

Age determination materials and equipment

Jonathan A. Short

Resource Ecology and Fisheries Management Division
Alaska Fisheries Science Center
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
7600 Sand Point Way NE
Seattle, WA 98115

Email address for contact author: jon.short@noaa.gov

Virtually all of the equipment employed by the Alaska Fisheries Science Center Age and Growth Program is used to enhance the visibility of annual marks so they can be contrasted with checks (non-annual marks) and be more easily counted. Equipment and supplies are broken up into the following categories: general supplies (Table 1), sample storage (Table 2), specimen preparation (Table 3), microscopes, imaging, and software (Table 4), and vendors (Table 5)¹.

The equipment and supplies tables alphabetically list item name, purpose, manufacturer, model, and vendor. The purpose column describes a primary use for each item, although many items will have multiple uses that are not listed. The manufacturer column may be blank if the manufacturer is unknown or may be listed as “generic” for common items if any manufacturer is adequate. There are many items that could easily be substituted, such as paper cups and tongue depressors, but specific model numbers and manufacturers are given for the sake of clarity.

¹ References to trade names or commercial entities do not imply endorsement by the National Marine Fisheries Service, NOAA.

Table 1
Equipment and supplies - general supplies.

| Item | Purpose | Manufacturer | Model | Vendor |
|------------------------------|--------------------------|----------------|---------------------|-------------------------|
| Dissecting needle - straight | Sample handling | | 08965A | Fisher Scientific |
| Forceps | Sample handling | Miltex | Semkin dressing - 5 | Tru-Care Health Systems |
| Forceps - fine tip | Sample handling | Miltex | Jeweler style | Fisher Scientific |
| Latex gloves | Sample handling | Evolution | 11-462-68 (B-E) | Fisher Scientific |
| Mineral oil | Clearing break and burns | Generic | | |
| Modeling clay - green | Microscope stage | Permoplast | SB33496M | Nasco |
| Nitrile gloves | Sample handling | Fisher | 19-130-1597(B-E) | Fisher Scientific |
| Paint brushes – artists' | Mineral oil application | Generic | Fine tip | |
| Petri dish bottom - large | Microscope stage | Kimble | 100 mm x 15 mm | VWR |
| Petri dish bottom - small | Microscope stage | Kimble | 60 mm x 15 mm | VWR |
| Rubber cement | Microscope stage | Generic | | |
| Task wipers - large | Clean-up | Kimberly Clark | KIM34256BX | GSA Advantage |
| Task wipers - small | Clean-up | Kimberly Clark | 34155 | GSA Advantage |
| Velvet - black | Microscope stage | | "Royalty" | Jo-Ann Fabric and Craft |
| Watch glass | Microscope stage | | Syracuse 913A | Fisher Scientific |

Table 2
Equipment and supplies - sample storage.

| Item | Purpose | Manufacturer | Model | Vendor |
|------------------------------|-----------------------------------|-----------------------|---|---------------------------------------|
| Barcode scanner - USB | Otolith sample tracking | Metrologic | Voyager MS9540 | Bar Code Equipment Services |
| Boxes - plastic (box & lid) | Survey otolith collections | Consolidated Plastics | 65260KY, 65230KY | Consolidated Plastics |
| Ethanol - specimen | Otolith preservative - round fish | | 70 grain ethanol diluted from 95% | Washington State Liquor Control Board |
| Foam insert | Survey otolith collections | The Foam Shop | Closed cell foam (1.5" x 48" x 108") | The Foam Shop |
| Glycerol | Otolith preservative - flatfish | | Certified ACS | Fisher Scientific |
| HMIG labels - custom | Sample labeling | | Lab Safety Supply | 30913TC |
| Sample boxes - custom | Observer otolith collections | McCallum Co | Custom cardboard | McCallum Co |
| Sample boxes - custom | Survey otolith collections | | Custom Styrofoam | |
| Scintillation vials | Survey otolith collections | Wheaton | 20 ml PET w/ poly seal cap attached (986736) | Fisher Scientific |
| Storage containers - plastic | Otolith section containment | Fred Meyer | 6.2" x 4.6" x 2.7" | Fred Meyer |
| Thymol | Otolith preservative - flatfish | Alfa Aesar | 98+% | VWR |
| Vial cap labels - white | Sample labeling | Avery | AVER808 | Kipper Tool |
| Vial caps - black | Survey otolith collections | Acme Vial and Glass | PS18 cap 18-400 black phenolic polyseal liner | Acme Vial and Glass Co |
| Vials - glass | Survey otolith collections | Acme Vial and Glass | S910-4 (4 dram) Short Style Clear | Acme Vial and Glass Co |
| Vials - hinged polypropylene | Observer otolith collections | LA Container | EP290 2.5 dram (9.5 ml) 0.68" x 2.25" | LA Container |

