



MATSON'S LABORATORY, LLC

est. 1969

A wildlife laboratory offering cementum aging and tetracycline biomarker screening

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## Matson's Laboratory News

October 2011

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Matson's Lab began operating in the small Montana community of Milltown in August, 1969. Founders Gary and Judy Matson continue to operate the lab, and are collaborating in a management transition that will take place over the next 5 years. Services will continue uninterrupted using our established methods and honoring our [core values](#).

About the Lab by Gary Matson

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We are honored to continue as the source of cementum age and tetracycline biomarker analyses for worldwide clients we have worked with for many years. Our staff of 6 technicians continues its high performance in maintaining the standardized histological processing and analysis methods we've developed over our 42 years of serving the community of wildlife biologists.

To ensure long term stability and quality of our services, we are conducting a 3-year period of ownership transition and are approximately half way through. Our Laboratory Manager, Lindsay Ketchum, and her husband, David, will become owners of the Lab in the spring of 2013. After the sale, Gary Matson will continue as a consultant. Lindsay came to the Lab in October, 2002. She has mastered all of the lab processing methods,

and performs age analysis with high precision (see below). Lindsay and David will be dedicated performers as Lab owners in the years ahead.

A major issue in our service continues to be CITES permit procedures. We have been cautioned by the U. S. Fish and Wildlife Service that samples may be confiscated if they arrive in the U.S. with deficiencies in the CITES permit document (expired valid date, incorrect quantity, lacking Customs validation). Please refer to the reminders on our web site: <http://www.matsonslab.com/html/Services/Shipping/ShippingIntl.htm>

The Lab specializes in efficiently delivering accurate analyses. We greatly appreciate the help our clients provide by scheduling work in advance. The more advance, the better. Many schedule work a year in advance and sometimes for multiple years. Advance scheduling ensures the best chance at receiving data when it is needed.

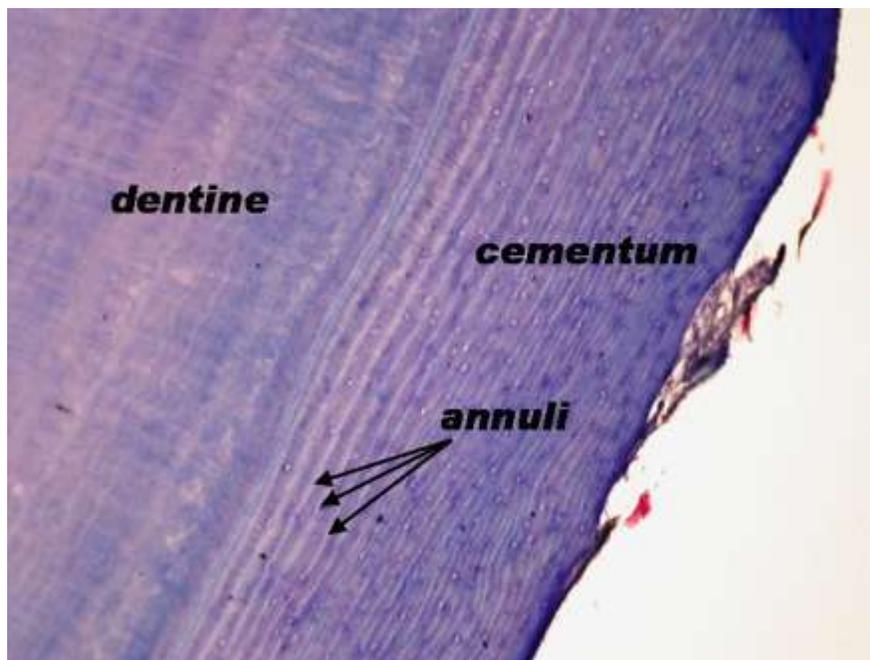
Our extensive experience at applying standardized methods for processing and analysis is the key in providing results that are consistent and within the narrowest accuracy limits possible. During the period from September 2010 to September 2011 the Lab processed 93,834 teeth. Since we began keeping track in 1978, we have processed more than 1.8 million teeth.

