

## **Beetle Utilization of Artificially Created Tree Snags in Harvested Areas**

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Snags are dead standing trees that are naturally killed by fire, wind, lightning, insects/disease, drought and/or flooding. Snags are a natural component of forest ecosystems and provide foraging areas and nesting/roosting cavities for many vertebrate species. The value of snags has become increasingly recognized over the past few decades. However, snags are frequently still removed during timber harvest for safety concerns and many snags are harvested for fuel and fiber.

An artificially created snag is a live tree intentionally killed using various techniques (e.g., girdling, topping, herbicide treatment, use of pathogenic fungi, or pheromones to attract tree-killing insects). Artificially created snags are incorporated into harvest schemes as one technique to increase the density of cavity nesting birds in an area. Using the topping technique, trees die immediately, but stand for a long period. Topped trees are frequently used by various birds. However, topping can be expensive and labor-intensive. We chose to use the harvesting process itself as the mechanism to produce the snags. Trees to be topped were selected and marked prior to harvest. When the units were harvested, the operator could then top the chosen trees by cutting the tree at an appropriate height.

The overall objective of the work is to determine if artificially created snags serve as a useable habitat for wildlife and to determine how well these snags 'survive' typical stand management practices and weather conditions. One important aspect of snags is their relationship with insect communities and the affect snags may have on these insect populations. Snags can potentially act as a habitat for destructive insect pests. Any buildup of pest populations would have to be closely monitored. Therefore, one of our sub-objectives was to examine the insect utilization of artificially created snags.

During the initial year of the project (2002), two tree species were examined (Douglas-fir and grand fir). Fifteen trees of each species were topped and beetles that were captured at traps located directly adjacent to the high stumps were captured and analyzed. During 2002, a total of 25,978 beetles were captured (17,901 beetles in traps adjacent to the Douglas-fir high stumps and 8,077 in traps adjacent to the grand fir high stumps). There were a total of 26 families of beetles captured (Table 1).

With 13,631 individuals captured, the bark beetles (Scolytidae) were by far the most abundant group of beetles captured. Bark beetles can be very destructive insect pests of forests. However, the majority of bark beetles captured adjacent to the high stumps were not economically important species and no evidence of pest buildup was determined. The numbers of bark beetles captured at the two tree species differed greatly but the pattern of capture throughout the summer was similar (Figure 1). Several other families

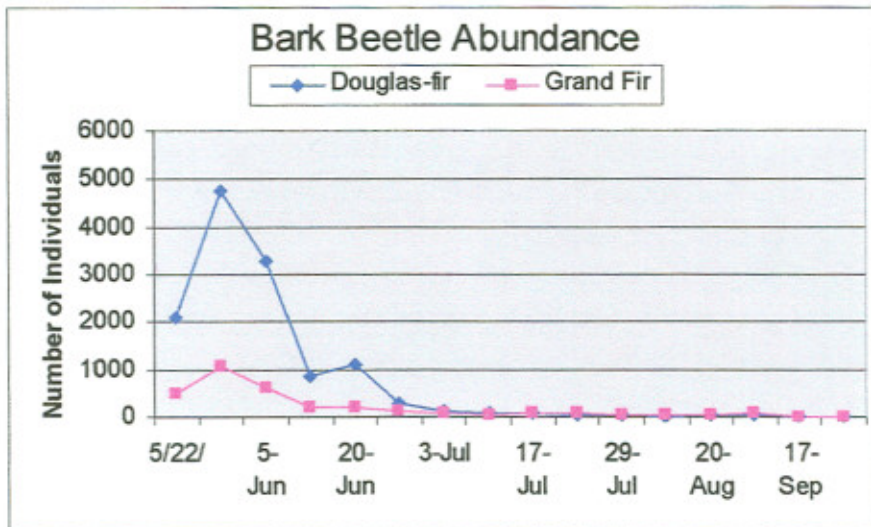
of beetles were also frequently captured and again, the temporal distribution of these beetles was similar throughout the summer between the two tree species (Figure 2).

In summary, there are distinct temporal patterns to the capture of the various beetle families. These patterns, coupled with other biological information should provide a mechanism for monitoring potential pest situations and a mechanism for optimizing the timing of snag creation for insect utilization of the snags. Insect utilization is important because the insects provide the food source for some of the desired wildlife.

**Table 1: The families of beetles and numbers of individual beetles captured at the artificially created high stumps throughout the summer of 2002.**

Beetle family	Douglas-fir	Grand fir
Cupedidae	12	1
Melandryidae	10	17
Histeridae	76	45
Mordellidae	102	80
Silphidae	2	0
Zopheridae	0	1
Staphylinidae	258	266
Oedomeridae	2	3
Scarabaeidae	18	13
Stenotrachelidae	5	2
Buprestidae	495	351
Meloidae	1	1
Elateridae	278	274
Salpingidae	521	136
Lycidae	1	0
Cerambycidae	356	323
Ptinidae	5	8
Curculionidae	1095	1106
Trogositidae	612	316
Platypodidae	10	9
Cleridae	174	132
Scolytidae	11521	2110
Melyridae	12	4
Nitidulidae	117	64
Cucujidae	11	14
Tenebrionidae	381	1337
Coccinellidae	39	43
Corylopidae	60	70
Other	677	791

**Figure 1: Bark beetles captured throughout the summer at traps placed adjacent to artificially created tree snags (high stumps) of 15 Douglas-fir and 15 grand fir.**



**Figure 2: Capture of four other beetle families throughout the summer at the same artificially created snags.**

