**Information about Shortspine Thornyhead Age data**

Age and length information for Shortspine Thornyhead were explored in special projects by a California State University-Moss Landing Marine Labs Master’s student (Kline 1996) and the Southwest Fisheries Science Center (Butler *et al.* 1995).

**Datasets:**

[Kline (1996)](https://drive.google.com/file/d/1MMGDx71_Zg2-bjEG0M0J2YjJTP3GygPr/view?usp=share_link) Master’s thesis (Greg Calliet MLML advisor; John Butler SWFSC mentor)

[Butler *et al.* (1995](https://drive.google.com/file/d/1ryWyj6RaVRXv3dWkRrg0msEkbgdjwG3j/view?usp=share_link)) NOAA tech memo

Notes:

Formatted files that run with R code (SST\_Age\_Growth\_Butler\_Kline.R)

* + “S. alascanus\_Kline 1996\_formatted”
    - All fish unsexed
    - Contains fish information, multiple otolith age reads, and otolith measurements from Kline 1996
    - Each row is a different fish
    - Some column headings re-named from original file
    - Extraneous calculations in side columns removed
    - Any asterisk on a number was removed, but documented in the “notes” column
  + “Original NMFS S. alascanus data\_1991\_formatted”
    - Fish and age information from Butler et al. 1995
      * All fish sexed
      * Note: fewer fish in this file than the number of fish reported in the tech memo; unclear exactly which fish these are
      * Each row is a different otolith (i.e. a fish that had two otoliths removed and aged would be duplicated)

Documentation of column headings

* + Kline 1996 (and Kline pilot study)
    - **COLL\_DATE\_yr\_mo:** collection year and month (example: 9109 for Sept 1991)
    - **TOW:** tow number (if from a science survey–missing for some fish due to not all fish being processed at sea)
    - **DEPTH:** meters; trawls along 200 m isobaths from 200 to 1400 m
    - **SPECIMEN:** identification number for each fish
    - **TOT\_LENGTH\_mm:** total length in millimeters
    - **HEAD\_LENGTH\_mm:** millimeters
    - **HEAD\_HEIGHT\_mm:** millimeters
    - **EYE\_DIAMETER\_mm:** millimeters
    - **SEX:** does not have sexed fish (two fish with sex information are likely an error; DK said fish were not sexed)
    - **AGE\_1st\_read:** DK 1st read at 50x magnification, transmitted light
    - **AGE\_2nd\_read:** DK 2nd age at 50x magnification, reflected light (I believe this is the age used in the thesis analysis)
    - **AGE\_3rd\_read:** DK 3rd read at 30x magnification, transmitted light
    - **OLEN\_mm**: otolith length in millimeters
    - **OWID\_mm**: otolith width in millimeters
    - **OWT\_mg**: otolith weight in milligrams
    - **NOTES\_1**: DK notes
    - **NOTES\_2**: Added notes
    - **HEIGHT\_OTO\_core\_1st\_five\_increments\_ocular\_measurement**: otolith core measurements
    - **THICKNESS\_WIDTH\_OTO\_core\_1st\_five\_increments\_ocular\_measurment**: otolith core measurements
