

2008 CARE Workshop
April 1-3, 2008
Nanaimo, British Columbia, CANADA

Meeting Minutes

Tuesday, April 1, 2008

CALL TO ORDER:

Kristen Munk (ADFG), CARE chairperson, called the meeting to order at 8:30am at the Pacific Biological Station (PBS) in Nanaimo, B.C. Canada.

HOST STATEMENT:

Host Shayne MacLellan (CDFO) introduced Ted Perry, Head of Marine Ecosystems and Aquaculture Division and Facility manager of the PBS. Mr. Perry welcomed everyone to Nanaimo and to PBS. He gave a brief recap of the history of CARE, including mention of the first meeting in 1983 which arose from the concerns and need to standardize age reading methodologies, which led to the creation of CARE. He invited everyone to attend the 100th anniversary open house at PBS the week of April 23rd.

MacLellan went over the emergency info, PBS facility layout and computer info. She stated that a representative from Buehler Canada would be giving a product demo the following day and reminded everyone about the potluck the following evening. She explained the “Age the Geoduck” contest that would be held during the workshop: a geoduck peel would be placed at a specified scope for all to age and prizes would be awarded to the person with the correct or closest age. MacLellan thanked Nikki Atkins (PSMFC) for all her hard work on the t-shirt and poster design and presented her with a hat and laminated poster.

INTRODUCTIONS:

Workshop participants introduced themselves and stated what agency they worked for, how long they had been an age reader, and what their area of expertise was.

See Table 1 - CARE Workshop attendees, April 1-3 2008.

Additionally, Munk passed around a form “Retirement/Departure from Age Reading” and requested that each participant generally indicate the number of years till retirement/departure. She stated that this information would be provided to the TSC.

APPROVAL OF 2008 AGENDA:

The 2008 Agenda (Appendix I) was approved.

APPROVAL OF 2006 CARE WORKSHOP MEETING MINUTES:

Munk reminded everyone that the 2006 CARE Meeting Minutes had not yet been passed, following a failed attempt in 2006, and opened the floor to comments. Delsa Anderl (AFSC) listed a few changes that needed to be made to the “NMFS-AFSC Agency Overview” section and to Craig Kastle’s presentation on age validation of POP. These changes were accepted.

The 2006 Meeting Minutes were approved by all present.

WORKING GROUP REPORTS:

Chair Report - 2007 TSC Meeting and “2006 CARE to TSC Report”: Munk gave a brief overview of the annual TSC meeting in Santa Cruz, CA, May 2007. She reported that the TSC extended their appreciation to all of the age readers for all their hard work. She briefly referenced the TSC-to-CARE recommendation: that the TSC wishes to rely on fishery managers to identify species of concern or interest and instruct their age lab supervisors to communicate to their age readers the necessary age structure exchanges. This recommendation will be expanded on later during discussion of Recommendations.

CARE Manual and Glossary Working Group: MacLellan reported that the updates to the manual were almost complete at the time of the 2006 CARE workshop. She worked with John Sneva (WDFW, retired) and Lisa Lysak (ODFW) to finalize the lingcod and Dover sole sections and made an addition to the glossary that arose during work on the Dover sole section pertaining to the term “light/dark boundary”. Jon Short (AFSC) assisted MacLellan with placing the updated version of the manual on the CARE website; this version became available December 2006. No progress was made on the “hake section”, and no other manual sections have been proposed at this time. MacLellan announced that she would like to step down as chair of the CARE manual.

Age Structure Exchange Reports: MacLellan reported that there were 3 exchange samples initiated in 2007 (hake, sablefish, and lingcod) and 3 samples in 2008 (sablefish (2) and yelloweye).

MacLellan restated the protocol for initiating and handling exchange samples and the purpose of structure exchanges. Munk referenced the sections of the CARE Charter pertaining to primary and secondary structure exchanges. The key points were: initiate the exchange well before CARE; only primary exchanges are tracked for CARE; the sample size needs to be manageable; and the results are to be submitted to the Vice-Chair. Munk explained that the previous requirement of precision test data had been dropped, in part because exchange samples were not always “fair tests”, that is, samples might be of stocks (growth patterns) which other agency readers were not familiar with, or, not all readers always had access to a freshly burned specimen to age.

Darlene Gillespie (CDFO) suggested that exchanges include good-quality photos if possible. A discussion ensued pertaining to imaging of structures. Munk mentioned that not all specimens (patterns) photograph well. Anderl reported that the AFSC often uses images as an ageing tool where each reader marks the photo with dots to denote annuli, which are hidden for the next viewer. After, the image notations are brought back and comparisons can be made and documented between-readers.

Munk commented on showing an image of a sablefish specimen from a previous CDFO exchange: the very old specimen had a highly cyclic pattern, and when shown to others, they expressed skepticism. That is, while age readers had aged it as >60y, the individuals she showed it to thought ‘more like 12’: they had enumerated the number of cycles. Munk added that, if a specimen was too old or with a growth pattern too condensed to mark individual annuli, such as her example, the notations on the image could indicate groups of annuli rather than single years.

CARE Website Working Group: Short reported that the CARE website had changed from HTML to a program called “Joomla”. During the 2006 CARE meeting, the website committee

was tasked with updating and/or changing the Ageing Methods table to make it more user-friendly; Short displayed this updated table and demonstrated how to navigate through it.

