Draft Meeting Minutes Kootenai Valley Resource Initiative
July 17, 2023 6:00 p.m.
Hybrid Board Meeting Boundary County Annex Building

Board Members in Attendance:
Bob Blanford, Business/ Industry
Dave Bobbit, IDFG
Dick Staples, Mayor, City of Bonners Ferry, KVRI Co-Chair
Ed Atkins, Corp. Ag/Landowner
Eric Olson, Soil/ Conservation
Gary Aitken, Jr., KVRI Co-Chair
Kennon McClintock, Conservation/Environmentalist
Kevin Knauth, US Forest Service
Sandy Ashworth, Social, Cultural, Historical
Tim Bertling, Boundary County, KVRI Co-Chair
Tim Dougherty, Business & Industry
Wally Cossairt, Boundary County, KVRI Alt Co-Chair

Agency/Others in Attendance:
Ben, Robertson, Boundary County
Caleb Davis, Office of Rep. Fulcher
Chris Bachmann, Yak Valley Forest Council.
Christy Johnson-Hughes, U.S. Fish & Wildlife
Debbie, Dumroese USFS
Debosa Bahe, KTOI
Frank Edelmann, IDFG
Gary Aitken, Jr., KVRI Co-Chair
Jenna Ditzel, Idaho Soil & Water Conservation
Jim Woodword, Bonners Ferry
John O'conner, Citizen
Kierstin Cox, KTOI
Marc Kilmer, Office of Senator Risch
Norm, Merz, IDFG
Shelby Therian, KTOI
Theresa Wheat, KTOI

- Introduction and Roll Call at 6:00 p.m.

Debbie Dumroese was the first speaker presenting on Biochar, a type of intentional charcoal used for enhancing soil health and carbon content. She highlighted that collaborative efforts have been essential for exploring efficient methods of producing Biochar, making it more accessible, cost-effective, and reducing the reliance on open burning. Biochar was defined as intentionally created charcoal utilized to improve soil quality. Its porous nature, as depicted in a visual, contributes to its effectiveness. With a high organic carbon content, Biochar stands as a swift approach to boost soil organic matter and carbon levels. This concept traces its roots back to indigenous communities, especially in tropical regions where soil nutrients are rapidly depleted. Recent studies in Brazil revealed that the presence of charcoal in soil leads to more fertile and productive land compared to non-treated soil.

The research uncovered that charcoal in the soil facilitated increased plant growth, particularly benefiting crops like corn, wheat, and soybeans. While the impact on forest sites took time to manifest—up to a decade—the alteration in water retention capacity played a significant role in this transformation.

Derived from woody biomass, Biochar possesses both positive and negative charges, rendering it adept at retaining nutrients in the soil. By applying Biochar to fertilized pastures, the need for frequent fertilization diminishes due to its nutrient-holding capabilities. It finds particular utility in restoring mining sites, as it absorbs and immobilizes heavy metals, thus preventing their migration into water systems.

In Northern California, Biochar has been employed effectively to counteract the presence of heavy metals like mercury, stemming from historical gold rush activities. This metal-binding property helps safeguard aquatic ecosystems and reduce bioaccumulation in organisms, including humans. Additionally, Biochar significantly impacts water retention. Particularly on coarser-textured soils, its incorporation elevates water-holding capacity by approximately 40%, a boon for crop growth in regions facing water scarcity and shifting climates.

A noteworthy application lies in forest management. In the case of the Umpqua National Forest, previously unattainable longevity of green vegetation was achieved through Biochar-enhanced soil, benefiting wildlife forage and ecosystem health. This potential extends beyond forests to vineyards and orchards, underscoring Biochar's versatility.

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The underlying challenge of excess biomass from overstocked forests is addressed through Biochar production. This offers a two-fold solution: alleviating biomass overload and enriching depleted soils. Biochar thus contributes to managing wildfire risk, pest outbreaks, diseases, and drought, all while mitigating climate change effects by altering carbon sequestration practices.

Debbie introduced a pioneering approach to optimizing the management of slash piles, which are commonly used in land clearing and forestry. Traditional burning of these piles can lead to soil degradation due to excessive heat. To mitigate this, the presenter drew inspiration from the charcoal-making process used in Jack Daniels' whiskey production.

