Hike

Continued from Page 1B

first running predator in Oregon, Daphoendon, were more abundant in the period following the eruption.

Busy volcanoes create layered cake

Nick and I walked deeper still into the otherworldly badlands, on dry, dusty ground, crossing several small footbridges.

Below the ignimbrite, layers of pale multi-colored rock shot up before us - alayered cake of geology.

Before and after the Crooked River eruption, volcanism in Oregon was busy. Volcanoes east and west of John Day erupted frequently, spewing rhyolite ash that piled up and weathered into clay and silt, eventually hardening into siltstone and claystone.

The brown and tan layers of our geological cake are unaltered siltstone or claystone. Other layers tell a different story.

"Blue-green colored layers," Nick explained, "is from a mineral called celadonite." Celadonite forms when hot water chemically weathers volcanic soils before solidifying into rock.

White shelf-like layers are volcanic tuff—formed from the ejected ash from more explosive eruptions. Each layer represents only one eruptive event.

All this layering — or stratigraphy allows paleontologists to divide time into subunits, characterized by their ashes and geological composition. Each layer of colorful rock represents a different time frame and different environment.

"The ashes are like page numbers," Nick said. Each layer represents about 10,000 years.

All in all, at Blue Basin, there are 7 subunits — numbered B through F with some letters divided further.

It's sedimentary, my dear

Nick directed me over to a spot where rocks were crumbling from the hillside. You could see material falling from the exposure - a perfect place to look for fossils!

John Day Fossil Beds National Monument, perhaps not too surprisingly, is known for its fossils.

Which raises the question - Whv?Why is John Day a hotbed for fossils?



The Blue Basin Overlook Trail in John Day Fossil Beds National Monument features gorgeous views of volcanic ash that has turned to blue-green claystone, now exposed to the weather and carved into towering cliffs. The three-mile trail loops around the rock formation and up the hillsides of the surrounding John Day River Valley. THOMAS PATTERSON/STATESMAN JOURNAL

This can be answered in one word water.

Though hard to imagine now, with the hot summer sun beating down on us in a dry, desert environment, Blue Basin was once a wide, river valley. A river valley that flooded frequently, depositing sediment along its banks and into its floodplains — sometimes burying the remains of dead animals or plants, and preserving them in sedimentary rock.

Collecting fossils

Now looking at the crumbly hillsides, it was easy to see how water was still at work — this time eroding away the layers of rock and exposing fossils.

On any given day," said Nick, "ten field collections might be extracted from this unit."

Considering that Blue Basin has been studied for over 30 years, that is a lot of fossils!

According to Nick, "a collection" is a fossil "that can be identified to a fairly high level." In other words, identifying that a fossil came from a mammal would not constitute a collection, but identifying the fossil came from a rhino, that would!

'What is most important is the context," explained Nick. So, in addition to gathering the fossil, additional information is gathered.

Any specimen found loose, or "in float," is put into a bag with any other material that is found within a threemeter area.

FORM ED-1					
NOTICE OF BUDGET HEARING					
A public meeting of the Silver Falls School District 4J School Board will be held on June 13, 2022 at 7:00 pm at Silverton High School's Library; 1456 Pine					
Street, Silverton, Oregon. There will also be a virtual option to join via Zoom. The link can be found at https://mettings.boardbook.org/public/Organization/1569.					
The purpose of this meeting is to discuss the budget for the fiscal year beginning July 1, 2022 as approved by the Silver Falls School District 4J Budget					
Committee, A summary of the budget is presented below. A copy of the budget will be available at https://silverfallsschools.org. This budget is for an annual					
budget period and was prepared on a basis of accounting that is the same as the preceding year.					
Contact: Steve Nielsen - Business Manager Telephone: (503) 873-5303 Email: nielsen_steve@silverfalls.k12.or.us					

