RIPPLES IN THE GRANDE RONDE

WINTER SPRING EDITION 2024

RIVERS UNITING NEIGHBORS·NEWS FROM THE GRANDE RONDE MODEL WATERSHED

PARTNERSHIPS IN THE AFTERMATH: RECOVERY FOLLOWING FIRE

by Ian Wilson, *GRMW staff*, with contribution from the Oregon Department of Forestry

I remember the spring of 2021. It was windy, cool, and dry. When we normally get spring rain, we instead received a steady diet of cool wind without meaningful precipitation. In the absence of our typical spring green-up, we went into the summer months in an unusually dry condition that was ripe for danger. In fact, we were in an extreme drought condition by the time we reached July. Large columns of smoke were visible from two large fires that started burning in early July across the Oregon border in Washington.

When my wife pointed out what she believed was a new column of smoke to the north of Lostine on the afternoon of July 15, my first response was that it probably belonged to one of the two large

A beaver dam analog with the Elbow Creek fire in the background, late in the afternoon on July 15, 2021. (photo courtesy of Ian Wilson)

Elbow Creek fire. (photo courtesy of the Oregon Department of Forestry)

complexes burning in southeast Washington. I quickly learned that she was right, and we watched with concern and trepidation as the column grew disproportionately in size. Before the smoke settled, I received a phone call from the local representative of the United States Fish and Wildlife Service (USFWS) informing me that there was grant money in their Partners for Fish and Wildlife Program (PARTNERs) program to assist private landowners affected by the Elbow Creek fire. He suggested that we work together to administer and put the money on the ground for private landowners. USFWS would handle the environmental compliance if I was willing to work with private landowners, assisting them with soil stabilization and restoration efforts aimed at wildfire recovery consistent with the PARTNERs mission.

My projects usually place me in the aquatic realm, restoring streams and freshwater ecosystems, so this was not the type of work that I have become familiar with in recent years. However, I do have a forestry degree and experience with wildfire suppression, so it was not necessarily new to me, either. Even though I might have to reach back further into my memory, I realized this partnership would be a great opportunity to help private landowners while also working across the entire watershed, so I agreed.

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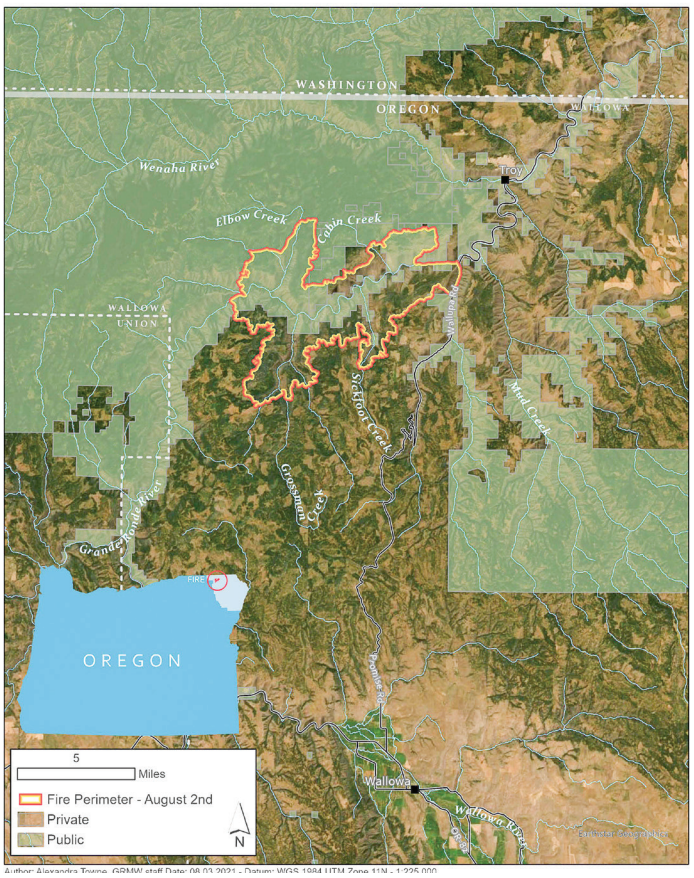

Map of the Elbow Creek fire area. (map courtesy of Alex Towne, Grande Ronde Model Watershed)

At this point in the story, it is important to recognize that several grants and agencies worked on Elbow Creek fire restoration efforts, and I am telling the story of just one of those grants. There was collaboration across multiple agencies, taking into account the concerns of private landowners affected by this fire and their recovery goals while minimizing redundancy.