TOPICS FOR DISCUSSION/NEW BUSINESS:

Symposia/Conference Overviews:

ICES Workshop on Age Determination of Redfish: MacLellan attended and reported on the ICES Workshop “Age Determination of Redfish” in Vigo, Spain, Aug 28 – Sep 1, 2006. Participants included Germany, Spain, Iceland, Russia, Poland, and Canada. Presentations pertained to the life history of *S. mentella* and *S. marinus* in the North Atlantic, preparation and ageing methods by various agencies, structure exchange results, and age validation. Results from four exchanges concluded there was high bias and low precision for the species, and that ages for broken and burned specimens were slightly lower than specimens that were thin-sectioned. Radiometric results showed ages higher than ages produced using the break and burn method, but confirmed high longevity and slow growth of the species. It was recommended that more exchanges be conducted and another workshop held to discuss interpretational differences between readers and agencies. The next workshop will be held in Nanaimo Sept 2-5, 2008 and will focus on reviewing the results of the most current exchanges, identifying the most appropriate preparation method, identifying sources of ageing error, and determining progress of QC/QA in redfish ageing labs.

Western Groundfish Conference (WGC): Willy Dunne (ADFG) attended and reported on the WGC in Santa Cruz, CA, Feb 4 – 8, 2008. The WGC has been held biennially since 1981 and will be held in Alaska in 2010. A total of 110 posters and presentations were given at the conference yet only 4 pertained to pure age determination, including a presentation by Munk on age validation using bomb radiocarbon, and only 15 had the term “ageing” in the title. Forty percent of the posters and presentations mentioned the importance of ageing in regards to stock assessments, marine reserves, and sustainability. Dunne summed up by suggesting age reading labs could benefit by presenting more work involving age reading at future conferences.

Dunne also mentioned that as with the CARE workshop, the WGC occurs in even years, which makes it hard for some CARE members to receive travel funds to attend both. This led to a discussion of moving the CARE workshop to odd years to allow for attendance at both events. Munk tabled the discussion, to be brought up later in the meeting.

Sclerochronology Conference: Munk attended and reported on the 1st Annual Sclerochronology Conference in St. Petersburg, FL, July 17-21, 2007. Along with her poster, there was only 1 other otolith presentation, the majority relating to bivalves and oxygen isotope research. The oldest clam species reported on was a 200+ year old *Arctica islandica* specimen. MacLellan and Gillespie from PBS attended the conference.

Position Titles: Munk opened the floor for a discussion regarding age-reader position titles. Some examples of titles were: Age-reader, Age Reading Specialist, Sclerochronologist, and Biochronologist. MacLellan stated that the term “sclerochronology” seems to be broadening to include research on fish and shellfish.

A discussion ensued regarding the difficulties of adapting new age-reader position titles. Anderl stated that the Federal Government cannot change position titles. Betty Kamikawa (PSMFC) reported that PSMFC converted to pay banding, which changed the age-reader positions to “technicians” and made the job descriptions less scientific. MacLellan stated that the decision

lies with managers but that job descriptions should always include the importance of age reading data to fisheries management, as well as the amount of effort and work required to become a knowledgeable age-reader. Munk added that there needs to be a distinction between a production age-reader and an individual who does project-specific age reading. Munk mentioned that she had written and submitted position descriptions for a new ADFG job-class series for Age Reader I, II, and III but that nothing had come of this.

Marginal increment determinations: Josie Thompson (ODFW) posed the question of plus-growth in black rockfish and whether it varies with latitude. MacLellan reported that they see plus-growth in August but that the amount depends on the species and age of the specimen; they have seen differences in fish collected from the same area. Munk added that there can be differences with depth. MacLellan went on to discuss that the 3 toughest areas for age readers were: the 1st year, the transition zone, and the edge. She stated that the key is to be consistent in pattern interpretation and that although the 1st year and transition zone interpretation improve with experience, consistent edge interpretation is difficult as it can vary between individuals and years. Munk added that readers also need to be flexible in pattern interpretation. She referenced extremely large growth zones seen in the 1990's that are related to El Nino years. Anderl agreed that AFSC readers have the same problem interpreting the edge, and added that the readers show consistency interpreting edge growth between certain species such as flatfish and mackerel, but little consistency between sablefish, pcod, and Pollock.

break 10:00am – 10:20am

“Joomla 101”: Short expanded on his earlier discussion of the features of “Joomla”. From an Information Technology (IT) perspective, the program has many beneficial features: email and print functions built in, search capabilities, the option to view pages in PDF format, automatic language translation, document management abilities, calendars, and web pools. The program also allows any user to edit and update information, which Short then demonstrated. Each piece of information on the website is separate so it can be edited without affecting other areas. Goals for the website include: keeping the information fresh, making documents available to users, archiving old material, and allowing users different levels of access. Short mentioned that the CARE Charter is a new addition to the website.

Short worked with MacLellan and Betty Goetz (AFSC) to update the Species Information table. If a user wants information for a specific species but doesn't want the information for all of the agencies, they can select the details for the species and view information on ageing methods, stock specifics, production numbers, and validation publications. Lance Campbell (WDFW) expressed concern that listing validation publications would lead users to assume that all species had been validated.