Oh yeah... prices. No changes during the coming 2011-2012 season; changes possible in October 2012. We appreciate the change to work with all of you! -Gary

### **Ringed Seal: the oldest wild animal aged at Matson's Lab**

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The lab aged an Ontario ringed seal canine as 42 years (41 to 43 yrs). The species example, below, shows the annuli so closely spaced they are difficult to visually identify except at higher magnifications. Ringed seals have been the longest lived



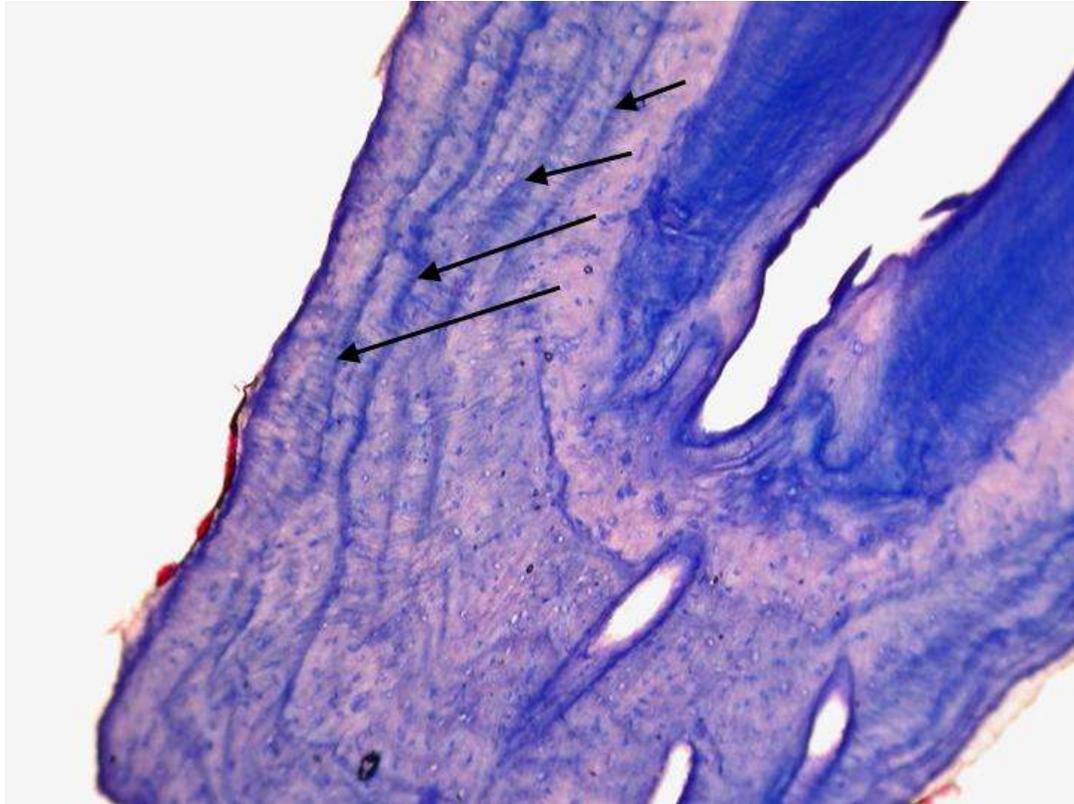
mammals aged at the Lab. Bears are next, living to the late 30's.

Ringed seal canine. 100x. Cementum age 33 years (32-34 years).

Stoat



The Lab processed, for the first time, a large sample of stoat teeth from New Zealand. Many times, cementum characteristics from a "first time" species indicate results are likely to be unreliable. In the case of the stoats, distinct annuli suggest reliability of results.



