

Writing Item 1

Populations of the yellow cedar, a species of tree that is common in northwestern North America, have been steadily declining for more than a century now, since about 1880. Scientists have advanced several hypotheses to explain this decline.

One hypothesis is that the yellow cedar decline may be caused by insect parasites, specifically the cedar bark beetle. This beetle is known to attack cedar trees; the beetle larvae eat the wood. There have been recorded instances of sustained beetle attacks overwhelming and killing yellow cedars, so this insect is a good candidate for the cause of the tree's decline.

A second hypothesis attributes the decline to brown bears. Bears sometimes claw at the cedars in order to eat the tree bark, which has a high sugar content. In fact, the cedar bark can contain as much sugar as the wild berries that are a staple of the bears' diet. Although the bears' clawing is unlikely to destroy trees by itself, their aggressive feeding habits may critically weaken enough trees to be responsible for the decline.

The third hypothesis states that gradual changes of climate may be to blame. Over the last hundred years, the patterns of seasonal as well as day-to-day temperatures have changed in northwestern North America. These changes have affected the root systems of the yellow cedar trees: the fine surface roots now start growing in the late winter rather than in the early spring. The change in the timing of root growth may have significant consequences. Growing roots are sensitive and are therefore likely to suffer damage from partial freezing on cold winter nights. This frozen root damage may be capable of undermining the health of the whole tree, eventually killing it.

NARRATOR

Now listen to part of a lecture on the topic you just read about.

MALE PROFESSOR

Unfortunately, we still don't know what's killing the yellow cedar. None of the explanations discussed in the reading is adequate.

First, the cedar bark beetle. Well, the problem with this explanation is that healthy yellow cedars are generally much more resistant to insect infestation than other tree species. For example, the bark and leaves of the yellow cedar are saturated with powerful chemicals that are poisonous to insects. So, healthy cedars are unlikely to suffer from insect damage. So how can we explain those dead cedars that were infested with beetles? In those cases, the beetles attacked trees that were already damaged or sick and would have probably died anyway. So the beetles are not the fundamental cause responsible for the decline of the yellow cedars.

Second, although bears damage some trees, they're not the cause of the overall population decline. Yellow cedar populations have been declining all across the northwestern coast of North America, both on the mainland and on islands just off the coast. There are no bears on the islands, yet the island cedars are still in decline. Since the decline occurs with and without bears, the bears cannot be responsible.

And finally, the theory about the roots suffering from frost damage. Well, the reading passage forgot to take one fact into account—many more trees are dying at lower elevations, where it



is warm, than at higher elevations, where it is cold. If freezing damage were responsible for the decline, we would expect to see more trees dying in the cold weather of high elevations. Instead, more trees are dying in the relative warmth of the low elevations. So, although the climate change may have made the cedar roots more sensitive than they used to be, this isn't what's killing them.

1. **Question:** Summarize the points made in the lecture, being sure to explain how they challenge the specific theories presented in the reading passage.

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