This innovative method involved reconfiguring the arrangement of the slash pile. Larger logs were strategically placed at the pile's base, a design inspired by charcoal-making piles. This arrangement had several objectives:

- **Heat Dispersion:** By positioning larger logs at the pile's base, the method aimed to dissipate the heat generated during combustion, preventing it from excessively affecting the soil.
- **Efficient Extinguishing:** The approach was designed to enable faster and controlled extinguishing, similar to the process used in charcoal production for whiskey.
- **Increased Biochar Yield:** The cooler base helped ensure that more organic material transformed into charcoal rather than being consumed as ash, leading to a higher proportion of bBiochar.

This innovative technique not only addressed soil impact concerns but also emphasized a higher biochar yield, contributing to soil health improvement and carbon sequestration.

2. Kiln-based Methods:

The presentation delved into a range of kiln-based techniques for Biochar production, catering to varying scales of operation:

a. Box Kilns:

A central focus was a box kiln design developed by Darren McEvoy at Utah State University. This design was particularly suitable for processing materials like pinion juniper, aimed at mitigating their abundance in sagebrush areas. Key features included:

- **Dimensions:** The kiln spanned approximately 10 feet in length and 4 feet in width, facilitating efficient batch processing.
- **Dual-wall Construction:** The kiln incorporated a double-wall structure for enhanced safety and accessibility, especially for field crews loading materials.
- **Loading Flexibility:** Both excavators and field crews could load the kiln, offering versatility in operation.
- **Cooling Mechanism:** Post-batch, the charcoal underwent rapid cooling using hoses or a fire truck, yielding higher biochar proportions in comparison to ash.

b. Circular Kilns:

An alternative design involved stacked circular sections that were sealed to regulate airflow and emissions. This configuration allowed for controlled combustion and efficient biochar production. The sealed environment ensured precise control over temperature and oxygen levels throughout the process.

c. Ring of Fire Kiln:

For smaller-scale initiatives, the Ring of Fire Kiln, developed by Kelpie Wilson at Wilson Biochar, was highlighted. Its compact and portable design made it ideal for conservation crews engaged in forest restoration and other conservation activities. Its modular construction facilitated transport and assembly on-site.

3. Top Lighting:

The presentation underscored the importance of top lighting as a technique for enhancing combustion efficiency and reducing environmental impact. Igniting the pile from the top offered dual advantages:

- **Flame Cap Development:** Top lighting prompted the development of a flame cap, which minimized smoke and particulate emissions.
- **Controlled Combustion:** This method allowed for precise control over combustion, leading to efficient Biochar production.

Debbie talked about the creation of an air curtain burner, developed in conjunction with Air Burners Incorporated. This innovative apparatus, measuring around 10 feet in length and 4 feet in width, distinguishes itself by incorporating a curtain of air. This feature ensures that the smoke and particulate matter remain contained, leading to a remarkably clean burn. In comparison to conventional kilns, which operate in batches, this air curtain burner boasts a continuous feed system. This continuity enhances its efficiency and operational flexibility.
Field tests of the burner were conducted extensively, involving the placement of two units in different locations – one in Idaho and the other in Oregon. This strategic deployment allowed for the identification of optimal conditions for its utilization, thus refining its effectiveness.
The burner's design stems from the "char boss" concept, originally developed by Air Burners, in collaboration with the Forest Service.
A crew of approximately three individuals could effectively manage the burner. This team would consist of an excavator operator, a person overseeing the feeding of materials, and an individual responsible for removing the produced Biochar from the quench pan.
The speaker elaborated on the current applications of the produced Biochar, which is being utilized for woodland and trail restoration. Specifically, it is employed to enhance soil conditions in compacted areas, allowing for the cultivation of pollinator species and trees.

Biochar Production Options and Equipment: Exploring Versatility

Ring of Fire Kiln: Affordable and Accessible DIY Biochar Production
The "Ring of Fire" kiln offers an accessible entry point into Biochar production at a cost of around $2,200. Designed as a do-it-yourself kit, assembly is a breeze, taking roughly 20 minutes to set up. Despite its ease of use, this kiln's efficiency is moderate, generating approximately two cubic yards of biochar over a five-hour operational window. The return on Biochar production is about 5%.

