical mark is already visible on the vertebrae without the aid of microscope or UV light.
- Image analysis has begun for the fish at large 126 days. The mark is visible in the illicium, but not in the otolith. The vertebra has not been analyzed yet.
- Image analysis was completed for two tagged fish that were recaptured during the last time frame. Both fish were released the same day and recaptured 333 and then 365 days later. The fish that was at large 365 days shows a strong mark in the illicium, however the mark in the fish that was at large 333 days is absent (Figure 1). The mark in the vertebra is bright in the fish that was at large 365 days and much less intense in the fish that was at large 333 days (Figure 2). The mark in the otolith is absent from the fish that was at large 333 days. There is a possible mark in the fish that was at large 365 days, but the mark is not concentric, and is only visible at the tapering end of the otolith (Figure 3).
- A presentation titled "Age Validation of Monkfish" was given at the Southern New England Chapter of the American Fisheries Society 2014 Winter Science Meeting on January 29, 2014.
- Collaboration continues with Katie Quaeck, a PhD student at the National Oceanography Centre, Southampton. Eye lenses were removed from two injected fish and then heated for 12-24 hours in a 60°C oven. These fish were both recaptured tagged fish, one at large

for 126 days and the other at large for 365 days. Five samples are now ready to be mailed to Southampton, England.

Special Problems:

Tag shedding has become a problem with recent recaptures. The three fish at large for 333, 365 and 537 days were all returned without a DST. Unfortunately, the only identifying number was on the DST so we do not have exact growth information for these fish.

It is also surprising that these three fish, all injected on the same day, with the same concentration and the same batch of fluorexon, exhibit different intensities and visibility of the mark. It is more surprising that the mark is absent in the illicium of one fish (333).

Table 1. Monkfish specimen held for the age-validation experiment. Two injected during this time frame. Specimen D.IG is being held at The Maritime Aquarium in Norwalk, CT. All three are currently alive.

IDENTIFICATION	INJECTION DATE	AMOUNT injected	LENGTH (cm)	Acclimation Time (days)	DAYS ALIVE AFTER TREATMENT	DAYS ALIVE IN LAB	Growth	SEX
BO	2/13/2014	Fluorexon 25 mg/kg	63	70				
LL	3/27/2014	Fluorexon 25 mg/kg	29	12				
D.IG	6/14/2013	Fluorexon 25 mg/kg	43.5	75				

