

CARE check in meeting

February 17, 2026

Virtual

- **Welcomes by Mark Terwilliger**
- **GTC Meeting**
 - Scheduled to be held in Port Townsend
 - Ali Whitman & Dana Haggarty attending
 - Alison Whitman:
 - Focus will be on increasing tribal and First Nation engagement. Continuing to plan on in-person meeting. Considering other options with the widespread travel restrictions.
- **Agency Reports**
 - CDFO – Nanaimo – Audrey Ty
 - 6 Full time agers. Audrey acting manager until March.
 - Currently working on Dover sole (500), arrowtooth flounder (800). Completed ~1600 sablefish. Lingcod (300 finrays, no otoliths yet; worked on training samples but stopped due to funding loss). Begun ageing Pacific cod (100 currently, training more agers) 1,100 Pacific hake this year. 3800 silvergrey rockfish. 800 widow rockfish. 700 yelloweye. 16,600 herring. 550 eulachan. 1000 chum, 5000 coho, 20,000 sockeye and 26,000 Chinook. 491 geoduck
 - 6 full time agers currently.
 - Steven Wischniowski – Working on alternative age estimation (FTNIR, otolith shape, salmon scale images, rockfish age-otolith weight relationships). Funding issues and hoping for future funds. Short slide presentation on these newer methods and equipment setup.
 - Winnipeg Lab – Shu Ting Zhao
 - Shu Ting took over as lab supervisor in September after Laura Heuring retired.
 - Lab aged 42 species and 26,865 samples. Top 5 are Arctic char, dolly vardon, lake whitefish, Greenland halibut, longnose dace
 - 2 full time agers and 2 part time agers. One is full time until March.
 - 4000 deepwater redfish otoliths, plus 2000 more coming; building the protocol for ageing
 - Looking at incorporating 3D scans, do exchanges with other labs, and marine mammal ageing (beluga, walrus, killer whales, sperm whales.)

- ADF&G – Juneau – Kevin McNeel
 - Currently has two permanent staff, seasonal staff, and interim personnel borrowed from adjacent ADF&G projects (Kevin McNeel, Mark Plumb, Kaitlyn Johnson, Gage Cadenhead, and Mark Boedefeld)
 - Species processed: sablefish, yelloweye rockfish, black rockfish, rougheye rockfish, shortraker rockfish, redbanded rockfish, lingcod, and dark rockfish.
 - 30% double read rate, outlier analysis with otolith weight-age models and length-age models
 - ICES Workshop: emerging methods and technologies for the automated analysis of calcified structures (WKETAC)
 - Lipid extraction from tarpon scales to evaluate reconstructing lifetime reproductive hormone profiles using scales. (Still pending)
 - Support of graduate and doctoral level students at the University of Alaska, Baylor University, Humboldt University, Oregon State University, University of Texas, and San José State University.
 - Claire Stuart defended her thesis on quillback rockfish and provided slides and initial increment data from that work.
 - The ADU is continuing to work with AFSC to study rougheye/ blackspotted otolith shape and to study gadid hormone analysis through live rearing fish formerly at Little Port Walter.
 - Some processing was impacted by staff turnover and building closures due to freezing and snow, but new staff calibrated during this period and facilities reopened after several weeks.
- ADF&G- Homer DSF- Marian Ford
 - Cook Inlet and Prince William Sound management areas.
 - Lead production ager Marian Ford. Corey Litwiniak hired into our vacant aging technician position. He will be responsible for lingcod sample prep and will be training for aging lingcod and black rockfish. Clay McKean supervises out of the Anchorage office.
 - Prioritizing black and yelloweye rockfish and lingcod. Total of 2,376 black rockfish otoliths and 338 Yelloweye Rockfish were aged this season, 451 Lingcod still need ageing.
- AFSC – Seattle – Derek Chamberlin
 - Personnel changes this past year: 3 retirements (Thomas Helser, Irena Benson, Chris Gburski) Andrew Chin moved to IPHC.
 - 5 folks on research team, 6 on the production aging team, with overlap between teams. One contractor through PAC states.
 - Production aging impacted by staffing loss as well as the federal shutdown.