CARE website: Munk posed the question of changing how the CARE website is cited. She stated that as a living document the website can still be cited as “gray literature” in some journals. Munk suggested that the CARE manual should be cited separately from the website.

Omar Rodriguez (PSMFC) asked about the possibility of including agency presentations/posters and related project work on the website. Munk suggested adding links to agency websites, and Thompson suggested adding image links. A discussion ensued concerning the use of a disclaimer on the website. Munk requested that a working group be formed to write a disclaimer and provide wording for a website citation. Short, Atkins and Gillespie volunteered to write this CARE to CARE recommendation.

CARE Minutes: Munk asked for discussion pertaining to expediting approval of CARE workshop meeting minutes. MacLellan stated that 2 years is too long to wait to approve workshop minutes. Munk noted that we should not post minutes to the CARE website or report on them until they have been approved. She suggested that we could approve meeting minutes via email following the workshop; following discussion she asked for a motion. Thompson moved to use email for approving the 2008 meeting minutes; the motion was approved. Munk stated that we would note this with a CARE to CARE recommendation, and insert appropriate protocol language into the Charter.

Between CARE meeting activity: Munk requested discussion on conducting inter-agency work between CARE workshops, for example, calibration sessions and structure exchanges. Anderl stated that it is sometimes difficult for AFSC to obtain necessary funding so it may be best to keep training and calibration sessions at the actual workshop. Sonya Elmejjati (ADFG) posed the idea of extending the CARE workshop to allow for more training and calibration time. Munk suggested the members make a CARE to CARE recommendation considering extending the workshop to fit in extra scope work, which would give agencies a chance to include the necessary funds in their budgets. Munk, Patrick McDonald (PSMFC) and Sandy Rosenfield (WDFW) volunteered to write this CARE to CARE recommendation. [Note: This recommendation did not happen.]

Equipment Reviews: Munk reported on the Leica KL1500 LCD light unit. She stated that the light unit works great, but that the bulbs blow out more frequently than other units and the cost is \$25 per bulb.

NON-AGENDA ITEMS:

Imaging Software: Anderl asked how other labs use images. She mentioned that the AFSC uses images in their reference collection, for reader training, and to help clear up discrepancies between readers. Atkins reported that PSMFC uses Adobe Photoshop Elements. Thompson reported that ODFW uses Image Pro Plus. Steve Wischniowski (IPHC) reported that they use a Leica camera to take photos and Leica Applications Software (LAS) that allows the images to be manipulated.

Moving CARE to an odd year rotation: Munk returned to the previously raised topic of moving the CARE workshop to the year opposite the Western Groundfish Conference. She suggested that the adjustment year could be 2009, CARE would next meet in 1 year, and that the biennial rotation would then recommence. Munk requested a motion; Dunne moved to change CARE to the off year from the Western Groundfish Conference. The motion was approved. Munk stated that this would be documented with a CARE to CARE recommendation.

AGENCY OVERVIEWS:

CDFO: MacLellan reported that PBS is responsible for production ageing for the Pacific Region. Currently there are 10 people on staff, but some of the long-term age-readers will be retiring in 2-5 years. They second-read 20% of groundfish and salmon age structures, and 10% of herring age structures. Current projects include geoduck chronology and bomb radiocarbon research, shellfish preparation technique research, documentation of lab methods and protocols, redfish structure exchanges, data security, and collaboration with ADFG on a Chinook salmon reader comparison study. PBS is also working on projects for the 2009 International Otolith

Symposium, and will be attending the upcoming “Ameri-dendro Conference” in June 2008. Upcoming events at PBS include the 100th anniversary Open House (April 23-27) and ICES Redfish Workshop in September.

lunch 11:45a.m. – 1:15p.m.

IPHC: Joan Forsberg (IPHC) reported that the IPHC ages 30,000+ otoliths per year using the break and bake method, and second-reads 10% of the otoliths. The otoliths are stored in glycerin. All of the ageing must be completed by mid-Oct because the stock assessment uses current age data. Some of the sampling of IPHC halibut is conducted by ADFG. The mean age of halibut aged by IPHC is 12-15 years. Maximum age of Pacific Halibut from the Gulf of Alaska was validated using bomb radiocarbon (Piner and Wischniowski 2004).

Steve Wischniowski reported on current Marginal Increment Analysis (MIA) research. The goal is to standardize edge interpretation by determining when deposition of the annulus occurs and where it is first laid down. The study compares age and growth of juvenile halibut (0-3 years) from the Queen Charlotte Islands, Gulf of Alaska, and Bering Sea in order to document differences by latitude. The study includes measuring “growth checks” on adult otoliths and conducting elemental analysis on juvenile otoliths. Future work includes; collecting adult female halibut during winter while they are on the spawning grounds to determine site fidelity, and collaborating with Craig Kestelle to validate age of Bering Sea halibut using bomb radiocarbon.

ODFW: Thompson reported that she is the main age-reader for her lab, with 1 additional person working part-time for 3 months. Current work includes organization and sample inventory, completing the framework for a new database for recreational fisheries data, and completing an aurora rockfish chronology. Future work includes: production reading for stock assessment, with species of interest identified as black rockfish, cabezon and possibly spiny dogfish; entering past and current data into the recreational fisheries database; standardizing a QC program for the lab; and working on a greenling sample type comparison with the other ODFW age reader.