Table 3
Equipment and supplies - specimen preparation.

| Item | Purpose | Manufacturer | Model | Vendor |
|-------------------------------|---------------------------|-------------------------|--------------------------|---------------------------|
| Alcohol burner | Otolith burning | | SB34435M - 4 oz | Nasco |
| Aluminum oven trays | Otolith burning | Custom | | Unknown |
| Artificial water | Otolith mounting | Wildlife Artists Supply | AW100-128 (1 gallon kit) | Wildlife Artists Supply |
| Ball bearings - Tyslide saw | Saw repair | ABEC-1 | 6138K14 Stainless steel | McMaster-Carr |
| Benchtop Tyslide saw | Thin-sectioning | Tyslide | 565-021 | Jencons, Ltd |
| Cigarette lighter | Lighting alcohol burners | Bic | | Grocery store |
| Contact cement | Adhering grinding discs | Generic | | |
| Cups - waxed paper | Resin and silicone mixing | Igloo | 8295 - 9 oz | MSC Industrial supply |
| Diamond wheel | Otolith cutting | Norton | 69014192342 - 3" | B. E. E. Industries |
| Diamond wheel | Otolith cutting | Norton | 69014192064 - 4" | Bee Industrial Supply |
| Ecomet | Otolith coring, grinding | Buehler LTD | | Buehler LTD |
| Ethanol - alcohol burner | | | 95% ethanol | WA Liquor Control Board |
| Glass slides | Otolith sectioning | Hillquist | 10-19 - 2" x 3" | Hillquist |
| Grinding discs - PSA | Otolith coring, grinding | Struers | PAPNO 320 - 320 grit | Struers |
| Grinding discs - PSA | Otolith coring, grinding | Buehler LTD | 305118320100 - 320 grit | Buehler LTD |
| Grinding discs - PSA | Otolith coring, grinding | Struers | PAPZO 600 - 600 grit | Struers |
| HDPE plastic | Otolith mold construction | | HDS55230035 | MSC Industrial supply |
| HDPE plastic | Otolith mold construction | | HDS55265035 | MSC Industrial supply |
| High speed blades | Otolith sectioning | Pro-Slicer | 4" x 0.004" x 5/8" | Pearson's US lapidary |
| Isomet 5000 | Otolith cutting | Buehler LTD | | Buehler LTD |
| Isomet low speed saw | Otolith cutting | Buehler LTD | | Buehler LTD |
| Mold-making catalyst | Otolith mold construction | Dow Corning | 1 catalyst | Robert McKeown |
| Mold-making silicone | Otolith mold construction | Dow Corning | 3112 RTV | Robert McKeown |
| Pill cutter | Otolith cutting | Dura-med | | Amazon.com |
| Sandpaper | Otolith sanding | 3M Abrasives | B54979 - P600A | Noble Sales |
| Scalpel blades - carbon steel | Otolith cutting | | BD-371310 | VWR |
| Thin Section machine | Thin-sectioning | Hillquist | 1005 | Hillquist |
| Toaster oven | Otolith burning | Panasonic | NBG100PS | Nowonsale.com |
| Toaster oven | Otolith burning | Black and Decker | FC150BR | Amazon.com |
| Tongue depressors | Resin and silicone mixing | Puritan Medical | 705A/704 | Stanley Supply & Services |

Table 4
Equipment and supplies - microscopes, imaging, and software.