There were a few main stipulations with the PARTNERs grant: 1) the money had to be applied on private property affected by the Elbow Creek fire, 2) the money had to aid in fire recovery from measures such as seeding, tree planting, and soil stabilization, and 3) the efforts needed to benefit fish and wildlife in addition to the landowners affected.

The first site visits to the area damaged by the Elbow Creek fire were staggering. It was obvious that the fire had consumed much of what was in its path on the initial run, including trees, structures, and property. The impact in some areas was devastating, and I left with a sinking feeling in my heart for the folks who had to deal with this reality.

All that remains of a four-wheeler following the Elbow Creek fire. (photo courtesy of Ian Wilson)

Even though this initial visit left a lasting impression on me, I was resolved that this grant was going to provide assistance that was both needed and appreciated. Seeing the impact on the ground, my initial suggestion was to use native grass seed to stabilize the soil while also offering valuable forage for elk, mule deer, and native pollinators as well as songbird habitat.

Native grass seed is an important recovery tool for stream restoration and can be applied to upland areas with equal success. Other grants were focusing on reforestation and non-native vegetation control, so the native grass seed idea was welcomed, and partners wanted to secure and plant more trees for recovering the landscape.

I worked closely with the Oregon Department of Forestry team, who were already engaged in administering planting efforts on adjacent private lands. Their help was invaluable in determining the tree spacing and unit layouts and working with reforestation contractors

A USFWS biologist stands amidst the devastation of the Elbow Creek fire. (photo courtesy of Ian Wilson)

Western Larch seedling after planting. (photo courtesy of the Oregon Department of Forestry)

and private landowners.

The landowners we worked with were grateful for our help, and we were happy to be able to assist. This project was truly a great collaborative effort among different community members that will in part set the recovery trajectory in a positive direction. My heartfelt thanks go out to the landowners who we worked with and the partners who made a great team of cooperation and accomplishment.

Reforestation crew planting areas in the Elbow Creek fire recovery area. (photo courtesy of the Oregon Department of Forestry)

The Elbow Creek fire started on July 15, 2021, and had a footprint of 22,959 acres on multiple ownerships, both private and public. With several landowners affected, multiple entities combined their efforts to work toward assisting private landowners, even before the fire was completely extinguished. The Natural Resource Conservation Service, Farm Service Agency, USFWS, and Grand Ronde Model Watershed offered financial assistance to interested landowners. Once a list of interested landowners was established, the ODF provided technical assistance for boots on the ground, including reforestation requirements after salvage logging was completed. The ODF also worked with counterparts within the Blue Mountain Private Lands Forest Network to acquire tree seedlings grown from the proper seed zone and assisted landowners in making connections with tree planting contractors who could prepare the site and plant seedlings. This process took several seasons to accomplish due to the operational scheduling of salvage logging, the growing of tree seedlings, and crew scheduling. The number of acres reforested on private ownership was 43.5, and 13,050 seedlings were planted. Four-hundred pounds of native grass seed were applied across three different properties.

These projects would not be achievable without the collaboration of willing landowners and those who can provide all assistance needed, whether it is financial or technical, or from an agency or private contractor.■

Native grass seed recovery. Top September 2022, bottom June 2023. (photo courtesy of Ian Wilson)

Why Community Scientists Watch the Snow Fall in Northeastern Oregon

by Ethan Shaw, *Snowfield Project*

As in so much of the American West, mountain snowpack supplies the bulk of our water here in the Grande Ronde River Basin. And as spring starts to settle in, with wildflowers busting out, turkey vultures making their crooked-wing reappearance, and thunderheads rumbling back into the northeastern Oregon skyscape, all eyes, per usual, are on that high-country white stuff.

Snow is a pretty remarkable substance, one that's easy to take for granted (or – and let's be honest – to curse on occasion). It's relentlessly changeable, for one thing, a real shapeshifter. Thermodynamically unstable, snow begins morphing almost the moment it hits the ground. Temperature and vapor gradients, the pressure of overlying layers, wind and sunshine, and the simple, inexorable roll of time all help transform, rework, and stratify the snowpack for as long as it stands.

