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Bears Prefer Trees in the Spring

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BY DALE L. NOLTE

As they emerge from their winter den, bears need an energy source and food is relatively scarce. Concurrently, trees are breaking dormancy and starting to generate carbohydrates. Consequently, bears commonly girdle Douglas-fir trees during the spring to feed on the available carbohydrates. Bears strip bark from a tree with their claws, then feed on the sapwood by scraping it from the heartwood with their teeth. Scattered remnants of bark strewn at the base of a tree and vertical tooth marks are characteristic indicators of bear activity. Most frequently bears forage on the lower bole of trees, girdling the bottom three to five feet. However, some bears may climb and feed on the upper boles while sitting on lateral branches. Occasionally, a bear will strip an entire tree.

Damage inflicted by bears is extremely detrimental to the health and economic value of a timber stand. A single bear can peel bark from as many as 70 trees per day. Complete girdling is lethal, while partial girdling reduces growth rates and provides avenues for subsequent insect and disease infestations. Economic loss is compounded because bears select the most vigorous trees within the most productive stands, and frequently damage occurs after implementing stand improvements such as thinning or applying fertilizer. The fiscal loss is further exacerbated because of the extended time, 20-plus years, necessary for a timber stand to return to its pre-damaged state.

PHOTO COURTESY OF ERWIN AND PEGGY BAUER

Bear damage occurs in the spring when bears emerge from their dens and energy demands are high.

Historically, management to protect timber resources from bear damage consisted of lethal removal. Although lethal removal continues, it is generally incorporated within a broader management plan. Animals are not generally captured and relocated because it is difficult to locate suitable sites or sites where resource managers want additional bears. Non-lethal approaches such as repellents, fences and frightening devices are impractical to protect timber stands. Efficacy has not been demonstrated for any of these techniques. Regardless, the disturbance to other wildlife species and potential environmental consequences if these tools were operationally implemented across large-scale timberlands should prohibit their consideration. An alternative feeding program has demonstrated efficacy to reduce tree girdling by bears. In addition, common silvicultural practices also can influence whether bears select to forage in a timber stand.

Scientists at the Olympia Field Station conducted a series of studies in western Oregon and Washington to determine forage selection criteria of black bears girdling trees during the spring and relate these criteria to silvicultural practices. Carbohydrate availability appears to drive bear choices among available trees. Bears select trees high in carbohydrates. Bears also prefer trees containing low terpene concentrations to those with higher concentrations. Subsequently, scientists examined how applying urea fertilizer, thinning stands and pruning trees can alter concentrations of these chemical constituents. Fertilization had a positive effect on tree growth and on carbohydrates the year after fertilizing, but did not change terpene concentration. Carbohydrates were similar in fertilized and unfertilized trees after the first year. The observed tree diameter increased in the absence of increased vascular tissue mass, which suggests a growth spurt the same year the treatment was applied. Trees in thinned stands also contained significantly higher carbohydrate concentrations, with only minor impacts on terpene concentrations. Thus, the net effect of thinning was an increase in the

ratio of carbohydrates to terpenes in vascular tissue. These data support observations that increased bear damage is more likely to occur in fertilized stands shortly after treatment and in stands post thinning.

Pruning 40 percent of the live canopy significantly decreased vascular tissue mass and carbohydrate concentrations while having no impact on the terpene concentrations of vascular tissue. Thus, pruning decreased the carbohydrate to terpene ratio, rendering pruned trees to be less preferred to bears than unpruned trees. Bear preference for unpruned trees was later demonstrated in a survey of bear damage on a site where every other tree had been pruned. Four times as many unpruned Douglas-fir trees were damaged than pruned Douglas-fir, while the likelihood for bears to damage western hemlock was threes times more on unpruned than pruned trees.

The NWRC Olympia Field Station also conducted a series of studies to evaluate the program providing alternative foods to bears to reduce tree girdling. Timber and wildlife managers posed several questions regarding efficacy and long-term consequences of the feeding program.

The station evaluated the efficacy of the program and conducted concurrent studies to assess select behavioral characteristics of feeding bears and impacts of providing supplemental feed on nutritional status of bears.

The efficacy study revealed the percentage of damaged trees in stands with foraging bears varied from two percent to 52 percent. When supplemental feeding was introduced on these stands, damage was reduced to approximately 10 percent of that sustained on untreated stands.

Concurrent experiments provided insightful data on bear use of feeding stations. Numerous bears fed at the stations, including females with and without cubs, yearlings and boars. Bear feeding bouts at the stations were generally short, less than 30 minutes. Bears generally fed alone, although two to three adult bears were observed at a feeder simultaneously and the feeding partners were not consistent. There was little antagonistic behavior observed around the feeders, and no evidence that this behavior inhibited foraging opportunities at the feeders for long. On the rare occasion a bear was driven from a feeder it returned later that same day to feed, generally within an hour. Supplemental feeding also did not affect the home range sizes of bears in feeding areas, but it may serve to concentrate bears in a particular location. Bears consuming supplemental feed did gain a significant nutritional advantage while feeding, but this did not equate in long-term increases in age-specific body mass or fat content.

PHOTO COURTESY OF NWRC OLYMPIA FIELD STATION

A common characteristic of bear damage is loose bark lying at the base of girdled trees.

Regardless of the measures selected to reduce bear damage, it is essential for managers to monitor activity. None of the approaches are without potential failure and bears can inflict extensive damage quickly. Our data suggests silvicultural practices can affect tree palatability. However, foraging is relative and although implementing or delaying a practice may alter available carbohydrates, bear damage can still occur. For example, thinning will increase potential for damage, but if choices are limited, then bears are likely to peel in unthinned stands. Our data also suggest that providing alternative foods can reduce damage and that the negative consequences of the program we evaluated were minor. Monitoring, however, is important because efficacy may be density dependent and damage has occurred in stands with feeders. Feeding also should be considered a long-term commitment. Pulling active feeders from stands while trees remain vulnerable to bears may lead to significant damage. ◆

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