

EVALUATION OF BLACK TURPENTINE BEETLE
INFESTATIONS ON THE HOMOCHITTO AND DESOTO NATIONAL FORESTS,
MISSISSIPPI

by

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ABSTRACT

The Homochitto and DeSoto National Forests were examined during October 1968 to evaluate the status of the black turpentine beetle, Dendroctonus terebrans (Oliv.). The purpose of this evaluation was to define the impact of the black turpentine beetle on the Mississippi Forests and to determine if chemical control measures against the beetle are still needed. Current findings expressed in terms of tree mortality and degree of attack to apparently undamaged trees cannot justify a continued spray program on either the Homochitto or DeSoto National Forest.

INTRODUCTION

An evaluation of black turpentine beetle infestations on the National Forests in Mississippi was made during October 21-24, 1968, by personnel from the Alexandria Office of the Division of Forest Pest Control, Pineville, Louisiana. Mr. Roy Ray, of the Forest Supervisor's Office, National Forests in Mississippi, together with respective personnel from the Bude, Homochitto, Black Creek, and Chickasawhay Ranger District of the Homochitto and DeSoto National Forests assisted in the collection of field data.

The purpose of the evaluation was to define the impact of the black turpentine beetle, *Dendroctonus terebrans* (Oliv.), on the National Forests in Mississippi and to determine if chemical control measures against the beetle should be continued.

Fresh cut stumps and infested standing trees were first sprayed on the Homochitto Forest in early 1954. Beetle infestations continued to increase through 1958 and 1960; by 1961, populations were reported at an all-time high on the Homochitto and considered a threat to residual stands (Cambre, 1961). Thereafter (1962-65), beetle activity was reported as "variable" with no alarming reports of extensive loss. Only in 1966 were black turpentine beetle populations reported "not as heavy as usual" (Overgaard, 1966); and in 1967, chemical control was terminated on upland sites following two consecutive years of relatively low turpentine beetle activity (Terry, 1967). Current findings, expressed in terms of tree mortality and degree of attack to apparently undamaged trees cannot justify a continued spraying program on the Homochitto National Forest.

Insecticides were first used on the DeSoto National Forest during 1957 when the black turpentine beetle was reportedly infesting 2000 acres of timber on the Black Creek District (Jones, 1961). Problem areas had primarily been associated with turpentine production areas and also with wet bottom lands. Until recently, infestation levels have apparently remained relatively constant since spraying started in 1957. However, Terry (1967) reported that of all Districts evaluated in Mississippi, the Black Creek District had the highest incidence of successful attacks and also had the most activity along skid trails and logging roads. Results from the current investigation did not show a high degree of tree mortality directly resulting from black turpentine beetle attacks. The rate of attack to apparently undamaged trees was relatively high, however, on the Chickasawhay and Black Creek Districts.

METHODS

The present evaluation was concerned with the Bude and Homochitto Districts, and the Black and Chickasawhay Districts of the Homochitto and the DeSoto National Forests respectively (figs. 1, 2, and 3).

The survey was conducted in a systematic manner by physical inspection of recently logged areas (cutting units) on each District; the cutting units in this case were either selective cuts or seed tree cuts. Ten sample plots were established on survey lines in each cutting unit. The sample plots were selected at five-chain intervals and were of variable size as determined by a wedge prism (B. A. Factor of 10). Trees within their respective plots were then examined for evidence of mechanical injury (fig. 4), incidence and degree of black turpentine beetle attacks, and also for the proportion of successful turpentine beetle attacks (fig. 6). In cases where a large number of attacks were observed on a single tree, a maximum of 10 attacks were examined to determine the proportion of successful attacks (fig. 5).