Snow is not only variable in its state and structure; it also fluctuates enormously on an annual, geographic basis. On average, it reigns across some 15-20 million square miles of the northern hemisphere alone in the depths of winter. Come the northern summer, the snow cover is retracted to only a couple of million square miles. That's a heck of a flip-flop, needless to say, and it has all kinds of seasonal environmental impacts, from the habitat it creates to all of the solar shortwave radiation it reflects. After all, snow is the most naturally reflective substance on the planet, with its albedo (a measure of reflectivity) at 90 percent or more.

The winter snow cover of our region's lower-elevation basins and foothill flanks is often of the ephemeral variety. Snowfalls whiten the landscape for a few days, maybe weeks, and then a big thaw – or, say, a multi-day blow of that fierce wintertime south wind over the Grande Ronde Valley – exposes bare ground again. Then another snowfall and another melt or sublimation event hits.

By contrast, our mountain snow cover is seasonal, building gradually on high as winter rolls on. While the more ephemeral snow of the lowlands expands and retreats over and over, the snowpack up in the Northern Blue Mountains, the Elkhorns, the Wallowas, the Seven Devils, and our other highlands accumulates (that's the pattern we all count on, anyway).

Ethan Shaw surveys July snowfields in the Strawberry Range of the Southern Blues. (photo courtesy of Ethan Shaw)

And, of course, it's that season-long buildup of high-country snow that makes the Wallowas and the Blues our great natural water towers and fountainheads, benefitting everything from salmon and steelhead to crops and cattle.

Dozens of perennial snowfields lie in the high country of the Wallowa Mountains. (photo courtesy of Ethan Shaw)

Community Snow Observations (CSO): Crowd-Sourcing Snowpack Data

From remote sensing to direct measurements, resource managers and scientists keep close track of that all-important seasonal mountain snowpack. But the snow-monitoring coverage anywhere is inevitably incomplete. One way to fill in some gaps and improve the resolution of the snowpack picture is by mustering community science.

That's the spirit behind an initiative called Community Snow Observations (CSO), for which I'm a Community Scientist Ambassador. Part of the NASA Citizen Scientists for Earth Systems Project, CSO invites anybody and everybody to measure snow depth from their favorite backcountry playgrounds to their own wintry yard-scapes and submit the data via an app. Such measurements add to a growing crowd-sourced database of snow measurements that help researchers better understand regional snowpack variability and refine water-runoff models.

All you need to participate is something to measure with – a snow probe is ideal, but you can also use a tape measure or ruler – and the ability to upload your numbers to an app such as Snow Scope. Find an undisturbed swath of snow, and take

Through Community Snow Observations, anybody can submit snow-depth measurements to improve snowpack monitoring and runoff models. (photo courtesy of Ethan Shaw)

three or four measurements (if you can) to get an average depth.

You can learn more about CSO at ***communitysnowobs.org*** and explore real-time snow data at ***mountainsnow.org***.

The Wallowa-Blue Mountain Snowfield Project

Meanwhile, a few years ago, I launched another snow-monitoring effort here in our region: The Wallowa-Blue Mountain Snowfield Project. Inspired by similar research in places as far-flung as the Scottish Highlands, the Japanese Alps, and Australia's Snowy Mountains, this project surveys and tracks the seasonal and perennial snowfields of (you guessed it) the Wallowa Mountains and the higher ranges of the Blues, including the Elkhorns and Strawberries.

What exactly is a snowfield? Well, maybe its alternative name, a snowpatch, is more self-explanatory. Snowfields are discrete bodies of snow left behind by the recession of continuous snow cover (or conceivably, in some cases, a specific snowfall or snow-drifting event). Snowfields can hold on in favorable locations more sheltered from sunshine and heat, especially north- or northeast-facing cirques, couloirs, draws, and hollows.

Besides offering less exposure to direct-beam solar radiation, such sites also often hold snow for the longest amount of time because of wind, as snow scoured off slopes by westerly and southerly winds eddies out and piles up on the leeward side. Wind breaks apart snow grains as they are torn from the ground, bounced along, and abraded against one another. This fine, pulverized, gust-driven snow can accumulate into dense drifts, slabs, and cornices, providing a good foundation for a summer snowpatch.

