WATER AND RIPARIAN MANAGEMENT

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Clean Water: Emerging Issues

What is Fish Habitat?

How Can I Make the Stream on My Land Better for Fish?

Forests and Drinking Water

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Taxation

This magazine is a benefit of membership in your family forestry association
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A s a slightly informed observer, the following is my opinion on watershed success for the recovery of salmon. Salmon are pretty easy to manage in as much as they return to their natal stream and allow us to count them. While I have no argument with the science presented for the protection and recovery of a number of anadromous fish with regard to riparian protection, I have many questions about the potential for success of these riparian areas.

While the science tells us that certain features, primarily water temperature, large woody debris, and lack of silt, are key elements for the success of salmon, I see other variables that make the success of riparian protection a moving target. Nature has always subjected species such as salmon to many of the same conditions that we attempt to alleviate. Low oxygen, variable stream flows, mass wasting, and ocean conditions have always been a threat to salmon.

As I see it, at least for the five main species of salmonids (there are six) their survival is a numbers game. They lay down 2,000 or so eggs in their redds for good reason, as their survival rate is on the order of one percent. With adequate numbers they will use every available spawning area to full advantage with excess numbers being necessary to ensure they do. With a hatchery environment and feeding to a larger size before release, returns may approach three percent. The Japanese found this out when they aggressively established chum salmon hatcheries on 226 streams on Hokkaido and Honshu Islands back in the 1960s. I’m unsure that these hatcheries are still operating, but I assume they are. The establishment of this added number of fry had one of the greatest impacts on salmon in the North Pacific. Interestingly, in the 1970s returning fish to streams to the Hood Canal and other drainages in the Puget Sound Basin saw an obvious decline.

I believe a Desired Future Condition (DFC) in the very small streams we protect requires that returns to these streams must approximate the presetlement numbers to be successful. In Alaska where the commercial salmon fishery is a huge industry, many natal streams are monitored to ensure an optimal return. Commercial fishing cannot commence until the predicted return shows that it will reach the required goal. Also, in systems that appear to be threatened or may even have streams that have lost all return will have the entire bay closed to commercial fishing for numerous years until runs are adequately reestablished. Even at that Alaska uses hatcheries. I’ve read that 70 percent of the pink salmon return to Prince William Sound is hatchery stock. The Canadians also enhance salmon production. The predicted sockeye return for the Fraser River system in 2010 was 25 million, but was actually 34 million. I’m not sure what the Russians are doing with regard to enhancement, but they still use fish traps on Sakhalin Island now named Ostrov Sahalin.

The aforementioned is by no means cause for any conclusions about salmon recovery in the small streams we protect. The problem for me is, just how long do I have to wait to see my efforts come to fruition given the fact that salmon are highly exploited? What I see in Hoke Creek does not meet my expectations for recovery. Nor do I believe it ever will, given the current enhancement and exploitation of salmonids. Providing harvestable salmon and achieving recovery of wild salmon in all our streams seems questionable to me.
The Idaho Forest Practices Act (FPA) regulates harvesting activities on all private forestlands within the state. The Idaho FPA administrative rules are promulgated by the Forest Practices Act Advisory Committee (FPAAC), which meets several times a year to discuss all facets of the Idaho FPA. For many years, there has been an FPAAC Shade Subcommittee, tasked to better define forest management adjacent to Class 1 (fish-bearing) streams. This committee has been looking specifically at trees that provide over-the-stream shade, and contributions of large organic debris (LOD) into the stream.

Currently in Idaho, along each side of all Class 1 streams, there is a 75-foot stream protection zone (SPZ) where operators must retain 75 percent of the existing shade following each harvest (the “shade rule”). Also, there is a tree-retention rule requiring operators to leave varying quantities and sizes of trees within a 50-foot zone on either side of Class 1 streams. The shade rule has always been a tough rule to regulate; it is difficult to quantify with no formal, standard system in place as to how an operator measures shade. In addition, one can remove 25 percent of the existing shade with each harvest, which could be misappropriated if a landowner wanted to harvest every few years or even every year. In my years in Idaho, I haven’t seen much abuse with the existing regulation, though the opportunity to do so is definitely there. I know many of the larger private landowners in the northern part of the state generally avoid harvesting within the 75-foot SPZ adjacent to Class 1 streams—definitely exceeding the current FPA standards.

During both the 2000 and the 2004 Idaho Department of Environmental Quality (DEQ) quadrennial water-quality audits, over-the-stream shade along Class 1 streams was identified as an area of concern. Both the federal Environmental Protection Agency (EPA) and Idaho DEQ are closely scrutinizing water temperature in all Idaho streams. Water temperature affects fish habitat, dissolved oxygen levels, bacteria and algae populations, and water pH. Vegetation providing effective shade over Class 1 streams can be one of the major influencing factors on water temperature. The table shows the current Idaho water temperature standards:

<table>
<thead>
<tr>
<th>Use Metric</th>
<th>Warm Water</th>
<th>Seasonal Cold</th>
<th>Cold Water</th>
<th>Salmonid Spawning</th>
<th>Bull Trout</th>
</tr>
</thead>
<tbody>
<tr>
<td>MDMT*</td>
<td>33°C (91°F)</td>
<td>26°C (79°F)</td>
<td>22°C (72°F)</td>
<td>13°C (55°F)</td>
<td>N/A</td>
</tr>
<tr>
<td>MWMT*</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>13°C (55°F)</td>
</tr>
<tr>
<td>MDAT*</td>
<td>29°C (84°F)</td>
<td>23°C (73°F)</td>
<td>19°C (66°F)</td>
<td>9°C (48°F)</td>
<td>N/A</td>
</tr>
</tbody>
</table>

*MDMT = Maximum Daily Maximum Temperature  
*MWMT = Maximum Weekly (7-day average) Maximum Temperature  
*MDAT = Maximum Daily Average Temperature

The Shade Subcommittee, in order to address the audit findings and the EPA/DEQ concerns, has been creating a new system that will help landowners better quantify shade needs, and the corresponding tree retention, along Class 1 streams. The new proposed system will be based on forest types (dry to wet). Cruise plots within the 50-foot buffer zone of the SPZ will most likely need to be measured prior to harvest. The measurements from the plots will be used to calculate existing shade, as well as determine how many trees (by diameter class) can be removed in the upcoming harvest. What little I have seen of this new system is a very reasonable, quantifiable system based on good science. The rule modifications that FPAAC approves over the next year or two will take much of the guesswork out of Class 1 riparian management and help landowners to better minimize water temperature increases on their forestlands.
You Think You’re Just Managing Timber, But...

As I write this message, water and riparian management issues are certainly a timely topic as the Pacific Northwest has been rained, drizzled, misted, hailed, and snowed upon without letup for months. We all have water issues: too much, too little, or just the right amount, but not in the right place or at the right time. Frustrating!

You think you’re managing just your timber, but in addition, you are managing the public resources of air, water, and wildlife for the state of Oregon and the nation. No one will interfere if you cut your timber before it’s mature, but if you make poor decisions that affect water quality while harvesting timber, road construction, or road maintenance you will hear from an ODF stewardship forester or an irate neighbor.

How old were you when you first heard the terms riparian and watershed? Today every elementary student can give you a working definition of these terms and hopefully has been involved in some restoration project through his/her school. This upcoming generation of citizens will graduate with a far higher basic knowledge of watershed issues than previous generations.

Whether this will lead to a reasonable voting record on their part remains to be seen. OFRI continues to air TV ads that demonstrate the woodland community’s commitment to best management practices in the woods.

Water quality has been identified in public surveys as one of the top values the public expects from forests. For management guidance in protecting water quality, we in Oregon rely on the Oregon Forest Practices Act, which regulates private forest activities. Oregon’s FPA was the first of its kind in the nation, passed in 1971 and modified regularly by the Board of Forestry. The latest modifications have dealt with buffers for fish-bearing streams to keep our water sediment-free and cool.

I found the scientific articles in this issue of Northwest Woodlands to be fascinating. Again I was reminded that: trees on the south side of the stream provide the majority of the shade to cool the water; their roots stabilize the soil; a stream with quiet pools and good gravel provides spawning grounds for a wide variety of fish; leaf litter in the water attracts insects which in turn become fish food; the entire streambank becomes a connective corridor for wildlife.

Oregon’s FPA laws are based on the best available science. But, as in all science, as we develop scientific answers to some questions we find many additional questions that we need to address. How wide do riparian areas need to be to be effective? What mix of conifers and hardwoods is best? How should we be dealing with invasive species in riparian areas? And, if riparian areas are so important, why aren’t ranchers and farmers held to the same standard?

I think it’s important that we woodland owners keep our social contract with the public by following FPA riparian rules as they are refined. Oregonians are supportive of tree farming as long as they are assured we use best management practices. The Tree Farm System sign says it best: Water, Wildlife, Wood, and Recreation. The last word is recreation—have some fun in that water! You’ll find us in our Luckiamute swimming hole every summer.
Now is the Time to Get Ready to Plant

- Preparing your site for planting is where you get the best value for your investment of time and money. It is SO much harder to treat invasive weeds once they have become established and you have to work around your newly planted seedlings.

- Order seedlings if you haven’t already. Some species and stock types are scarce and you may need to wait an extra year for the right seedlings before you plant.

- Grazing animals and rubber tires from tractors are great soil compactors. Compacted soils don’t allow for good root growth and need to be broken up before you plant. Your soils should be dry in late summer and should be ripped only when they are dry. Use a heavy piece of equipment with a ripper tooth capable of getting down 18 inches or more into your soil. Rip your site in parallel rows and later plant your seedlings in the ripped rows.

- Control woody vegetation with foliar herbicide application. Himalayan blackberries, Scotch broom, undesirable hardwoods, salmonberry, and the like can be controlled with a foliar herbicide application before planting. If you are reforesting and harvest occurred during the summer, you may wish to wait a year to let your brush recover enough for a foliar spray to be effective. Brush with just a few resprouted leaves will not adsorb enough herbicide. Spraying too late in the fall can have a similar effect as some of your target plants begin to harden off and won’t translocate your herbicide from their leaves to their roots.

- If you have larger landowner neighbors, consider joining your project to one of theirs. For an aerial herbicide application you might also get hooked into a cooperative flight with other small woodland owners organized by a forestry consultant or with a neighboring industrial forestland owner to hold your cost down and increase the likelihood your operation will get done.