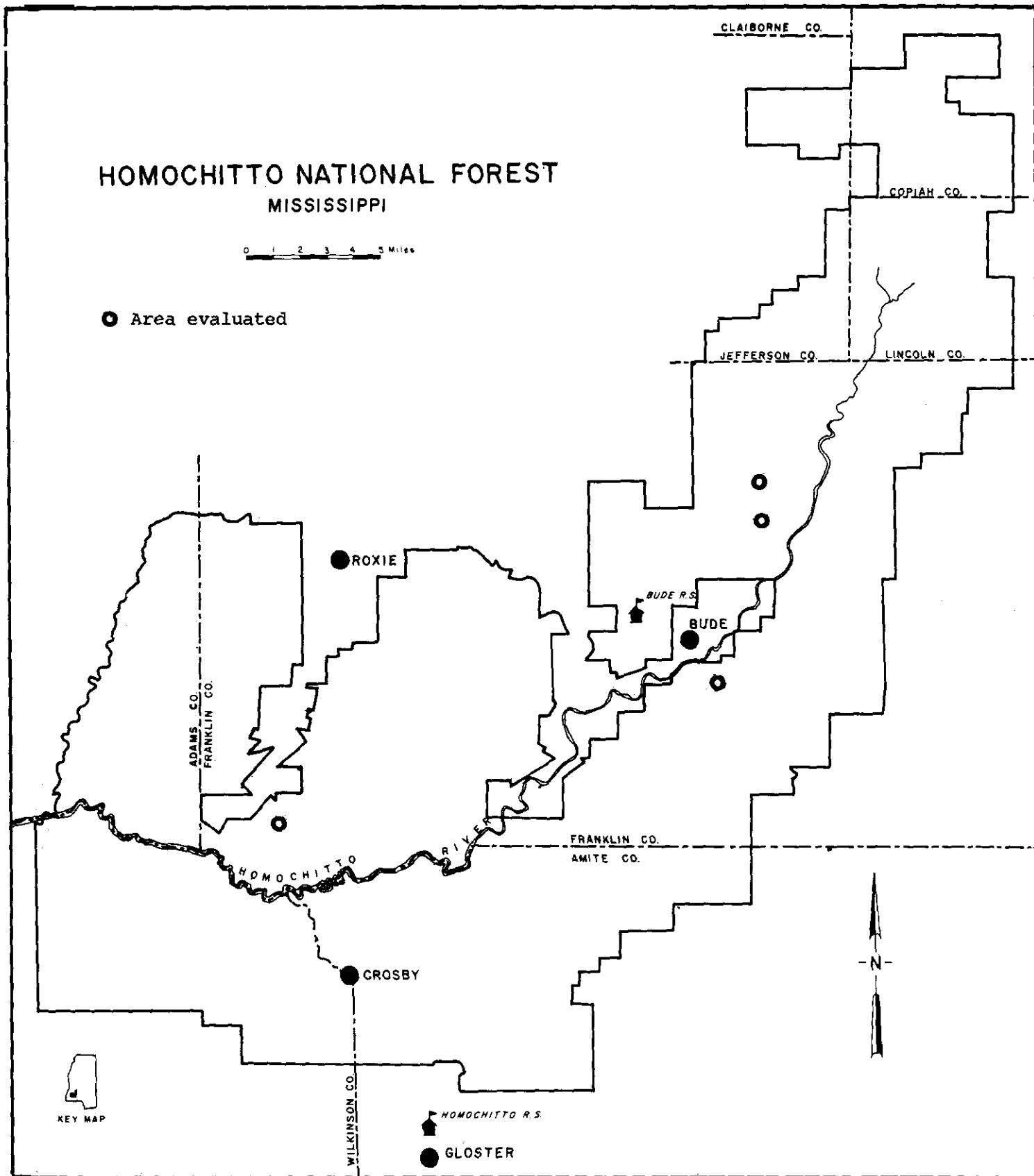


Fig. 1. Location of areas evaluated for black turpentine beetle infestations on the Bude and Homochitto Districts, Homochitto National Forest, Mississippi--October 1968.

