

**Four Notch Aerial SPB Hazard Rating**  
**By: Dr. Stephen Clarke, NFGT Forest Entomologist**  
**and Allen Smith, Texas Forest Service**  
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An area-wide southern pine beetle (SPB) hazard rating was completed for the Four Notch Forest Health Initiative project area. This large area hazard rating system was developed by the Texas Forest Service (Billings et al. 1985). Using aerial photographs, the pine regions of east Texas were divided into 18,000 acre grid blocks (5.74 x 4.87 miles). By discriminant analysis, an equation was developed to classify SPB hazard within the blocks. The factors used in the analysis were:

1. Host type – nonhost, young pine, pine host;
2. Percent pine coverage – 15-69%, 70% and above;
3. Percent pine closure – below 80%, 80% and above;
4. Landform – upland, ridge or sideslope, bottomland.

These factors were correlated with infestation data from 1973-1977 to develop the discriminant analysis equation. Using the equation, a block with a discriminant score of less than 0.42 was classified as low SPB hazard, 0.42 – 1.11 as moderate hazard, and a score greater than 1.11 was high hazard. The equation was validated by correlating the number of infestations from 1982-1984 with the ratings derived from aerial photography from 1980-1983.

In February and March 2003, color infrared aerial photographs were taken of the Four Notch FHI project area. These photos were scanned, digitized, and ortho-rectified. The discriminant analysis equation was applied to the entire project area, based on the data acquired from the photos from 59 30-acre plots systematically spaced throughout the site. The analysis returned a score of 1.81, indicating high SPB hazard. In 1983, the northern quarter of the project area had been classified as moderate hazard, with the remainder classified as high hazard. Overall, the Texas Forest Service indicates that current SPB hazard in and near the project area is similar or slightly higher than in 1983.

**Literature Cited**

R. F. Billings, C. M. Bryant, K. H. Wilson. 1985. Development, implementation, and validation of a large area hazard- and risk-rating system for southern pine beetle. USDA Forest Service, Southern For. Exp. Sta., Gen. Tech. Rep. SO-56, pp. 226-232.