Invasive Weed Control. Remember, controlling invasive weed populations is your responsibility.

- Now is the time to control Himalayan blackberries with foliar herbicides. Based upon the type of chemical you use and the seedlings planted, you may do a “directed” spray, avoiding contact with your trees, or an “over the top” spray. The reason September is good for blackberry control is they are storing food in their roots for next year. Good is any time after you have ripe berries and before you have a frost. This could be late August to the end of October for many of you. Preferred herbicides are Glysophate (Accord) and Triclopyr (Garlon 4). With Accord, you need to wait for Mother Nature to rinse the dust off the leaves before applying as the active ingredients bond with the dust particles and are not adsorbed by the leaves. Suspended solids in your water source would act just like the dust particles. For rates and timing for your area, check with your local forester or chemical dealer, and make sure you follow the label instructions. Rubber boots, rain pants and water repellent gloves are now standard apparel when I apply herbicides. Crossbow and Roundup herbicides are not registered for forest use.

Invasive Weed in the Spotlight: Bedstraw, any plant from the genus *Galium*, also called cleavers.

- My wife calls bedstraw “sticky weed.” You may have a pet name for it around your place. I have it from other Down on the Tree Farm committee members that livestock and chickens will eat it, so it may have some redeeming qualities.

- You are probably more familiar with the seed head attached to your socks or the frayed cuff of your pants. Or maybe attached to one of your pets. Running your contaminated socks or pants through the wash does not remove the seed head. You may even discover they have relocated to the inside of your socks.

- What have you heard about Bedstraw? True or False
  - Native to the Northwest? True. Two varieties are Oregon bedstraw, *Galium oreganum*, and catchweed...
bedstraw, *Galium aparine*. Catchweed bedstraw is the plant you are probably most familiar with.

- Pioneer Day Mattress Ticking Material, hence the common name bedstraw? True.
- 756,000 seeds per pound? True.
- Seed available commercially? False.
- Will it mysteriously appear on the site where I just eradicated Himalayan blackberries? Probably.
- It is a serious problem in young conifer plantations. False.
- Stem is rectangular like the mint family. True.

- Bedstraw is not an invasive we need to put a lot of effort into controlling as tree farmers. Maybe we should think of it as a native invasive and only deal with it occasionally. It pulls easily and doesn’t appear to have much root mass when compared to the mass of foliage. It doesn’t like Accord. You are better off for your effort in time and/or money to focus on non-native invasive species and/or other tree farming activities.

- **Fall is Here and Winter is Just Around the Corner. It is Time to:**
  - Get your property ready for hunters, whether you want them or not. If you have hunting trespass problems and don’t hunt the area yourself, maybe you should consider leasing the hunting rights for your land to someone who does like to hunt and let them deal with the trespassers. This has been done successfully by many landowners throughout the USA.
  - Water is going to freeze, so drain it out of your equipment and/or add antifreeze. While you are at it, you might want to add fuel stabilizer to small equipment that might be sitting for a few months.
  - Maintain water bars, and clean out ditches and culverts. Seed bare ground by the end of September.
  - Cover burn piles so you have a dry spot on the low side and/or into the prevailing wind. Any pile burns better with wind pushing the fire into your pile.
  - Once you are confident the fire season has past, get that fall burning done!

- **Woods Words**
  - Jammer: One who gets 10 pounds into a 9 pound container? No, we are actually talking about a type of logging machine. Also known as the Idaho Jammer, this highly portable cable yarding machine was popularized in the last half of the 20th century for the steep slopes of northern Idaho. Most of these machines were put together by local loggers and came on a variety of self propelled and towable trailers. Also a loading rig of almost any kind.

- **Good of the Order**
  - Woodlands Carbon Company, www.woodlandscarbon.com, recently had their first sale of family forest owner carbon. Mike Barnes is the guy to call at 971-237-5364.
  - Oregon Small Woodlands Association has their new website up and running, www.oswa.org. The past issues of the *Northwest Woodlands* magazine are available in the members section. Another good reason to be a member.
  - Watch Washington Farm Forestry Association’s website at www.wafarmforestry.com for a website upgrade coming soon.

Down on the Tree Farm is edited by David Bateman with help from Linn County Small Woodlands members Aaron White, Joe Holmberg, Jonathon Christie, Roy Stutzman, and Neal Bell, and OSU Extension Forester Rick Fletcher. This column is a project of the Linn County Small Woodlands Association and the OSU Extension Master Woodland Managers. Suggestions always welcome; send to Dave Bateman at knothead@smt-net.com.

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New Ideas for Riparian Management Areas

By GEORGE G. ICE

Areas with special protection adjacent to streams go by many different names, including buffers, equipment exclusion zones, filter strips, riparian management zones, riparian management areas, shade strips, stringers, and water course and lake protection zones. Throughout this article we will refer to them as riparian management areas (RMAs) as we describe some new ideas about forest RMAs and how they should be managed. While most of the examples provided here are from Oregon, the findings are relevant to other Northwest forestlands.

One of the first and most influential tests of alternative riparian forest management was the Alsea Watershed Study in the central Oregon Coast Range. The original study (1959-1973) assessed the effects of timber harvesting on water, aquatic habitat, and salmonid resources (especially coho salmon and cutthroat trout) using a paired watershed approach. Paired watershed studies measure outputs from a control and a treated watershed during a calibration and a post-treatment phase. During the calibration phase the relationship between the two watersheds is established. The treatment effect is the difference between the observed outputs from the treated watershed and the expected outputs, based on the control watershed, during the post-treatment period.

Flynn Creek Watershed served as an undisturbed control. Deer Creek Watershed was patch cut with RMAs left along fish-bearing reaches of the stream. Needle Branch Watershed was nearly completely clearcut and subsequently slash burned; no streamside vegetative buffer was left to protect it. Slash was initially felled across the stream and then removed. In some reaches equipment was operated in the stream channel.

Needle Branch experienced dramatic water quality changes for temperature and dissolved oxygen (fish, like humans, need oxygen—passed through gills—for respiration). Changes in discharge, sediment, and nutrients were also measured. Dissolved oxygen deficits were believed to result from el-
vated stream temperatures and loading of fresh slash in the stream. In contrast, Deer Creek (with RMAs) experienced much less change in water quality and no statistically significant changes in fish. These results contributed to adoption of the Oregon Forest Practices Act and development of rules to protect water quality and fish habitat in 1971. This and other studies identified RMAs as a key practice to maintain water quality, and RMAs are part of forest practice or Streamside Management Act rules in all the states within the Northwest Woodlands geographic area. Figure 1 shows the Needle Branch Watershed after harvesting and site preparation in 1966 compared to the watershed after it was harvested in 2009.

How wide is enough?

One of the most divisive issues related to assessing forest practices rules is the question, “How wide is wide enough?” for an RMA. In reality, this cannot be answered because RMAs must be defined in at least three dimensions: (1) width; (2) reach extent (length); and (3) management practice limits. In turn, effectiveness can be measured using multiple metrics from fish productivity to various water quality parameters. One of the key findings from efforts to synthesize our understanding of RMAs is that there tends to be a law of diminishing returns and the greatest benefits to streams are secured from the portion of riparian forest nearest the stream (see Figure 2). RMA width can be a poor predictor of performance for some functions. A study at Oregon State University by Jon Brazier and George Brown found that timber volume and buffer width were poor criteria for controlling stream temperature. Instead, effective shade or “canopy density along the path of incoming solar radiation...” was the key riparian forest parameter influencing stream temperature.

Synthesis of research from NCASI Technical Bulletin 799 showing that riparian functions are satisfied most efficiently near the stream and that it takes more and more of the RMA to affect additional benefits (law of diminishing returns). [POM=fine particulate organic matter, LOD=large organic debris] The three dark purple lines show the results from three separate studies of LOD, each finding that 70-90% of LOD is coming from the first 25 meters (82 feet) of the stream adjacent riparian area. The two light purple lines (including the dotted line) stopping at about 60 meters (196 feet) are two different representations of sediment removal patterns.


Figure 1.

Needle Branch Watershed as part of the Alsea Watershed Study Revisited. Photo on the left shows the watershed after harvest, stream cleanout, and hot prescribed burn in 1966. Photo on the right shows the same watershed in 2009 with riparian vegetation left along fish-bearing reaches.

Figure 2.

Synthesis of research from NCASI Technical Bulletin 799 showing that riparian functions are satisfied most efficiently near the stream and that it takes more and more of the RMA to affect additional benefits (law of diminishing returns). [POM=fine particulate organic matter, LOD=large organic debris] The three dark purple lines show the results from three separate studies of LOD, each finding that 70-90% of LOD is coming from the first 25 meters (82 feet) of the stream adjacent riparian area. The two light purple lines (including the dotted line) stopping at about 60 meters (196 feet) are two different representations of sediment removal patterns.

Riparian management areas cannot overcome all impacts

There sometimes seems to be a perception that RMAs can overcome all upslope impacts. While RMAs often dramatically reduce such impacts, they cannot be the only best management practice (BMP) applied in a watershed. Deer Creek in the Alsea Watershed Study provided a good example. While temperature and dissolved oxygen were largely protected, sediment outputs increased as a result of forest management activity even though RMAs were used. The cause is believed to have been sidecast road failures in the upper basin. A study at the same time as the Alsea, in the H.J. Andrews, also experienced extensive road failures that scoured one watershed to bedrock in some reaches and caused massive sediment delivery downstream despite the presence of RMAs (Figure 3).

Can streams benefit from riparian disturbance?

The Alsea Watershed Study and subsequent research taught us that riparian buffers can significantly reduce impacts to sediment, temperature, and dissolved oxygen by maintaining cover and shade, reducing soil disturbance near the stream, keeping fresh slash out of the stream, and maintaining forest floor conditions that allow for trapping and settling of sediment. Early concerns about depressed dissolved oxygen concentrations, as well as concerns about fish passage, led to stream cleanouts. Subsequent research found that in-stream large wood was important in providing pools and fish habitat. More recent work in small streams identified the importance of wood for hiding cover. Today the benefits of in-stream large wood are widely accepted. One of the most remarkable and controversial findings in this era was that some (but certainly not all) debris flows that deposit material from tributaries can provide beneficial habitat for fish.