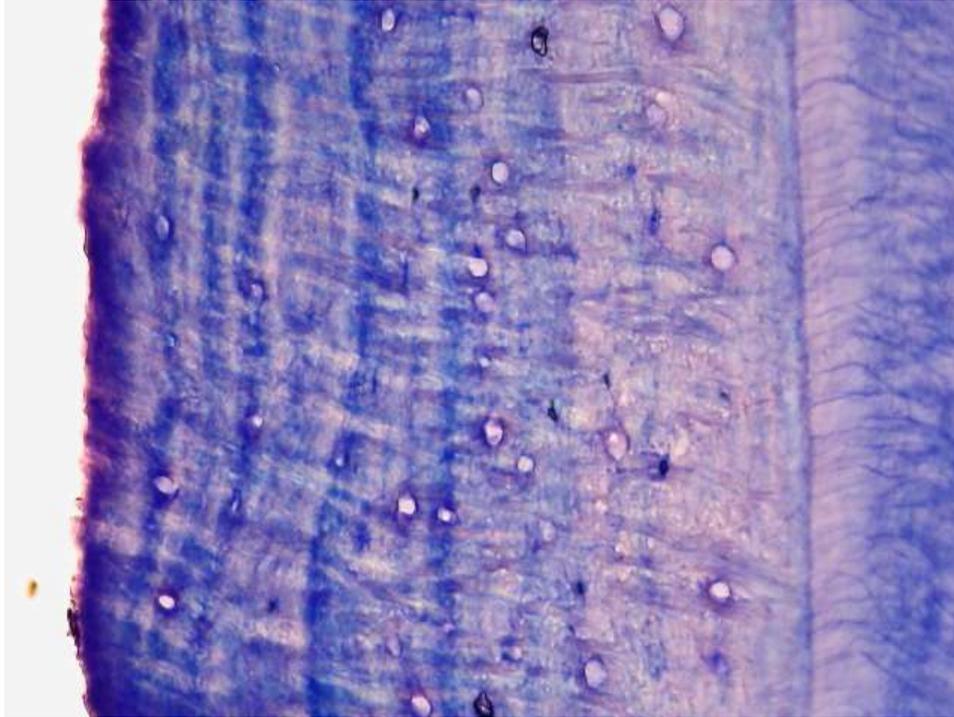
New Zealand stoat canine. 100X. Cementum age 4 years.

Cats and Dogs

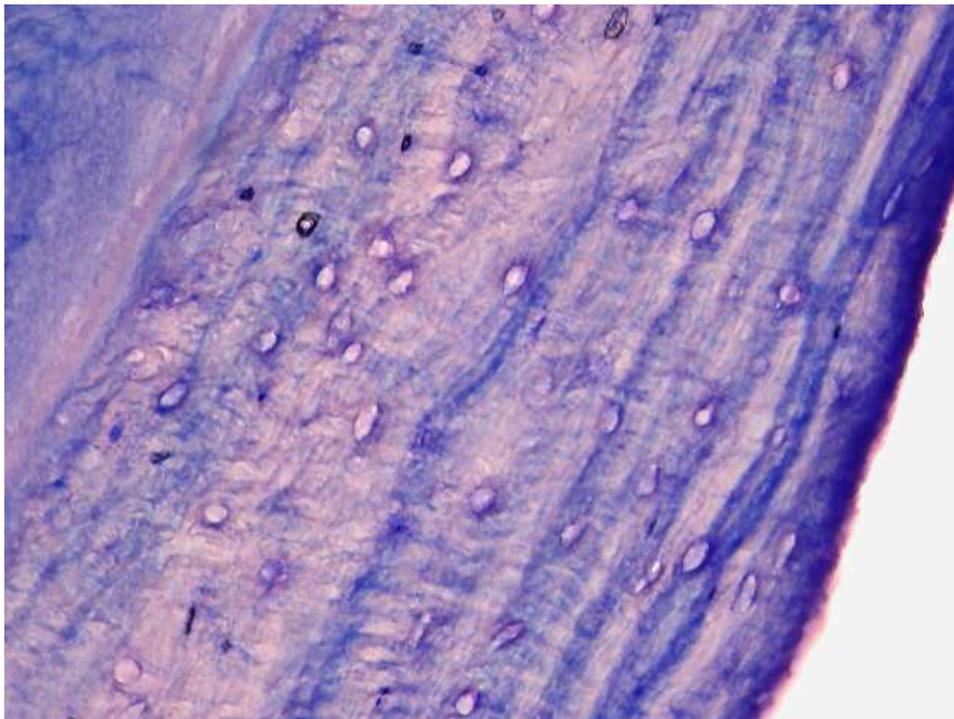


Cementum aging reliability varies among species because of differences in cementum characteristics. Rocky Mountain elk and northern black bear populations are among the most accurately aged because cementum annuli of both species are distinct, simple (few components), and deposited in a regular pattern.

