neighborhood naturalist

Nature you can find in town and the nearby countryside *Corvallis, Oregon* *Winter 2007-08*

Raccoons

By Don Boucher

We were looking for animal tracks on the muddy banks of the shallow Cheadle wetlands at William L. Finley National Wildlife Refuge. Raccoon prints were so dense it was a lost cause to find any other species outside the hoof prints from deer and elk. We gave up tracking and decided to relax on the banks of the wetland and watch birds. Within ten minutes, a family of raccoons (mom and three youngsters) appeared. They were industriously rummaging with their hands in the water. I set the up the video camera and we watched them for about 20 minutes. They kept moving, catching and eating their prey with their hands, while hardly breaking stride. The youngsters were two-thirds grown and very cute. The family made their way closer to us, when the mother finally noticed that we were watching. She hurried her little ones off into the tall rushes on the opposite bank.

Finley Refuge is ideal natural habitat for raccoons. Even though raccoons are remarkably adaptive, there are certain natural conditions that suit them best. They typically reside near shallow water, they must have a reliable variety of plant and animal foods and they need trees for denning. The Refuge meets these needs perfectly. It turns out that these same conditions found in nature are also present in urban areas. Cities contain many water sources such as rivers, irrigated lawns, canals, ponds and fountains. Cities have a variety of foods such as fruit trees, gardens, trash cans and restaurant dumpsters. In urban areas, buildings, other structures and trees are opportunities for raccoons for them to seek refuge and for sleeping.

photo by Don Boucher

This raccoon family was catching small aquatic animals in a shallow wetland at Finley National Wildlife Refuge.

Raccoons are in the mammalian order Carnivora, which includes cats, dogs, weasels, bears, sea lions and seals. Many of the animals in this order are primarily meat eaters but the raccoon is a prolific omnivore. However, the raccoon's teeth resemble those of other carnivores more than those of most omnivores (such as pigs or humans for example). At the next level of classification is the raccoon family, Procyonidae. American members of this family are ringtails (also known as the cacomistles), coatis, kinkajous and olingos. Most live in the tropics but a species of ringtail ranges as far north as southern Oregon. There's only one species in

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In the summer, we set up a motion-sensing camera near Dunawi Creek in our neighborhood. The tree was smeared with peanut butter and apples were scattered about. One rascal is dangling fram a small branch (right photo) in an attempt to reach a tree-bound apple.

photo by Don Boucher

This raccoon was sleeping in a tree on mild spring day. Moments before the photo was taken, Western Scrub-Jays were scolding the raccoon (raccoons often raid bird nests). The raccoon was too sleepy and stubborn and the jays gave up their vigilance.

Raccoons *continued from front page*

the raccoon family that lives in the Willamette Valley—the Northern Raccoon or *Procyon lotor.* The Northern Raccoon ranges from Central America to southern Canada. There is a "southern" raccoon. Its official name is the Crab-eating Raccoon (*Procyon cancrivorus*) and it lives in South and Central America. There are as many as five other raccoon species restricted to Caribbean Islands or islands off the west coast of Mexico. Within the species *Procyon lotor* there are a couple dozen subspecies. The subspecies *Procyon lotor pacificus* is a darkish, large subspecies that lives throughout most of Oregon, Washington and southern British Columbia. Within our population of raccoons there is a tendency toward reddish-brown coloring. An example of extreme coloration might be an individual photographed in the Soap Creek Valley area of Benton County who was as red as a fox.

The Northern Raccoon may be a commonplace animal but its natural history is not very well understood. Early European naturalists in North America could not agree on the relations of this animal. Some thought raccoons were like dogs while others thought they were like bears or cats. The affinity to bears has been the preference up until the late 20th century. What we do know is interesting. Recently science has matched DNA clues with dental and skeletal patterns, and some biologists believe that the raccoon family is most closely related to the weasel family. This new science has also supported that the Red Panda of Asia is also in the raccoon family but the Giant Panda is more like a bear. Be that as it may, raccoons are neither weasels nor bears and are unique among our wild neighbors.