There are curious anomalies in research findings related to fish and their responses to riparian forest conditions. In many, perhaps most cases where streams are exposed to direct solar radiation, fish populations actually increase as long as streamwater temperatures remain below harmful levels and in-stream wood is not removed.

A key observation from a series of studies in the Oregon Coast Range was that more open or hardwood-dominated riparian stands can provide “hot spots” for fish productivity (we think because more light leads to increased primary production and supports macroinvertebrates that can be food sources for fish, but perhaps also because fish can see prey easier), but this is most likely where there is sufficient in-stream large wood. The riparian conditions that contribute to large wood recruitment and relatively open canopy conditions do not generally occur with the same stand conditions (although there may be opportunities to thin riparian stands to focus growth on residual trees and simultaneously increase light to streams). Without active management of riparian stands we cannot and should not expect to optimize conditions for fish everywhere at the same time.

Perhaps the most direct test of how active riparian management can affect fish populations is a study by Dr. Peggy Wilzbach and colleagues in northern California. Using a replicated block study design, they tested whether adding salmon carcasses (to enhance low nutrient concentrations and possibly provide direct food for fish) or opening riparian canopies affected trout populations. The riparian canopies were opened by cutting near-stream hardwoods. The authors found that opening the riparian forest resulted in an increase in trout biomass, but addition of salmon carcasses did not. Interestingly, early versions of the Oregon Forest Practices Act allowed “staggered harvesting” along streams as long as they did not significantly increase stream temperatures.

Other emerging concerns about riparian management areas

While land managers have embraced RMAs as an effective practice to protect water quality, there are emerging concerns about their use.

At some point active management of riparian areas may be necessary to
regenerate desirable forest stand conditions. For many years silviculturists have warned that without active management buffers will suppress regeneration of trees along the stream corridor. Dr. Dave Hibbs, professor at Oregon State University, has stated that: “Side light will allow the development of a shrub understory. As existing trees senescence, a gradual success to a shrub community will probably occur. No tree regeneration is likely in absence of deliberate efforts to secure it.” Dr. Mike Newton, emeritus professor from Oregon State University, noted that the principles for regeneration success found on upland sites (e.g., healthy, large seedlings; control of competition; full sunlight) can also be applied to regeneration of riparian forest stands, although riparian areas face additional risks such as beaver.

Lack of active riparian management can be a major problem if non-native noxious shrubs such as butterfly bush (Buddleja davidii) invade riparian areas. Butterfly bush can form dense thickets that crowd out native plants. There are dozens of invasive riparian plants of concern for forest riparian areas.

We typically think that forest harvesting increases water yields by reducing evapotranspiration, but water supply concerns are increasing and RMAs could be a practice of concern. Deep-rooted riparian vegetation can access streamwater during low soil moisture periods. RMAs may create conditions where riparian vegetation, exposed to full sunlight, could have increased uptake of water. In some water-short regions, such as the Southwest, there are proposals to remove invasive riparian vegetation (e.g., saltcedar, Tamarix chinensis) that are using large amounts of water.

Of course, another major concern is the economic impact of leaving RMAs. If rules require increasingly extensive and management-limiting RMAs there can be economic costs to landowners, especially where stream networks are dense.

**Pollution control trading**

One emerging area of interest is the use of pollution control trading to minimize costs. The idea is to trade high-cost pollution control solutions for lower cost controls. One of the water quality issues for the Willamette Basin in Oregon is water temperature. Presumably, a company discharging heated water could trade with a forest landowner to provide an offset to thermal pollution by maintaining trees along a stream. The forest landowner would be paid for this pollution control and the discharger would save money over a costly diffuser or other pollution control practice. There are a few problems with this scheme: shade is already maintained under the Forest Practices Act rules; all water pollutants, including thermal pollution, decline as flow moves downstream; and pollutants of interest may not be controllable by forest or riparian forest management alternatives.

**Optimization**

When we optimize we either get more out of the same investment or we spend less to get the same benefits. The concept of optimization, while perhaps not often feasible for pollution trading strategies with other industries, is still an area of interest in most pollution control communities. Agriculture has been especially aggressive at trying to develop tools to simultaneously test BMP effectiveness and the costs associated with BMP alternatives. One example of optimization is a study by Weyerhaeuser Company that looked at the tradeoffs of increasing RMAs along headwater channels while reducing RMAs along mainstem reaches so that no net increase or decrease in area in RMAs was realized. Could this strategy result in a balance that optimizes environmental benefits with no additional cost to the landowner?

**Conclusions**

These observations can be summarized as follows:

- RMAs can reduce negative water quality impacts and retain large wood for future recruitment.
- RMAs do not necessarily represent optimal habitat conditions for fish. Recently logged stream reaches where riparian forests have been removed can actually have elevated fish populations as long as large wood is not removed.
- There are potential long-term consequences of managing uniform buffers, such as creation of persistent riparian brush stands and possible reductions in streamflow, especially during low flow periods.
- There appear to be opportunities to increase fish productivity by opening some reaches and managing for a mixture of riparian canopy species, wood recruitment potential, and reach exposure levels.
- There are opportunities to explore optimization strategies that balance the economic costs of RMAs with their environmental benefits in ways that achieve water resource objectives.

If you are a small woodland landowner and you have streams, lakes or wetlands in or adjacent to your property, you will need to understand the state rules for RMAs that you operate under. You know your property better than anyone else. Most states allow for alternative practices if you can show that they meet or exceed the protection provided by the standard rules. Think about how you can best manage your property to protect water quality, wildlife, and fish, but also meet your own management needs. Be open to pollution control trading options if they are economically beneficial for you. Follow debates about revisions to the rules for forest RMAs and make sure they make sense for your woodlands.

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Clean Water and Family Forest Management: Some Emerging Issues

By PETER A. BISSON

Over the last two decades most attention given to issues concerning water quality and forest management in the Pacific Northwest has focused on protecting habitat for salmon and trout. The attention has been catalyzed by multiple listings of fish populations under the Endangered Species Act and by adoption of watershed-based Habitat Conservation Plans (HCPs) and negotiated legal agreements for state and private lands. Additionally, efforts to recover salmon by protecting water quality and restoring stream and riparian habitat have included ambitious regional programs such as the Puget Sound Partnership (www.psp.wa.gov/) and the Northwest Power and Conservation Council’s Program for the Columbia River Basin (www.nwcouncil.org/fw/Default.asp). Most of these programs focus on federal and state lands, large industrial forests, and tribal lands, but small privately-owned forests play a key role in protecting water quality and conserving fish and wildlife.

Demand for clean water for a variety of uses will increase. Watersheds are where we live, grow crops and create various forms of industry. As the Pacific Northwest’s human population expands, competition for water and the ecological goods and services that water provides will grow more intense. While protecting fish habitat will remain important, it will be only one of a suite of issues with which family forest managers charged with protecting water resources must remain engaged. In almost every case, they will be faced with balancing the ecosystem needs of fish with the need for drinking water, sanitation, energy, agriculture, commerce and recreation.

With this in mind it is helpful to review emerging issues that are of interest to small woodland owners: climate change, wildfires and invasive species. That climate is changing is beyond scientific dispute, even though the causes of change may continue to be publicly debated. With climate change the frequency and severity of wildfires will also change, as will the patterns of invasion of new plants and animals into the Pacific Northwest and elsewhere. Each of these factors can cause significant changes in water quality and quantity, but their specific impacts in the context of forest management, and what can be done about them, are incompletely known. This article examines each issue from a scientific standpoint and considers how new findings can be incorporated into family forest management strategies.

Climate change

Potential effects of climate change on water quality in the Pacific Northwest include: (1) higher air temperatures resulting in increased precipitation falling as rain rather than snow; (2) diminishing winter snowpack and reduced flows during subsequent low flow periods; (3) possible increases in peak storm flows; and (4) rising water temperatures (see Figure 1).

Climate scenarios predict an increase in large floods, wildfires, and forest pathogen outbreaks, some of which have potential to actually improve habitat as a result of enhanced floodplain connections and trees entering streams. Many effects...
of climate warming, however, will have negative consequences for water supplies and aquatic organisms, at least in the short term. Summer water shortages are likely to be exacerbated by reduced snowmelt runoff—a problem affecting the water needs of both fish and humans. Severe wildfires and more frequent intense rainstorms can cause stream changes (heavy sedimentation, streambed scour and loss of riparian forests) that result in mortality and reduced productivity of aquatic organisms, as well as direct threats to water supplies and property. Over decades to centuries, wildfires and floods contribute to maintaining aquatic habitat, but the short-term consequences of these events are socially undesirable. Managers are therefore faced with the difficult task of formulating strategies that balance the long-term benefits and short-term risks of these rare events.

From a habitat standpoint, maintaining as much water as possible in streams and lakes during dry periods is an effective way of combating the harmful effects of climate change, and there will be obvious benefits to downstream water users of keeping flows as high as possible. Connecting rivers to their floodplains by allowing them to meander and maintain surface connections to floodplain ponds provides a safety valve that helps reduce the scouring effect of high flows on spawning locations, provides refuges for aquatic organisms, and improves water quality. Some of the ways small woodland owners can help buffer the adverse effects of climate change include:

- Minimize increases in water temperature by maintaining well-shaded riparian areas.

Examples of the effects of climate change on water quality: (a) shrinking perennial drainage network of headwater streams; and (b) extreme low flows during the dry season.

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- Maintain a forest stand structure that retains snow water and promotes fog drip, and reduces the “rain on snow” effect associated with forest openings in the transient snow zone.
- Disconnect road drainage from the stream network by diverting runoff away from active channels to soften discharge peaks during intense storms.
- Ensure that fish have access to seasonal habitats, e.g., floodplain ponds in winter or cool water areas in summer.
- Protect springs and seeps from water appropriations that would lessen habitat quality and downstream water availability.

**Wildfires**

Wildfires cause immediate increases in water temperature, although direct heating is brief. Some fire retardants used to control wildfire contain chemicals that can harm aquatic life if present in sufficient concentrations. More significantly, however, sediment concentrations usually rise in the post-fire environment, watersheds become more prone to landslides, peak flows often increase during storms, stream food webs are altered, and loss of riparian vegetation leads to higher prolonged stream temperatures. All of these changes can be harmful to fish and they typically cause problems for downstream water users. Nevertheless, the role of wildfire in maintaining long-term habitat complexity has been shown in several recent studies. Wildfires have been found to be a catalyst for delivering trees and boulders to streams. These fire-derived materials can function as aquatic habitat for more than a century and help maintain the productivity of salmon and trout.