NMFS-AFSC: Anderl reported that the AFSC has two production ageing team leaders: Betty Goetz oversees Bering Sea and Aleutian Islands Pollock and rockfish, while Anderl oversees Gulf of Alaska sablefish, Pollock, and pcod. Craig Kestelle is the age validation specialist and does project-specific age reading. Charles Hutchinson handles ageing of new and difficult species, which includes determining the best methods for sample preparation and ageing. Jon Short is the IT Specialist. The AFSC is currently working on writing an age-reading manual and building a reference collection. They have completed validation studies for POP, Northern rockfish, yellowfin sole, and Dover sole. In 2008, they will begin a known-age sablefish study and validation studies using bomb radiocarbon on shortraker rockfish, giant grenadier, and kelp greenling.

NMFS-NWFSC/PSMFC: McDonald reported that they have 5 full time age readers and production age 25,000+ structures per year. Production ageing is dependent on stock assessments and current species aged include sablefish, POP, Dover sole, dark-blotched rockfish, canary rockfish, and petrale sole. The PSMFC age readers attended the 2008 Western Groundfish Conference.

WDFW: Rosenfield reported that they have 3 age readers who production-age both freshwater and marine species. Herring and shellfish are also aged by WDFW but in a separate unit. Production ageing is regulated by stock assessments and species aged include yellowtail and

yelloweye rockfish, lingcod, dogfish, and sardines. They also age specimens from Puget Sound that are not reported to CARE. Current research includes strontium mark analysis on ~~rockfish~~ salmon. [Edit made 5/27/08 per JT/km]

ADFG: Munk reported for the 4 ADFG groundfish ageing labs. ADFG is split into 2 divisions: Commercial and Sport fish. Homer has 4 part-time age readers: 2 in Commercial Fish Division and 2 in Sport Fish Division. Kodiak has 2 part-time readers in Commercial Fish Division. The Age Determination Unit (ADU) in Juneau is the statewide ageing lab. The ADU has 1 production age reader (and 2 vacant positions). The ADU receives all age structures from Region 1 (Southeast AK) and only part of the structures collected from Region 2 (Southcentral AK); for example, sablefish, shortraker and rougheyeye rockfish. She showed a summary table for all ADFG age structures collected and aged, with relative percentage by species. Statewide, over 60% of age data produced are sablefish. Ongoing projects at the ADU include age validation using bomb radiocarbon and building a reference collection.

SCIENTIFIC PRESENTATIONS:

Using the Dendrochronology Technique of Cross-dating to Accurately Age Pacific geoduck, *Panopea abrupta*: Gillespie presented work completed at PBS using the techniques of dendrochronology to cross-date ages of geoduck clams. PBS took over ageing of geoducks in 2003 using the traditional ring-count method. Geoducks are long-lived (>150 years) and slow-growing, and are a key component of Pacific fisheries with a value of over \$30 million. During the life-span, environmental signals are recorded in their growth pattern that can be compared to previously known signals recorded in tree rings. These signals can be identified and compared between geoducks within a population such that an exact date of birth and subsequently the age of each geoduck specimen can be accurately determined. This research has applications in climate reconstruction, oceanic variability, and age validation.

The objectives of the study were to: 1) compare the cross-dated age to the ring-count age of geoducks using a pre-existing chronology; 2) investigate how far the chronology could extend geographically; and 3) evaluate the advantages of using cross-dating rather than traditional ageing methods. The results of the study showed that 72% of the specimens were underaged by traditional ring counts; some strong year classes and recruitment events were entirely missed by annual ring counting; the application of cross-dating using the known signature years became more difficult the further the specimens were collected from the chronology site; and though the cross-dating method is only slightly faster than the traditional method, quality and precision of the age data were greatly improved.

Since the study, PBS and Dr. Bryan Black (Hatfield Marine Science Center) have collaborated on the completion of 4 more geoduck chronologies from the Pacific Coast.

Future work includes; building a catalog of chronologies; assisting with future chronology development; cross-dating historical samples in order to improve age data; using the method to production age current and future geoduck samples with subsequent improvement in precision and accuracy; and attempting to use the method on ageing other long-lived, slow-growing species such as rockfish.

Bomb radiocarbon at the AFSC: Anderl reported on Craig Kastle's age validation work using bomb radiocarbon for POP, yellowfin sole, and Dover sole. Atomic bomb-testing during the 1950's and 1960's resulted in increased ^{14}C in the water column as a result of atmospheric

fall-out and terrestrial run off. Kastle used the previously determined reference curve for Pacific halibut to compare results for both species. One key assumption in doing this is that reference standards and the chronology specimens received the same ^{14}C input from the same area. The POP and yellowfin chronologies showed several specimens that appeared to be under-aged. Due to the confidence in the age determinations for those specimens, a possible explanation for the phase shift is that those fish came from a different area with different ^{14}C input. The yellowfin specimens that appeared to have been underaged could be explained by the fact that they were collected from the Bering Sea and the comparison halibut reference curve is for the Gulf of Alaska.

Future work includes creating a reference curve for the Bering Sea.

A discussion ensued when Wischniowski pointed out that it has been reported that 30% of ^{14}C uptake comes from diet, which could also cause a phase shift.