A raccoon is a superbly adapted animal. It has a sharp sense of smell and sensitive hearing. It cannot see distant objects or recognize patterns as well as humans, but excels with better night vision and motion detection. The raccoon's unique claim to fame is its sense of touch and manual dexterity. They "see" with their hands and have a relatively large part of the brain dedicated to processing sensory input from them. Remarkably, the hands do not lose their sensitivity in icy water. Perhaps you have seen a raccoon busily feeling around in shallow water, staring blankly while mentally absorbed in what its hands are doing. This sensory ability may be linked to the raccoon's so-called washing habit. A raccoon's behavior is connected to its sense of enjoyment. The same is true for people. Our dominant senses are vision and hearing and therefore we like art, music and movies. Raccoons explore their world through their hands and take pleasure in it. Research has suggested that when a raccoon's hands are wet, they are more sensitive. That makes sense because they find a lot of food in shallow water. Even when finding food in dry

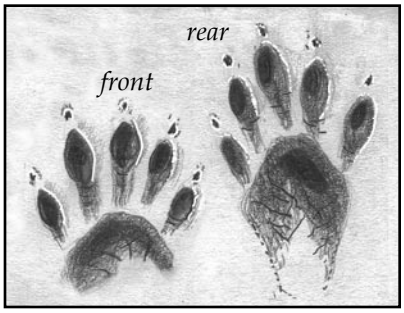

illustration by Don Boucher

▲*The raccoon hand print (front foot, left) is slightly wider than long. The rear foot (right) has a long heel like a human or bear but it may not register depending on soil type or the raccoon's gait. Claw marks usually show.*

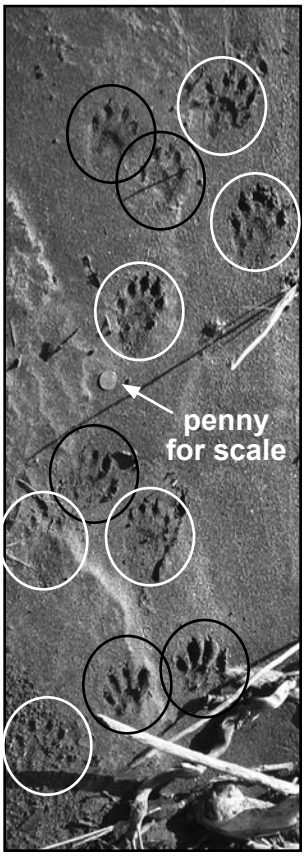

photo by Don Boucher

► *Raccoon tracks (black circles) and River Otter tracks (white circles) side by side on the east bank of the Willamette River in downtown Corvallis. The simplest way to distiguish them is that raccoons have finger-like toes but otter toes are round.*

neighborhood naturalist

Neighborhood Naturalist promotes interest about nature in mid-Willamette Valley backyards, neighborhoods, and countryside.

Submissions:

This is a newsletter that caters to nature enthusiasts. Any article suggestion, story, poem or artwork which celebrates nature in the Willamette Valley will be considered for publication. The newsletter publishes 4 times a year around the Solstices and Equinoxes. Send your submissions two weeks in advance.

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conditions, they often seek a source of water in which to dunk the food. Raccoons eat anything and have no reservations toward ingesting gritty or messy meals. I believe that raccoons dunk their food in water because it enhances their ability to tactilely enjoy it. At the very least, the increased sensitivity of wet hands may simply allow a raccoon to evaluate its food more precisely.

Like many mammals, raccoons are predominantly nocturnal but they won't pass up a good food source if it's available during the day. While watching raccoons at the Cheadle wetlands, it was mid-morning. So presumably the fishing was particularly good at that time. In the city, raccoon activity is often relegated to when most people sleep. Raccoons sleep most often during the day and a safe place to roost is very important to them. They prefer hollow tree cavities above ground but any cavity, a building or even a burrow, may be used as long as it's dry. In good weather they may sleep on an exposed tree limb. An area without trees or suitable roosting sites will have very few or no raccoons.

