Riparian Book Club Discussion: Natural Wood Regime, November 5, 2025	
Please note that the responses to Questions 1–12 and 14–15 were provided live and are summarized here. This summary does not include the subsequent group discussion that participants engaged in. Question 13 was not addressed during the session and is answered below.	
Question	**Answer**
Do you have any thoughts on about how bridges and culverts could be designed to accommodate large wood?	*Summary, please see recording for full response and dicussion: When it comes to bridges and culverts, the key is to give the river more space—build bridges higher and with fewer supports in the channel. For culverts, the trend is toward larger, more natural designs that allow aquatic organisms to pass and expose natural sediment instead of just corrugated metal. These designs also help with the movement and storage of wood.* *A lot of related research comes from the Alps, where intense rainstorms and landslides send huge amounts of wood downstream, often clogging bridges. There, engineers have experimented with wood retention structures placed upstream of valuable infrastructure. These can include open check dams or SABO dams—bar-like barriers that let water and sediment through but trap large pieces of wood—or steel cable systems stretched across channels that catch wood only during high flows.* *Overall, the goal is twofold: design bridges and culverts to better accommodate natural river processes, and strategically trap or temporarily store wood before it reaches and damages critical structures.*
Do you think the apparent natural wood regime in wilderness areas is artificially high due to fire suppression?	*Summary, please see recording for full response and discussion: Honestly, I'm not sure. We may have greater density of forest stand density, because of fire suppression, and we've probably got a different structure of the forest. I don't know about the wood regime being artificially high, because it's the balance between recruitment and transport that really governs how much wood is in storage.*
Are there any places that you have seen attempts to improve the wood regime in areas that were done wrong? If not in practice could you think about it theoretically where it could be done incorrectly?	*Summary, please see recording for full response: Yeah, I think putting a lot of wood into transport-dominated reaches and expecting the wood to stay there. It'll go downstream to the first place where you have a depositional regime.*
In the managed and unmanaged forest study, did they have the same natural flow regime and history of flow modification? How do you see changes to these two regimes interacting with one another?	*Summary, please see recording for full response and discussion: The transport capacity would depend on exactly how the flow regime was changed. Deforestation versus thinning treatments as it relates to the amount of wood. It depends on how the wood is being recruited. If you have wood coming in mostly by individual tree fall, then thinning could potentially if it's being done in the riparian corridor and could have a big effect.* *The key thing to remember is that wood that falls into the channel from individual tree mortality is mostly coming from the floodplain or the riparian corridor. If an individual tree falls over on a hill slope or an upland, it's probably not going to reach the channel. The only way it would get into the channel is by some type of mass movement (avalanche or landslide), or to a lesser extent, a blowdown.* *In any kind of deforestation, whether upland or riparian, ther is reduced wood recruitment, but if it's in the riparian or floodplain zone, it's going to have a much more direct effect.*
What's the best way or tools to "unskew" stakeholder expectations of a natural wood regime?	*Summary, please see recording for full response and discussion: It's important to start by thinking of rivers as ecosystems, not just as channels for moving water. Just like the way "rainforest" carries a more positive, life-rich image than "jungle," the way we talk about rivers shapes how we value them.* *Historically, rivers looked very different—full of wood, beaver dams, and complex channels that created diverse habitats and slowed the flow of water. Since European settlement, we've simplified and straightened them, often turning them into efficient canals that actually make floods and sediment problems worse.* *When we think about future challenges like more intense rainfall and wildfires, we should be asking what kind of river system we want—rigid and vulnerable, or natural and resilient.* *And finally, science alone can't convince people. It's about talking with communities, understanding their concerns, and offering positive alternatives—for example, showing how keeping wood in rivers improves fish habitat or benefits local ecosystems, rather than just saying "don't remove it."*
Can you talk a little more about deforestation versus thinning treatments as it relates to the amount of wood we should see in streams?	*Summary, please see recording for full response and discussion: It really depends. It depends on how the wood is being recruited. If you have wood entering the stream primarily from individual tree fall, then thinning — if it's done in the riparian corridor — could potentially have a major impact.* *The key point to remember is that wood which falls into the channel from individual tree mortality is usually coming from the floodplain or the riparian corridor. If a tree falls on a hillslope or upland area, it's unlikely to reach the stream channel.* *The only way upland material typically makes it into the channel is via mass-movement events — avalanches, debris flows, landslides — or, to a lesser extent, a blowdown. So: any deforestation — whether upland or riparian — will reduce the source of wood. But if the deforestation occurs in the riparian or floodplain zone, it will have a much more direct effect unless most of your wood is arriving via landslides or avalanches.*
