

Committee of Age Reading Experts

2026 Committee Report

Prepared for the Sixty-sixth Annual Meeting of the
Canada-USA Groundfish Technical Committee

April 21 – 22, 2026



Prepared by
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2024-2027 CARE Chair

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A. CARE Overview

1. History

The Committee of Age Reading Experts (CARE) was a subcommittee of the Canada-USA Groundfish Committee's Technical Subcommittee (TSC). CARE was charged with the task to develop and apply standardized age determination criteria and techniques and operate within the Terms of Reference, approved by the TSC in 1986, and the CARE Charter, developed in 2000 and approved by CARE in 2004. In 2024 the TSC recognized that they had not operated under the parent committee for several years and voted to adopt the new name of Canada-United States Groundfish Technical Committee (GTC), with CARE to operate as a subcommittee under the GTC.

2. Report Period

This report covers the work period of March 25, 2025-February 17, 2026. This reporting period covers activities occurring between formal CARE meetings, discussed during a virtual CARE check-in held February 17, 2026. An Executive Summary of the 2025 CARE virtual check-in held March 24, 2025 was provided to the GTC immediately after the meeting and was summarized in the Report of the 65th Annual Meeting of the GTC. It will be referenced below to address current updates to CARE Working Group reports and recommendations. Current officers through June 30, 2027 (elected at April CARE 2024 Meeting) are:

- Chair – Mark Terwilliger (ODFW-Newport, OR)
- Vice-Chair – Chelsea Cooke (CDFO-Nanaimo, BC)
- Secretary – Nikki Paige (NWFSC-Newport, OR)

The Secretary will prepare a draft of the minutes from the recent virtual CARE check-in to be distributed to CARE members for review and subsequent approval prior to March 31, 2026, and posted to the CARE website. Due to the proximity of the GTC meeting following the virtual CARE check-in, it is necessary for the Chair to prepare the report to the GTC to include proceedings of the recent check-in as an executive summary.

3. CARE check-in – Executive summary

a. Overview

CARE typically meets biennially for a conference that usually lasts three days. The meeting is split between “business” and hands-on calibrations at microscopes to review and standardize age reading criteria. Occasionally extra time is scheduled for a specific focus group or workshop, which meet during the hands-on calibration portion of the meetings. During the April 2023 CARE meeting, CARE membership voted to move the meetings back to ‘even’ years to stagger our meeting with the Western Groundfish Conference, and agreed to meet in Newport, OR in 2024. Three weeks after the 2023 CARE meeting, Western Groundfish voted to move their conference back to even years (next meeting in 2026), so CARE followed suit at the 2024 meeting and voted to convene on odd years once again, with the next in-person meeting scheduled for Nanaimo, BC in 2027. The specific dates will be finalized sometime after July 31st, 2026.

Due to the long period between in-person meetings, a virtual CARE check-in was held on February 17, 2026 to update ageing activities and progress on CARE Working Groups, ageing structure exchanges, format for the 2027 CARE meeting and recommendations from the 2025 CARE virtual check-in. The CARE check-in was virtually attended by 36 CARE members and both the U.S. and Canada Co-Chairs of the GTC (Table 1).

b. Agency Reports

AFSC (Derek Chamberlin), CDFO-PBS (Steve Wischniowski/Audrey Ty), CDFO-Freshwater Institute (Shu-Ting Zhao), IPHC (Andrew Chin), ADFG-Juneau-ADU (Kevin McNeel), ADFG-Homer-Sport Fisheries (Marian Ford), ADFG-Homer-Commercial Fisheries (Andrew Pollak), NWFSC-PSMFC (Patrick McDonald/Emily Wallingford), WDFW (Andrew Claiborne), ODFW (Mark Terwilliger), and SWFSC-La Jolla (Brittany Schwartzkopf/Brad Ensmann) provided oral reports summarizing and updating agency activities, staffing, organization, new species, and projects. There was no representation at the CARE check-in from ADFG-Kodiak or SWFSC-Santa Cruz. Details from the agency reports will be available in the finalized CARE minutes and posted to the CARE website by mid-March 2026.

c. Other CARE Activities

Mark Terwilliger (ODFW) worked with the GTC co-Chairs to draft a document in support of making funding available for archival storage of ageing structures. The letter of support is meant to be a living document to reflect personnel changes in the Chairs of both CARE and the GTC. This support letter was mailed out to the CARE ageing lab leads. Mark Terwilliger also presented to the group an ageing difficulty matrix designed by Pat McDonald (NWFSC) that potentially could be coupled with the U.S. West Coast Groundfish Assessment Prioritization Tool to help assessors better understand species' ageing and structure preparation complexities.

