

What the report found:

# A SUMMARY

## Forest management's effects require continued study



*Trees to Tap* includes an extensive chapter on Findings and Recommendations, which can be accessed online at [OregonForests.org/TreesToTap](http://OregonForests.org/TreesToTap). Though it's clear that forested watersheds produce higher-quality raw water than other land uses, concerns still remain, prompting calls for continued study.

### SEDIMENT FROM FORESTRY OPERATIONS

The authors found little direct quantitative evidence in the studies reviewed that forestry activities and forest roads impact community drinking water in Oregon. But they point out there is considerable indirect evidence that forestry can have such effects, inferred from the following, among others:

- extensive findings regarding linkages between past and current forest harvest activities, forest roads and landslides in upper watersheds
- cumulative and legacy effects of past harvesting, site preparation, and forest road construction and use when best management practices were not as robust

- “The inherent connectivity of hillslopes, headwaters and larger downstream waterways,” along with the easy movement of fine sediment and turbidity, especially during high flows
- the lack of provisions to protect small, non-fish-bearing and intermittent streams during harvesting

The authors state that the potential for forest operations to affect drinking water quality or quantity is higher for operations in steep, landslide-prone terrain, in areas with relatively more erodible soil and rock types, areas with a significant extent of unbuffered small streams, or where previous operations have left significant amounts of soil or sediment stored in streams.

### FOREST CHEMICALS

According to studies reviewed for *Trees to Tap*, traces of herbicides can reach streams during strong storm events, especially the first flush from heavy fall rains.

Most studies on the effects of forest chemicals were conducted on the active ingredient only. In actual use, these chemicals are usually mixed with other ingredients to improve their effectiveness and application. The effects of these mixes are often unknown.

According to *Trees to Tap*, intermittent and non-fish streams can make up a significant portion

of a watershed but may be unprotected by a forested buffer. As noted, foresters may not apply chemicals directly to surface water or protected riparian vegetation. Ten-foot vegetated buffers are required on headwater streams that still contain water in mid-July, but these buffers do not include large trees. Studies show that without larger trees to slow or stop chemical drift, chemicals can drift into protected stream reaches during application, or migrate into streams and flow into lower parts of the watershed, especially during and immediately following post-application storm events.

### WATER QUANTITY

Water quantity, also known as “water yield,” following timber harvest is a concern because water system managers need reliable, predictable and sustainable sources of raw water. Variables include geology, soil type, harvest size and harvest proximity to stream channels. According to *Trees to Tap*, study results on this topic vary widely, with some watersheds showing large increases in water yield after harvest and others showing little to none.

Complicating the picture are long-term effects where young, vigorously growing plantations of Douglas-fir yield less water flow during the summer dry season than adjacent old-growth watersheds.

The difficulty of consistently predicting the effects of forest harvest and regeneration on water yield have prompted calls for an expanded research agenda to study the relationship between timber harvest and processes that affect watershed storage.