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SHARPSHOOTER

OREGON SOCIETY OF SOIL SCIENTISTS

VOL. XIX NO. 4

Summer Tour Round-up

by Ed Horn, OSSS President

The 2006 OSSS summer tour happened August 25, 2006 in Central Oregon. Thirty-nine people braved dusty washboard roads and took hikes that led us into riparian areas, Paleontological badlands, silver sage wetlands, and wagon trail traces from the lost Meek wagon train. Stories of early day pioneers capped off the tour at the Post General Store, the center of Oregon.

The tour started at the Chimney Rock trail head parking area located in the scenic Crooked River canyon. This was across the road from where we camped, fished, hiked, drank beer, wine and talked dirt.

The first stop was at a riparian demonstration area along Bear Creek, interpreted for us by Janice Staats of the Bureau of Land Management National Riparian Service Team. Changes to this riparian area have been monitored for the last 30 years. Changing livestock use from season long grazing to a late winter / early spring grazing system has led to sediment capture in an initially down cut and widened channel. Vegetation re-growth in the channel and sediment capture have allowed for floodplain re-establishment and an increase in bank stabilizing vegetation for summer thunder storms. The surrounding shallow soils of the uplands create flashy high water flows during spring snow melt and during intense summer



Group shot. Photo taken by Ron Reuter



Breached alluvial fan deposit partially blocking Bear Creek

thunder storms. Janice showed us where a side channel fan deposit partially dammed Bear Creek three years ago and was finally washed out by high spring melt conditions this past year (see picture above). Getting the right riparian root stabilizing vegetation established in the channels is important in rehabilitating the stream system. Juniper thinning on the surrounding uplands helps keep a diverse and healthy stand of shrubs and perennial grasses, which increases water infiltration and slows water flow to the creek.

The second stop was on a stream terrace surrounding Camp Creek to look at a Blancocanyon soil. The Logan Butte Badlands were visible to the south and they provided much of the alluvial sediment from which the Blancocanyon soil was formed. Tom Clark described the of the Blancocanyon soil which included a highly erosive sodium affected subsoil layer topped by recent ash deposits. He also told us that the Blancocanyon soil was named from the 1958 movie *The Big Country* starring Gregory Peck.

Stop 3 included a three hour hike through the Logan Butte badlands and fossil beds led by John Zancanella, Paleontology Coordinator for Oregon-Washington Bureau of Land Management. John initially told us about the importance of Logan Butte for Paleontological study. It is an ACEC (Area of Critical Environmental Concern) and is known for its rich mammalian

(Continued on page 4.)

Center of Oregon monument





PRESIDENT'S MESSAGE



by Ed Horn, OSSS President

Greetings. Our 2007 Oregon Society of Soil Scientists Winter Meeting is scheduled for Thursday and Friday, February 22 and 23, 2007 in Astoria, Oregon. Come "Explore the Earth on Lewis and Clark's Turf" in Historic Astoria at the Holiday Inn Express. Thanks to Kathy Clark's hard work, we have a block of rooms reserved at reduced rates. Reservations can be made by calling 1-800-315-2621 or online at www.hiexpress.com. Please save these dates and join us in Astoria to schmooze with fellow OSSS members and learn more about Northwestern Oregon. Check our OSSS web site at osss.peak.org for late breaking information about the meeting.

I recently got a chance to visit the Jorinada Range and Agricultural Research Station in Las Cruces, New Mexico. An interagency team was convened to look at soil input to ecological site descriptions. They wanted us to answer questions like: How can inherent and dynamic soil properties be used to define and describe ecological sites? and What soil criteria should be used for differentiating and delineating ecological sites? Looking at "ecological site

state and transition models", when is a transition so severe that a new site should be created?

As state and transition models are being developed, it is increasingly important to incorporate soil properties into these models. Looking at the 5 soil forming factors is an important 1st step in starting to answer the above questions.

These factors are 1) Climate (temperature and precipitation), 2) Topography (landforms, slope, aspect), 3) Parent material (Geology), 4) Biologic (Plants and Animals), 5) Time for the previous factors to express themselves.