4. CARE Subcommittee (Working Group) Reports - Executive Summary

a. GTC Meeting 2025

The 2025 GTC meeting was originally to be held in Santa Cruz, CA but was held remotely due to federal travel and meeting restrictions. Mark Terwilliger (ODFW) presented proceedings of the 2025 CARE check-in and reviewed progress on GTC recommendations to CARE. Highlights from the 2025 CARE check-in were noted, including individual ageing lab production numbers and structure exchanges, examples of scientific collaborations between CARE researchers and graduate students, and updates to CARE Working Group reports. Mark also gave a brief presentation on the 2024 rougheye/blackspotted structure exchange that showed strongly positive ageing bias from WDFW compared to ODFW, NWFSC, and AFSC; as a result, WDFW agers recalibrated their methodology and reaged a percentage of their samples for the 2025 assessment. Finally, Madison Bargas' (OSU) graduate thesis work that addressed spatial variation in age, growth and maturity of black rockfish in the California Current and Gulf of Alaska was highlighted. There were no CARE-to-GTC recommendations presented at the meeting.

b. Structure Exchanges

There were 3 exchanges initiated in 2025 (Table 2). Two exchanges (WDFW→SWFSC) were performed to standardize ageing methods for coastal pelagics (Pacific sardine and northern anchovy), while the third (rougheye/blackspotted rockfish; WDFW→ODFW) contributed to the 2025 assessment and was initiated due to degradation of the original 2024 exchange sample. The exchanges of easy-to-read and difficult-to-read Lingcod unpaired structures (as part of the structure comparison study, see below) initiated in 2024 were limited due to lack of funding for that study but remain in progress.

c. CARE Manual Working Group

1. The Manual Working Group met in 2025; individual chapters assigned.
2. Leif Rasmuson has comments from Shayne MacLellan on the history section.
3. Julie Pearce has documents from DFO lab for health and safety section.
4. Jamie Hale added notes about manual submission to the CARE website. Committee would like to post the new manual cover to the website.
5. Barb Campbell is working on one general break/burn section and some restructuring.
6. Deadline June 1, 2026 for current update. Considering freezing updates at that point to publish manual while continuing to support the next version.
7. Working on automated formatting and chapter notations.
8. Consolidate versions and working documents into a central google drive.

d. CARE Website Working Group

There were some issues with the website where the species information was not accessible. Jon Short (AFSC) worked with the host to resolve the situation. James Hale (NWFSC) stated that production numbers are current through 2024. Completed exchange invoices and meeting notes from 2024 and 2025 are updated on the website.

e. Lingcod Working Group

Mark Terwilliger (ODFW) reported on the status of this Working Group. Due to lack of funding, we will not have a student age all the samples as originally planned, and there is a desire by the GTC as well as this Working Group to wrap up the project. Mark received the “ugly” structure exchange, aged those structures, and passed them off to ADFG-ADU, but other than that no exchange ageing has occurred. It was decided to scale back the project to using individual lab ages and potentially eliminate validation. Kevin McNeel (ADFG-ADU) mentioned that there are two cross-structure comparison studies for Lingcod, including DNA methylation techniques, by West Coast researchers currently completed and hopefully will be published in a timely manner. The Working Group agreed to meet virtually to describe next steps prior to the release of the 2027 assessment species list.

5. GTC-to-CARE Recommendations

a. 2025 GTC-to-CARE Recommendations

- The GTC recommended carrying over 2024 recommendations 1, 2, 4 and 5:
 1. The GTC recognizes the significant progress made on recommendations by CARE. We thank CARE for their efforts and look forward to hearing about further results at future meetings.
 2. The GTC recognizes the important work that occurs at the CARE meeting, and we recommend that age reader experts from west coast agencies continue to meet in person in order to verify that groundfish ageing is consistent across agencies on the Pacific Coast.
 - a. The GTC will highlight this in its supervisor’s letter to agency leadership and supports exploring additional potential funding sources, such as PSMFC, to fund travel for CARE meetings.