Snowpatches also may recur at the base of chutes and cliffs, where avalanches heap up snow on a regular basis. So, both wind and avalanches can create localized pockets of exceptionally deep snow, which may persist well into summer, especially where protected to some degree from sunlight. Long story short, snowfields are topoclimatic features that exist because of interplays among sun angle, snowfall, wind, and terrain.

Seasonal snowfields are those that endure for some length of time into the ablation season before disappearing. (Ablation is a catchall term for all the processes that make snow go away, not only melting but also, for example, sublimation, where snow turns directly to water vapor without an intervening liquid phase, and wind erosion.) As our winter snowpack begins melting off in the spring and the snowline rises, the foothills and then the high country become a patchwork of seasonal snowfields, with some lasting days, some for weeks, and some for months. Indeed, in the ephemeral-snow country of our lowlands, snowpatches are obviously a fixture even of the midwinter landscape. I call those that stand well into mid- or even late-summer before vanishing *persistent seasonal snowfields*.

It's worth noting that, given the right set of conditions (a big-time snowpack the winter before, a cooler-than-normal summer, etc.), seasonal snowfields sometimes scrape by until the first lasting snowfalls of autumn. But typically in most years, they give up the ghost sometime during the ablation season.

Contrast the seasonal snowfields with *perennial snowfields*, which are those that, more often than not, do last the whole ablation season, surviving to become reburied by the next winter's snows. Indeed, perennial snowfields can survive years, decades, and centuries, maybe longer. Some researchers contend a snowfield can't be considered truly perennial unless it has persisted for at least 20 years with only limited variation in area. Folks sometimes call these enduring snowpatches "permanent," but given that we are talking about snow/ice features that are highly responsive to climatic shifts, that's a misleading term.

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Wind-drifted snow on leeward slopes, including cornice remnants, often lasts deep into summer. (photo courtesy of Ethan Shaw)

***Firn*-ice of the perennial snowfield in the Legore Lake cirque in late summer, during a very lean snow year.** (photo courtesy of Ethan Shaw)

Figuring out where the truly perennial snowfields lie in our mountains is a big aim of the Wallowa-Blue Mountain Snowfield Project. The snowfield search involves scrutinizing historical photographs and aerial/satellite imagery, tapping deep local knowledge, ground-truthing features shown on topo maps, and monitoring snowpatches year after year, which is the heart of the work.

Snow that lasts more than one year is technically called *firn* (German: "of last year"). It is a denser, more granular form of snow, partway on the road to glacial ice. So, a typical perennial snowfield is often composed of *firn* overlain by fresher seasonal snow, sometimes cored with ice. You will therefore also see perennial snowfields in the scientific literature referred to as *firn*-patches or ice-patches (or, heck, even *firn*/ice-patches).

You can't talk about perennial snowfields without talking about glaciers. *Firn* that continues to get more and more compacted and dense can evolve into ice, and ice that thickens enough will start moving under its own weight, birthing a legit glacier. Ice in continuous motion distinguishes an active glacier from an inactive icepatch or snowfield, but telling these features apart, especially on aerial or satellite images, can be tricky. That's especially true when it comes to "glacierets" or "microglaciers," which are ("as the name suggests") little glaciers that may be smaller than perennial snowfields.

There's a gradient here. A perennial snowfield can be the forerunner of a glacier. (Expanding and coalescing mosaics of perennial snowfields under a climate turning cooler and wetter is one proposed model for how continental ice sheets form.) A declining glacier can eventually turn into stagnant or dead ice (also known as an icepatch), which (again) falls under the broad taxonomic umbrella of "perennial snowfield."

The glacial cirques carved out by massive Pleistocene ice are, unsurprisingly, the premier habitat for perennial snowfields in the Wallowas (and long-lying snowpatches in the high Blues). In fact, some of those Wallowa cirques supported genuine alpine glaciers until relatively recently, well into the 1900s. Many mountain ranges in the American West and around the world grew small glaciers during the so-called Little Ice Age, a period of cooler climate lasting roughly from the 1300s to the mid-1800s. The most recent glaciers of the Wallowas were probably mainly the dying remnants of Little Ice Age ice.