Bomb radiocarbon at the ADFG-ADU: Munk reported on age validation work completed at the ADFG-ADU using bomb radiocarbon (BRC). Advantages of this validation method include greater resolution ($\pm 2\text{y}$); ^{14}C is directly measured, one fish = one ^{14}C value; there is a small range of “nonambiguous” years (1959-1965); and processing is cost effective (\$450 per specimen). Assumptions include uniform mixing of the surface layers and uniform uptake of ^{14}C in the otolith.

Thus far, BRC validation effort has been made for sablefish, several rockfish species, and geoduck. The highest age currently validated for each species based upon the “discrete bomb radiocarbon years”, is as follows: sablefish (n=10) 48y, dusky (n=8) 44y, black (n=9) 43y, tiger (n=9) 46y, red-banded (n=6) 43y, rougheye (n=2) 40y, shortraker (n=1) 41y, and geoduck (n=3) 41y.

Two lingcod specimens were analyzed for ^{14}C , however, despite the fact that the values fell precisely on the ^{14}C curve, she does not consider these specimens as “validated” because the ^{14}C values occur in the range of “ambiguous” peak values.

Future work includes completing sample sizes for red-banded, rougheye, and shortraker rockfishes, and geoduck; developing full and regional chronologies for dusky and black rockfish; and investigating the slight phase shift seen in the tiger rockfish radiocarbon data.

break 2:55pm – 3:15pm

NON-AGENDA PRESENTATION:

False annuli identification and mapping in juvenile halibut: Wischniowski reported on the process of lasering across “growth checks” in juvenile Pacific halibut to measure strontium level. Samples were processed at the Woods Hole Laboratory. Only those specimens with a high confidence in the age determination were included in the study. Initial results indicate a correlation between water temperature and strontium uptake. The goal is to use the measurement of the checks in the young fish and relate this to older fish.

PROGRESS ON PAST RECOMMENDATIONS

2007 TSC to CARE 001 “TSC will rely on fishery managers and stock assessment authors to interact directly with their ageing lab supervisors to communicate with CARE for ageing exchanges. TSC appreciates the work of CARE and recognizes that a direct link between the assessment biologist and the ageing lab is the most efficient means of requesting species ageing exchanges.”

Rosenfield reported that the 2008 yelloweye exchange was initiated after she was contacted by the fishery managers.

The goal of the recommendation was achieved.

2006 CARE to TSC 001 “The biennial CARE meetings have been held traditionally at the Seattle NMFS-AFSC facilities. The Pacific Biological Station (PBS), Nanaimo representatives offered to host the 2008 CARE meeting. Two reasons were given for this proposed departure. First, this invitation coincides with the PBS 100th anniversary (1908-2008). Second, agency travel policies can prohibit age readers from different participating agencies and labs to attend the CARE meeting at the Seattle AFSC facilities. The CARE requests TSC members to support this recommendation and encourage travel funding. This rotation will allow PBS to share in the hosting responsibilities and for greater CARE participation among their personnel. It would also appropriately acknowledge PBS’s substantial contributions to the field of fish age and growth.”

The goal of the recommendation was achieved.

CARE to CARE 001 “The CARE Age Structure Exchange (CASE) table presently identifies inter-agency exchanges occurring on species of interest to the TSC, or other inter-agency calibrations as needed. CARE recommends to itself to modify the CASE table and process. We will continue to track structure exchanges per the CARE Charter, however, we will drop precision test results from the CASE table. We will develop a CASE invoice, accessible on the CARE website. Upon initiating an exchange, the originating agency will contact the CASE coordinator for an exchange id. number. The originating agency will conduct the exchange, fill out all information in the CASE invoice, and submit it to the CASE coordinator upon its completion. The CASE coordinator or designee will update the website to allow linked access within the CASE table. Inclusion of precision statistics is optional.”

MacLellan pointed out that the table displaying past structure exchanges needs to be updated; it only displays exchange data through 2004.

The goal of the recommendation was only partially achieved. The CASE invoice still needs to be added to the website.

CARE to CARE 002 “CARE recommends making changes to the Summary of Age Reading Method, regarding format and information included. The current table info will be split into two tables; one to include “Methods” information (agency, species, method, validation, area, structure, validation and validation citation). The method, validation and citation columns would provide anecdotal information that will be updated. The method column would include all methods used historically or currently and provide dates when methods were adopted. The validation column would indicate method and extent (e.g. all ages, up to age 30, longevity) and the validation citation column would indicate dates and contact. The new 2nd table would

include agency, species, calendar year and number of fish per species aged. Total fish and total species aged would be calculated. Number of readers involved per calendar year for all fish aged will also be included. It is recommended that this data would reside on the website and that a small relational database would house the data. A mechanism would be developed to query the database to assess the breadth and depth of expertise for species by agency for all species aged. Development of database will be in small steps. The Vice-chair will be responsible for updating both tables on an annual basis.”

A discussion ensued regarding the changes made to the table as a result of the recommendation. MacLellan suggested the sentence “number of readers involved per calendar year for all fish aged” no longer be a goal and the suggestion was approved by all.

The goal of the recommendation was achieved.