- Since March of 2025 produced just over 15,000 traditional otolith ages from 17 species, and double read just shy of 6000 of those. Produced 4600 FT-NIRS ages for Eastern Bering Sea walleye pollock.
- Top 5 species: Walleye Pollock (~9,000); Pacific Cod (~ 2,500); Rex Sole (~1500); arrowtooth flounder (~1,100) and sablefish (~1,100)
- Implemented FT-NIRS for eastern Bering Sea walleye pollock.
- Data generated for the 2026 bottom trawl survey and the 2025 Fishery collection; plan to only produce FT-NIRS ages for EBS pollock
- Onboarding Eastern Bering Sea Pacific Cod, Aleutian Islands and Gulf of Alaska rockfish this year, possibly next year.
- Ongoing research: incorporating trace element data into some Pacific cod validation analysis; trends in Pacific cod maturity; research into the use of spectroscopy to predict fish condition.
- Manuscripts published: on reproductive biology of shortspine thornyhead; applying FT-NIRS to daily age estimation for pollock; effects of ocean warming on a suite of different Bering Sea species.
- IPHC – Seattle - Andrew Chin
 - The IPHC currently has two full-time and two part-time age readers. One of the full-time readers (Andrew) new in 2025 replacing Chris Johnson who retired.
 - In 2025, a total of 20,031 otoliths were collected, 13,817 otoliths of which were aged for the stock assessment.
 - Age reading plan for 2025 included:
 - Reading all current-year setline survey otoliths prior to assessment
 - Reading a subsample of otoliths from commercial catch samples
 - Re-aging subset of 2022, 2023, and 2024 setline survey otoliths in the winter/spring of 2024/2025 (n~3000)
 - Reading the 2024 recreational and trawl survey otoliths in the winter/spring of 2024/2025
 - New reader training
 - Age reading plan for 2026 involves:
 - Reading all setline survey otoliths plus all commercial samples from WA/OR/Canada and BS/AI but aging a 50% subsample of commercial samples from all other areas
 - Reading the 2025 recreational and trawl survey otoliths in the winter/spring of 2025/2026.
 - Additional age reading tasks:
 - IPHC is also investigating the use of artificial intelligence (AI) for aging Pacific halibut from otolith images. Age group staff have been photographing otolith surfaces and broken-and-baked (B&B) otolith

sections for input into the AI along with ages derived from baked sections.

- Initial training images: B&B otoliths from the 2019 setline survey collection (the most recent year of full coastwide survey)
- In 2024, photos of the whole otolith surface as were taken for each survey otolith. Surface photos were also captured for a subset of the 2025 survey otolith collection. Will use the paired surface and B&B images to compare AI age estimation accuracy for whole vs baked section images. (Would be more efficient if surface photos could be used)
- Using Amscope camera, TIFF format, same magnification for all images
- No annotation of image to mark rings; inputs to model for training currently include image and age. the model decomposes the image into so called convolutional layers and identifies itself the features that are informative for age determination. Other data such as date and area of catch, length, sex, etc. can also be added
- Beginning in 2025, three (up to six as of Jan 2026) UW and NWIC student volunteers recruited for capturing otolith photos for the AI project. Custom app was created to smooth out workflows for volunteers
- WDFW – Olympia - Andrew Claiborne
 - Personnel Update:
 - WDFW has the same team in the Fish Ageing Lab since CARE last met in 2025.
 - Jenny Topping- Lead Groundfish Age Reader
 - Merrie Schultz- Groundfish Age Reader
 - Austin Anderson-Salmon Age Reader
 - Christina Jump-Freshwater Age Reader and Database
 - Andrew Claiborne-Team Lead and Salmon Age Reader
 - Activities Update:
 - Finalized a NOAA Tech Memo with the SWFSC that describes ageing methodology for coastal pelagic species (anchovy, Pacific sardine and Pacific mackerel).
 - Extensive database work for spiny dogfish that have been aged by WDFW.
 - Re-entering historical data that was not previously entered on the raw ageing sheets.