Factors used for understanding soil formation can also be used for understanding plant community formation. For ecological sites, it is important to consider soil properties as the 6th factor in plant community formation. At the Jorinada we looked at both inherent and dynamic soil properties.

Inherent soil properties are those properties that are developed and expressed over long periods of time i.e. greater than decades or centuries; geologic time. Examples of inherent soil properties that influence plant communities are:

- Topsoil texture and thickness (includes rock fragment content)
- Abruptness of transition between soil horizons
- Soil depth to restrictive layer or rooting limiting layer (this would include kind of restriction)
- Salinity, alkalinity, CaCO₃ (amount and distribution in soil profile)
- Available water capacity (tied to texture and depth

to restrictive layer. This property becomes more apparent with increasing precipitation [i.e. with 12 inches of precipitation it is more apparent than with 6 inches]

- Depth and duration of surface and/or subsurface water inundation
- Parent material kind and type
- Climate – (temperature and precipitation) – not an inherent soil property but important in plant community formation
- Topographic (landform, aspect, slope, and position in the landscape) - not an inherent soil property but important in plant community formation

Dynamic soil properties are properties that can change and be measured over shorter periods of time; less than decades or centuries, or in the time it take to recover from natural disturbance or human impacts from management. Some dynamic soil properties that we looked at were:

- Soil crust aggregate stability
- Soil pH,
- Salinity,
- Organic carbon content,
- Soil bulk density
- Infiltration
- Bare surface interspaces.

Ariene Tugel, Soil Scientist at Jorinada, laid out 3 requirements for selecting dynamic soil properties to measure. First, the relationships between the dynamic

(Continued on page 7.)



WESTSIDE NOTES

by Dan Cressy, West-Side

Soil Judging

Here is an update on the Oregon State soil judging team by its coach and OSSS vice president, Will Austin: The 2006 NW Regional soil judging contest was held at Sunriver, Oregon. Participants included Washington State University Cougars, University of Idaho Vandals, and of course the OSU Beavers. OSU took 4 of the top 6 high individual scores. Many thanks to Ron Reuter and Tom Clark for their outstanding efforts as official judges, also to Jerry Kathan of Deschutes County for his facilitation of practice sites and to Steve Wert for the use of his property for the contest sites. Next stop for the OSU team is Logan, Utah for the 2007 National contest. We will be sending at least 8 students to Logan. Without OSSS support we would not be able to provide the experience of soil judging to so many students.

Soil Survey

The Tillamook County and Northern Lake County soil surveys are now online. They can be accessed using the Soil Data Mart (soildatamart.nrcs.usda.gov) and Web Soil Survey (websoilsurvey.nrcs.usda.gov).

Soil and Water Conservation Districts

I am not real familiar with Oregon's Soil and Water Conservation Districts and the important work they do. I suspect many OSSS members are like me in this regard, so I did a little research on the subject. There are 45 local Soil and Water Conservation Districts (SWCDs) throughout the state (about 3000 nationwide). Their origins trace back to the dust bowl days of the 1930s when President Roosevelt wrote the governors of all the states recommending legislation that would allow local landowners to form soil conservation districts. SWCDs are loosely tied to state and county governments. They have an elected Board of Directors made up of volunteers. There is a small paid professional and administrative staff that carries out the programs. In Oregon funding is primarily through grants. Some additional funding comes from the Oregon Department of Agriculture and other government sources. The grants

(Continued on page 6.)

DATES TO REMEMBER

February 22-23, 2007: Oregon Society of Soil Scientists Winter Meeting; Astoria, Oregon; Holiday Inn Express. Information is available at osss.peak.org. Motel reservations can be made by calling 1-800-315-2621 or online at www.chiexpress.com.