The debate within the natural resource community over what are appropriate pre- and post-fire forest treatments goes far beyond maintaining clean water, and therefore it is useful to consider the issue from stream protection in a much larger context. Because climate change will lead to more and hotter wildfires for a variety of reasons, the question arises: “What can be done to reduce short-term damage to aquatic and riparian conditions while conserving the long-term habitat benefits of fire?” At present, there are no simple answers to this question. Fuels reduction treatments may be worthwhile in riparian areas where the risk of intense fire is very high, but some riparian zones are not likely to burn severely and fuels treatments may compromise aquatic habitat development and harm water quality if they reduce wood recruitment, alter floodplains, and damage stream banks. Likewise, post-fire treatments such as salvage logging and erosion control using hay bales may be appropriate in some locations, but inappropriate in others.

Family forest managers are encour-
aged to examine the recent literature on wildfires and water quality in the western U.S., as perspectives on the role of fire have changed over the last decade and future fire regimes will differ from those of the past. The topic of fire management and water quality protection will continue to be of interest to scientists in the coming years.

**Invasive species**

Invasive species are not usually associated with clean water issues in the Pacific Northwest, but they may have a significant impact on water conditions such as nutrient concentrations. Many invasive aquatic species (plants, invertebrates, and fish) are concentrated in coastal and interior lowlands where many family forests are located, and invasive riparian plants are spreading throughout the Pacific Northwest at a rapid rate.

For example, several varieties of Asian knotweed are considered threats to native vegetation and are invading many watersheds where they are capable of displacing native shrubs and trees (see Figure 2). The proliferation of invasive species will be aided by climate change, more frequent wildfires, and expanded human development. Although there are programs in place to detect and control some unwanted invaders, many will simply become part of our future forested landscape.

We have a very incomplete understanding of the impacts of invasive species on water quality and quantity. In some parts of western North America dense growth of non-native species such as tamarisk have lowered streamflow by taking up water. Whether reduced flows can be attributed to invasive riparian plants in the Pacific Northwest is not clear and probably unlikely in high-rainfall coastal areas. Programs aimed at eliminating invasive plants for habitat reasons, however, often rely on herbicides to kill these aggressive invaders and multi-year treatments are common. For species such as knotweed, stem injection of herbicide by hand is often the method of choice, with the added benefit of reducing entry of the chemical into streams compared to application by spraying; however, this method is labor intensive. However, there are few scientific studies of the effects of invasive species on small woodland streams, and more work is needed.

**Establishing realistic clean water goals**

Climate trends, a changing fire regime, invasive species, and a number of other factors related to human development will make it more difficult for streams in forested watersheds to conform to existing water quality standards. One conclusion seems clear: We will not be able to restore streams to conditions that existed prior to Euro-American settlement. Instead, we face a future in which conditions, even in the most pristine watersheds, will differ from the past. For some fish, especially those adapted to cold waters, the environmental margin between survival and local disappearance will grow thinner. This poses a challenge to water quality regulators to develop clean water goals that are realistic in the face of inevitably changing conditions, and to small woodland managers to develop conservation strategies that strive to reduce risk in those circumstances where aquatic resources are imperiled. In the Pacific Northwest, scientists are actively investigating methods of identifying environmental “hotspots” over large geographic areas (places where predicted changes and highly sensitive species overlap), in which tempered water quality expectations can be met by innovative management approaches that provide for effective water stewardship.

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What is Fish Habitat?

By BOB DANEHY

As a woodlot owner you likely have intimate knowledge of the ground you manage and the associated plants and animals that live in the woodlot. The forest you are managing has grown, been harvested, and regrown. During that cycle of growth, relative abundances of various biota may have fluctuated, but overall most are probably still there. In the following, I will focus on the riparian system, which can be defined as the stream and associated areas adjacent to the stream. Most of the animals in the forest will use the riparian system for water or to forage. For other organisms, most obviously fish, this system is where they live all the time. The reason I use riparian system rather than riparian zone or riparian area is because “system” indicates that there are interactions between the stream and terrestrial components. In fact, each is dependent on the other, as the stream is critical for a healthy riparia and the riparia is critical for a healthy stream. While the primary focus of this article will be on fish and what it takes to keep fish happy, remember: Because of the availability of water, riparian systems are hotspots for forest life!

The riparian systems that surround the stream on your property provide resources and influence instream conditions for the fish that live in the stream. Ecologists have spent careers defining the habitat of many organisms and building complex scientific models to measure habitat quality. Underlying all that science, habitat for animals can be described by three components—food, cover, and water. In general for fish, good habitat means adequate food available within the stream or from surrounding vegetation, places to rest or hide, and water of good quality.

**Food.** Fish eat a variety of prey; a common approach used by fish in streams is to target food that is floating downstream. Those drifting prey are of two basic types: (1) aquatic animals—mostly insects—that leave the substrate purposely or accidentally; and (2) terrestrial items—again mostly insects—that fall in the stream from adjacent vegetation. Many of the drifting aquatic insects are developing from larvae to adults. If they do not become prey, they emerge as adults from the water, find a mate, and deposit eggs back in the stream (more on life cycles later). The period of time out of the water as adults can range from hours to months, and during that time they are potential prey for many forest animals. The aquatic part of the system is supporting the terrestrial food web. Conversely, those terrestrial insects that fall into the stream and are consumed by fish provide an example of the terrestrial part of the system supporting the aquatic food web.

**Cover.** The cover that the riparian system provides is produced by the system itself. For fish the cover is the substrates that comprise the stream bed; the pools that are scoured in the bed; the banks that are undercut; and large in-channel wood. By far in forested streams the most important type of cover is large wood, as not only does it grow and is delivered from the riparian system, but it creates, maintains, and forms most of the other cover types. In forests, a riparian system without large wood in the stream is one with poor fish habitat.

**Water.** Water quality is the third piece of the habitat triangle for fish. Since forest chemicals are beyond the scope of this article, let’s assume that you strictly follow the manufacturer’s instructions and adhere to all applicable best management practices associated with forest chemicals. If that’s the case, there are only two water quality

The photo on the left is a Coho salmon stream and a stream reach in need of structure. Note the shallow water, unsorted substrates, and alder canopy. Photo on the right shows two structures right after placement (note hard hat for scale) in the stream. Through time the structures will capture floating debris, the stream will become more complex, and velocities will change, which will scour bed and sort gravels.
concerns for your forest stream—elevated water temperatures and higher-than-normal delivery of sediment.

Stream temperature is controlled by a few factors, but mostly it is the amount of direct sunlight that hits the water surface. If the buffer can intercept most of the direct sunlight, the stream will have close to its expected thermal regime. Cases can be made for openings to increase production of algae that helps instream bugs and ultimately fish; however, by and large a well-shaded stream provides better fish habitat than an unshaded one, not to mention that the trees are a source of food and nutrients and also eventually contribute cover as large wood. Water temperature is extremely important to fish; since their bodies are the same temperature as the water, their metabolic rates are dictated by the temperature of the water. In streams with high levels of food, fish can grow well even in moderately warm water. However, in late summer when flows are low and temperatures are their highest, instream food production is low. In summary, shade is good for fish.

Another factor that influences stream temperature is complex channels. I previously described streams without wood as being poor fish habitat because of lack of cover. The wood has an additional benefit as it captures substrates (sediments) moving downstream during high flows (bed load), which develop a stream bed. This area of a riparian system that extends from the top of the stream bed to the underlying bedrock is called the hyporheic zone. Flowing water moves between this zone and the surface water through downwelling and upwelling, which allows heat to dissipate and keep part of the flow out of direct light. This is another example of the riparian system interacting to keep water temperatures cool, as the terrestrial vegetation shades the stream and contributes the trees that fall into the stream and capture bedload that develops the hyporheic zone.

Fine sediment is a natural part of streams; high flows will lift small particles off the bed and transport them downstream. Fine sediment type will vary with local geology, as places with high amounts of clay can create cloudy or muddy water, whereas in places with sandstone, sand will deposit in slow water areas (for example, along stream margins) or on high terraces as the high flows recede. For fish, the water quality concern occurs when there are higher than normal amounts of fine sediment in their habitat. Sediment deposition can come from a single episode, such as a landslide bringing in a pulse of sediment, or more chronic delivery from road networks. The impact on habitat is greatest while very young fish are rearing in the substrate. While cloudy or muddy water may perhaps interfere with feeding, those conditions usually last only for a couple of days. The

—Continued on next page—
major impact occurs when there is so much fine sediment that it covers the substrate and suffocates the developing eggs. Water quality impacts to fish by high water temperatures and excessive fine sediment are common, yet their detrimental effects can be minimized with thoughtful planning (see accompanying article on page 20).

Another concept to keep in mind when thinking about what makes good habitat for fish is their life cycle. Depending on which fish live in your stream they may live their entire life (resident species) or only live part of their life (migratory species) on your property. Fish start as eggs, usually deposited in the stream bottom, emerge as young (fry), mature into juveniles, and develop into sexually mature adults, then start the cycle again. Each life stage requires different types of habitat. The habitat is still comprised of food, cover, and water; however, the habitat needs change during the life cycle. For example, the cover required by a fry that is less than an inch in length is very different than what is needed for an adult. Therefore, from a fish stewardship viewpoint, streams with little complexity are unlikely to be able to provide the range of habitat needs required for the entire life cycle.

Each species of fish has a different life cycle. To make it even more complicated, there are species in which populations from different locations or even individuals within populations have differences in their life cycles (for example when they migrate). In the Northwest there is probably one salmonid species (trout or salmon) inhabiting your streams, so I’ll focus on that group. However, please remember there are other fish from sculpin to dace, and even lamprey that may also be in your stream, each with their own habitat requirements and life cycle.