- Created a reference set of unworn dogfish spines and collected a variety of measurements on them
- Collaborated on a 4-day workshop for ageing Spiny Dogfish with the NWFSC lab.
- Currently production ageing Petrale Sole; Spiny Dogfish, Lingcod, Widow Rockfish, and Redbanded Rockfish on list of species that will be aged in 2026-2027
- Production Age Reading Update since 2025 CARE:

Agency	Scientific Name	Common Name	Year	N
WDFW	<i>Sardinops sagax</i>	Pacific sardine	2025	93
WDFW	<i>Sebastes flavidus</i>	yellowtail rockfish	2025	299
WDFW	<i>Eopsetta jordani</i>	petrale sole	2025	960
WDFW	<i>Oncorhynchus mykiss</i>	steelhead	2025	9,160
WDFW	<i>Oncorhynchus keta</i>	chum salmon	2025	46,513
WDFW	<i>Oncorhynchus kisutch</i>	coho salmon	2025	2,811
WDFW	<i>Oncorhynchus nerka</i>	sockeye salmon	2025	588
WDFW	<i>Oncorhynchus tshawytscha</i>	Chinook salmon	2025	44,669

- NWFSC – Newport – Patrick McDonald, Emily Wallingford
 - Patrick
 - Post 2025 assessment deadlines continued to age chilipepper, sablefish, widow and yellowtail. Preparing lingcod and dogfish structures ahead of a 2027 assessment decision. Plan on allocating resources to petrale sole, hake, dogfish, canary and lingcod in preparation for the 2027 assessments.
 - No changes in staff; 7 staff total
 - Species of interest:
 - Chilipepper rockfish (first year for this lab), quillback (CA only), yellowtail (north), rougheye/blackspotted complex, widow, sablefish

- Ready for 2027
 - redbanded – Trained on samples aged by a previous ODFW age reader for some maturity work. Then production ageing survey for recent years.
 - dogfish – preparation and ageing and coordinating a workshop with WDFW. Processed 2,754 dogfish spines from our freezer (defleshing)
 - lingcod – Cutting and mounting backlog of prepped fin rays. Now have over 2,300 lingcod slides ready to age when the time comes.
 - petrale sole – ageing CA Comm and survey at this point
- Government Shutdown – PSMFC housed in a NOAA building so we didn't have access to the building for the most part or its resources. Most of us were able to work from home and a couple of us were able to work in space that OSU was able to set aside for us.
- Overall numbers:
 - Aged 31,196 structures and that includes our production double reads
 - Weighed 31,162 age structures
 - Transferred 26,530 otoliths out of ethanol and into tray bins for dry storage
- Emily
 - Total FT-NIRS Production Scans by Species in 2025: sablefish – 14,764; Pacific hake – 4,120; chilipepper – 7,817; redbanded – 1,346
 - 2025 Grand Total: 28247
 - We collected data for several projects this past year, including:
 - Redbanded Accessory Project- comparing RDBD spectra collected with and without Teflon.
 - English sole Project- comparing spectra of the Eyed vs the Blind otolith.
 - Operator Comparison Project- comparing the spectra across all 7 lab members scanning the same subsample on one spectrometer
 - Machine Comparison Project- In January of 2025 we received a second Tango spectrometer from La Jolla. This project compared the spectra of multiple species between our original Tango and the La Jolla Tango. We just finished collecting the last set of data for this project, and we hope to get our second

Tango production scanning once we're able to analyze the results.