The Big Box Kiln: A Welder's Delight with High Capacity
For those proficient in welding and fabrication, the "big box" kiln offers an intriguing avenue. Priced at approximately $12,000, the cost reflects its metal-intensive construction. This kiln, however, boasts impressive capacity. It can conduct two separate batches in a day, yielding five to ten cubic yards of Biochar per batch.

The Charboss: Industrial-Grade Efficiency at a Higher Price
The "Charboss" is a standout among Biochar production systems, designed for larger-scale applications. With a significant price tag of about $150,000, this equipment showcases substantial productivity. Outputting around one ton of Biochar per hour, it offers a Biochar return rate of 15% to 20%, which can vary depending on feedstock moisture levels.
Innovative Utilization: Forest Service's Novel Approach
The Forest Service's inventive approach involves deploying a single Charboss unit at regional offices or forest levels. Contractors can then rent and utilize this equipment, mirroring the shared usage model seen with agricultural machinery for soil and water conservation.

Carbonator Units: Cutting-Edge Biochar Production

Carbonator units, exemplified by Tiger Cat's model, are a step ahead in sophistication. These larger units, measuring twelve to fourteen feet, feature remote control and track mobility. A striking example was highlighted through an image of the carbonator in action, exemplifying its robust capabilities.

Modular Biochar Solutions for Local Applications
Biochar production isn't confined to large-scale endeavors. Modular Biochar products find application in small communities and farms. For instance, the "power plant" by All Power Labs serves as a compact unit deployed across various locations. The contained Biochar from Biochar Solutions captures excess heat for practical purposes like heating barns or workspaces.

Production rates vary among the discussed options. The Ring of Fire kiln yields two cubic yards of Biochar over five hours with a 5% Biochar return. The big box kilns offer higher throughput, generating five to ten cubic yards daily through two batches. The Charboss leads in efficiency, producing around one ton per hour with a 15% to 20% biochar return rate.

The NRCS introduced a program rewarding landowners for integrating Biochar into soil. However, Biochar's impact varies based on feedstock and soil type. It was successful in restoring pH and increasing meat production in the Columbia Basin. The meeting emphasized the significance of thoughtful Biochar use considering diverse contexts.

Barriers to Biochar adoption were discussed, mainly from the Forest Service perspective. Challenges included navigating differing air permit requirements across states and difficulties in contracting. States like Oregon, Washington, and California were praised for pioneering contracting practices, making it easier to offer Biochar as an option.
The high costs associated with equipment, such as carbonators or kilns, were identified as a hurdle, ranging from $150,000 to $600,000. Efforts to lower these costs were emphasized. Uncertainty around application rates was another obstacle, with questions about how much Biochar to use per acre.

The potential benefits of Biochar were outlined, including wildfire risk reduction, soil carbon increase, climate change mitigation, and various ecosystem services. The role of biochar in revitalizing rural economies and engaging youth in natural resource activities was highlighted, particularly in the absence of established forest infrastructure. In summary, biochar's advantages include being safe, shovel-ready, and scalable. The challenges highlighted encompassed regulatory complexities, contracting issues, equipment costs, and the need for clarity in application rates.

Congressional Updates:

Marc Kilmer provided a natural resource update during the meeting. He mentioned that there are ongoing efforts concerning the Commission for Hill issue. He discussed a recent phone call with the Seattle office, revealing that the 120-day pilot program for border crossing hours is ending soon. However, the border crossing hours will not immediately revert to the old 05:00 hour; they will remain open until 07:00 p.m. as they evaluate the data. Mark highlighted that the number of trips is still lower than in 2019, pre-COVID levels. He emphasized that the last hour of crossing and the number of travelers in a car, particularly commuters, are being closely considered.