One major difference in the salmonids is when they spawn. Cutthroat trout and steelhead trout (rainbow trout are the freshwater form) spawn in the spring, while most other salmonids spawn in fall or early winter. For fish that spawn in the fall, their eggs will develop through winter and emerge in early spring, whereas fish that spawn in spring will emerge later in the spring or early summer. Once out of the substrate young fish must begin feeding quickly. Since they can’t swim well, slow water habitat, particularly very shallow water that can exclude predators, is required. Mortality is high during this life stage and individuals that grow quickly are more likely to survive to the next life cycle stage. Depending on the size of the reproducing females, hundreds of eggs are produced. Survival of a small fraction of offspring through the first summer is typical.

Habitat requirements change rapidly during the first year of a salmonid’s life. This is why complexity within the stream channel is desirable. What is complexity? In forested streams it starts with large wood in the channel. Earlier I discussed the riparian system as a link between the terrestrial and aquatic areas, and there is no bigger link within that system than large wood and the recruitment of large wood from the riparian corridor.

Trees eventually die, be it from disturbance such as windthrow, the
stream undercutting the bank, or pests and diseases. These trees can contribute to the complexity of the stream channel by falling toward the stream. If the tree is big relative to the stream, it can contribute to fish habitat for decades. Natural mortality from a mature riparian system will supply a steady supply of large wood to channels.

Once in the stream, the large wood disrupts flow paths, creating a range of velocities; substrates being transported downstream during high flows are deposited and sorted; and the branches, root wads, and bole create cover in and around the tree. Organic material such as leaves, branches, and twigs from the stream-adjacent trees get caught up in the structure. The most obvious habitat feature is cover, but the accumulated organic material serves as homes for aquatic insects that become prey items and sorted substrates create patches of potential spawning habitat. Fish habitat is enhanced by the complex suite of flow and substrate conditions that are formed by the large wood in the channel. These habitats develop through time, so as decades pass, large wood eventually breaks up, and new trees fall in creating a mosaic that changes but still provides habitat for all life history stages.

Biologists speak of habitat or life cycle bottlenecks. The bottlenecks are habitat factors that limit a particular life cycle stage. It could be a lack of gravels of the appropriate size for spawning, low velocity water for emerging young to feed in, or rearing habitat such as pools for juveniles. For example, for Coho salmon, winter rearing habitat is critical to make it through the first winter before leaving for the ocean. The habitat that has been found to be lacking is alcoves or side channels that are out of the main flow during winter storms. Developing good habitat throughout a species life cycle can greatly help fish populations' health, and complex riparian systems can do that.

So far I have largely spoken of freshwater habitats as they are on your tree farm. While the features of those described for resident fish still apply, the species that migrate to the ocean, large rivers, or lakes have other concerns. The life history strategy of moving to larger waters allows the fish to grow much larger as the food resources are better in those habitats. Depending on the species, individuals may return in 1.5 years (Coho) or as many as four or five years later for some steelhead trout and Chinook salmon. These fish will grow from outgoing young (smolts) of a few inches to incoming adults of a couple feet. One additional aspect of habitat for these migrating fish is fish passage, both downstream and upstream. Migration problems are a product of human development: dams and roads. Movement pass dams are beyond the scope of this piece, but road crossings are certainly something woodlot owners need to be aware of. Before the life cycle can start over, the returning fish need to reach the spawning grounds. Even for fish that do not move long distances, culverts can be a habitat concern as most salmonids move upstream to spawn, so they could need to get past road crossings.

Just as in the past couple of decades, the future will present challenges to forest managers. With so many species of fish already listed as threatened or endangered in the Pacific Northwest, fish will remain a focus of regulators. Collectively if we can demonstrate that fish and fiber can coexist through proactive and thoughtful management of both, perhaps the next generation of tree farmers will have a bright future.

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What Can I Do to Make the Stream(s) on My Land Better for Fish?

By BOB DANEHY

I hope that many of you have asked this question. Before offering some approaches and suggestions, let us first be clear about the regulatory landscape. Much of the Pacific Northwest is under some level of regulation with ESA (Endangered Species Act). Therefore, before doing anything with your stream, first consult with your local state fish agency office to determine if there are any restrictions such as when work can be done or types of projects allowed. For example, using cabling to hold materials in place is usually not allowed. Depending on the project, permits may be required for actions like adding structure to the stream, which may be considered fill. In any circumstance, it is best to consult with the local fish biologist about what you would like to do. He or she will likely be very helpful, have knowledge of other local efforts, and may even be aware of funding sources. In Oregon, watershed councils have become the prime group for fish habitat restoration and most have some funding. In other states there will be groups ranging from agencies to nonprofits with which the local state fish biologist will be able to help you make contact.

As the owner of a property you probably have a good understanding of the history of that property. It may have been in your family for generations. If you do not know the history, this is your first step.

Undoubtedly, the property you have managed has been logged at least once. However, what other activities occurred and how was the early logging done? Was mining part of the history? Berms of rock along the banks are a tell-tale sign of mining. Was the stream straightened at any time? Straightening shortens the distance, which thereby increases the gradient, and therefore the velocity and erosive power of the stream. Is there evidence of a past debris flow? On the westside, if the riparian system is alder dominated and there is any sort of stream gradient, it likely had a debris flow. What is the fire history and how intense and extensive was the fire? Most eastside forests have burned in the last couple hundred years. Was the stream used to transport logs? If so, the channel may still have too much bedrock substrate.

Once you know the history, you have a better idea of why the stream looks like it does. If you know of a stream nearby of similar size that doesn’t have the same history or has been impacted to a lesser extent, it can give you a perspective of what the stream could be like and therefore help to formulate a restoration goal.

Restoration and enhancement of fish habitat starts outside the riparian system. The two primary water quality concerns for fish in forested ground are water temperature and fine sedi-
ment. State practices differ across the Pacific Northwest and each set of regulations addresses these issues in a slightly different manner.

In the accompanying piece on fish habitat, I described bottlenecks, which you will recall are habitat factors that limit a particular life cycle stage. One late-summer bottleneck for fish across the Pacific Northwest is high water temperatures. It is a time of low flow and cloudless days of intense sunlight. One way fish habitat on your streams can be improved is keeping consistent shade on the stream. In states where buffer regulations allow some selection of which trees are harvested, simply walking the stream on an August afternoon and marking which trees provide shade is an important step in restoration. Shade matters and it grows! Depending on the width or the orientation, effective shading will vary, but with a long-term approach a well-shaded stream can be established.

Roads are an essential part of forest management and minimizing sediment delivery is an important restoration action. Fine sediment is part of the stream ecosystems as high flows gradually erode one bank as other banks are rebuilt. In a managed forest, road, particularly road crossings, can add higher than normal amounts of fine sediment. That sediment can smother the eggs in winter and cover food-producing gravels. As a landowner you probably know how many road crossings you have and which ones deliver the most sediment to the stream. For crossings in steep to moderate terrain, the road length delivering runoff in ditches can be shortened to reduce sediment inputs. During storms, as ditch length gets longer, volume increases and that increases the erosive power of the runoff. Ditch relief culverts or water bars, which direct runoff into the forest floor, accomplish two things: they reduce the length of road delivering to the stream and decrease the erosive power of the runoff.

Next, you will want to walk the channel. If you can walk the channel without needing to climb over something every 25 yards, the stream needs more complexity. Increasing that complexity by adding large wood to the stream at the time of a future harvest can be cost effective as machinery is nearby and lower quality trees can be used. These “sticks-in-cricks” projects are popular and there is a lot of information available on how to size the wood so it is stable and designs that have been shown to be most effective (see sidebar).

The second feature to look for is how well connected the stream is to the floodplain. If the stream was mined, otherwise straightened, or used to transport logs, the main channel may be down cut and not be well connected to the potential habitat that could be developed in the floodplain. Look for evidence of old channel meanders. Reconnecting these potential habitats at all flows or high flows can provide rearing habitat for young fish and cover for large fish during high flows. Adding complexity in the channel and reconnecting the main channel to secondary channels can provide your stream with a range of habitats for different stages of the life cycle.

Improving fish habitat in the streams of your forest need not be some big project involving consultants and contractors. It is about having an understanding of what the fish need and looking for opportunities. Those opportunities could be during a scheduled harvest, a funding source you identify, or even a big storm that knocks some trees down.

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If you are a woodland owner who values certainty in life, you may not want to read this article right before bedtime. This is because after 30-plus years of logging roads being exempt from Clean Water Act permitting requirements, the Ninth Circuit Court of Appeals recently jettisoned the exemption and concluded that stormwater runoff from logging roads is subject to Clean Water Act permitting requirements. As discussed below, the Ninth Circuit did so in an opinion that left many basic questions unanswered. For example, how would a woodland owner who uses a forest road to haul a load of timber even get a Clean Water Act permit given that the Environmental Protection Agency (EPA) has no permit program in place for logging roads?

The Ninth Circuit is the largest of our Courts of Appeal, covering nine western states and two U.S. territories and presently boasting 46 judges. If you are reading this article, there is a good chance you live within the court’s jurisdiction. In August 2010, a three-judge panel of Ninth Circuit judges concluded that two public roads used for logging and related silvicultural activities on Oregon’s Tillamook State Forest were “point sources” of pollution (similar to a factory discharge pipe), thus requiring Clean Water Act permits (National Pollutant Discharge Elimination System, or NPDES, permits). Because of the decision’s potentially far-reaching ramifications—its impacts could extend into the everyday world of all roads, public or private, that feature ditches or culverts designed to capture and properly dispose of stormwater runoff—the Ninth Circuit was asked to rehear the case. But on May 17, 2011, the court declined to do so. Instead, the court issued a revised version of its logging roads decision that included a previously-missing justification for why the court had subject matter jurisdiction over the case.

The logging roads decision arose out of an Oregon district court case filed in 2006 by the Northwest Environmental Defense Center (NEDC) against Oregon’s State Forester, the individual members of Oregon’s Board of Forestry, and four Oregon forest products companies: Hampton Tree Farms, Inc., Stimson Lumber Company, Georgia-Pacific West, Inc. and Swanson Group, Inc. The lawsuit claimed that stormwater flowing into ditches alongside two publicly-owned roads on the Tillamook State Forest in northwestern Oregon was transporting sediment into streams and rivers in a manner that constituted “discharge of a pollutant from a point source” and hence required a Clean Water Act permit.