4. The GTC requests that CARE consider methods to advance communication between CARE and the GTC, particularly mechanisms to be able to respond more quickly to emerging issues. The use of virtual platforms might be a potential mechanism, in addition to the forum on the CARE website. The GTC continues to recommend that a GTC representative attend the biennial CARE meeting.
 - a. The GTC suggests that the CARE and GTC leadership connect periodically (1-2 times per year, as appropriate) between meetings.
 5. The GTC requests that CARE add a link to the updated GTC website and the GTC will do the same to the CARE website.
- The GTC also presented 2 new recommendations during the 2025 meeting:
 1. The GTC requests that a joint committee be formed that includes interested members from CARE and GTC to analyze and report on the long-term lingcod aging project.
 2. The GTC requests that CARE members discuss the use of new applications in aging groundfish, including epigenetics, FT-NIRs, and AI, noting that these don't replace the importance and need for traditional aging. The GTC requests CARE provide some feedback/context on these new applications to the GTC at a future meeting.

b. Progress on 2024 GTC-to-CARE Recommendations

- **Carried-over recommendations**
 1. CARE Chair, Mark Terwilliger, will attend the 66th Annual Meeting of the GTC in Port Townsend, WA. The Chair will highlight CARE activities during calendar year 2025 in a PowerPoint presentation to GTC members.
 2. At the 2024 meeting, CARE voted to have the next in-person meeting in 2027 in Nanaimo, BC. Since then, CARE has held virtual check-ins on May 24, 2025 and February 17, 2026 to update production numbers and CARE-to-CARE and GTC-to-CARE recommendations. During the check-ins it was noted that more progress could be made on recommendations between assessment cycles. In terms of the annual meeting, travel restrictions and funding lapses have unfortunately forced CARE members to decide on a remote-only meeting in 2027. The Chair and Vice Chair will meet remotely in the near future to discuss format for a remote 2–3-day CARE meeting, and we are hoping to include guest speakers and breakout sessions with presenters in different ageing labs showing live-camera work with problematic samples.
 4. CARE recognizes the importance of communication with the GTC. GTC co-chairs Ali Whitman (ODFW) and Dana Haggarty (CDFO) were extended invitations to attend the 2026 CARE remote check-in, and both co-Chairs participated.

5. The CARE website currently has a link to the Minutes and Reports page of the old TSC website, as the new GTC website is still under construction. A new link will be added to the CARE site once the new GTC site is functional.

- **New recommendations**

1. The lack of funding for a student and the desire to finish the study as soon as possible was discussed during the check-in, along with possible future steps. GTC co-chair Dana Haggarty (CDFO) expressed a desire to see this project completed and can support the project with data analysis after a comparative dataset has been completed. The Lingcod Working Group agreed to meet remotely, prior to the release of the 2027 assessment species list, to discuss future steps for a pared-down study (see below). GTC co-Chairs will be invited to attend.
2. There was a lot of discussion on the use of AI and FT-NIRS by various ageing labs at the CARE check-in. Stephen Wischniowski (CDFO) gave a presentation at the 2026 CARE check-in on alternative age estimation methods that he is pursuing as well as the equipment necessary (for weighing, imaging, and FT-NIRS) to start modelling with age predictions. Topics included imaged chum scales that are being used to train an algorithm for ageing salmonids, the use of otolith shape analysis and FT-NIRS to differentiate cryptic complex species and using otolith weight-to-age relationships to get a better representation of age classes for model training and assessments.

Kevin McNeel's (ADFG-ADU) lab virtually attended the ICES Workshop on emerging methods and technologies for the automated analysis of calcified structures (WKETAC), focused on band identification and AI image-based age estimation. The lab continues to collaborate with Merck Consultants, a Google image-based measurement program. His lab is also working on extracting lipids (reproductive hormones) from incrementally grown structures to see if they correspond with changes in life history.

Derek Chamberlin (AFSC) discussed how his lab produced 4600 FT-NIRS ages for Eastern Bering Sea walleye pollock and produced age predictions for the 2026 bottom trawl survey and have plans for to only produce FT-NIRS ages for EBS walleye pollock going forward.