Aren't the raccoon's mask and striped tail charming? It's not clear exactly why raccoons have evolved to look the way they do. Masked facial patterns are common in many mammals and birds. A mask's function can make the pattern of a face appear cryptic, aiding in camouflage. Another reason for such patterns is species recognition, like a kind of signature for the species. Raccoons are not predominantly dependent on camouflage, so perhaps their tail and facial patterns are more useful for recognition. The raccoons, ringtails, coatis and the Red Panda all have striped tails and maybe the tail pattern was especially useful to a common ancestor. We do know that the striped tail and masked face of the raccoon exists because it is somehow functional to the species.

Raccoons are problem solvers. Years ago I worked in a kitchen at a restaurant. Raccoons were a familiar sight as they often raided our dumpsters. One night, after my shift was over, one of the cooks called me over to the back door where we accessed the dumpster. Through a narrow crack in the door we peeked as a raccoon went to work on the dumpster. There was a pile of empty cardboard boxes nearby. The raccoon pushed cardboard boxes, one at a time, over to the side of the dumpster. When the boxes were as high as the dumpster, the raccoon climbed in. On previous occasions the raccoons were discouraged and chased away, but not that night. In our judgment, this raccoon earned its meal of half-eaten baked potatoes and steak scraps!

Suggested reading:

Raccoons, A Natural History. Samuel I. Zeveloff. 2002 Smithsonian Institution

Ice Age Flood

by Lisa Millbank

Fifteen thousand years ago, in the last few millennia of the Ice Age, a lobe of the Cordilleran Ice Sheet dammed the Clark Fork River on the Idaho panhandle. The impoundment created a vast inland sea extending far into western Montana. Glacial Lake Missoula covered 2,900 square miles and held 530 cubic miles of water at its maximum size (about half the volume of Lake Michigan). Increasing pressure against the ice dam melted some of the ice, allowing water to enter flaws in the ice and gradually enlarge the fissures. Finally, the weakened dam began to shatter, sending loud cracks and groans echoing off the surrounding mountains. With a final thundering report, the dam exploded outward, and the earth trembled as a wall of water 2,000 feet high surged forth. What had been placid Glacial Lake Missoula was now a towering monster, plowing across the Idaho panhandle at 70 miles per hour.

The flood overran northeastern Washington's Glacial Lake Columbia, scoured the rolling Palouse country (where it picked up billions of tons of fertile loess), and backed up at the bottleneck of the Columbia Gorge. Squeezed into the narrow channel, the flood tore away at the andesite walls of the Gorge. At the site of present-day Portland, the land quivered and an ominous rumble from the east announced the approach of the waters. A powerful wind gusted over the Portland Valley, the menacing roar grew louder, and the waters arrived. From the mouth of the Gorge erupted a 500-foot wall of water, muddied by the soil it carried, laden with uprooted trees, and capped with icebergs that floated all the way from Montana.

At Portland, the floodwaters crashed against Rocky Butte and the Tualatin Hills. Northeast of Portland, the Columbia River enters the Kalama Narrows. Though nearly two miles wide, the passage was too small for the massive flood, and the water rose behind it. The backed-up waters fountained through two gaps in the Tualatin Hills. One gap was the historic channel of the Tualatin River (where Lake Oswego now lies). The other gap was the Willamette River channel.

In minutes, the flood overwhelmed the Tualatin and Willamette Rivers and roared into the Willamette Valley. Although geologists estimate that two-thirds of the floodwaters continued down the valley of the Columbia River to the Pacific Ocean, that still left about 175 cubic miles of water to inundate the Willamette Valley. Imagine the unlikely islands in that dark, turbulent lake: the Chehalem Mountains near Newburg, the Salem Hills, and the tops of many small hills like Knox Butte near Albany. The brown water that lapped at those strange new shores was choked with rafts of trees, scattered animal carcasses, and icebergs.