In 2007, the Oregon district court dismissed the logging roads lawsuit on the grounds that any discharge of pollutants from the public roads was excluded from the Clean Water Act permitting system by the EPA’s so-called Silvicultural Rule (found at 40 C.F.R. § 122.27(b)(1)). Under this rule, timber harvest operations, surface drainage, or road construction and maintenance from which there is natural runoff are exempt from the permitting requirement because they are diffuse, “nonpoint” pollution sources. NEDC appealed the dis-
the Ninth Circuit to stay its decision. The logging roads decision now is the law in Alaska, Arizona, California, Hawaii, Idaho, Montana, Nevada, Oregon, and the American Forest and Paper Association, have decided to seek U.S. Supreme Court review of the decision. In May 2011, the Oregon Forest Industries Council took issue with EPA’s authority to adopt the Silvicultural Rule outright, but it certainly rendered the rule impotent with respect to logging roads.

The technicalities of the Ninth Circuit’s decision are not the point of this article, although they may provide the basis for a request for U.S. Supreme Court review of the decision. In a nutshell, the Ninth Circuit took issue with EPA’s authority to adopt the Silvicultural Rule in a way that exempted logging road stormwater runoff from the Clean Water Act. The court also held that certain amendments to the Clean Water Act dealing with stormwater discharges had not exempted logging road stormwater runoff from the Clean Water Act’s permitting requirement.

So why the above reference to the Supreme Court, and what does the logging roads decision mean in a practical sense?

First, the four Oregon forest products companies in the case, joined by the Oregon Forest Industries Council and the American Forest and Paper Association, have decided to seek U.S. Supreme Court review of the logging roads decision. In May 2011, the forest products entities had asked the Ninth Circuit to stay its decision while they decided whether to seek further judicial review, but the Ninth Circuit denied that request on June 3, 2011. The Ninth Circuit’s refusal to stay its decision means the logging

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New Water Quality Controls Affecting Woodland Owners in Oregon’s Coastal Zone

By Julie Weis

If you are a woodland owner in Oregon's expansive coastal zone, you may be affected by a September 2010 legal settlement that will soon cause the state to impose new land management restrictions on individual properties in an effort to improve water quality. The settlement has its origins in an Oregon district court lawsuit brought against the National Oceanic and Atmospheric Administration (NOAA) and the Environmental Protection Agency (EPA) under the federal Coastal Zone Act Reauthorization Amendments (CZARA). Under CZARA, states like Oregon must develop an acceptable management plan (called a Coastal Nonpoint Pollution Control Program) for controlling nonpoint source pollution from logging and other land uses. Otherwise a state risks losing federal grant monies available under the Coastal Zone Management Act.

NOAA and EPA have not fully approved Oregon’s program due to concerns about the adequacy of Oregon’s Forest Practices Rules, particularly with respect to riparian areas, landslide-prone acreage and forest roads. The lawsuit thus used the threat of lost federal funding to leverage a settlement that puts significant pressure on Oregon to develop so-called “implementation-ready” Total Maximum Daily Loads (TMDLs), described in the settlement as a “new and novel approach to achieving and maintaining water quality standards” in Oregon’s coastal zone. Currently, this issue and remedy appear to be unique to coastal Oregon, with no obvious implications for other local areas or nearby states.

The new and novel TMDL approach envisions coastal zone woodland owners answering to two state regulatory authorities, Oregon’s Department of Environmental Quality (DEQ), and the Oregon Department of Forestry. Under the new approach, DEQ will develop allowable daily pollution loads (i.e., TMDLs) and water quality management plans for specific waterbodies, then assign individual load allocations to property owners adjacent to those waterbodies. Landowners, including woodland owners, then will be required to implement property-specific plans for controlling pollution inputs to adjacent waterbodies. DEQ also will establish “safe harbor” best management practices (BMPs), which if used by a landowner would act as a surrogate for satisfying the individual load allocations.

If this sounds like a major change to you, it is—woodland owners historically have not been subjected to direct water quality regulation by DEQ for forest practices, nor anything resembling an individual pollution load allocation. Rather, Oregon law tasks the Board of Forestry (BOF) with establishing BMPs for forest practices so that “non-point source discharges of pollutants resulting from forest operations on forestlands do not impair” water quality standards. These BMPs are better known by woodland owners as the water protection measures of Oregon’s Forest Practice Rules. In an effort to avoid a clash between DEQ and BOF over regulation of Oregon forest practices, the new TMDL approach will recognize the validity of BOF BMPs that are “at least as protective as the DEQ BMPs.” But if the BOF BMPs are deemed insufficient for a given coastal waterbody, a local woodland owner either would have to comply with DEQ’s safe harbor BMPs, or develop and obtain approval for their own BMPs.

Oregon’s coastal zone is large—it encompasses almost all watersheds that drain into the Pacific Ocean—so many Oregon woodland owners are potentially affected by this settlement. How implementation of the settlement will play out, and whether DEQ will face a challenge to its assertion of authority over woodland owners, remains to be seen. But for now, DEQ is moving forward on its implementation-ready TMDL approach, starting with those lucky Oregon woodland owners in the Mid-Coast Basin, which includes the Alsea, Siletz-Yaquina, Siletcoos, and Siuslaw sub-basins.

Paul Adams, professor and Forest Watershed Extension specialist at Oregon State University, also contributed to this sidebar.
Forests and Drinking Water: Fact or Fiction?

By PAUL W. ADAMS

Public opinion surveys in the Pacific Northwest repeatedly show that most people rate clean drinking water among the highest values associated with our forestlands. The minds-eye image of a clear, cool, easy-flowing stream shaded by an evergreen forest canopy can be pictured by almost anyone. Such images contribute to public concerns about forestland use and related management practices, which often focus on potential impacts to water supplies and other aquatic resources. Woodland owners typically share many of these concerns, even when relying upon a well water supply or a municipal water system that has only an indirect connection to forestlands.

The broad and ongoing interest in forests and drinking water leads to many different ideas, perceptions and questions. Even if you know exactly where your own water supply originates, hopefully you’ll find this “Fact or Fiction?” approach interesting and informative as it reviews this topic. It draws from both forest watershed research studies as well as our knowledge and experience with specific drinking water sources and issues on forestlands in the region.

Most drinking water in the Pacific Northwest comes from forestlands. Fact or Fiction?

Generally, this is a fact. Upland areas dominated by forest cover typically are where most of stream and river water originates as rain or snowmelt, so these areas supply most of the water volume at municipal system intakes. Initial pioneer settlements in the region simply tapped nearby rivers and streams. But as towns and cities grew, public leaders looked to cleaner sources upstream, sometimes acquiring key portions of or entire forest watersheds for that purpose.

Undisturbed forest watersheds are a consistently pure source of drinking water. Fact or Fiction?

This is fiction. The simple reason is that during the rainy or snowmelt season, natural erosion on hillslopes and in stream channels occurs even in pristine watersheds, leading to relatively high levels of sediment in stream runoff. Water quality studies have verified this, and practical experience during major storms typically shows a need for extra water treatment of the muddy water, or the use of alternate supplies from wells or storage reservoirs.

Drinking water is pure water. Fact or Fiction?

This is pure fiction. Virtually all drinking water, whether from an individual well, municipal system, or commercially marketed bottle, contains more than just H₂O (i.e., hydrogen combined with oxygen). In fact, if you drank truly pure water (which is most closely approximated by distilled water) it would taste “flat” and unappealing. The typically benign minerals and other compounds (e.g., calcium, sodium, bicarbonate) added to water in small amounts as it moves through the atmosphere and soil help give water its unique “taste.” Interestingly, most bottled water sold in the U.S. is simply tap water that’s had the chlorine from municipal treatment removed prior to bottling—other natural minerals are left in the water or some even may be added prior to bottling to give it more “body.”

Did You Know?

The Organic Act, passed by the U.S. Congress in 1897, established the primary purpose of the western federal forestlands that became our National Forests. It states that these lands are “…for the purpose of securing favorable conditions of water flows, and …a continuous supply of timber.” The O & C Act of 1936 similarly states that the western Oregon BLM lands are for “…providing a permanent source of timber supply, protecting watersheds, regulating stream flow, and …the economic stability of local communities.” The U.S. Forest Service and BLM thus recognize the compatibility of water and timber production from forestlands, and for over a century these agencies have supported research to better understand how to maintain and improve that compatibility.

How forests currently are managed is a critical concern for drinking water. Fact or Fiction?

This is a fact, at least with respect to wildfire hazards on federal forestlands. These hazards have increased dramatically in recent decades, especially on federal lands east of the Cascade crest and other areas of pine and drier mixed conifer forests. Some of the largest water quality impacts ever observed on forestlands have occurred after major wildfires. In addition to potentially heavy sediment from hillslope and channel erosion, streams can have higher temperatures from canopy shade loss and...
excess nutrients (e.g., nitrates) as ash and soil leachates are flushed to streams after wildfire.

*This can be fiction in mixed land use watersheds.* The intakes for many municipal water systems are located in the lower parts of large watersheds that have many different land uses. Thus, most of the water volume can originate on forestlands but the quality of that water can be greatly altered by downstream land uses. Even with harvest and other forest practices, research and stream monitoring show that other land uses (agriculture, urban and suburban development) typically have much greater potential impacts on local water quality. For example, pesticide applications on forestlands in Oregon represent less than four percent of the amount applied annually on agricultural lands (OR Dept. Agriculture, 2007 pesticide use report).

**Forests help add water to our drinking water supplies. Fact or Fiction?**

*This is fiction, except where heavy fog occurs frequently.* Like other plants, trees draw up and transpire (i.e., evaporation through the pores of leaves and needles) significant amounts of moisture from the soil. In addition, the large amount of surface area in the forest canopy results in evaporation losses from leaves, needles and other surfaces when wetted by lighter rain or snow showers. In forested watersheds, these water losses total about 10-20 inches annually. Thus, although forestlands provide relatively high quality water, the “cost” is that we must share some of the rain and snowmelt with the trees and other plants in the forest. The only exception is some unique coastal and mountain locations where “fog drip” (heavy condensation on tree and other plant surfaces that drips to the ground like rain) adds significant amounts of moisture.