Munk expanded on the question previously posed by Campbell (WDFW), pertaining to how users of the website will interpret the “validation” information; specifically will the user think that all data for a species has been validated. Anderl and MacLellan offered multiple suggestions regarding how validation information is displayed: 1) move the validation column so that it no longer identifies a specific agency; 2) remove the sentence above the “Validation Publications” table that states “Ageing validation citations for” to allow for additional listings of publications pertaining to the specific species; or 3) create a new validation table that includes agency, validation method, and citation. Thompson volunteered to mock up a table for the members to review.

adjourn 4:20p.m.

Wednesday, April 2, 2008

HANDS-ON WORKSHOP:

Scope work and discussion at scheduled work stations 8am - noon

lunch noon – 1:15p.m.

Product Demo: Tom Hunter from Buehler Canada demonstrated the ISOMET 4000 Laser Precision Saw. Applications for age reading include the ability to section through a specified point on the structure, variable RPM (up to 5000RPM), feed rate of 1mm/min up to 20mm/min, the ability to cut more than one structure at a time (i.e. 5-10 clam shells), and the ability to reverse the arm that holds the chuck and cut from the opposite side. The unit has an internal coolant tube that can be filled with any nonflammable liquid and a cover that is lowered during cutting due to the high RPM capability. The total cost is \$15,000 and includes a single blade, default chucks to hold specimens, and a 2 year unlimited warranty.

Scope work and discussion cont 2p.m. - 4:30p.m.

adjourn 4:30p.m.

CARE Potluck hosted by the Graham and Darlene Gillespie family, 6:00pm

Thursday, April 3, 2008

CONCLUDING CARE BUSINESS:

Geoduck contest winner: Omar Rodriguez and Steve Wischniowski came up with the correct age and were each given a prize. The age of the geoduck was 92.

Updates to CARE website table: Per earlier discussion and tasking, Thompson presented modifications to the Summary of Age Reading Methods table. The “Validation” column was removed from the Agency Method List table. The sentence above the “Validation Publications” table will now read “Related age and growth research for ...”. The table will include validation publications as well as related age and growth research for each species.

Proposed modifications with group edits were approved.

2008 RECOMMENDATIONS

Draft recommendations were projected for all to discuss and edit. The following are the recommendations resulting from this group discussion:

A. 2008 CARE to CARE

1. **2008CC-01** “Move CARE workshop to off-year from Western Groundfish Conference”: The CARE recognizes that their biennial workshop coincides with the biennial Western Groundfish Conference, and that this co-occurrence creates competition for same-year travel money. This can prevent attendance to one or both, and where off-year travel budgets might be underutilized. CARE proposes to move their workshop out of phase to the Western Groundfish Conference. CARE will next convene in 2009, the adjustment year. This will begin the new biennial sequence of 2009, 2011, 2013, etc.
2. **2008CC-02** “Add CARE website disclaimer and citation information”: CARE recommends adding site and citation information to the CARE website. A new link in the sidebar entitled “Site information” will open a page with the following information:

“This website is subject to periodic update and data may not have been formally peer reviewed. If you have specific questions please contact the contributing agencies.”

“If you wish to cite the webpage the following format is suggested: Committee of Age Reading Experts (CARE). “Title of Page.” Date accessed: <access date> <URL>”.
3. **2008CC-03** “Create CARE trial forum”: CARE recommends creating a three-year web-based trial forum for the discussion of age reading topics by the CARE community and other age-reading personnel. Users of the forum would be required to set up a user name and password; anonymous commenting would be disabled. Specific categories would be created for different areas of discussion: Specific species (with Flatfish, Rockfish, Roundfish, Elasmobranchs, and Invertebrates as sub-categories), Preparation Methods, Digital Imaging, Equipment, Other and Off Topic. Each user will be able to choose whether they

receive e-mail notifications of posts for the entire forum, specific categories/sub-categories, individual discussions, or none at all. Nikki Atkins (NMFS-NWFSC/PSMFC) will act as Moderator of the forums.

4. **2008CC-04** “Expedite approval of meeting-minutes”: CARE recommends expediting their approval of meeting-minutes. The CARE Chair will send an email to workshop participants asking to approve the minutes: Yes or NO. Workshop participants will be given 2 weeks to reply; if “out of office” emails are received by the Chair, the time frame will be extended per their discretion. Prior to approval, meeting-minutes will be sent out for editing/corrections to members (see Charter protocol). Meeting-minutes will not go out for approval until all edits are complete, and, will not be posted without approval.

FUTURE WORKING GROUPS 2008-2011

Manual Committee: Betty Kamikawa (PSMFC; Lead), Kristen Munk (ADFG), Betty Goetz (AFSC)

Web Committee: Jon Short (AFSC; co-Lead) and Nikki Atkins (PSMFC; co-Lead)

Charter Committee: Kristen Munk (ADFG; Lead), Shayne MacLellan (CDFO), Delsa Anderl (AFSC) or Betty Goetz (AFSC)

Sablefish Working Group: ADFG, CDFO, NMFS-NWFSC/PSMFC, NMFS-AFSC

2008-2011* ADMINISTRATION NOMINATIONS

Chair: Shayne MacLellan (CDFO)

Vice-chair: Sandy Rosenfield (WDFW)

Secretary: Jennifer Topping (WDFW)

*Terms for CARE Administrators begin July 1, 2008. The upcoming three year term includes the adjustment year of 2009, followed by a return to the biennial rotation. Therefore there are two workshops: one each in 2009 and 2011, served by the same Administrators.