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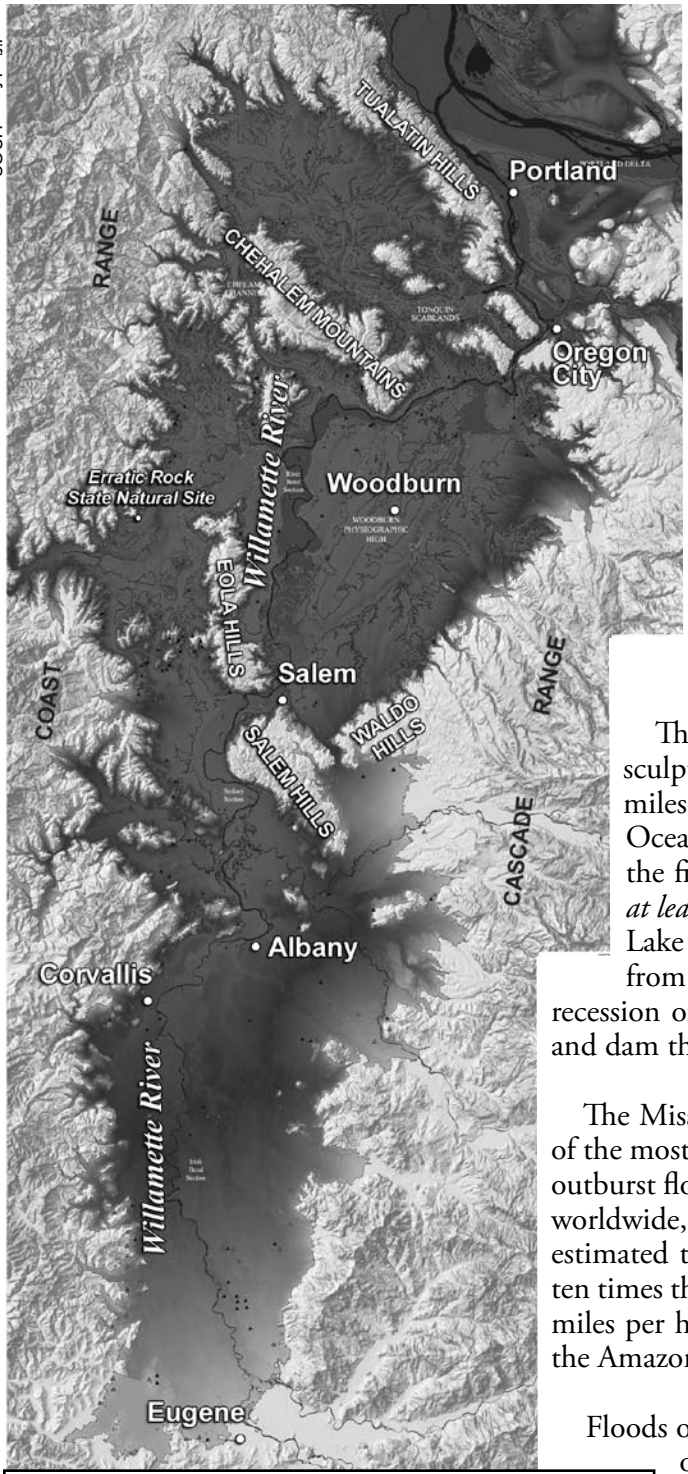
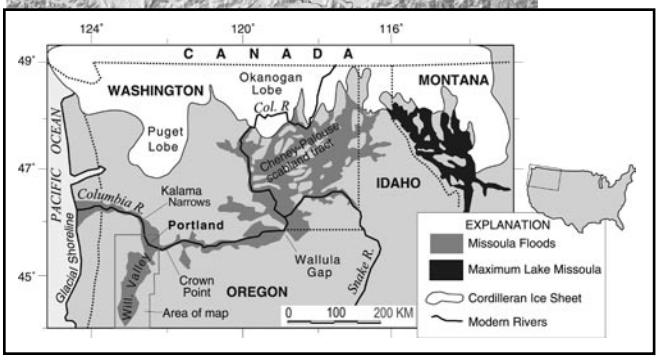
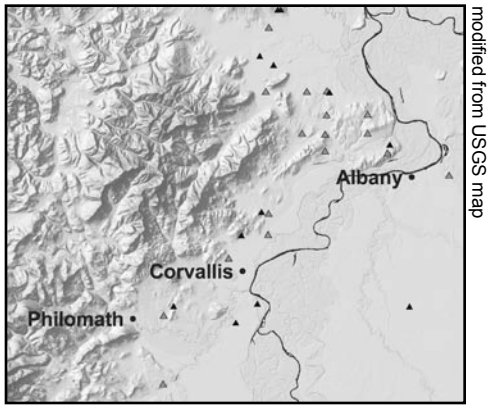
modified from USGS map