FINANCIAL SUMMARY - RESOURCES					
TOTAL OF ALL FUNDS	Actual Amount Last Year 2020-21	Adopted This Year 2	Budget 2021-22	Approved Budget Next Year 2022-23	
Beginning Fund Balance	\$3,586,474	\$5,892,733		\$4,147,452	
Current Year Property Taxes, other than Local Option Taxes	12,869,903	13,438,800		13,960,870	
Current Year Local Option Property Taxes	0	0		0	
Other Revenue from Local Sources	3,048,695	7,227,250		6,373,934	
Revenue from Intermediate Sources	1,034,091	1,200,000		1,165,000	
Revenue from State Sources	38,884,410	42,920,186		42,953,530	
Revenue from Federal Sources	3.610.734	4,355,000		5.098.100	
Interfund Transfers	335.000	480,000		535.000	
All Other Budget Resources	0	0		0	
Total Resources	\$63,369,307	\$75,513,969		\$74,233,886	
	¢22.004.490	CI CLASSIFICATION			
Other Associated Doursell Costs	\$23,994,409	\$27,755,377		\$27,040,944	
Durebaged Capitage	10,044,031		11,707,005	11 511 010	
Functionaseu Services	7,800,977	11,500,047		11,011,019	
Supplies & Materials	2,923,236	3,889,362		3,038,886	
Other Objects (avecant debt convice & interfined transfers)	492,195		1,200,270	1,247,603	
Debt Convices	680,288	738,200		/ 16,602	
Debt Service*	6,268,812	8,445,000		8,559,100	
Interfund Iransfers"	335,000	480,000		505,000	
Operating Contingency	0	1,328,216		1,394,360	
Unappropriated Ending Fund Balance & Reserves	0	2,351,993		1,569,791	
Total Requirements	\$59,145,629	\$7	5,513,969	\$74,233,886	
FINANCIAL SUMMARY - REQUIREMENTS AND FULL-TIME EQUIVALENT EMPLOYEES (FTE) BY FUNCTION					
1000 Instruction	\$32,065,304	\$37,236,397		\$36,077,309	
FTE	315.11	319.62		331.77	
2000 Support Services	18,849,988	22,871,893		23,343,026	
3000 Enterprise & Community Service	1.073.309	1,608,200		1.625.300	
FTE	11.50	11.50		12.00	
4000 Facility Acquisition & Construction	545,516	1,192,270		1,160,000	
FTE	0.00	0.00 0.00			
5000 Other Uses	6 076 510	<u> 9 445 000</u>		9 550 100	
5200 Interfund Transfers*	335,000	480,000		505,000	
6000 Contingency	000,000	1,328,216		1.394.360	
7000 Unappropriated Ending Fund Balance	0	2,351,993		1,569,791	
Total Requirements	\$59,145,629	\$75,513,969		\$74,233,886	
Total FTE	453.85		461.53	476.95	
" NOT INCLUDED IN TOTAL SUUU UTNER U	ises. To be appropriated separa	tely from other 50	JUU expenditu	ires.	
	PROPERTY TAX LEVIES	Data an Aman		Data or Amount Anneural	
Dermanant Data Laury (Data Lingth 0.4 5 450 months 200)	Rate or Amount imposed			Rate of Amount Approved	
remanent kate Levy (Kate Limit <u>\$4.5458</u> per \$1,000)	\$4.5458	\$4.5458		\$4.5458	
Local Option Levy	¢4.017.000	¢4 200 070		¢4 457 170	
Levy For General Ubligation Bonds	\$4,217,938	\$4,309	,210 \$4,457,176		
STATEMENT OF INDEBTEDNESS					
LONG TERM DEBT	Estimated Debt Outstanding		Estimated Debt Authorized. But		
	on July 1		Not Incurred on July 1		
General Obligation Bonds	\$21,515,000			· ·	
Other Bonds	\$43,626,412				
Other Borrowings	\$2,610,102				
Total \$67,751,514					
OR-GC1084281-01					

Fossils that are found "in situ," or in the rock, also require detailed documentation of fossil location and position in the rock, as well as other contextual information.

It should be noted that fossils are collected in the park only by permit. Individual collecting is not allowed, Nick warned, and is a "bad idea for science."

Evidence of past life

"Fossils are evidence of past life," Nick stated.

So, what life existed in Oregon's John Day region?

One of the best records of life at Blue Basin is found in the blue-green layers of the Turtle Cove Assemblage from 29 million years ago - just before the Crooked Caldera Eruptions.

Imagine expansive open areas with rolling hills and dales. The climate would have been dry and cool - suitable for the hardwood forests.

As for the animals, there were a lot of them! According to Nick, the diversity of life that once existed in the John Day region was tremendous with at least 100 different extinct species of vertebrate life found in the Turtle Cove assemblage.

Most abundant were herbivores, specifical ruminants like Hypertragulus - a mouse-deer creature — which make up about 47% of fossils collected in the Turtle Cove Member. There were also sheep-like and pig-like ungulates, small horses, and massive rhinos.

Evolution see-saw

Carnivores, though not as abundant as herbivores, were diverse 29-millionyears-ago. At any given time, there would have been up to 10 species of dogs, each with their own role to play in the ecosystem.

Now, there are few dog species, or canids, in Oregon. And many older lineages have gone extinct as other groups, like weasels, began to dominate and



Travel through time at Blue Basin at John Day Fossil Beds National Monument. EMILY PARENT / STATESMAN JOURNAL

branches of the tree of life end in a dead end.

Small things

Next to the Oreodont fossil replica was a thick layer of sandstone jettying out toward us.

"This is a channel or river deposit," Nick said pointing at the layer of rock.

He explained that river deposits are unique in that they produce a lot of small fossils, like rodents, that have small home ranges - telling us a lot about local conditions.

As Nick puts it, "smaller things tell us a lot more about the environment than bigger things."

Nick elaborated, "Rodents are uniquely adapted to their environments." Thus, when a species disappears in a region, for example, that can indicate a local environmental change.

Nick used the example of a small deer-like mammal, Hypertragulus, that disappeared from the Great Plans of North America, but persisted in the west for several millions of years more.

A specialist

Nick and I continued down the trail until we reached a final fossil replica. The replica was of a false saber-toothed cat - a nimravid.

Twenty-nine million years ago, three or four species of nimravid coexisted as specialized carnivores, each relying on a different food source for survival. This worked great for a time, as it reduced competition between species.