| Item | Purpose | Manufacturer | Model | Vendor |
|--|---------------------------|-------------------|---|-------------------|
| Bifurcated light guides | Specimen imaging | Chiu Tech | GVL-18-8 | Chiu Tech |
| Compressed air | Microscope cleaning | Generic | | |
| Cotton swabs | Microscope cleaning | Generic | | |
| Digital microscopy camera | Specimen imaging | Leica | DFC 420 | Bartels and Stout |
| Halogen bulbs | Light source repair | LAMP | EJA projector lamp | Adorama |
| ImagePro software | Specimen measurements | Media Cybernetics | ImagePro Plus 5.0 | Tanji |
| Leica Application Suite (LAS) software | Specimen imaging | Leica | LAS 2.7.1 | Bartels and Stout |
| Light sources | Specimen imaging | Chiu Tech | FO-150 | Chiu Tech |
| Photoshop Elements | Image merging, annotating | Adobe | Photoshop Elements 4.0 | |
| Replacement fan for light source | Light source repair | | 80 x 80 x 25.4 mm, 120v, 21 CFM, 115 VAC, imp protected | Chiu Tech |
| Stereo microscopes - ergonomic | Specimen viewing | Leica | MZ 9 _s | Bartels and Stout |
| Stereo microscopes - imaging | Specimen imaging | Leica | MZ 9 _s | Bartels and Stout |
| Stereo microscopes - standard | Specimen viewing | Leica | MZ 9 _s | Bartels and Stout |

Table 5
Equipment and supply vendors.

| Company | Phone | Web Site |
|-------------------------------|-----------------|--|
| Acme Vial and Glass Co | (800) 394-2745 | www.acmevial.com |
| Adorama | (888) 582-2500 | www.adorama.com |
| Airgas Norpac | (206) 224-0430 | www.airgas.com |
| Bar Code Equipment Serv. | (904) 249-3862 | www.barcodeservice.com |
| Bartels and Stout | (425) 453-1705 | www.bartelsandstout.com |
| BEE Industrial Supply | (510) 293-3180 | www.beeind.com |
| Buehler Ltd | (800) 283-4537 | www.buehler.com |
| Chiu Technical Corporation | (631) 544-0606 | www.chiutech.com |
| Consolidated Plastics | (800) 362-1000 | www.consolidatedplastics.com |
| Fisher Scientific | (800) 640-0640 | www.fishersci.com |
| Foam Shop, The | (206) 525-2301 | www.friendlyfoam.com |
| Forestry Suppliers Inc | (800) 647-5368 | www.forestry-suppliers.com |
| Global Computer Supply | (888) 445-2725 | www.globalcomputer.com |
| GSA Advantage | (877) 472-3777 | www.gsaadvantage.gov |
| Hillquist | (303) 722-9766 | www.hillquist.com |
| Jencons Ltd | +44 1342 337474 | www.jencons.co.uk |
| Jo-Anns Fabric and Craft | (888) 739-4120 | www.joann.com |
| Kelsun Distributors | (425) 453-1199 | www.kelsun.com |
| Kipper Tool | (770) 532-3232 | www.kippertool.com |
| LA Container | (714) 694-0101 | www.lacontainerstore.com |
| Lab Safety Supply | (800) 356-0783 | www.labsafety.com |
| McCallum Co | (888) 368-9445 | www.mccallumco.com |
| McMaster-Carr | (562) 463-4277 | www.mcmaster.com |
| MSC Industrial Supply | (800) 645-7270 | www.mscdirect.com |
| Nasco | (800) 558-9595 | www.enasco.com |
| Noble Sales | (791) 871-1911 | www.noblegov.com |
| NowOnSale.com | | www.nowonsale.com |
| Pearson's U.S. Lapidary | (877) 765-7787 | www.pearsons-usli.com |
| Polymer Clay Express | (800) 844-0138 | www.ploymerclayexpress.com |
| Robert McKeown | (908) 218-9000 | www.robertmckeown.com |
| Stanley Supply & Services | (800) 453-3169 | www.stanleysupplyservices.com |
| Struers | (888) 787-8377 | www.struers.com |
| Tru-Care Health Systems | (800) 842-2734 | www.tru-care.com |
| University Bookstore | (800) 335-7323 | www.bookstore.washington.edu |
| VWR | (800) 932-5000 | www.vwr.com |
| WA State Liquor Control Board | (360) 664-1600 | www.liq.wa.gov |
| Wesco Autobody Supply Inc | (206) 527-0808 | www.wescopbe.com |
| Wildlife Artists Supply | (800) 334-8012 | www.taxidermy.com |