2009 CARE Workshop: Anderl (NMFS) offered to host the 2009 meeting, to be held at the Sandpoint Lab. Chair MacLellan will work with Anderl on specific dates.

CLOSING REMARKS

Munk adjourned the 2008 CARE workshop by thanking all the participants, with a round of applause for each: those who gave presentations; Nikki Atkins for the t-shirt design; Darlene Gillespie and family for hosting the potluck; Jon Short and Shayne MacLellan for all their hard work on the website and manual; and Shayne MacLellan and all of the PBS Sclerochronology Lab for putting together a great workshop.

Chair adjourned meeting 10:00 a.m.

10:00a.m. – noon

Scope work and discussion continued

PBS facility tour

Sablefish Working Group discussion: Sablefish age readers met to discuss the 2009 sablefish exchange and begin work on the agenda for a collaborative known-age study (Appendix II).

Table 1. CARE Workshop attendees, April 1-3 2008.

Attendee	Agency	City, State/Province
Kristen Munk	ADFG-ADU	Juneau, Alaska
Jodi Neil	ADFG-ADU	Juneau, Alaska
Phil Cowan	ADFG-Homer	Homer, Alaska
Willy Dunne	ADFG-Homer	Homer, Alaska
Marian Pfeil	ADFG-Homer	Homer, Alaska
Sonya Elmejjati	ADFG-Kodiak	Kodiak, Alaska
Karen Charles	CDFO	Nanaimo, British Columbia
Nora Crosby	CDFO	Nanaimo, British Columbia
Darlene Gillespie	CDFO	Nanaimo, British Columbia
Joanne Groot	CDFO	Nanaimo, British Columbia
Mary Jane Hudson	CDFO	Nanaimo, British Columbia
Diana Little	CDFO	Nanaimo, British Columbia
Shayne MacLellan	CDFO	Nanaimo, British Columbia
Sue Mahannah	CDFO	Nanaimo, British Columbia
Judy McArthur	CDFO	Nanaimo, British Columbia
Joan Forsberg	IPHC	Seattle, Washington
Linda Gibbs	IPHC	Seattle, Washington
Robert Tobin	IPHC	Seattle, Washington
Steve Wischniowski	IPHC	Seattle, Washington
Delsa Anderl	NOAA-AFSC	Seattle, Washington
Chris Gburski	NOAA-AFSC	Seattle, Washington
Charles Hutchinson	NOAA-AFSC	Seattle, Washington
Jon Short	NOAA-AFSC	Seattle, Washington
Nikki Atkins	NOAA-NWFSC/PSMFC	Newport, Oregon
Betty Kamikawa	NOAA-NWFSC/PSMFC	Newport, Oregon
Patrick McDonald	NOAA-NWFSC/PSMFC	Newport, Oregon
Omar Rodriguez	NOAA-NWFSC/PSMFC	Newport, Oregon
Josie Thompson	ODFW	Newport, Oregon
Lance Campbell	WDFW	Olympia, Washington
Sandy Rosenfield	WDFW	Olympia, Washington
Jennifer Topping	WDFW	Olympia, Washington

APPENDIX 1. 2008 CARE MEETING AGENDA

Agenda
Canada-US Groundfish Committee
Committee of Age Reading Experts
April 1-3, 2008
Nanaimo, British Columbia, CANADA

I. Call to Order (8:15 a.m.) – Kristen Munk, Chair

II. Host Statement (welcome, building misc, evacuation plan, CARE social, T-shirts, etc)

- A. Ted Perry
- B. Shayne MacLellan

III. Introductions

- A. Round-table intros (name, agency, yrs as age reader, specialty)
- B. Attendance sheet

IV. Approval of 2008 Agenda

V. Approval of 2006 CARE Workshop Meeting Minutes [~8:40]

VI. Working Group Reports (brief report of work accomplished 2006-2008) [~8:40-9:10]

- A. 2007 TSC Meeting/2006 CARE report (Munk)
- B. CARE Manual (MacLellan)
- C. Age Structure Exchanges (Vice Chair: MacLellan)
- D. Website (Short)

VII. Topics for Discussion/New Business [~9:10-10:45]

- A. Symposia/Conference Overviews (2y prior to '08CARE): Spain 2007 (MacLellan), 2008 WGC (Dunne), 2007 Sclerochronology Workshop (Munk),
- B. Updates: ?CARE Manual, ?CARE exchange, etc
- C. Position Title: Age-reader, Age Reading Specialist, Sclerochronologist, Biochronologist
- D. Reader Attrition
- E. Marginal increment determinations, "latitudinal differences in initiation of growth" (Thompson)
- F. "Joomla 101" (Short)
- G. CARE Website: citability; disclaimer
- H. CARE Minutes: completion and posting
- I. Between CARE meeting activity
- J. Equipment Reviews: KL1500LCD (Munk?);
- K. Non-Agenda'd items

---Break, 10:00 – 10:20 ---

VIII. Agency Overviews (~4min ea) [~45min, 10:45-11:45, 1300-1315]

- A. CDFG- Erwin (not attending)
- B. CDFO – MacLellan

- C. IPHC – Forsberg?
- D. ODFW - Thompson
- E. NMFS-AFSC - Anderl
- F. NMFS-NWFSC/PSMFC - McDonald
- G. WDFW – Rosenfield/Topping
- H. ADFG - Munk

--- Lunch 11:45a.m.-13:00p.m.