**We’re now facing drinking water shortages, even on the “wetside” of the region. Fact or Fiction?**

*This is fiction with respect to our needs specifically for drinking water, but overall water shortages are growing throughout the region.* Although each of us uses roughly 100 gallons of water per day, only about five percent of that use actually requires water quality levels that ensure safe human consumption. Other water uses require much greater amounts of water, including toilet flushing, residential and agricultural irrigation, and industrial processes. Supply problems are increasing not because we need more drinking water, but because often there is only a single municipal system to meet all major needs. Such situations offer few or no alternative water sources, and thus shortages can arise as we produce and consume exceptionally high quality water to flush toilets and water lawns.

**Protecting most trees from harvest is most important in watershed protection. Fact or Fiction?**

*This is fiction.* Limiting disturbance in streamside areas and protecting many of the trees that provide shade and woody debris can provide notable water quality benefits. However, it is overly simplistic to assume that protecting most trees from timber harvest (including those in riparian areas) is best for watershed resources in the long run, as the earlier wildfire hazards example also suggests. Management practices that maintain or help restore favorable soil conditions (especially high infiltration) are most important for good water quality and flow. And given that forestlands provide consistently higher quality water supplies than any other land use, watershed protection starts with practices and policies that help maintain forestland use, including some allowances for economic benefits from those lands.

**Paul W. Adams** has been a professor and Forest Watershed Extension specialist at Oregon State University since 1980. His work at OSU has included studies on the Seaside and Astoria municipal watersheds, as well as an overview entitled *Municipal Water Supplies from Forest Watersheds in Oregon: Fact Book and Catalog,* published by the Oregon Forest Resources Institute in 2001. He can be reached at paul.adams@oregonstate.edu.

Because wildfires can seriously damage water supplies, forest thinning and brush control to reduce fire hazards can be important. Although dry forest types are especially vulnerable, this wildfire and heavy sedimentation occurred in the Dallas city watershed in northwest Oregon.
In Both Rural and Urban Settings, Trees Pay Us Back Dollar-for-Dollar, and Then Some

**By CYNTHIA ORLANDO**

Most small woodland owners already know trees are a vital component of a rural community—providing benefits and increasing the economic value of your property over time, but what about an urban community? Trees supply a community’s residents with a multitude of benefits including clean air, clean water, wildlife habitat, and psychological well-being. When a community’s trees are well-cared for, most visitors deduce the citizens are well-cared for, too.

Many city dwellers look to their small woodland owner friends for information about trees. Well, here is information you can share about how urban trees improve life for your city-dwelling friends. Consider just a few of the ways both urban and rural trees benefit the communities in which we live.

**Environmental benefits**

Air pollution control is one way trees help improve livability in our neighborhoods, as trees remove both solid and gaseous pollutants from the air.

Trees also reduce stormwater runoff costs by intercepting, using, and storing rainfall. Progressive local governments are increasingly looking toward non-built stormwater management strategies like trees to reduce the costs of constructing storm water control infrastructure.

**Energy conservation**

With summer here, it’s a great time to appreciate how much trees can help us with energy reduction. Deciduous trees planted on the south, west and east aspects of a home can create welcome shade, reducing air-conditioning costs during the hottest months of summer.

Solar panels typically are placed on south-facing roofs, but trees and solar panels can coexist. Planting trees to shade the west side of your home will leave plenty of exposure for the panels, while keeping the house cool in summer.

Likewise, evergreens planted on the north or west sides of your home can reduce winter heating costs by serving as windbreaks; buffering occurs best when evergreen foliage is maintained close to the ground. Another tip: when planning gardens, select areas on the south or east side of large trees—leaf mulch during the winter is great for garden soil.

**Economic benefits in urban areas**

How about economic contributions? Can trees really help a community weather the storm of a recession? Studies have shown that shoppers are willing to spend more money in tree-lined business districts than in districts without trees.

In addition, several studies have shown that homebuyers and real estate agents assign between 10 and 23 percent of the value of a residence to the trees on the property. Local governments capture some of this monetary value, since enhanced property values increase the tax base.

Trees in urban areas provide a great return on the investment, but usually don’t get the credit. That’s starting to change. A Davis, California, study estimated its city’s trees to be worth $35 million, and a study of trees in Portland appraised their capital value at $1.1 billion, or $15.3 million in annual benefits to residents.

What about costs? Is it expensive for a city to maintain a strong tree program? Costs of tree management compare favorably with the costs of maintaining streets, sewers, and other assets. And over time, records should show that while most other urban assets decline in value, trees grow in value.
Overall, it’s the mature trees with larger crowns that provide us with the greatest benefits. Just remember, providing enough room on-site for the trees’ roots and ultimate height is an important consideration—so take time to select the right site before you plant a tree.

**Mature trees around your home**

Whether you live in the city or the country, a healthy, stately or majestic tree can add thousands of dollars to the sale value of your home and your neighborhood.

Here are some guidelines to create stateliness from young trees:

- **Plant a species that will create a large canopy in plenty of rooting space and plenty of sun, away from overhead wires, sidewalks, and driveways.**
- **Keep grass and lawn mowers away from the tree by covering the area under the canopy drip-line with bark mulch.**
- **Do not harm the trunk.**
- **Water the tree to establish it for at least three to four dry seasons, reducing the frequency of watering every year.** That is, water weekly during the first dry season; bi-weekly in June-October during the second year; and three to four times during the summer and fall the following year.
- **Do not disturb the area under their canopy; make sure your older trees are well maintained by an arborist certified by the Pacific Northwest Chapter of the International Society of Arboriculture (PNW-I.S.A.).**

**Prune during winter months and don’t top**

While we’re on the topic of maintenance, a quick reminder: Make sure you prune any ornamental trees in need of pruning during the winter months, rather than during warmer weather. Pruning when trees are dormant minimizes risks of pest problems associated with wound entry, and allows trees to use the full growing season to begin closing and compartmentalizing wounds.

If done correctly, pruning can lengthen a tree’s life, increase its value to the landscape, and minimize liability problems. If done improperly, however—especially if trees are overpruned or “topped”—pruning can lead to numerous problems including insects, decay, safety issues, and ultimately, a shorter lifespan for the tree.

Avoid topping your trees. Topping—the indiscriminate cutting back of tree branches to stubs—is a common but detrimental practice. Many people mistakenly top trees because they grow into utility wires, interfere with views or sunlight, or simply grow so large that they worry the property owner. Without its protective crown of leaves and branches, a tree cannot feed itself or protect its sensitive bark from damaging sun and heat.

If you have questions about correct pruning techniques, contact a certified arborist, your local university extension agent, or your state forestry urban forestry program, or visit www.treesaregood.com/treecare/treecareinfo.aspx.

**More management tips for the trees on your property**

Before building around trees, contact a consulting forester to identify how to get the most value out of the trees you need to remove. Sawmills take logs only in certain lengths, so if you take a tree down and would like to sell it, make sure it’s a marketable length.

A consulting forester can also tell you whether the trees you want to remove might destabilize the rest of the stand when they’re gone and how to thin your remaining trees for optimal health. Consulting foresters, stewardship foresters and other resource professionals can advise you on ways to manage your forestland/trees for wildlife habitat or other objectives, and how to establish or reestablish trees on your property.

Upright dead trees with loose bark and decaying wood are incredibly valuable for nesting holes; they also host insects that birds and other wildlife are happy to eat. To increase habitat for birds and other desirable wildlife, consider maintaining a few small snags or wildlife trees on your property, but not big or near enough to the house to cause damage if they fall.


**Fire-prone communities**

Of course, if you live in a fire-prone community, you’ll want to consider which tree species might make the best choices when planted close to your home. Thick bark and the high moisture content of their foliage make ponderosa pine and western larch good fire-resistant tree planting choices.

Maintain a safe distance between your home and any potential fuel sources such as dead or dying trees and vegetation, and remove as much dead vegetation around your property as you can to help lessen the chance of a rapid fire spread.

Arborvitae and blackberries are fire-prone plants to avoid, and remember not to pile firewood within 30 feet of your home. For more information about protecting your home from wildfire, visit www.firewise.org/resources/homeowner.htm.

**Healthy trees = healthy communities**

In short, trees make important social, environmental, and economic contributions to our rural and urban communities in which we live, and our quality of life. Properly managed, healthy trees signify time and money well spent, a good indicator of a healthy property and community. ■

**Cynthia Orlando** holds a B.S. in forest management and is a certified arborist with the Oregon Department of Forestry in Salem. She can be reached at 503-945-7421 or cynthia.a.orlando@state.or.us.
TreeSmarts: Answers to Your Tax Planning Questions

TreeSmarts: Answers to Your Tax Planning Questions is a new column that will appear in every other issue of Northwest Woodlands (summer and winter). Whether your interest is in how new tax policies might affect you, learning strategies to better arrange your financial and business affairs, or something else, column editor Rosemary Sanchez will answer questions from landowners on any topic related to estate, business and tax planning. As readers have not yet had a chance to send in their questions, this inaugural column provides a brief update on a few tax items of interest to landowners.

Estate Planning: New Laws, New Opportunities—Now What?
The Tax Relief, Unemployment Insurance Authorization and Job Creation Act of 2010 (TRA 2010) enacted new laws for federal gift, estate, and generation-skipping transfer (GST) taxes. These new laws have opened a window of opportunity that allows us to move from an uncertain tax environment to certainty. However, this window of opportunity is limited as these new laws are only effective through December 31, 2012.

The new estate tax law provides for an estate tax exemption of $5 million for each individual ($10 million for married couples). This means that an individual who dies in 2011 or 2012 may exempt the first $5 million of assets from estate tax (with a 35 percent maximum estate tax rate on the excess). Also, the surviving spouse can use the unused portion of the estate tax exemption of the deceased spouse. This is referred to as the “portability” provision. For example, if the deceased spouse used $3 million of the estate tax exemption, the executor of the deceased spouse’s estate may elect to transfer the “unused” estate tax exemption of $2 million to the surviving spouse. Keep in mind, however, this portability provision is available for deaths that occur through December 31, 2012.

The portability provision allows the surviving spouse to use the transferred exemption from the deceased spouse toward their own lifetime gifts or toward their estate. This benefit is only available if the surviving spouse makes the gifts or dies in 2011 or 2012.