Mountain lions are less likely to be accurately aged because annuli are often indistinct, complex, and occur in an irregular pattern. However, the Lab expects our results for lions to be have a stable error rate and comparable over time because we use a standardized, species-specific analysis model. Lion teeth with very distinct, regularly deposited annuli serve as a template for the species and an interpretive guideline for teeth with indistinct, complex annuli.

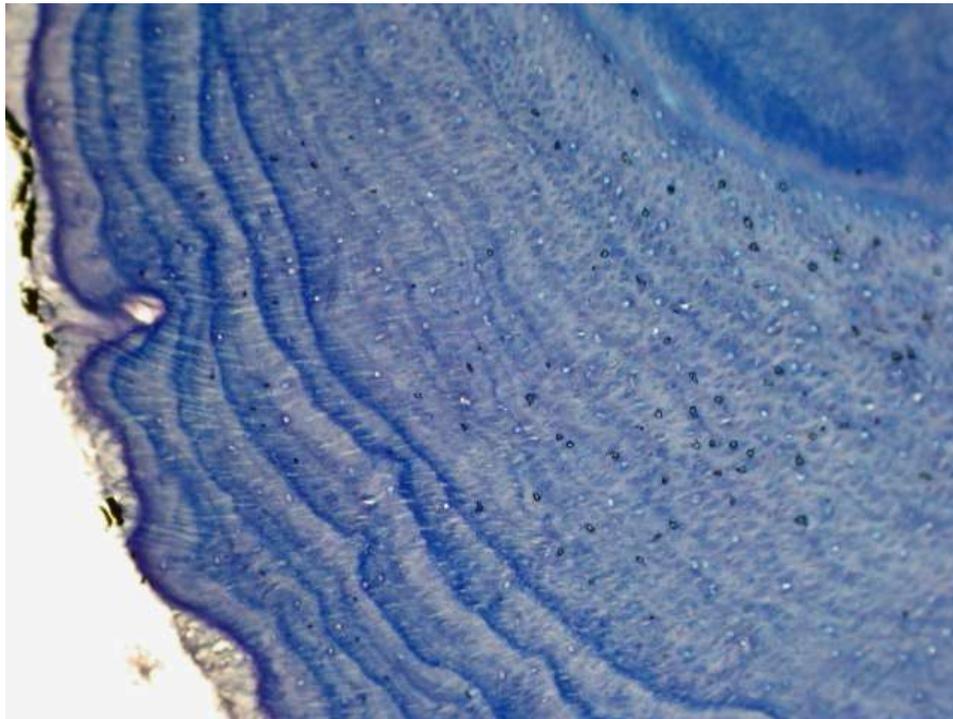


Mountain lion Premolar 2. 400X. Cementum age 6 years. The first annulus is less distinct; annuli are complex with "minor" components repeated in the same way each year. This type of distinct annulus pattern occurs in perhaps fewer than a third of lion teeth.