However, as the environment changed and food sources became scarce, being a specialist was not such a great thing. And eventually the entire nimravid family went extinct.

According to Nick, being a specialist was not easy in Oregon's changing environment.

'Unless vou are a bone crusher. There always seems to be enough bones...," he smirked.

Amphitheater

Eventually, Nick and I reached the very end of the hike — a place known as the amphitheater. Here it is easy to see the many layers of colorful rock reach-

Public Notices

BUBIC NOTICES Public Notices are published by the Statesman Journal and available online at www.StatesmanJournal.com. The Statesman Journal lobby is open Monday - Friday from 8 a.m. to 5 p.m. You can reach them by phone at 503-399-6789. In order to receive a quote for a public notice you must e-mail your copy to <u>SJLegals@StatesmanJournal.com</u>, and our Legal Clerk will return a proposal with cost, publication date(s), and a preview of the ad.

LEGAL/PUBLIC NOTICE DEADLINES All Legals Deadline @ 1:00 p.m. on all days listed below: ***All Deadlines are subject to change when there is a Holiday.

The Silverton Appeal Tribune is a one day a week (Wednesday) only publication

Wednesday publication deadlines the Wednesday prior

LEGAL/PUBLIC NOTICE RATES

Silverton Appeal Tribune: • Wednesdays only - \$12.15/per inch/per time • Online Fee - \$21.00 per time

• Affidavit Fee - \$10.00 per Affidavit requested

public notices/legals email: sjlegals@statesmanjournal.com or call: 503.399.6789

equipment

take on the role of some of these dog species.

"Depending on what is going on and the evolutionary process," said Nick, "the pendulum swings" and dominant groups die off. Nick described these shifts as "the evolution see-saw."

Though Nick was quick to clarify that a decline in dog species, doesn't mean that dogs are less evolved than say weasels. There is no hierarchy to life.

"No animal or plant that is alive today is no more or less evolved than anything else alive today," said Nick. It just doesn't work that way."

Survival of the fittest

Nick and I were now deep into the badlands — walls of rock towering over us. Off a short spur, we reached an informational sign and an encased replica of a tortoise fossil from the genus Stylemys — the belly of the beast protruded from the rock.

Stylemys were lands tortoises - their physiology not all that different from turtles today. Nick pointed out how the two plates, known as plastrons, of the fossil were tilted inward - "a male," Nick noted, " concave so he doesn't roll off."

Modern male turtles today still have concave plastrons for mating. Traits like this, that provide a reproductive advantage, tend to persist in the fossil record. After all, survival of the fittest requires the ability to replicate.

Extinction

A short while later, we reached another short spur and signed fossil replica - this time of a sheep-like creature,known as an Oreodont. Contorted and missing limbs, the fossil replica of the Oreodont lay awkwardly under the casing. The contortion is a clue to its life as a prey species.

Nick pointed out other features. The Oreodont's fang-like canines used for snapping branches, depressions above the cheekbones providing space for large chewing muscles - both clues that Oreodont's were herbivores.

He also pointed out a small depression on the face — the location of a scent gland, present in some ungulates today.

Today, despite their long history in North America, the entire diverse group of Oreodonts are all extinct. A reality that gives one pause – most of the ing back into the ages. The "pages of time" literally surround you.

Nick called out each laver: lower green is unit C, browns unit D, the ledge layers E1-E3, followed by the Blue Basin Tuff and unit F, with dark Picture Gorge ignimbrite capping it all.

Layers and layers of rock containing fossils of past life, telling a 29-millionvear-old story.

Storytelling

After a few minutes taking in the amphitheater, Nick and I made our way back to the trailhead. As we walked, he said something that struck me:

"I tell students all the time that the most important thing, as a scientist, is that you have to be able to communicate what you have done to somebody else. Because if you can't, what is the point of doing it in the first place?"

Paleontologists are storytellers. They take us back in time to better understand the future. Oregon's story is dramatic-punctuated by fiery volcanic eruptions, changing climates, and a serious of unique life forms — but it is also a lesson in understanding occurrences of change.

Life is a state of flux. And you don't need a Flux Capacitor to see that.

The Hike

Trailhead: Blue Basin Parking Lot/ Island in Time Trail

Distance: 1.2 miles

Elevation Gain: approximately 250 feet

Details: Restrooms at the trailhead. Plenty of parking available. No passes required for entry. Hike the 3.25-mile (750 elevation gain) trail for a birds-eye view of Blue Basin from the same parking lot.

Emily Parent is a science educator, freelance writer, self-professed nature nerd, and avid hiker. To read more of her writing about science and nature in the outdoors visitwww.trailscholar.com

Nicholas Famoso (Nick) is the Paleontology Program Manager and Museum Curator for John Day Fossil Beds National Monument. Nick got his bachelor's degree from South Dakota School of Mines and Technology where he studied fossil mammals and marine reptiles. He later went on to earn his master's degree and Ph.D. from the University of Oregon in geological and earth sciences.



coins

Check out the

classified ads everyday.