    - Columns/information added to the original file:
      * **Genus:** *Sebastolobus*
      * **Species:** *alascanus*
      * **Common\_name:** Shortspine thornyhead
      * **Data\_source:** pilot study or thesis
      * **Collection\_source:** commercial fishery or science survey
      * **Collection\_region:** general biogeographic region
      * **Collection\_specific\_location:** a more specific location (no coordinates); information is from DK and thesis; specific location is somewhat uncertain for samples from SWFSC survey on the David Starr Jordan (DS91-09 (238); SW of Santa Cruz, California-Monterey Canyon) and MLML survey (possibly from Farallon Islands, west of San Francisco, California)
      * **Collection\_month:** pulled from COLL\_DATE
      * **Collection\_year:** pulledfrom COLL\_DATE
  + Butler et al. 1995
    - **COLL:** is perhaps collecting trip information? Possibly corresponds to a NMFS SWFSC slope survey? Some may be year and month, but others unknown
    - **FISH**: is perhaps a fish number within a cruise?
    - **OTO**: likely an otolith ID number (sort COLL 1229-1294 and FISH 401-884, get OTO 1-884) (COLL=1299 - 1323 get 2 otoliths collected from each fish!! OTO 1-200) (COLL=7902-8409 and get OTO 1-62)
    - **LEN\_mm:** fish length in mm, Fork length is measured in the tech memo
    - **WT\_g**: fish weight in grams
    - **SEX**: 1=male, 2=female, 3=unknown (no unsexed fish)
    - **SIDE**: location of the otolith? (left or right side of the head)
    - **OWT\_g**: otolith weight in grams
    - **OLEN\_mm**: otolith length in millimeters
    - **OWID\_mm**: otolith width in millimeters
    - **MAC\_computer\_age**: A computer program tested to identify growth increments to determine age
    - “DK, AR, JB” are initials for the different otolith readers
      * **DK\_reader\_4**: 4th reader, Donna Kline age (test reads for DK to learn how to age fish)
      * **AR\_reader\_1:** 1st reader, Angel Rodriguez
      * **JB\_reader\_2:** 2nd reader, John Butler (JB 1st read)
      * **2rD**: 2nd reader, John Butler (JB 2nd read)
      * **mean\_AGE\_AR\_JB:** mean age between AR and JB (used in the original analysis)
    - **Fraction\_diff\_AR\_JB:** percent deviation from minimum reading
    - **prd\_predicted\_by\_oto\_weight**:a predicted age based on otolith weight
      * Equation: 5.858 + 88.044 \* OWT
    - Columns/information added to the original file:
      * **Genus:** *Sebastolobus*
      * **Species:** *alascanus*
      * **Common\_name:** Shortspine thornyhead
      * **Data\_source:** Butler et al. 1995
      * **Collection\_region:** general biogeographic region
      * **Collection\_specific\_location:** a range in latitude from the Butler et al. 1995 tech memo
      * **Collection\_year:** range of years from the Butler et al. 1995 tech memo