March 1-3, 2007: National Society of Consulting Soil Scientists Annual Conference; San Antonio, Texas. Information is available at www.nscss.org

March 9-10, 2007: Oregon Onsite Wastewater Association Annual Conference; Chinook Winds Casino in Lincoln City. Information is available at www.o2wa.org

June 10-15, 2007: Society of Wetland Scientists Annual Meeting; Sacramento, California. Information at: www.sws.org/sacramento2007/index.html

June 17-21, 2007: Western Society of Soil Science Meeting; Boise, Idaho. Information available at www.asa-cssa-sssa.org/branch/western-soils/

November 4-8, 2007: Soil Science Society of America Annual Meeting; New Orleans, Louisiana. Information available at www.acsmeetings.org/2007

Note from Scott Burns: The State Soil is back on the table for the legislature this year!!! I led a field trip a couple of years ago, and a man named Richard Page mentioned that he was a Jory! I told the story about it being a state soil, but we cannot get it through the legislature. He has taken the bull by the horns, has a sponsor (Mitch Greenlick, and the bill is LC1213. We might be asked to support it! I just wanted to update all OSSS members!



(Summer Tour: from front page.)



**Dennis Worrel,
Tom Clark,
Christine
Harrison, Jude
Dady, Bobbie
Gross hiking
chimney rock
trail**

**Silver
Sage
and
Swale-
silver
soil**



**Janice Statts along
Bear Creek**



**Tom Clark and
MaryBeth Smith at
Lost Meek Trail
wagon Rutts**

fossils of mid-Tertiary age (29 Ma). Logan Butte is the location where 6 vertebrate species were first described in the Turtle Cove Member of the John Day Formation. John also informed us that Logan Butte is surrounded by private land and is not available for the general public to access with out obtaining permission from the landowner before crossing his property. Nonhikers were treated to a class on Oregon fossils and local plant identification, by Kathy Clark, which included making a plant press.

Hiking through the badland channels of Logan Butte we occasionally would find fossil bone fragments (see picture below) washed from the bare ash-laden hills. John told us that after a paleontologist finds an exposed fossil in a sediment layer, the surrounding sediments are very carefully probed to determine the extent of the fossil. It is then isolated from the surrounding rock and jacketed in plaster to protect it from the elements and during transport (see picture of jacketed fossil on hillside at right). It can take years to fully extract a fossil from the surrounding rock. John showed us a jacketed fossil on the hillside that was removed by John Day Fossil Bed employees the day after our tour (see picture on page 5 of jacketed fossil). At another stop we looked at a fluvial pocket shaped channel body. This we can say was truly old alluvium. At the



**Jacketed fossil on hillside at
Logan Butte**

**Jaw bone and
teeth of an
Oreodont**



**Fossil
Bone**



**John Day
Fossil Bed Park
Service
employee
jacketing
Oreodont jaw
at Logan Butte**

Central Badlands overlook, we stopped to view a sequence of fossil soils of green and buff tuffaceous claystone thought to have formed on poorly drained backwater floodplains deposits in a semi-arid to subhumid environment. In this same area just above the double tuff layer, a National Park Service employee found a fossil jaw bone and teeth of on Oreodont. It was exposed on the hillside in a fossil paleosol (see pictures at left).

Hungry from our hike, we drove to our lunch spot under a stately old growth juniper tree. Lunch was catered by chef Kathy Clark. There were four different kinds of tasty wrap





Kathy Clark at Lunch Stop

John Good (L) and John Zancanella (R) at Logan Butte



sandwiches with drinks, chips and veggies. Delicious fresh baked cookies made by Kathy's friend Jude Dady topped off the meal. Yummy - Thanks Kathy and Jude and helpers!

We left fat and happy bouncing and scraping over a rough jeep road to stop 4, a silver sage wetland playa to look at another soil. The soil is called Swalesilver silt loam and is located in a landform depression with no drainage outlet. This results in shallow ponding by water 3 to 6 months of the year. We looked at a hand dug profile of this soil thanks to the hard work of Tom Clark, Randy Hinson, Kurt Moffit and yours truly. Swalesilver has a silt loam surface layer with a thin ash layer abruptly transitioning into a heavy prismatic clay. We talked about the requirements for a jurisdictional wetland which include a hydric soil, hydrologic evidence of water presence, and hydrophytic vegetation. According to a PhD study by Dave Clausnitzer, this type of area has all three requirements and can be classified as a jurisdictional wetland.