◄*This map of the Willamette Valley shows the extent of the floods. The entire valley below 400′ was inundated.*

►*This closeup shows the locations of large glacial erratics found near Corvallis. Many of these rocks have been removed, especially on agricultural lands.*



modified from USGS map

As the main body of floodwaters exited through the Kalama Narrows on the Columbia River, the water pooled in the Willamette Valley began to drain. It had been there no more than a week or two, but it had time to deposit a thick layer of fertile silt and organic matter. It came into the valley in a ferocious rush, but now it left slowly. Along the receding shorelines, huge icebergs came to rest under the Ice Age sun as the water gently ebbed.

The flood left behind a scene of unimaginable devastation. It sculpted solid rock, uprooted forests, and ripped away several cubic miles of soil along its path from the Rocky Mountains to the Pacific Ocean. It destroyed almost all animal and plant life in its way, even the fish in the rivers. But as powerful as this flood was, *there were at least forty more cataclysmic floods*. For two thousand years, Glacial Lake Missoula filled and emptied with tremendous force, at intervals from nine to fifty-eight years and with varying intensity. Until the recession of the Cordilleran Ice Sheet, glacial ice continued to advance and dam the Clark Fork River.

The Missoula Floods (or Spokane Floods or Bretz Floods) were some of the most massive floods found in the geologic record. Such glacial lake outburst floods, also known as *jökulhlaups*, still occur in glaciated regions worldwide, fortunately on a much smaller scale. The US Geological Survey estimated that the peak flow of the largest Missoula Floods was almost ten times the combined flow of all the world's rivers, around 9.5-15 cubic miles per hour. By comparison, the average flow of Earth's largest river, the Amazon, is 0.014 cubic mile per hour.

Floods of this magnitude leave many signs of their passage, and many of the well-known features are in Washington and the Columbia Gorge. However, there is evidence in the Willamette Valley besides the deep, layered deposits of silt. Stranded icebergs released rocks embedded within them as they melted. The ice had been part of Montana's ice sheet, which enveloped tons of rock as it advanced through mountain valleys. The melting ice left behind this particular type of metamorphic rock, known as Belt rock, in conspicuous piles of pebbles or large single boulders. This is unlike any rock from the Cascades or Coast Range. The largest known Belt rock rests on the foothills of the Coast Range at Erratic Rock State Natural Site in Yamhill

photo by Lisa Millbank

Don is standing on the largest known erratic, at Erratic Rock State Natural Site. During the floods, the valley in the background was inundated. The rock rests on the former shoreline.

historic photo

Willamette Meteorite

photo by Lisa Millbank

Multnomah Falls in the Columbia River Gorge. The floods ripped away the andesite slopes, leaving behind near-vertical cliffs.

Range. The largest known Belt rock rests on the foothills of the Coast Range at Erratic Rock State Natural Site in Yamhill County. Known as the Bellevue (or Sheridan) Erratic, it is truly ancient like the other Belt rocks, around one billion years old. But the most exotic traveling rock is the Willamette Meteorite. This large iron-nickel meteorite was found near West Linn among other ice-rafted rocks, and because there was no impact crater associated with the meteorite, it must have been transported in ice. Unfortunately, the meteorite now resides at the American Museum of Natural History in New York City instead of on the forested hill where it came to rest after the floods. For millennia the meteorite was visited by local Native Americans, for whom it had great cultural significance. Lesser but interesting erratics still dot the Willamette Valley, but many prominent erratics in fields were blasted away long ago. Most erratics are in the form of small rocks that don't look like anything special; they are often scattered within the gravel bars of rivers.