Andrew Chin discussed how the IPHC is pursuing the use of AI for ageing halibut otoliths from images using a convolutional neural network model based on the DeepOtolith open-source platform.

Emily Wallingford reported on the use of FT-NIRS at the NWFSC. They produced approximately 30,000 otolith production scans in 2025 on a variety of groundfish species and worked on FT-NIRS projects, including an operator comparison project, a machine comparison project, and an English sole project looking for spectral differences between eyed- and blind-side otoliths. They also plan on using FT-NIRS to scan lingcod fin rays and Pacific spiny dogfish spines.

6. CARE-to-CARE Recommendations

- No new CARE-to-CARE recommendations were established at the 2026 CARE check-in; however, we did discuss progress on some of the CARE-to-CARE recommendations from the last in-person CARE meeting in 2024.

a. 2024 CARE-to-CARE Recommendations

1. CARE Manual Working Group
 - CARE Manual Working Group will work to update the current edition of the manual and incorporate the completed sections and add changes to reviewed sections by the next CARE. The details will be in a 2024 CARE-to-TSC working group report (approved unanimously).
2. CARE Website Working Group
 - The website committee will post a protocol on the CARE website for members to submit agency updates and contact information (approved unanimously).
3. Lingcod Working Group
 - The Lingcod Working Group will initiate a CARE exchange of easy and difficult unpaired structures for training purposes among participating ageing labs, followed by N=50 paired structures in a subsequent exchange among participating agencies to determine ageing lab bias. Grant funds will need to be acquired for a graduate student to perform validation, simulation, and generate single reader ages for publication purposes (approved unanimously).
4. Sablefish Working Group
 - The Sablefish Working Group will provide the website committee with a summary document to go into a working group tab that outlines the accomplishments of the Sablefish Working Group efforts since its formation. This will include a summary of exchanges, known-age images and juvenile otolith measurement data. This will be a living document (approved unanimously).
5. CARE Charter Group
 - CARE recommends the Charter Working Group review and submit to the Chair modifications to the charter for distribution to the membership for approval by the next CARE meeting (approved unanimously).
 - CARE meetings are to move to odd years again to alternate with the 2026 Western Groundfish Conference, with the next meeting to be held in 2027 (approved unanimously).
6. Otometrics Working Group
 - The Otometrics Working Group recommends that CARE reports current practices for the collection and use of otolith measurements. Records should include equipment and the types of measurements, the time required to collect data, data storage, and its use in QA/QC procedures. A document describing these practices should be completed by the 2027 CARE meeting (approved unanimously).

b. Progress on 2024 CARE-to-CARE Recommendations

1. CARE Manual Working Group
 - The CARE Manual Working Group met in 2025 to discuss chapter assignments, with new species-specific chapters as well as new chapters on history, QA/QC, ergonomics, and methodologies. A new CARE-to-GTC recommendation for a hosted Google Drive was discussed to facilitate review and editing of the manual. A deadline of June 1, 2026 was established for the latest version.
2. CARE Website Working Group
 - No updates to this Working Group were reported.
3. Lingcod Working Group
 - Due to lack of funding, we will not have a student age all the samples as originally planned. Mark Terwilliger (ODFW) received the “ugly” structure exchange, aged those structures, and passed them off to ADFG-ADU, but other than that no exchange ageing has occurred. The Working Group agreed to meet virtually to describe next steps prior to the release of the 2027 assessment species list and noted the desire amongst the GTC and CARE members to complete the project.
4. Sablefish Working Group
 - No updates to this Working Group were reported.
5. CARE Charter Working Group
 - No updates to this Working Group were reported.
6. Otometrics Working Group
 - There were no updates since the 2025 CARE virtual check-in, but Kevin McNeel (ADFG-ADU) suggested that the Otometrics Working Group meet up in the next 6 months to discuss what’s going on with AI and otolith measurements and how to wrap that up into a QA/QC chapter for the CARE ageing manual.

6. CARE-to-GTC Recommendations

a. 2025 CARE-to-GTC

- CARE recommends that the GTC host a central Google drive providing sufficient storage and access for CARE Manual Working Group members to upload manual chapters for editing and review.