Stop 5 was a short hike to the west of the playa to a spot where the Historic Lost Meek wagon train was thought to have descended into the Camp Creek Valley. John Zancanella talked about the methods of lowering wagons down steep hillsides using drag logs, rope breaks around trees, and hitching oxen to the back of the wagons. We viewed what appeared to be rope grooves in some juniper trees at this location and a rutted depression heading down the slope.

John Zancanella leading tour Logan Butte



Jacketed fossil being removed by National Park Service employees at Logan Butte

The tour finished up at the Post General Store and Post Office. We listened to a true story account of early day pioneers in the Post area, told by historian Kathy Clark. The story ended with a shooting in the back and a killing, a grim reminder of how wild it was back in the old days. The actual monument marking the exact geographic center of Oregon was a short walk away in a grass hay field northwest of the store. It was a long day, and we were all tired and happy that no one got lost or went postal for the 2006 OSSS summer tour.

Center of Oregon Benchmark located in Post, Oregon





(Westside Notes: from page 3.)

and most of the government funding are short-term soft money revenue that do not provide a secure year-to-year operating budget. For this reason most districts struggle to meet the demand for their services. To date only six districts have a voter-approved local tax base which provides stable funding. The SWCDs' varied functions are:

- Provide technical assistance, educational outreach, and other conservation services to landowners, managers, and citizens.
- Provide leadership in delivery of state water quality programs, watershed enhancement programs, and local conservation efforts that contribute to the Oregon Plan for Salmon and Watersheds.
- Coordinate and partner with state and federal natural resource agencies, private organizations, and local governments.

In Douglas County where I live there are the Douglas and Umpqua SWCDs. Jim Lee, a Douglas SWCD program manager, supplied me with some details of two current projects his district is coordinating. These projects are being funded in part by the federal government under the Secure Rural Schools and Community Self Determination Act of 2000. The act establishes a payment schedule to local counties in lieu of funds derived from harvest of timber on federal lands, which dramatically declined over the past ten years. A portion of these funds are earmarked to benefit public lands. Projects on private lands that indirectly benefit public lands are permitted as is the case here.

Under one project, oak woodland/savannas and riparian restoration is occurring at Douglas County's 1066 acre, Mildred Kanipe Memorial Park. Grassed woodlands, savannas and riparian areas are thought to function as overland flow filters, trapping fine sediments and allowing greater infiltration of water, improving water quality and overall hydrologic function. In the absence of fire, the oak woodlands and savannas have been encroached by younger oaks, conifers and the invasive English hawthorn and Himalayan blackberry. The encroaching canopies reduced important vegetative components, particularly grasses and forbs. These displaced components provided much of the sediment filtering and protective ground cover from erosion. Treatments to restore a more desirable mix of vegetation include the thinning of trees and the removal of the evasive species

through a "cut-stump treatment" with a tractor-like device and/or a chain saw, followed by the application of the herbicide Glyphosate to the stumps.

The woody material created by the treatments is being used to improve fish habitat. Thinned oaks are fallen into the creeks and some conifers are placed in the stream as formal stream fish habitat structures. Hawthorn in the riparian areas is either piled and burned or placed along the stream banks as stabilizing brush mattresses. Fire has been reintroduced to the oak woodland forests over the last two years as well. This year with the assistance of a private contractor and the Douglas Forest Protection Association, 225 acres were prescribed burned. The fires helped kill English hawthorn and Himalayan blackberry patches and the burnt areas were subsequently reseeded with a native grass seed and forb mix and in some instances straw-mulched where moderately to highly erodible silt loam surfaces were exposed. The project's goals include restoring habitat and improving forage for the recently delisted Columbia white-tailed deer. The Mildred Kanipe Memorial Park is considered "secured habitat" for the recovery of the Columbia white-tailed deer and efforts are on-going to improve habitat for many other sensitive species found at the park.