- This year we plan to continue collecting production scans (currently working on Acoustic hake), and do some exploratory scanning of additional structures (lingcod finrays and spiny dogfish spines).
- ODFW – Newport – Mark Terwilliger
 - Generally concentrate on nearshore groundfish, but a lack of nearshore species being assessed led to contributing to the rougheye/blackspotted assessment. (n=542 and 20% double read)
 - Began working on lingcod. Doing prep in-house, with help from a port sampler. Currently now caught up on the sportfish side through 2024. (n=1,285). Commercial side is read up to 2023, ~1200 aged. 2024 is prepped and ready to be aged. Reread the special project fins to check bias and drift.
 - Wrote letter of support for funding archival storage.
 - Began working on paper looking at lack of large older female black rockfish.
 - Upcoming trip in August to Cobb Seamount – hydroacoustic survey for black rockfish. Summer 2025 spent time at sea doing statewide hydroacoustic nearshore black rockfish survey.
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- SWFSC – La Jolla – Brittany Schwartzkopf. Brad Erisman
 - Brittany Schwartzkopf
 - Completed manual of age determination for managed and assessed coastal pelagic species (CPS) (<https://doi.org/10.25923/9esm-ke24>)
 - Based on Schwartzkopf et al. 2025 (<https://doi.org/10.1111/fme.70005>) and Schwartzkopf 2026 (NOAA Tech Memo), need roughly 500 ages per species per year – currently ageing Pacific sardine, northern anchovy, and Pacific mackerel. Completed a sardine and anchovy otolith exchange with WDFW. Plan to send otoliths to CDFW as well
 - Meeting with CDFW next week to discuss northern anchovy ageing
 - Discontinued FT-NIRS for CPS, machine sent to Newport, final manuscript accepted in Marine and Freshwater Research (<https://doi.org/10.1071/MF25148>)
 - 5 certified age readers, 1 more almost ready
 - Brad Erisman
 - Tuna update – currently focused on Pacific albacore, as well as bluefin. Looking into sex specific growth curves. Incorporating genetic sex ID techniques, allows to add detail to growth models. Adding more data makes the sex-specific growth curves converge. Paper in internal review

- Contributing data to Tawain’s aging efforts for bluefin
- ADF&G- Homer DCF – Andy Pollak
 - Currently two agers, training a new ager on black rockfish
 - Focused on black rockfish and yelloweye rockfish, worked with Kevin at ADU to catch up on yelloweye and currently working on 2024 yelloweye from Prince William Sound and Cook Inlet North Gulf Coast.
 - New training planned to age quillback rockfish
 - Annual goals are ageing 500-550 samples per management area and then broken down to subdistricts
 - Still sampling Pacific cod at reduced otolith take due to moratorium on cod ageing
- **GTC to CARE recommendations**
 - 1: Joint committee formation – interested members from CARE and GTC to analyze and report on the long-term lingcod ageing project. Dana expressed enthusiasm to finalize.
 - Previous plan of funding a student to age all agency’s samples did not go forward due to issues of funding. Do we want to keep trying for this?
 - “Ugly” structure exchange in progress
 - Validation work – may be outside our scope at the moment, but others have been looking at (Laurel Lam with fin rays and otoliths, incorporating FT-NIRS and DNA methylation; Katia Burke with fin rays and vertebra)
 - Plan to meet with leads in near future, before assessment species are finalized to determine next steps/writeup
 - 2: Discuss new applications in age and ground fish, including epigenetics, FT NIRS and AI. We've already heard from a bunch of different labs doing that sort of work.
- **CARE charter working group – no report at this time, will do so in future**
- **CARE manual working group**
 - Meeting last May to discuss progress and list of deliverables
 - Leif has rough draft on historical section; Julie has docs for the DFO safety section; Jamie added notes to the CARE site re: manual submission.
 - Barb did an update to the manual cover page and is working on general break-and-burn section
 - Considering a June 1 freeze for this current version
 - Sharing has been clunky, CARE to GTC recommendation needed to host a Sharepoint site

- **CARE website working group**
 - The care website did have some issues this year. There were some back-end issues, servers moved and CARE got kind of lost in the shuffle – resolved now. Production numbers for 2024 ready to be updated. Plan on getting 2025 numbers in so those can be added too.
 - Exchanges, invoices and meeting notes are updated by Jamie as they are sent to him.

- **Sablefish working group – nothing current to report**

- **Otometrics Working Group**
 - Recommend meeting up in the next 6 months to talk about measurements, AI, and how it is all being incorporated into QAQC
 - Proposal for creating Difficulty Ranking system for different species to be used in conjunction with NOAAs stock prioritization tool, so that assessors have an easy label to use when determining how different species are aged in different amounts of time.

- **Upcoming meetings**
 - Western Groundfish Conference, Feb 24-26 – hybrid event
 - CARE 2027
 - Plan for fully remote due to travel issues
 - Guest speakers, individual breakout groups, working groups