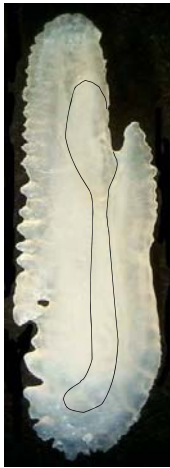
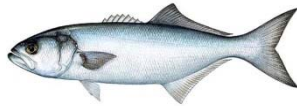
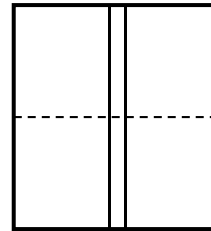


Bluefish Otolith Cutting and Reading Protocol



1. Determine which otolith is the right otolith by looking at the succal groove on the inner face. The tail of the groove will curl to the left when the head is anterior (and to the right on the left otolith).

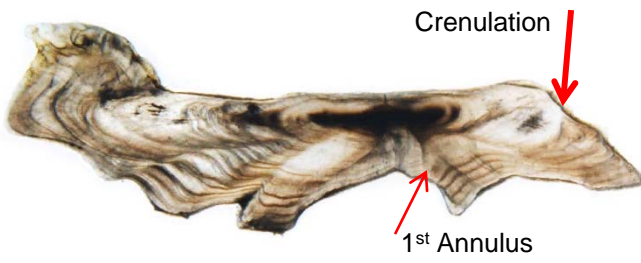
2. Mark nucleus with a pencil by holding the otolith up to a light. The nucleus will be a dark dot seen through the outer face. Draw a line through this area.



Example of an otolith cutting sheet, with correct orientation. Place otolith on sheet so that the line you drew through the nucleus on one of the two center lines.

3. Mount otolith on an otolith cutting sheet with the outer face outward (groove facing sheet) and the line you have drawn through the nucleus on one of the double lines in the middle.

4. Cut using 3" Buehler Diamond Wafering Blades. Take a thick section through the center of the otolith. Cut the section so that the nucleus is at one side of the section (ie. Do not put nucleus in center of section). Mount this section (nucleus side down) on a microscope slide using a thin layer of crystal bond. Wet sand the section using 400 to 1200 grit sand paper to an appropriate thickness so that the annuli can be easily read. Once the section is sanded, it can then be covered with a thin layer of crystal bond. A good section will have a crisp triangle as seen in pictures below. Be aware that the otoliths are very fragile.



Age 6 Bluefish, 6th Annulus on Edge (above)

5. Otoliths are read by counting each annulus, or dark ring. Bluefish can be difficult to read as the annuli are sometimes hard to see and false marks can be present. Sometimes the inner annulus is difficult to identify. Often a crenulation (bump on the outer edge) forms with first annulus. Double rings are also common at the first or second annulus. Make sure these eventually join as you visually follow them around the circumference of the otolith.

6. All otoliths should be read by 3 independent readers. The mode of the 3 reader is evaluated by a senior reader to establish the final age assignment.