Do you have recommendations on methods to quantify appropriate amounts of wood for a given stream system? How can the estimate inform design to avoid a contrived result, get natural look and function?	*Summary, please see recording for full response and discussion: It's not an easy question. We do have numerical models for wood transport and storage, but they're still very research-oriented. In practice, I'd rely on the reference reach approach—find the most natural, undisturbed rivers you can, often in national forests, wilderness areas, or parks, and use them as guides.* *There's now a good amount of published data on wood loads and distribution in the Intermountain West and Pacific Northwest, so reviewing that literature can help inform design and avoid creating something that looks artificial.* *Ideally, the best method is to add wood and let it naturally redistribute, as some Forest Service projects in Oregon are doing, though this isn't always feasible where mobile wood might threaten infrastructure. In such cases, you can use simple models to predict where wood will be most effective—for example, in creating pools or enhancing channel structure.* *Ultimately, every natural channel is highly variable—some have large jams, others scattered pieces—so the goal should be to find and learn from the most natural analogs possible, whether through field study, satellite imagery, or existing research.*

The Amazon is a good example of a more natural wood regime in a riverine sstem. At times of the year, and in differing tributaries the PH can go as low as 4 due to wood and decompostion of organics. Does Ph have an effect on nutirent transfer or availability?	*Summary, please see recording for full response and discussion: Yes, pH does affect nutrient transfer and availability, as does things like tree species and climatic regime, because it influences wood decay.*
Have there been advancements in scaling the identification and quantification of natural vs contemporary wood regimes since the paper was published? Or is it still largely river-specific?	*Summary, please see recording for full response and discussion: As a scientific community, the river-science folks are working on this, but I'd say that for now, the knowledge remains largely specific to particular rivers.* *The earliest work on river wood began in the Pacific Northwest around the very late 1970s—circa 1979 or 1980. From that region comes the bulk of our studies, and they've done enough that they're beginning to generalize from them.* *But in the Intermountain West, we're not at that stage yet. We have far fewer detailed, quantified studies here, so things still tend to be river-specific. What you can do is compare types of rivers. For example, based on my many years of work in the Colorado Front Range, I believe the findings are broadly applicable to mountain streams in much of the Intermountain West. What matters less is the particular mountain range, and more is whether you're in a sub-alpine or montane elevation zone, since those zones often differ in disturbance regimes, fire history, precipitation amounts and types.*
Can you talk a bit about how likely reference conditions/restoration targets typically vary with stream gradient, confinement, and valley typology (low gradient alluvial vs steeper transport reaches)	The scenario varies by geographic region, but in the Colorado Front Range and likely most mountain streams in the Intermountain West, I expect steeper, laterally confined reaches to have minimal wood storage and recruitment primarily from adjacent uplands. I expect lower gradient reaches with less lateral valley-floor confinement to have much greater abundance of wood in storage and to recruit wood via bank erosion and individual or mass tree mortality on the floodplain, as well as from adjacent uplands. As the wording of the question implies, I expect depositional reaches for sediment to also be depositional sites for wood and transport reaches for sediment to also be transport reaches for wood.
Should non-native species (example Crack willow) be replaced by native species (cottonwoods) when the large, old crack willows are providing habitat, wood, shade, mostly positive affects?	*Summary, please see recording for full response and discussion: No. I understand the problems with invasive species, but I also understand that we usually can't get rid of them entirely, and sometimes they turn out to be not so bad. Replacing a non-native species could be a lower priority over other actions.*
Is wood important in wetlands and fresh water bays?	*Summary, please see recording for full response and discussion: Yes. There have been fewer studies, so there's less extensive literature. There's several papers on the importance of large wood in estuarine environment and nearshore environments. Saltwater environments, like sandy coasts or gravel coasts. It may not be as important physically, because you usually don't have the velocity of flow or the rates of sediment transport, but it's definitely important for biogeochemistry and for ecology. And freshwater bays, yeah, without question.*