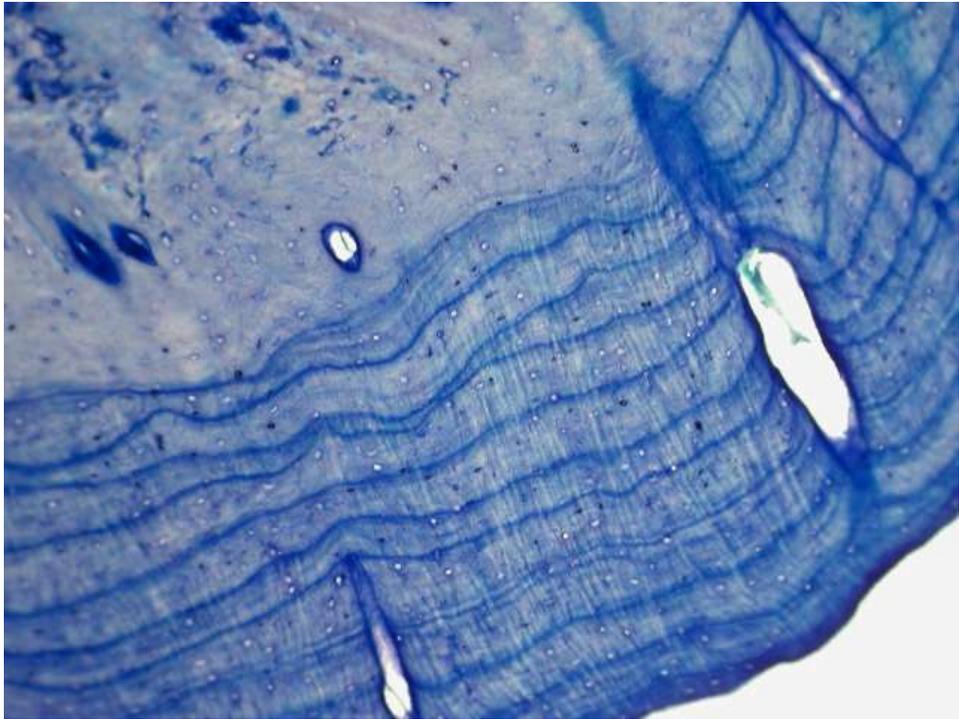
Mountain Lion Premolar 2. 400X. Matson cementum aged as 5 years, but the irregular annulus pattern contributes to the likelihood of error.

Wolves have complex cementum annulus patterns contributing to variability in cementum characteristics and increasing the chance of age analysis error. For some individuals, the annuli are very distinct and the Lab would "go to court" with the age analysis evidence. For others, the evidence is not straightforward and error is more likely.



Wolf canine. 100X. Cementum age 6 years. Cementum deposition is most abundant the first two growth seasons of life and characterized by the presence of non-annual annular structures. The first prominent annulus is formed during the 2nd winter of life.

Coyotes have variable cementum properties similar to those of wolves. For some individuals, evidence used for age analysis is straightforward.



Coyote canine. 100X. Cementum age 11 years. As in wolves, the first prominent annulus is formed during the 2nd winter of life.

Lab performance measurements; accuracy and precision



Accuracy test, known age,

Species	Source	Tooth type	Known age	Cementum age
elk*	Wyoming	I1	4	2
elk*	Wyoming	I2 or I3	4	2

*Elk were housed at the Wyoming Game and Fish Research Unit and supplementally fed. Although cementum structure was atypical, there was evidence indicating the correct age. The result is best interpreted as an analysis error, useful as examples for elk age analysis technician training. Lab results for known age wild elk have been determined to be 97% (Hamlin et al. 2000)

Precision tests using blind duplicates, Sept. 2010 through Sept. 2011

Species	Source	Tooth type	n	Average age	± 0	± 0 or ± 1	% ± 0 or ± 1
Whitetail deer*	Texas	I1	135	6.0	64	121	90%
Elk	Colorado	I1	9	11.7	7	9	100%
Moose	Northwest Territories	I1	2	10.0	2	2	100%
Coyote**	South Carolina	C	14	0.9	14	14	100%

*Southern whitetail deer populations have cementum characteristics differing from

those of northern populations and are more difficult to accurately age. Hamlin (2000) reported an accuracy of 85% for the Lab's analysis of known age whitetail deer.

**Most individuals in this sample were less than 1 year old; age analysis was uncomplicated because of the absence of annuli.

Literature Cited

Hamlin, Kenneth L., D. F. Pac, C. A. Syme, R. M. Simone, and G. L. Dusek. 2000. Evaluating the accuracy of ages obtained by two methods for Montana ungulates. J. Wildl. Manage. 64:441-449.

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We appreciate opportunities to test accuracy and precision and are happy to receive known age teeth as well as blind duplicates. We process, without charge, known age teeth and a number of duplicates up to 10% of a sample size and not exceeding 50 teeth.

Your inquiries, as always, are welcome. Thank you for taking time to look over this update!

Quick Links...

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[Our Website](#)

**Contact Information**

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