Other information provided by Donna Skaggs-Kline

* + SST are difficult to age, especially after 10 years of age
  + Early “settlement” marks were fairly distinct
  + SST have ontogenic movement to deeper water, perhaps the surveys do not collect the oldest/largest fish
* Relevant email correspondence with DK

February 13, 2023:

Below is a list of what I have on hand right now.

Jane, I’m sorry but I didn’t keep any of my reference literature. I did a paper purge during COVID lockdown and recycled all of my old references so no Miller thesis.

I was able to access all of the files from my 3.5 inch diskettes and transfer them to a hard drive for the archive. I found the files for both species that I had imported into .xls and my original VonBert files and have attached the Shortspine files. If you would like the Longspine, I can send them as well. I’ve also attached the original file that John Butler sent for the NOAA data that I used in my thesis (SST88). He also provided some Longspine data that I used and I can send all of that if you’d like.

The really good news is that I found both the Cruise plan and the Cruise report from the collection of my fish. They are in the binder with the original datasheets. I included a couple of additional small collections, just for Age & Growth purposes, since I had a limited number of Shortspine specimens. I can scan those if you need them.

Inventory:

1. Three data binders, morphometrics, alpha spectrometry logs and raw data, and printouts from radon data collection including:
   1. Collection information – NMFS cruise plan and tracks where fish were collected. Includes all trawl info and specific dates.
   2. Original data sheets for evaluation of NMFS otoliths and all of my data collection including morphometrics and radiochemical logs and data.
   3. Notes and email printouts of conversations between Donna Kline and Gregor Cailliet (advisor at MLML), Cailliet and Waldo Wakefield, Kline and Butler, discussions with Rick Methot, etc.
2. Three VHS video tapes including MBARI video of Sebastolobus in situ, one that I think is a tape of my defense, and a third that I believe I used during my defense. I no longer have a VHS player so I’m not entirely sure what all is on these.
3. Section glass slides of individual otoliths – 3 boxes for Shortspine and 4 for Longspine. I’m missing a Shortspine box (#101-200) that I believe I sent to Allen Andrews at NOAA when he was doing TIMS. He may still have them. I also have a box of slides that were randomly selected (50/species) for the Precision Analyses. In the third Shortspine box I also have some slides from odd collections. About 30 from a Farallones cruise (info in the data binder) and a few labeled HF# that I have no recollection of even having. These were not used for analyses but I believe were the basis for a pilot study that I did to develop a proposal for funding.
4. Two clear boxes containing polonium plated samples in plastic vials.
5. One clear box containing all section remnants. Both species.
6. Two full vial boxes of extra otoliths – all Longspine. Sorry, I used all of the Shortspine as they were less abundant in these southerly recesses.
7. Photographic slides – tons! A small binder of slide pages and two trays filled. I still have my thesis slide tray plus all of the extras that I didn’t use. I was able to scan the ones used and they’ll be on the hard drive with the data.

*(NOTE: Archive sent to NOAA SWFSC, Santa Cruz, California, contact: j*[*essica.choi@noaa.gov*](mailto:Jessica.choi@noaa.gov) *and* [*melissa.monk@noaa.gov*](mailto:melissa.monk@noaa.gov)*)*

*……*

February 15, 2023

I cleaned up the data the best that I could and have attached a file with dates (to the month, not day) and tow numbers where I had them. I also saw that there were a number of blanks so I tried to resolve as many of those and the asterisks as best I could with my datasheets and my lab notebook from the project. Sorry, it’s a bit of a messy database. I wish I had had Access back then!

The first 32 Shortspines were actually collected in Monterey Bay in June 1991 by a local fisherman. They were primarily used for the pilot study and my learning how to section the otoliths and age them. John Butler also loaned me a box of slides to develop my skills as well. I believe some of those ages were included in one of the files. Also, the final 70 or so don’t have ages as I was running low on time and used them for radiochemistry to fill out the samples.

The first 51 Longspines were taken from a single tow on one of Greg’s class cruises in October 1990 before I arrived at MLML. They were also used to develop my skills and generate funding. They were included in only the age-length graph in my thesis but noted that they had been previously frozen. I had so many Longspines from the 9109 cruise that I ended up putting them in trash bags to transport them off the ship quickly when I couldn’t get all of the processing done. So a number of them don’t have tow or depth entries. I have a few sex entries that I was able to get later in the project.

I’ve also added .pdf’s of the cruise plan and report, my summary of the extra Longspine specimens, and an email from John Butler that explains the headers for his data and clearly indicates sex is 1=Male, 2=Female.

Hope this all helps! If you have more questions, I’ll be here. I’ll try to look for the missing sections at MLML and add them to the archive.

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List of files provided by Donna Skaggs-Kline (Original data copied from floppy disks to Excel)

* Files sent:
  + “S. alascanus-NMFS-MLML Comb”
    - Butler *et al*. (sexed fish) and Kline age data (unsexed fish) combined
  + “S.alascanus\_NMFS\_Age&Growth Analysis”
  + “Original NMFS S. alascanus data\_1991”
    - Butler *et al.* data with collection information
  + “SST88\_NMFS”
    - Another copy of the Butler *et al.* data (no new information in here)
  + “S. alascanus\_Kline 1996”
    - Kline 1996 study (unsexed fish)
    - 3 age reads per otolith by Donna Kline
  + “S. alascanus\_VONBERT\_Kline 1996”
    - Growth curve for Kline 1996
  + “Thornyhead data\_Kline\_1996”
    - Both SST and LST data for Kline 1996 thesis
    - Includes tow and depth information (which was copied to the “S. alascanus\_Kline 1996\_formatted” file
    - In the column headings it is noted that the multiple reads for DK were done with different microscope settings (i.e. different magnification and light source):
      * AGE 1: 50x magnification, transmitted light
      * AGE 2: 50x magnification, reflected light
      * AGE 3: 30x magnification, transmitted light