

## Bark beetles biting dust?

by Ed Berg

I spent a recent weekend on a geology fieldtrip to Seldovia. What a pleasure it was to hike through a live spruce forest! The towering green Sitka spruce along the Otterbahn Trail reminded me of the forests on the Homer side of Kachemak Bay ten years ago, before the spruce bark beetle shifted into high gear. The beetles have generally been moving down Kachemak Bay toward Seldovia. If a conservative observer were to judge the future by the recent past, he would predict that Seldovia too will inevitably fall to the beetles within the next several years. We used to say that “time and tide wait for no man,” but some would update that to time and beetles...

I disagree. I think that we have turned the corner and the beetles are in full retreat. Seldovia, and probably Kenai and Soldotna may well escape comparatively unscathed. Don't cut anymore trees until you've pondered the following observations!

First observation: the red-needle (fresh beetle-kill) acreage has dropped about 50% per year for the last three years on the Kenai Peninsula, according to the Forest Service's annual aerial surveys. This is primarily due to the beetles having eaten themselves out of house and home: from Tustumena Lake to Kachemak Bay there is simply not much mature forest left to eat. I admit that this says nothing about what will happen to the remaining survivors. Anchor Point held its own during the mid-1990s when everything to the north, east, and south was being hammered, but Anchor Point finally showed a lot of red trees in 1999. Being a temporary survivor didn't help Anchor Point.

Second observation: we have just had two relatively cool and wet summers. On the southern Peninsula there was a record drought from 1989 through 1997, which greatly turned up the volume of beetle activity. Warm temperatures increase evapotranspiration and drought-stress the trees. Even worse is the “long warm summer” effect (as shown by high degree-days figures) which allow the bark beetles to complete their normal two-year life cycle in one year. A long warm summer effectively doubles the beetle population, because in the following spring both one- and two-year beetles are released simultaneously.

This happened in 1993, 1994, and especially in

1997. In 1998 and 1999, however, in Homer annual precipitation was close to the mean and summer temperatures were down to the mean. These were two very “average” summers for the southern Kenai, and this means poor beetle reproduction and more beetle-resistant trees. These facts could save Seldovia, which still has very mature green trees, as well as help Anchor Point defend its younger trees.

In the central Peninsula it looks even better: annual precipitation was 15% above normal (and summer precipitation was 45% above normal) in 1998 and 1999, and summer temperatures were down to the mean, in sharp contrast to the warm dry summers of 1996 and 1997. These facts spell good news for tree-lovers from Kenai to Sterling and northward to Point Possession.

Third observation: a 20-30 year cycle in North Pacific sea surface temperatures has recently been identified by climatologists Steven Hare and Nathan Mantua at the University of Washington. Kenai and Homer, being coastal communities, track this cycle very closely in their annual temperatures. This cycle warmed up in the 1920s and 1930s, cooled down in the 1940s through the mid-1970s, and began warming up in 1977. In 1998 however the North Pacific sea temperatures began falling, and in 1999 they dived to chilly 1960s levels. This suggests that we may already be two years into a new 20-30 year cool phase. If so, we should see the beetles drop to insignificant background levels.

Fourth observation: it's hard to beat youth. Many of the stands in the Kenai-Soldotna-Sterling area are relatively young and beetle-proof. The two 1926 Burns south of Soldotna to Kenai have only moderate beetle-kill. The 1947 Burn in the Sterling area has very little beetle-kill, although much of this 310,000-acre burn is black spruce, which is rarely bothered by the spruce bark beetle. The 1969 Burn north of Kenai is much too young for beetles. Of the mature spruce forest north of the Kenai River (e.g., Swanson River Road north to Point Possession), much of this was severely beetle-thinned in the early 1970's (following the drought of 1968-69), and the surviving (i.e., younger) trees are growing vigorously and are not yet very susceptible to beetles.

Fifth observation: climate-wise, 1997 should have

been the ultimate year for beetle babies, if there were enough beetle parents available. The summer of 1997 was one of the longest and warmest summers on record, as measured by total degree-days above 60° F. Homer recorded 360 degree-days (mean 135), Kenai 477 degree-days (mean 240), and Sterling 1049 degree-days (mean 737) for May through August of 1997. This should have produced a huge crop of one-year beetles in 1998, on top of the normal two-year crop from 1996. It generally takes 2 to 3 years after a beetle “pulse” like this to see the red-needle acreage figures jump up in the annual aerial surveys. This means that in 1999 and 2000 the remaining live mature spruce trees on the Kenai Peninsula should be turning red, if there were in fact available beetle parents in 1997. We didn’t see many red-needle trees in 1999, so this year is the critical test. With luck, there weren’t enough beetles around in 1997 to take advantage of the good weather and their offspring didn’t do much damage.

The next several weeks will provide an excellent window to assess the beetles and the future of the remaining spruce trees. Two field observations are needed, and I am asking for the readers’ help. First, the beetle mating flight could occur any day now, as soon as we have several 60° F days in a row. I would like

people to report flights where they see dozens (not 4 or 5) of bark beetles flying around. In the past we have had Alfred Hitchcock-style in-your-face beetle flights, and even clouds of beetles visible at a distance. If we see anything like this, we might as well get out the chainsaws.

Second, I need observations of fresh red-needle trees (many trees, not 2 or 3). The needles of recently killed trees turn red in the late winter and early spring, and drop off over the next year. Driving along the Sterling Highway between Anchor Point and Ninilchik, I notice some clumps of red-needle trees, but a lot of the trees are already dead (and gray, with no needles).

To sum up, my predictions for this spring are that we won’t see any large beetle flights, or very many fresh red-needle trees. I think we are indeed over the beetle hump, but I may be wrong. I’d greatly appreciate a call with you observations. I can be reached during weekdays at the Kenai Refuge headquarters in Soldotna at 260-2812, and on weekends in Homer at 235-7268.

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