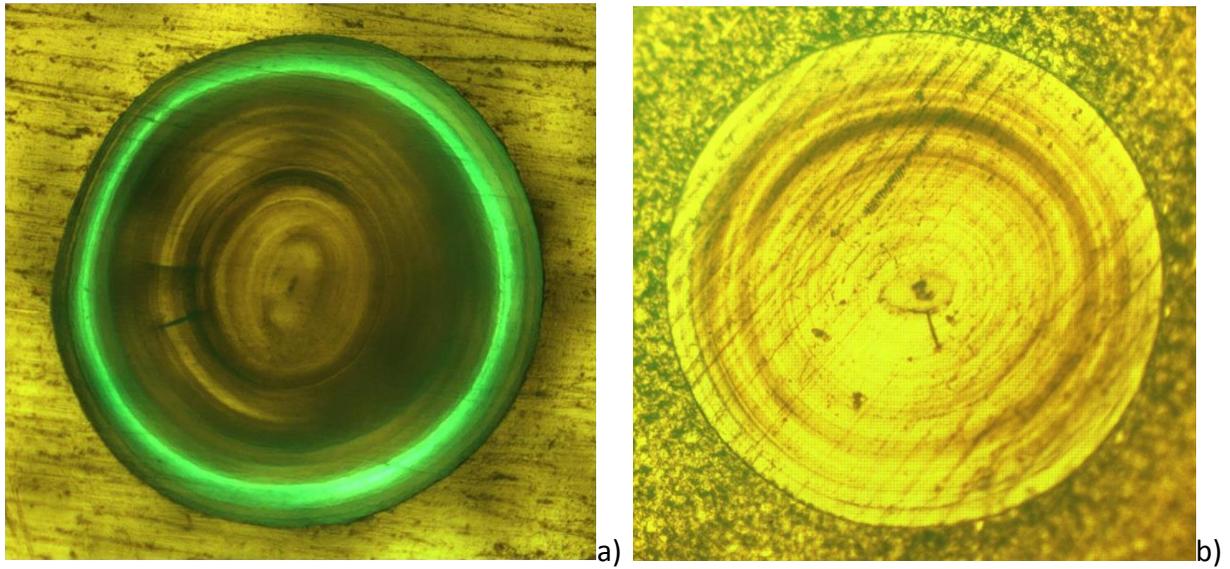
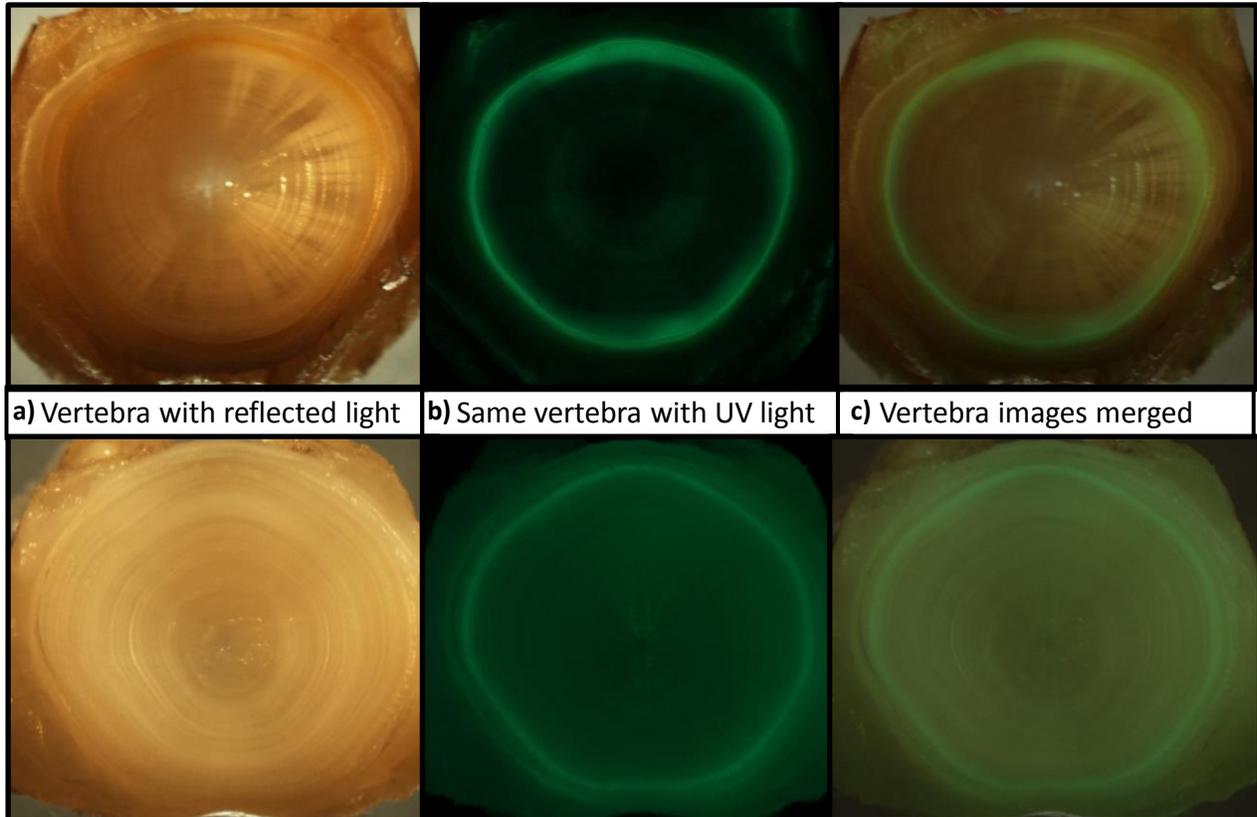


Figure 1. a) Illicium from male fish recaptured after 365 days at large. Image is taken with a mix of transmitted and UV light. b) Illicium from a male fish recaptured after 333 days at large, the mark is noticeably absent. Image is taken with a mix of transmitted and UV light.

365 days at large, male, growth unknown

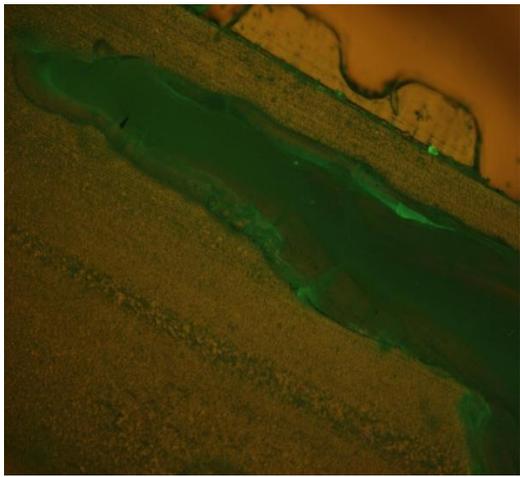


333 days at large, male, growth unknown

Figure 2.

Top row: vertebra from male fish released in October and recaptured a year later. Image a) is taken with transmitted light, image b) with ultra violet, and c) is a Photoshop image merging the first two images.

Bottom row: vertebra from male fish released in October and recaptured the following September. Image a) is taken with transmitted light, image b) with ultra violet, and c) is a Photoshop image merging the first two images.



a)



b)

Figure 3. a) Tapering end of the otolith showing a possible mark. b) Lower end of the otolith not showing a distinct mark.