The best-known historical Wallowa glacier—and the only formally named one—was the Benson, which occupied the mighty cirque of Glacier Lake on the northwest shoulder of Glacier Peak. But research by the Oregon Glaciers Institute (***orglaciersinst.org***) with whom I collaborate suggests based both on insights from local observers and study of glacial moraines that a number of other glaciers may have survived in the High Wallowas into the mid- or even late-20th century. A current project involves trying to determine just when these recent Wallowa glaciers may have died back into perennial snowfields.

The Wallowas may no longer have active glaciers; if they were a little loftier, a little colder, or a little wetter, then they might still have them. But the Wallowas do include dozens of perennial snowfields scattered along the heights of the Hurricane Divide, for example, and hiding under north faces from Sacagawea to Eagle Cap to Needle Point. Most survive in those "shadow" microclimates under glowering headwalls or within deep bowls and rocky gullies. A few occupy less immediately obvious perches in gentle ridgebrow hollows at just the right aspect, for example, revealing subtleties of terrain and wind that conspire to build a hardy, time-tested snowdrift-turned-*firn*-patch.

The number of perennial snowfields in the Wallowas makes them an important regional, intermountain reservoir of year-round snow, modest in acreage though it may be, between the more glacierized Cascade-Sierra and Rocky Mountain crests.

To help me keep track of snowfields, I've informally named a whole slew of them, seasonal and perennial alike, from the Wallowas and Elkhorns down into the Southern Blue Mountains. The Undertaker Snowfield. The Shark Snowfield. The Grizzly Face Snowfields. The Aneroid Snowfinger. The Steel Chute Snowfield. The South Prong Snowfield. The Cougar Snowpatches. (Naming snowfields, as with just about anything else, is a good way to get to know something better.)

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Seasonal mountain snowpatches in the Wallowas and Blues contribute runoff deep into summer. (photo courtesy of Ethan Shaw)

MEET THE BOARD

our newest member:

Morgan Olson

by Jesse Steele, *GRMW Staff*

In spring 2023, the Grande Ronde Model Watershed (GRMW) began the search for a new Economic Development and Industry Representative to serve on our Board of Directors. Morgan Olson was selected to fill that role in August and has been a great addition to the Board. We wanted to take a minute to introduce Morgan and let the community know about his role at GRMW.

Morgan and his girlfriend of 13 years live along Catherine Creek in the Grande Ronde Valley. Although they do not have any children, they have a multitude of animals that keep them busy. Morgan has six mules (see below), one horse, and 12 hounds. Morgan's girlfriend, April, owns three dogs and one cat. Morgan is an avid outdoorsman, so the mules and horses earn their keep as they haul Morgan and his gear around on pack trips to hunt and fish throughout the Pacific Northwest. Morgan also is a bear and cougar agent for the Oregon Department for Fish and Wildlife (ODFW), so the hounds are actively used for tracking in the summer and winter seasons. April's three dogs (Liam, Raisin, and Cooper,) are, in Morgan's words, "indoor fur babies."

Morgan moved to eastern Oregon to attend college, but he admits it was mostly to join the Eastern Oregon University (EOU) rodeo team and compete in bareback and saddle bronc riding. The region also offers a lot of fishing and hunting opportunities, which was another big draw for Morgan. It only took one year of living in the area for Morgan to make up his mind that Union County was going to be his home. Morgan did graduate from Oregon State University (at EOU) with two degrees, one in Range Land Management and the other in Crop Science. Three days after graduating, Morgan started working at Boise Cascade's particle board plant. He is now the Production Manager at both the La Grande sawmill and the particle board plant, both of which were purchased by Woodgrain in 2018.

Morgan owns about a hundred acres of property along Catherine Creek; most of it is leased for grass seed and forage production, but he has set aside some land that he actively manages for game bird habitat, and he considers himself fortunate to have a few small aspen patches that he works to improve through thinning and burning. As a hunter and landowner, Morgan appreciates wildlife more than most and voluntarily works to improve wildlife habitat on his land.