Table 1. Attendees of the 2026 Virtual CARE check-in, February 17, 2026

Last name	First name	Agency	Location	Country	Email
Whitman	Ali	ODFW/GTC	Newport	USA	alison.d.whitman@odfw.oregon.gov
Haggarty	Dana	CDFO/GTC	Nanaimo	Canada	Dana.haggarty@dfo-mpo.gc.ca
Pollak	Andrew	ADFG	Homer-DCF	USA	andrew.pollak@alaska.gov
Ford	Marian	ADFG	Homer-DSF	USA	marian.ford@alaska.gov
Johnson	Kait	ADFG	Juneau	USA	kaitlyn.johnson@alaska.gov
McNeel	Kevin	ADFG	Juneau	USA	kevin.mcneel@alaska.gov
Plumb	Mark	ADFG	Juneau	USA	mark.plumb@alaska.gov
Cadenhead	Gage	ADFG	Juneau	USA	Gage.cadenhead@alaska.gov
Chamberlin	Derek	AFSC	Seattle	USA	derek.chamberlin@noaa.gov
Matta	Beth	AFSC	Seattle	USA	Beth.Matta@noaa.gov
Neidetcher	Sandi	AFSC	Seattle	USA	sandi.neidetcher@noaa.gov
Pearce	Julie	AFSC	Seattle	USA	julie.pearce@noaa.gov
Short	Jon	AFSC	Seattle	USA	jon.short@noaa.gov
Stone	Kali	AFSC	Seattle	USA	kali.stone@noaa.gov
TenBrink	Todd	AFSC	Seattle	USA	todd.tenbrink@noaa.gov
Brogan	John	AFSC	Seattle	USA	john.brogan@noaa.gov
Ty	Audrey	CDFO	Nanaimo	Canada	audrey.ty@dfo-mpo.gc.ca
Wischniowski	Stephen	CDFO	Nanaimo	Canada	stephen.wischniowski@dfo-mpo.gc.ca
Mitchell	Michelle	CDFO	Nanaimo	Canada	Michele.Mitchell@dfo-mpo.gc.ca
Cooke	Chelsea	CDFO	Nanaimo	Canada	Chelsea.Cooke@dfo-mpo.gc.ca
McArthur	Judy	CDFO	Nanaimo	Canada	Judy.McArthur@dfo-mpo.gc.ca
Zhao	Shu-Ting	CDFO	Nanaimo	Canada	Shuting.zhao@dfo-mpo.gc.ca
Loewen	Tracey	CDFO	Winnipeg	Canada	tracey.loewen@dfo-mpo.gc.ca
Chin	Andrew	IPHC	Seattle	USA	Andrew.Chin@iphc.int
Hale	James	NWFSC	Newport	USA	jhale@psmfc.org
McDonald	Patrick	NWFSC	Newport	USA	pmcdonald@psmfc.org
Ortiz	Liz	NWFSC	Newport	USA	lortiz@psmfc.org
Wallingford	Emily	NWFSC	Newport	USA	ewallingford@psmfc.org
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Terwilliger	Mark	ODFW	Newport	USA	mark.r.terwilliger@odfw.oregon.gov
Schwartzkopf	Brittany	SWFSC	La Jolla	USA	brittany.schwartzkopf@noaa.gov
Erisman	Brad	SWFSC	La Jolla	USA	brad.erisman@noaa.gov
James	Kelsey	SWFSC	La Jolla	USA	kelsey.james@noaa.gov
Caltabellota	Fabio	WDFW	Montesano	USA	fabio.priorcaltabellotta@dfw.wa.gov
Claiborne	Andrew	WDFW	Olympia	USA	andrew.claiborne@dfw.wa.gov
Schultz	Merrie	WDFW	Olympia	USA	merrie.schultz@dfw.wa.gov
Topping	Jennifer	WDFW	Olympia	USA	jennifer.topping@dfw.wa.gov

Table 2. CARE age structure exchanges initiated in 2025.

Exchange ID #	Species	Originating Agency	Coordinator	Participating Agency
25-001	northern anchovy	WDFW	Andrew Claiborne	SWFSC
25-002	Pacific sardine	WDFW	Andrew Claiborne	SWFSC
25-003	rougheye/blackspotted rockfish	WDFW	Merrie Schultz	ODFW