On the Senate side, collaboration is taking place, primarily with the North Dakota office. This includes discussions about potential appropriations processes and legislation. He noted that tribal outreach is occurring in North Dakota, and they have communicated that there is Tribal interest in the matter. Marc mentioned that they are committed to continuing their efforts even as the pilot program concludes, with the goal of returning border

crossing to pre-pandemic levels. He indicated that the entire Delegation is focused on this goal. The update concluded with gratitude and an acknowledgment of scalability in their efforts.

Caleb Davis emphasized the ongoing efforts regarding the border issue and mentioned that they are collaboratively working on pushing for a resolution. Moving on to natural resource issues, he discussed the topic of breaching the four lower Snake River dams. He mentioned a recent public forum held by the Natural Resources Subcommittee in Tri Cities, where experts and scientists addressed the justification for breaching the dams in relation to salmon conservation. Caleb found the forum educational and expressed gratitude to those who attended. He also mentioned that Russ has been addressing issues related to historical sites, including the debate around Mount Rushmore, pushing back on potential changes. He informed the group about ongoing wildfires. He assured that their office is available for any community members who have concerns or questions about fires or other issues. A question was raised about whether the threats to historical sites are coming from within the government or external sources, to which Caleb responded that it's both, with discussions around removing historical sites on federal lands being a topic of concern.

Agency Updates:

Fish and Game: provided an update during the meeting. They mentioned that they recently had a quarterly meeting on July 25th in Coeur d'Alene, which was open to the public. They discussed various matters related to hunting and wildlife management. It was mentioned that they are preparing for the upcoming hunting season and will be releasing 625 pheasants for hunting throughout the area. This number is slightly lower than the previous year's release of 700 pheasants. They are working on planning the release to maximize hunting opportunities and are considering factors like spacing and timing.

The discussion then shifted to the sustainability of the pheasant releases. It was acknowledged that the released pheasants don't tend to survive for long due to factors such as limited suitable habitat and predation. Despite this, there are still hunters who enjoy the activity and purchase permits for pheasant hunting. Some pheasants are released in areas like Coeur d'Alene as well, and positive feedback has been received from hunters.

The conversation concluded with a desire to gather more information on the number of hunters and the success rate of pheasant hunting to better understand the impact and effectiveness of the program.

Sub-Committee Updates:

Forestry Updates:

Kevin Knauth gave an update for forestry, addressing salvage efforts and restoration post-fires in specific areas like Ball Creek and Trout Creek roads. A visual depiction was mentioned, illustrating considerations such as Grizzly Bear habitat, White Bark Pine habitat, Lynx habitat, logging systems, and road access. This approach is applicable beyond fire salvage, guiding vegetation restoration efforts.

Regarding current fire conditions, dryness was highlighted, with both valleys and ridges experiencing rapid drying. The early elevation of fire danger due to dry ridges has been unusual. There were small

Initial Attack (IA) fires that were contained effectively. However, there were concerns about the possibility of larger fires due to dry conditions.

The conversation also addressed challenges with Huckleberry pickers causing fires and the difficulty in enforcement. Ideas were discussed, including increased communication, patrols, and possible permitting systems, although challenges with enforcement and behavior change were acknowledged.

Tim Dougherty provided an update during the meeting, discussing several forestry-related topics. He suggested the possibility of a forestry field trip to Snow Creek, praising the forestry work conducted on Snow Creek. He highlighted the success of KVRI as a collaborative and expressed gratitude for the opportunity to represent business and industry on the board.

1. Tim then addressed an issue related to salvage opportunities in the aftermath of the Kootenai Complex Fire. He emphasized that there is a significant opportunity for the Forest Service to achieve good work by salvaging killed and dying timber, preventing the spread of insects, and preserving green trees. He mentioned that there has been a delay in analyzing potential salvage, which is time-sensitive due to deteriorating burnt timber. He pointed out that while there may not be enough time to analyze all potential acres, utilizing a categorical exclusion for analysis and road work on a smaller scale might facilitate winter harvest.

Tim concluded by discussing the future partnership between KVRI and the Forest Service, suggesting that collaboration should be prioritized in addressing salvage opportunities after future fire events. He thanked the board for the opportunity to provide his comments.

Meeting was called at 7:27 p.m.

Meeting Record Prepared by Kierstin Cox