

MIXED BAG

The Aging of Big Game Animals



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KNOWING THE AGE COMPOSITION OF EACH POPULATION OF BIG GAME SPECIES HAS LONG BEEN AN OBJECTIVE OF GAME MANAGERS. THE INFORMATION IS ESSENTIAL TO SETTING PROPER SEASON LENGTHS AND ALLOWABLE HARVESTS. IF A SPECIES IS BEING MANAGED PRIMARILY TO PRODUCE THE LARGEST POSSIBLE HARVEST OF INDIVIDUAL ANIMALS, THE ALLOWABLE TAKE IS CONSIDERABLY HIGHER THAN IF THE POPULATION IS MANAGED TO PRODUCE MATURE ANIMALS WITH LARGE TROPHY HEADS. TECHNIQUES WERE DEVELOPED 50 YEARS AGO TO AGE DEER AND ELK FROM GROSS EXAMINATION OF THE LOWER JAW TO DETERMINE THE LEVEL OF TOOTH REPLACEMENT AND WEAR. THIS KIND OF INFORMATION MAY BE ADEQUATE FOR SOME PROGRAMS RECOGNIZING THAT THE OLDER THE ANIMAL THE MORE DIFFICULT IT IS TO GIVE A PRECISE AGE.

It has also been known for many years that the teeth of mammals deposit a series of annual rings around their roots. The tooth root is decalcified with acid, embedded in paraffin, sectioned with a microtome, stained with proper stains, and the annuli counted from the microscope slides. Thousands of teeth of harvested big game animals from all over the continent are now being studied each year. Some game departments are set up to do this analysis in their own laboratories. Gary Matson, of Milltown, Montana, conducts a business doing this type of analysis and has been doing so for over 25 years.

The Alaska Department of Fish and Game has tooth sections of virtually every legally harvested bear, black, grizzly, and Alaskan brown for the past 20 years. Bear have tiny premolar teeth between their big canines and molars and one of these can be readily extracted from captured living animals for

study. If the bears are recaptured or shot later another tooth can be compared with the first one from the same animal. Also bears can be marked as cubs and recovered later as "known age animals." The degree of accuracy can be checked in this way. Working with the Matson Lab, the program has resulted in a high degree of accuracy in aging bears.

In preparation for this article, I requested the ages of each of the grizzlies and brown bears currently entered in the 22nd Awards Program. The data was returned promptly and the Alaskan biologists knew all along what would show up. The average age of these ma-

ture trophy male bears was 15-years old; the oldest 28 years and the youngest 8 years. We know from other studies that skulls of adult male grizzly bears, at least, continue to increase with age beyond 10 years.

We illustrate here (Figure A) photographs of a tooth of an Alaska Peninsula brown bear taken on October 7, 1991. This bear was 25 years old when killed. The 25 annuli don't all show in perfect sequence on one single section but by sectioning various portions of the root the annuli can be accurately counted.

Deer, for example, rarely live to be over 10 years of age. Elk, moose, and caribou are somewhat longer lived. Big-horn sheep which can be accurately aged by counting horn annuli do not commonly live that long. It is clear then that our bears are the oldest trophy animals hunted. The Alaska Game Department has age data for all of the legally harvested bears, not only the biggest trophy animals. One fact is clear and that is that Alaska bears, at least,

are capable of surviving for many years even with relatively heavy hunting pressure. Part of this is due to selection by guides and hunters so that immature animals are passed over until they have reached large body size. The Alaskan Game Department is constantly monitoring the ages of the harvested animals trying to maintain the greatest harvest allowable that will produce a continuing supply of mature animals.

Bear teeth are being intensively studied in other parts of the continent. The most exciting recent finding has been that of Pamela Coy and David Garshelis of Minnesota Department of Natural Resources who have discovered by studying the teeth of mature female black bears that it is possible to reconstruct the entire reproductive history of each individual. The illustration shown here (Figure B) illustrates a premolar from an 11-year old female taken from Saskatchewan in the spring. This shows the widely spaced annuli of the young animal but there are the three sets of pairs of annuli that are closely spaced. By properly identifying the annuli, the interpretation is that she had litters at age 6, 8, and 10. The nursing period during the spring, summer and early fall is recorded with closely spaced annuli. The light rings are considerably wider in the years in which she was not nursing. This is a fine example of the high quality work being done by our wildlife biologists in attempting to understand the lives of our game animals.

The records program of the Club has for years requested that hunters submit a lower incisor tooth of each trophy animal entered. We know that it is sometimes impossible to do this, but we are eager to have as many teeth as possible. The preferred tooth is a lower middle incisor for all of the hoofed animals. Whenever we can obtain an adequate sample we will study the sample and report our findings in this publication. Gary Matson is willing to section teeth of individual hunter-taken big game animals. His address is Matson's Laboratory, Box 308, Milltown, MT 59851.

FIGURE B (RIGHT)
THIS SECTION OF A FEMALE BLACK BEAR'S TOOTH SHOWS NOT ONLY HER AGE, BUT ALSO WHICH YEARS SHE HAD LITTERS. THOSE BEING THE 6,8, AND 10 YEAR MARKS.

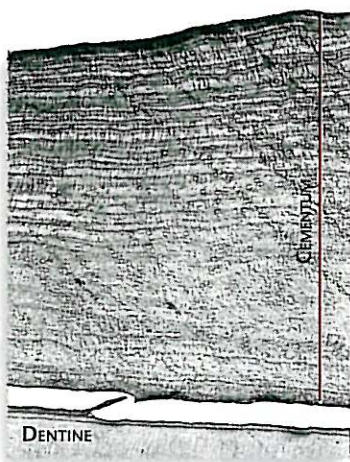
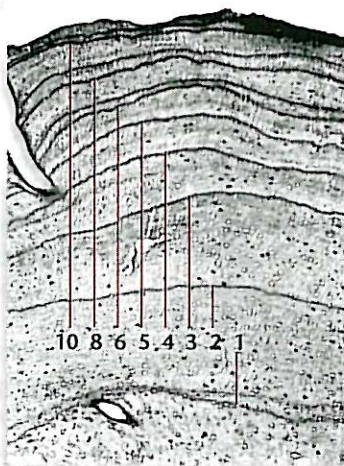


FIGURE A
FROM THIS TOOTH SECTION WE CAN SEE THE ANNULI FROM SEVEN YEARS OF AGE UP TO 25 YEARS.