The repeated devastation of the Willamette Valley must have had a tremendous impact on the plants and animals. Kenton L. Chambers proposes that the floods may have given rise to three unique species of Willamette Valley larkspurs. He believes that the disturbed plant communities resulting from the floods and the fresh deposits of silt allowed for rapid evolution through hybridization and/or mutation. One of these species is the beautiful white Peacock Larkspur (*Delphinium pavonaceum*) that grows in prairie remnants close to Corvallis. Its parent species is thought to be the purple *Delphinium menziesii*. Once white-flowered mutations appeared, perhaps in tiny populations spared by the floods, they may have attracted different insect pollinators than their purple cousins. Reproductively isolated, they would have continued on their own course as a separate species. The story of the larkspurs' heritage is probably just one of many such changes that were set into motion by the floods; how many is impossible to guess.

photos by Lisa Millbank

Menzie's Larkspur ***Peacock Larkspur***

Peacock Larkspur is thought to have descended from Menzie's Larkspur around the time of the Missoula Floods.

Some evidence suggests that humans may have lived in the Northwest near the time of the Missoula Floods. Projectile points and mammoth bone tools made by people of the Clovis culture were found near Wenatchee, Washington. Archaeologists believe these Clovis points to be around 11,000 years old, a time that approaches that of the last Missoula Floods. Could there have been humans in the Willamette Valley in those days? It seems likely that if humans were living in the path of any of the great floods, evidence of their presence would have been washed away and lost forever or buried under layer upon layer of silt.

The Columbia Gorge owes its ribbon of andesite cliffs, now adorned with dozens of waterfalls, to the Missoula Floods. Washington's spectacular flood features such as Dry Falls, Grand Coulee, and the Channeled Scablands reveal the scale and power of the water. These places are the tourist attractions, and rightly so. But we should also remember the awesome events that carried the soil from the windswept hills of eastern Washington. Because in this great, silty lakebed we call the Willamette Valley, the very soil beneath our feet tells the story.

Suggested reading:

Glacial Lake Missoula and Its Humongous Floods. David Alt. 2001 Mountain Press Publishing Company.

Naturalist Adventure

Free

Tracking - Wild Edibles - Native Plants - Birding

Each trip will focus on a seasonal topic of interest. Sometimes we may seek edible plants, find mushrooms, visit a tracking spot or watch birds. Trips will be conducted in a holistic, 'poke-around' fashion. If you want to learn about tracking, these field trips are for you. Children are welcome, but trips are not structured for small children (under 8 years, call or email with questions). Please leave dogs at home. Bring water, binoculars, rain gear, and shoes that can get muddy. Led by Don Boucher, 541-753-7689, bouchdon@peak.org

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In November, we visited Ankeny National Wildlife Refuge near Independence. Among the many waterfowl, the most glamorous were these Tundra Swans.

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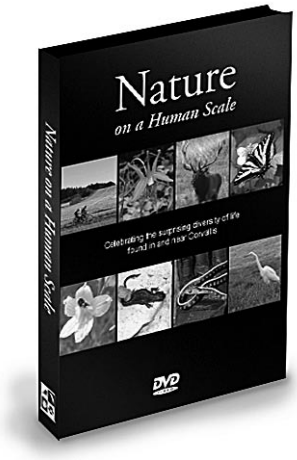
Main Feature: Discover a dazzling and colorful array of more than 170 local species in a journey through the seasons. All of the species featured live near Corvallis, and most of the movie was filmed on foot or by bicycle. Meet your wild neighbors and explore the richness of life—right here at home! (27 minutes)



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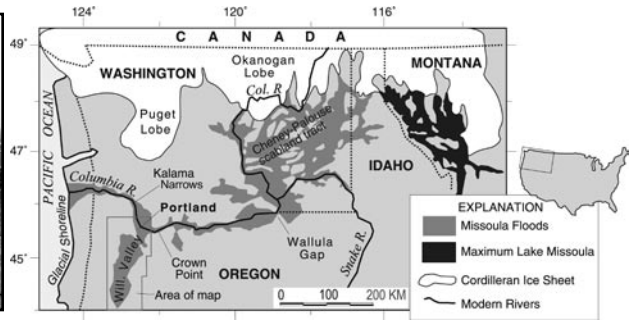

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