IX. Scientific Presentations [12min ea; 13:15-14:00]

- 1. Biochronology (Gillespie)
- 2. Bomb radiocarbon at the AFSC (Anderl)
- 3. Bomb radiocarbon at the ADFG-ADU (Munk; <12min)
- 4. ~~Revisiting a Time-Series of Sablefish Data (Munk; ~6min)~~
- 5. (added) False annuli identification and mapping in juvenile halibut (Wischniowski)

X. Recommendations (see Appendix I)

- A. 2007 CARE~TSC
 - 1. TSC to CARE (1)
 - 2. CARE to TSC (na)
 - 3. CARE to CARE (na)
- B. 2006 CARE~TSC
 - 1. TSC to CARE (none made)
 - 2. CARE to TSC (1)
 - 3. CARE to CARE (2)

XI. Hands-On Workshop

- A. Workshop Organization (calibration list; scope schedule)
- B. Discussion Points (see Appendix II)
- C. Session Work (T-Th/F; attendees welcome and encouraged to continue scopework through Thursday afternoon and Friday morning)
- D. Product Demo (Buehler); Apr2, Wed, 1pm (20min)
- E. Workshop report (form: 1/station)

XII. Concluding CARE business (Th morning, 8:15a)

- A. Recommendations: 2008
- B. Administration nominations
- C. Schedule and location of 2010 Meeting
- D. Closing

XIII. Adjourn *~ Noon, April 3, 2008

* microscope work to continue Thursday afternoon.

APPENDIX II. Sablefish ad hoc Working Group Agenda

Sablefish Age Readers ad hoc Working Group

----- DRAFT -----

Convened April 3, 2008 by the Pacific Northwest Sablefish Age Readers

Purpose:

The Sablefish Age Readers Ad hoc Working Group first met April 3, 2008 to discuss interest in and goals to firmly document age reading criteria and fundamental differences between stocks originating from southerly to northerly latitudes.

Goals:

1. Document and report current age-reading standards with a comprehensive age structure exchange
2. Calibrate interpretation of sablefish patterns
3. Document and report size differences for up to age-1y (1+[June]) sablefish stocks from south to north

I. Document interpretation of sablefish patterns

a. Exchange

- i. Each agency provides sample n~24 (exchange begin Oct 1,'08)
 1. Samples made up of Jan-May(June) sample dates, if possible
 2. Select proportions in age pools, for ex 1/3 ea: 1-15y, 16-30y, >30y
- ii. Each specimen should have 4 halves
 1. Each AGENCY new-burns ONE (1) otolith half
 - a. "Lead Ager" responsible for maintaining integrity of sample, for remaining participating age-readers
 - b. Emphasize use of photographs, used by additional agency age-readers
- iii. Capture month, day, and location (general) will be reported with sample
- iv. Data sheet – a single data sheet used by all
 1. Mockup due by Aug 1 (Neil)
 2. Includes reference images for learning of identified parameters
- v. Age
 1. Transition zone(s)
 2. Gage "growth rate" (per pattern)
 3. Classify marginal growth (edge)
 4. Each agency provides one data set per sample (due Jan 31,'09)

b. Images

- i. Images accompany data sheet to calibrate to data terms
- ii. Each exchange sample will be accompanied by photographs of ~6 or more specimens
- iii. Each agency will annotate an unmarked image with their annuli
 1. format to be determined (ppt 1 slide per image, agency files named: "<Sample name>_<agency name>")?

II. Calibrate interpretation of sablefish patterns

- a. Group discussion/scope work[simultaneous with 2009 CARE Workshop]
- b. Assessment
 - i. Age data precision (McDonald)
 - ii. Resolution
 - iii. Image comparison

- c. Calibration report
- III. Document and report size differences for age-1y sablefish stocks from south to north
 - a. Identify regional samples of known-age sablefish, 0 to 1y (group, due <date>)
 - i. n~50
 - ii. emphasize “late zeroes” through “early one-plusses” (thru June)
 - iii. One to multiple samples
 - 1. Intra and interannual
 - 2. Single location, for ex: “Southeast Alaska, 1999 (June, Aug), 2000 (Aug), 2001 (Aug)
 - b. Measure all agency otoliths (ADFG-ADU, send to Munk by “early July” 2008)
 - c. Summarize statistics (Atkins, due ~Oct '08)
 - d. Develop reference data and table (Atkins, due ~Oct '08)
- IV. Workshop reports
 - a. Report of the working group (Munk, 2009 CARE Workshop)
 - b. Scientific report of variation in known-age (0 to 1y) sablefish (~2009 or tbd)

Sablefish Working Group Participants (will add to as advised)

ADFG: Kristen Munk, Jodi Neil

CDFO: Shayne MacLellan, Karen Charles, Darlene Gillespie, Barb Campbell

NMFS-AFSC: Delsa Anderl, others?

NMFS-NWFSC/PSMFC: Patrick McDonald, Nikki Atkins, others?