In the other project, about twenty tree revetments will be built next year on eroding stream banks in a number of locations on private land across Douglas County. Stream conditions here were assessed to still be at a point where low impact bioengineering would provide effective solutions. The revetments will divert flow away from the banks while creating roughness to reduce stream flow velocity and trap sediment. According to Lee, they will eventually provide a great substrate to plant willows which create more roughness and trap more sediment and provide cover and food for salmon fry. The revetments themselves will provide the fry refuge in the winter during high flows. The trees will come from Christmas tree farms. They are 20 to 30 feet tall Scotch pines that never caught on with the public as Christmas trees and therefore no market developed. About twelve of these tree revetment projects have been coordinated by Douglas SWCD in past years with good results.

Black mud woes

I bought my home 16 years ago on Roseburg's infamous black mud, a somewhat poorly drained vertisol belonging to the Curtin Soil Series. It is an



(Westside Notes: from page 3.)

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I bought my home 16 years ago on Roseburg's infamous black mud, a somewhat poorly drained vertisol belonging to the Curtin Soil Series. It is an



older home with a foundation that is not reinforced with rebar and that only has an eight inch

If you must purchase a home on a high risk soil for foundation problems, buy one that is up to current code and invest in good drainage features as necessary to avoid the big stresses, anxiety and expenses that may come later.

After a lot of labor installing an additional French drain and two sump pumps and contracting out an expensive foundation stabilization job, I can finally rest easy again.

My painful lesson prompts me to give this strong recommendation:

If you must purchase a home on a high risk soil for foundation problems, buy one that is up to current code and invest in good drainage features as necessary to avoid the big stresses, anxiety and expenses that may come later. By the way, I have two yards of drainage rock left over. It is free to anyone who wants to haul it away.

Western Oregon Soil Trivia

While on the subject of vertisols, Will Austin submitted this tidbit: If a 20,500 mile long dry, ribbon of Bashaw clay was wetted, it would linearly expand long enough to reach around the earth's 24,900 mile equator. According to my calculation that is a 21.5 percent expansion. If you have any soils trivia you would like to share with readers, send them to me.

footing [The code today requires a two feet footing]. Before I committed to buying, an alleged foundation expert recommended by the realtor examined the foundation and concluded that since no cracking was evident after all these years, future problems were unlikely. You would think that I being a soil scientist would exercise good judgment and look elsewhere for a home but this house had features desirable to me and my wife so I put down my deposit.

All was well until last winter when after a wet November followed by record Roseburg precipitation totals for both December and January, my crawl space flooded for the first time since we lived there. Water got into the heating/air conditioning ducts but my biggest concern was what this high shrink-swell very clayey soil would do to the foundation with drying later in the year. Sure enough, my fears were realized and four large cracks along with a few smaller ones developed at the west end of the house. When one crack grew to 1.5 inches wide I knew our home was in trouble and I had to act.

(President's Message: from page 2.)

soil property and the ecological processes they reflect should be clearly defined. Second, the dynamic soil property should be easy to repeatedly measure accurately and precisely by different people. Third, the benefit-cost ratio of including the dynamic soil property should be relatively high. High benefit-cost ratios are typically associated with dynamic soil properties that are relevant to a number of functions or ecological processes.

Some ecological processes...

- Hydrology (infiltration/runoff, water table)
- Energy flow (warm vs. cool season)
- Nutrient flow (grassland, shrub-land)
- Soil erosion

It is important to start documenting the range in inherent and dynamic soil properties between ecological sites and states within ecological sites so that we can answer questions like those asked above. Dynamic soil properties become important in indicating the trend of change between states or sites from our short term management. If the change is severe enough, the ecological site changes. We need specific soil measurements to document when severe is severe. We need to start documenting the specific soil properties that drive plant community development. For example, how sandy does a site have to be, defined by the range in percent sand, silt and clay, and how thick do the sand layers have to be to retain the vegetative characteristics of the sandy site? Identifying and documenting soil specific drivers for regionally important benchmark ecological sites would be a good start for using soil criteria to define and describe ecological sites.





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All articles and advertisements submitted are subject to room available basis.

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