The new gift tax law increased the amount of the gift tax exemption, which allows a taxpayer to make gifts during their lifetime from $1 million to $5 million to be exempt from gift tax (with a 35 percent maximum gift tax rate on the excess). For example, if the taxpayer made gifts during their lifetime of $1 million through 2010, under the new law the taxpayer is entitled to make an additional $4 million of gifts during their lifetime. Keep in mind, however, this additional $4 million available for gifting is only good until December 31, 2012.

One type of gift that would maximize the advantage of this new law would be a gift of assets that have future appreciation and income earning potential such as units in a family limited partnership (or similar entity). This is a tremendous planning opportunity for a taxpayer to transfer a significant amount of wealth out of their estate during this limited window of opportunity.

The new laws “reunified” the estate and gift tax exemptions available to an individual. What does that mean? It means that an individual may transfer up to $5 million of assets during their lifetime (subject to gift tax) or at their death (subject to
estate tax), but the maximum gift and estate tax exemption on a combined basis is limited to $5 million. For example, let’s assume the deceased taxpayer utilized $3.5 million of their gift tax exemption during their lifetime. Therefore, at the date of death, the deceased taxpayer has an estate tax exemption remaining of $1.5 million (total of $5 million gift/tax exemption less the $3.5 million gift tax exemption). If the taxpayer’s estate at date of death is greater than $5 million, then the estate is subject to estate tax as the estate/gift tax exemption of $5 million was fully utilized ($3.5 million gift tax exemption plus the remaining estate tax exemption of $1.5 million).

The new generation-skipping transfer tax (GST) law increased the amount of the GST exemption from $1 million to $5 million with a maximum tax rate of 35 percent.

These changes provide a tremendous opportunity to mitigate estate, gift and GST taxes.

**Review Your Will**

All wills should be reviewed to determine what the outcome would be under the new laws regarding the distribution of assets and funding of trusts. Many estate planning strategies provide that an individual’s assets fund a family trust (aka, credit shelter trust) with the maximum exemption amount, and then fund a marital trust (providing for the surviving spouse) with the excess assets. If the estate is below $5 million, all the assets will fund the family trust with no assets available to fund the marital trust based on the current law. This may or may not be what the individual intended.

The current window of opportunity and time of certainty for estate planning has a closing date of December 31, 2012. Those individuals that recognize the opportunities and work with their estate planning team will be able to pursue winning strategies to accomplish their estate planning goals. Please see your estate planning advisor for your specific situation implementing any of the above information in compliance with current income, estate, and gift tax laws.

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**TreeSmarts: Answers to Your Tax Planning Questions** is edited by Rosemary Sanchez, a partner and CPA with Bancroft Buckley Johnston & Serres LLP in Seattle, Wash. She is a member of the AICPA and Board of Director of the WSCPA. Questions to be answered in future columns can be emailed directly to Rosemary at rsanchez@bbjsllp.com.

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You know how to read a 90 year old log... but can you read the 90 year old tax law?

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We count trees, not beans.
DEAR TREEMAN, I grow ponderosa pine on property that was a former wheat/alfalfa ranch. Pocket gophers are a part of the landscape and take 25 percent +/- of planted seedlings. (I aggressively treat for the rascals.) In a newly planted section, I wrapped the roots with small mesh chicken wire. Now I have to move these young seedlings/trees and am finding they have impressive roots. Could the chemicals on the wire have washed off and contributed to their handsome root structures? —Vic

DEAR VIC, Chicken wire is a form of galvanized wire, the main ingredients consisting of zinc-coated steel, containing a substantial amount of iron. While both iron and zinc are part of the mix of nutrients required by trees, deficiencies are not particularly common in most Pacific Northwest soils. So nix on the chemical benefits. Perhaps the ex crescence of roots was occasioned by the excessive excavation of the planting hole in order to accommodate the seedling and the wire wrap? Then again, perhaps we are digging too deep here, so nix on the physical benefits.

Let us consider the geometric structure of the chicken wire: hexagonal in nature. This structure can be found in other types of chemical compounds such as non-aromatic polycyclic hydrocarbons, including steroids. A derivative of this group includes brassinosteroids, a unique class of plant growth regulators with structural similarity to animal steroid hormones. In other words, your trees are “on the juice.”

Steve Bowers

Small wonder they have such “handsome” structures! But have those “rascals” caused a diversion in our deductive reasoning?

While the persuasive, preceding argument should satiate the most analytical of minds, if we must harbor another guess, perhaps a succinct investigation of the former wheat/alfalfa ranch plant physiology will bring us to a successful conclusion. All of that nitrogen gas (N\textsubscript{2}) in our atmosphere is unusable for your trees until it becomes ammonia (NH\textsubscript{3}). Alfalfa is a legume, and as such, contains root nodules with the bacteria Sinorhizobium meliloti, capable of biological nitrogen fixation. Those trees of yours are growing in a nitrogen-rich environment and with impressive roots to show for it!

And without any assistance from those pernicious pocket gophers. —Treeman

DEAR TREEMAN, I recently attended a timber sale workshop in which you were the speaker. You mentioned something about “playing the game” with the Scribner log volumes and how it is a battle with log buyers. A system as antiquated as Scribner should be eliminated and the use of the metric system would be a much better method of determining payment for your logs. —Jim

DEAR JIM, You aren’t the first to suggest a change in the methodology of log measurements in the PNW. And likely not the last. Over 10 years ago, there was a major effort in academia and some of our public agencies for adoption of the cubic measuring system. The argument was one of equitability between buyer and seller: measuring the total fiber content in a log versus product recovery, the basis for the Scribner Log Rule, amongst others. After all, the entities promoting this change were from the government and they were/are here to help.

A cynical analysis, dare we say realist, of the change will tell you it was due to that ubiquitous factor that comes into play anytime someone or some agency believes the rules incline to their disadvantage: money. Eliminate the Scribner log scaling “game,” pay for the entire fiber content of the log, and everyone will be happy. But as my mother used to say, “Not so fast there, Buster.”

Did anyone believe the private timber companies would voluntarily renounce this entrenched method of log measurement for one developed in a large part by the government? Actually, there were some companies that began offering the option of payment by cubic (cunit) or Scribner. What could have been more equitable than allowing someone to be paid the “old way” or a “new and improved” method? Well, not so fast there, Buster.

Buyers, and their respective mills, have been measuring logs by both methods for a number of years: one to measure mill efficiency and the other as a basis of payment to the seller. Companies possess huge databases of the ratios between Scribner Log Rule and the cubic system based on individual log length(s) and diameter(s). When offering a choice on method of measurement/payment, they merely plugged these ratios into the pricing structures and the seller, with an occasional small variation, received the same amount of money.

Fast forward to today and we see the payment option has disappeared, Scribner reigns supreme, once again lending credence to the old axiom: the more things change the more they remain the same. Or as Thoreau said: Things do not change; we change. —Treeman

DEAR TREEMAN, How much longer are we going to have to endure your diatribes? —Lee

DEAR LEE, At least until the global warming advocates who place the phenomenon’s cause-and-effect at the feet of anthropogenic contributions of carbon dioxide include our planet’s most significant greenhouse gas, water vapor, into their equations. Did I hear something about glaciers in the nether world? —Treeman
Washington, and two Pacific Islands. It also means the case now will be sent back to the Oregon district court—the Ninth Circuit’s decision did not impose a remedy on the state and forest products industry defendants, instead ordering the district court to conduct further proceedings consistent with the logging roads decision to address the remedy issue. At press time, the forest products entities had asked the Ninth Circuit to reconsider their request for a stay given their commitment to petitioning the Supreme Court for relief.

Second, if the case is not revisited by the Supreme Court (a very small percentage of requests for Supreme Court review are granted), some observers believe that many private and governmental entities will be required to obtain a permit for the discharge of stormwater from logging roads under their control or ownership. Although it is difficult to predict the way in which the Oregon district court will fashion a remedy, the Ninth Circuit’s acceptance of the argument that road use by log trucks is an industrial activity opened a door for requiring point source permits.

But woodland owners are often referred to specifically as nonindustrial landowners. Does that mean the log truck drivers who use woodland owners’ roads will have the permitting obligation even without having control or ownership over the roadway? And given that roads on woodland properties almost always are used for other purposes, can the “industrial” label be applied? Also, given that EPA currently does not have a permitting program in place for logging roads, how might one apply for a Clean Water Act permit to avoid potential environmental liability? If permits are required, EPA’s delegation of Clean Water Act permitting authority to states will cause the time-consuming permitting process to fall in most cases on already-overburdened state agencies that historically relied on comprehensive systems of “best management practices” (in the Pacific Northwest, these are each state’s forest practices rules) to address the issue of silvicultural stormwater runoff.

In short, the Ninth Circuit’s logging roads decision offers the woodland owner anything but certainty. So stay tuned as the parties seek Supreme Court review, or perhaps as a legislative solution becomes a possibility—the logging roads decision now has caught the attention of at least some members of Congress. A May 23, 2011, letter to EPA signed by 44 members of the House of Representatives, including Pacific Northwest Representatives from both the Republican and Democratic parties, urged EPA to reaffirm the wisdom of using best management practices to control stormwater runoff in the forest setting, and to take action to “limit the scope of” the logging roads decision.

Julie Weis is a partner in the Haglund Kelley Jones & Wilder law firm in Portland, Ore., where she enjoys putting her natural resources background to work on environmental law matters, including forest products issues, as part of a busy civil litigation practice. She can be reached at 503-225-0777 or weis@hk-law.com.

CALENDAR

2011 National Tree Farmer Convention, Aug 9-11, Albuquerque, NM. Contact: Amy Yambor, 202-463-5172, ayambor@forestfoundation.org.
Forest Owners Field Day, Aug 20, Chimacum, WA. Contact: Andy Perleberg, 509-667-6638, andyp@wsu.edu.
53rd Annual Pacific Northwest Christmas Tree Association Tree Fair and Show, Sept 9-10, Vancouver, WA. Contact: PNWCTA, 503-364-2942, bryan@ostlund.com.
Forest Owners Field Day, Sept 10, Whidbey Island, WA. Contact: Kevin Zobrist, 425-357-6017, kzobrist@wsu.edu.
Inland Empire SAF Annual Meeting, Sept 23-24, Contact: Dick Reid, IESAF Communications Chair, rreid66519@aol.com.

Send calendar items to the editor at rasor@safnwo.org by August 15, 2011 for the fall issue.
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