

*Forest Service Summary of the Logging to Control Insects:
The Science and Myths Behind Managing Forest Insects 'Pests.'*

*Region 6 -- Forest Health & Protection
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This 82-page report summarizes 177 published reports concerning the effects of “logging,” thinning, and other stand management techniques on conifer attack and mortality caused primarily by bark beetles or defoliating insects. There are 150 published articles that are annotated. The report has not been published in a refereed journal nor does it appear to have been peer-reviewed. The sole author of the report, Scott H. Black, is the executive director of the Portland-based Xerces Society for Invertebrate Conservation. He has degrees in ecology, horticulture, plant science, and entomology from Colorado State University.

One of the major problems with the Black report and its title is that the author fails to define the terms “logging” or “thinning.” The Dictionary of Forestry by J.A. Helms (1998) defines “logging” as “the felling, skidding, on-site processing, and loading of trees or logs onto trucks.” It is synonymous with “harvesting.” Helms defines thinning as “a cultural treatment to reduce stand density of trees primarily to improve growth, enhance forest health, or recover potential mortality.” The Black report appears to differentiate “thinning” from “logging” when, technically, thinning can be a form of logging especially when trees in thinned stands are selectively felled and loaded onto trucks. Because the term “logging” is not defined in the report, it is difficult to support statements concerning the effects of “logging” especially since the term is seldom used in the literature that is cited in the report. This becomes especially confusing to the public and politicians, who rarely differentiate “logging” from “thinning” when comments are made about the effects of “logging” on forest insects.

One key finding of the Black report is that “there is no evidence that ‘logging’ can control bark beetles or forest defoliators once an outbreak has started.” Despite the fact that the terms “logging” and “control” are not defined in the report, it is generally accepted by most forest scientists and managers that this statement is true. The bulk of the literature cited, however, says that prevention of bark beetle attacks by thinning overly dense forests **before**, rather than after an outbreak has started is one of the best methods of reducing infestation and preventing mortality caused by bark beetles on residual trees, should they occur (Sartwell and Stevens 1975, Cole and Cahill 1976, Mitchell et al. 1983, Amman and Logan 1998, Kolb et al. 1998, McDowell et al. 2003; all cited in the Black report).

An extensive compilation of scientific literature is listed under subject matter headings, which implies that this literature supports the views and conclusions expressed in the Black report. For example, another key finding of the Black report is that “although thinning has been touted as a long-term solution to controlling bark beetles, the evidence is mixed as to its effectiveness.” Although the author has cited many fine papers that report studies concerning thinning effects on bark beetles, he fails to properly summarize their significance. For instance, of 18 cited papers that report the effects of thinning on bark beetles, 14 of these clearly show a positive effect of thinning on preventing bark beetle attack and mortality of the residual trees. The Black report cites 42 papers under “Effectiveness of Thinning” but only 18 of these papers report the effects

of actual “thinning” on bark beetles. The other 24 cited papers report the effects of stand density, salvage-logging, tree physiology, fire, or other stand conditions **but not thinning** on bark beetle populations and dynamics. Thinning is a well-established and universally accepted prevention strategy by professional foresters and scientists to significantly reduce susceptibility to endemic bark beetle activity.

The Black report contains many generalities that are accepted by most scientists and foresters. There are many statements, however, within the report, which are taken out of context, misleading, or simply not true. For instance, it is not true that all Buprestidae “infest only dead and already dying trees.” As an example, the bronze birch borer (*Agrilus anxius*) typically attacks live birch (Solomon 1995). Similarly, the flatheaded fir borer (*Phaenops drummondi*) on Douglas-fir and spruce and the California flatheaded borer (*P. californica*) on ponderosa and sugar pine have been reported to attack and kill living trees under stress (Furniss and Carolin 1977). The statement, “It is commonly accepted that fire suppression and logging have led to simplified forests...” is not correct and is not supported by the references cited. Typical old-growth ponderosa pine stands that were subjected to frequent periodic and naturally occurring underburns are, in fact, very simple systems. Fire suppression and selective harvesting of the largest pines have converted these ecosystems into vegetatively diverse systems with shade-tolerant true fir and Douglas-fir that are subject to many forest health problems, including insect, disease, and wildlife-caused tree mortality (Goheen and Hansen 1993, Hessburg et al. 1994, Ferrel 1996, Filip et al. 1996).

In the Black report, literature is selectively cited, and opinions are extrapolated from research that often is inappropriately used to support the points being made. For example, where “logging” or “management” is cited as causing or aggravating bark beetle attack, most are examples of outdated or improperly done management techniques that are not indicative of good forestry practices today. The report states, “high-grade logging increases the relative abundance of shade-tolerant trees, which are more susceptible to insects.” High-grade logging has not been considered a proper silvicultural technique by most if not all current foresters and forest managers for many years.

Many of the cited examples of logging/bark beetle dynamics are from mixed-conifer coastal forests where bark beetle-caused tree mortality is often minor compared to beetle outbreaks in the drier eastside or interior forests of western North America. Extrapolating information collected in one type of ecosystem and inferring that it applies equally to a totally different ecosystem is not appropriate use of the literature. Also, the Black report cites literature from Mexico or Europe, which may have little or no relevance to logging/bark beetle dynamics in western USA and Canada.

The Black report advocates that natural processes be the preferred response to forest health problems and issues with minimal human intervention. There is an overlying theme in the report that only “nature” can properly “manage” forests. The author considers that actions taken by humans are outside of controls that occur “in nature.” Management or societal objectives (such as protecting or enhancing threatened or endangered species; protecting and maintaining existing

or future old-growth forests; or reducing fuels within urban/wildland interface) that require human intervention to achieve a desired outcome or in a more timely manner, are largely ignored.

In several places throughout the manuscript, the author juxtaposes two unrelated statements or studies that lead a reader with no background in forest entomology or forestry to erroneous conclusions. For example, in the executive summary it is stated, “many in the timber industry see them (insects) as agents of destruction ... and some foresters believe that the solution to the problem is increased logging.” The unstated and erroneous assumption is that federal and state agencies support this view when the conclusion is reached: “There is an urgent need for federal and state agencies and land managers to reevaluate their current strategy for managing forest insects...”

In conclusion, the Black report contains many examples of erroneous statements that are not even supported by the report’s cited literature. Professional foresters and land managers will be able to see this deficit. Unfortunately, this report may be viewed by others as refuting hundreds of published papers on effectively managing forest insects and diseases, which it does not. It will be more unfortunate when a poorly written but popular document such as the Black report is used as supporting information during litigation. During any project analysis, such a document should be considered in the context of its biased authorship, limited credibility, and dubious scientific value. It is recommended that analysis teams refer directly to the appropriate refereed or peer-reviewed literature and site-specific data, rather than popular review reports such as this.