In Morgan's free time, you will find him hunting, fishing, and running hounds. One of the things he appreciates about living in this area is that a 20-minute drive in any direction will put you on public land where you can enjoy the outdoors. Morgan has hunted across multiple western states and internationally, and he recently was able to harvest a massive bull moose in Alberta, Canada (see top-right). He also volunteers his time as a hunter representative for ODFW's Access and Habitat Board, the Habitat/Conservation Director for Backcountry Hunters and Anglers, a Board Member for the Wallowa Mountain Hells Canyon Trails Association, the Chapter President for the Union/Wallowa County Chapter of Oregon Hunters Association, and an ODFW Bear and Cougar Agent! I wonder how he finds time to sleep?

Morgan poses with a bull moose he harvested in Alberta, Canada. (photo courtesy of Morgan Olson)

When we asked Morgan what inspired him to take on another volunteer position as a Board Member for GRMW, his answer was simply that he was curious about all the large wood additions to the Upper Grande Ronde River and the habitat that was being created. The GRMW is grateful to have him as a Board Member. He brings a valuable perspective to the Board as a person with lots of management and timber industry experience as well as his interests in hunting and fishing. Next time you see Morgan around town, be sure to thank him for his dedication to hunting, fishing, habitat, and conservation.■

Morgan and his pack string enjoying public lands. (photo courtesy of Morgan Olson)

Morgan with a gorgeous steelhead he caught on the Deschutes River. (photo courtesy of Morgan Olson)

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Why Snowfields Matter

But, hey: Why care about snowfields? Well, let us count the ways.

First and foremost, snowpatches are part of that great mountain-snow system that is so foundational to our watershed's hydrology. Our many seasonal snowfields extend the release of runoff into summer, not just providing water during a moisture-stressed time of year, but *cold* water. Persistent seasonal and perennial snowfields continue contributing snowmelt in their own small ways through late summer and early fall.

Tracking the distribution and timetable of summer snowfields (where they are and how long they survive) therefore has hydrologic significance. It's also informative from the perspective of that albedo effect I mentioned earlier: even after continuous snowcover is gone, an extensively snow-patched mountainscape still reflects a good deal of solar energy, keeping said mountainscape cooler than it otherwise would be. A trend toward reduced and/or quicker-melting seasonal snowfields would have impacts on both the runoff and albedo counts.

Besides those big-picture effects, snowfields have plenty of more localized influence. They may not dramatically sculpt a landscape like glaciers do, but they still have geomorphic impacts: deepening their own beds to form so-called *nivation hollows* and accumulating mounds of rubble called *pronival* (or *protalus*) *ramparts* at their bases from falling rocks that skid down their frozen surface. More drought-intolerant alpine plants benefit from the cool, moist microhabitats created in and around snowbeds.

A remarkable variety of critters utilize snowfields in one way or another. Everything from seeds to insects and spiders is lofted upslope by thermals and winds, then deposited and trapped on mountain snowpatches. That "fallout" then becomes fodder for invertebrates and songbirds, including the gray-crowned rosy-finches that, in the Wallowas and other high western mountain ranges, preferentially nest near summer snow and ice. Elk and mountain goats are among the ungulates that will cool off (and seek relief from biting insects) near and on snowfields during hot summer afternoons in the high country. A 2019 study of Glacier National Park showed that mountain goats resting on snowfields had a notably lower respiration rate, suggesting these widely scattered snow features that are diminishing in that part of the Northern Rockies may provide critical refuge from heat stress for that cold-adapted beast.

Contribute Photos and Observations

As with CSO's efforts to measure winter/spring snowpack, you can help out with the Wallowa-Blue Mountain Snowfield Project. If you're hiking, camping, fishing, hunting, or working up in the mountains this summer and early fall, then don't hesitate to send me photos or observations of snowpatches: wallowasnowfields@gmail.com. The same goes if you have photos from the past, whether that's five or 50 years ago. It all helps with understanding where (and when) snowfields hang on in the Wallowas and Blues, which is, after all, another way to understand our watershed.■

Grande Ronde Model Watershed

Tuesday, April 23, 2024
5:00 p.m.
Wallowa Community Center
204 E 2nd St.
Wallowa OR 97885

Tuesday, June 25, 2024
5:00 p.m.
Elgin Community Center
260 N 10th St.
Elgin OR 97827

The public is welcome to attend.

Meeting dates are subject to change.
Please call (541) 663 - 0570 to confirm.
Thank you!

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