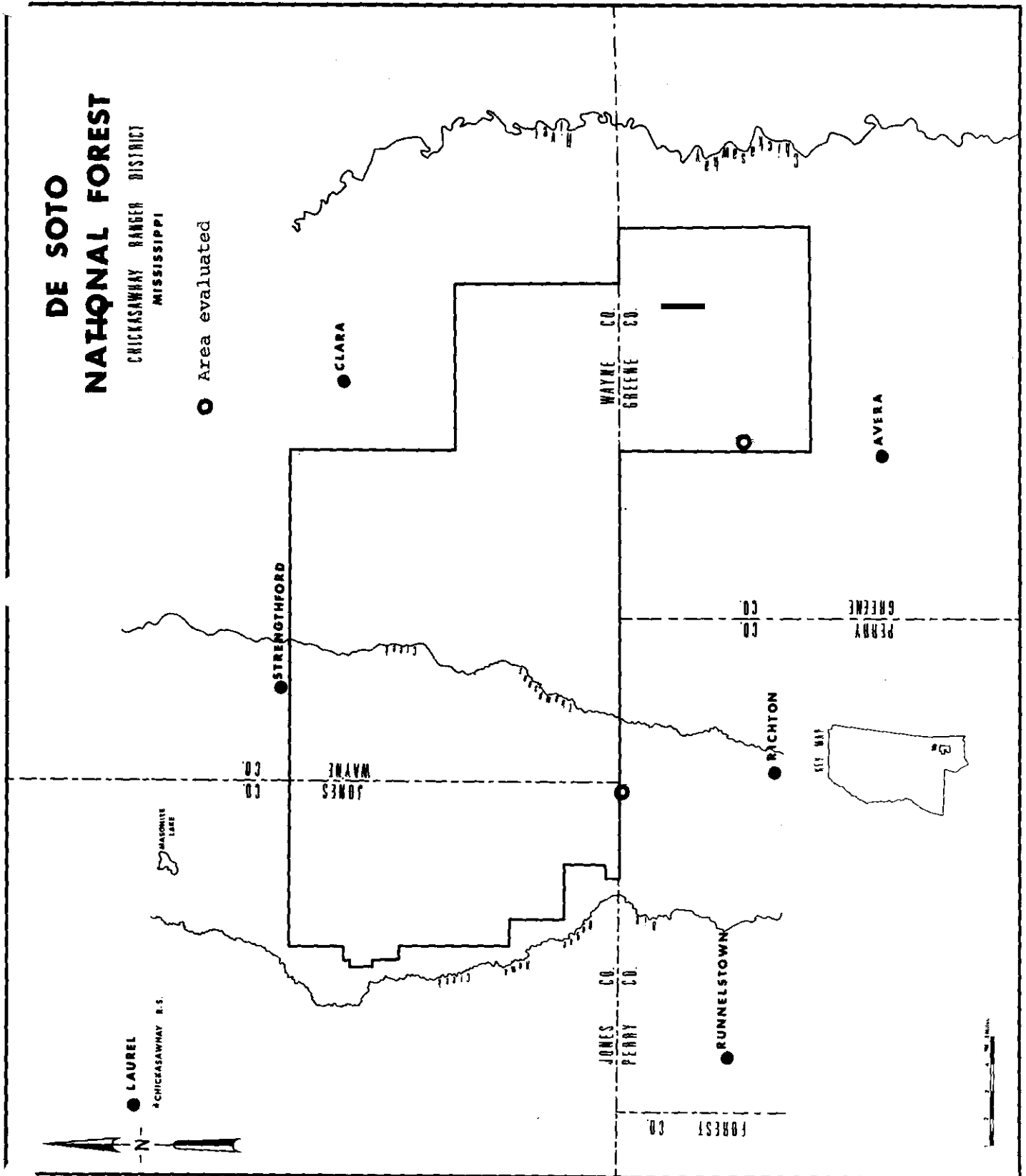


Fig. 2. Location of areas evaluated for black turpentine beetle infestations on the Chickasawhay District, DeSoto National Forest, Mississippi--October 1968.

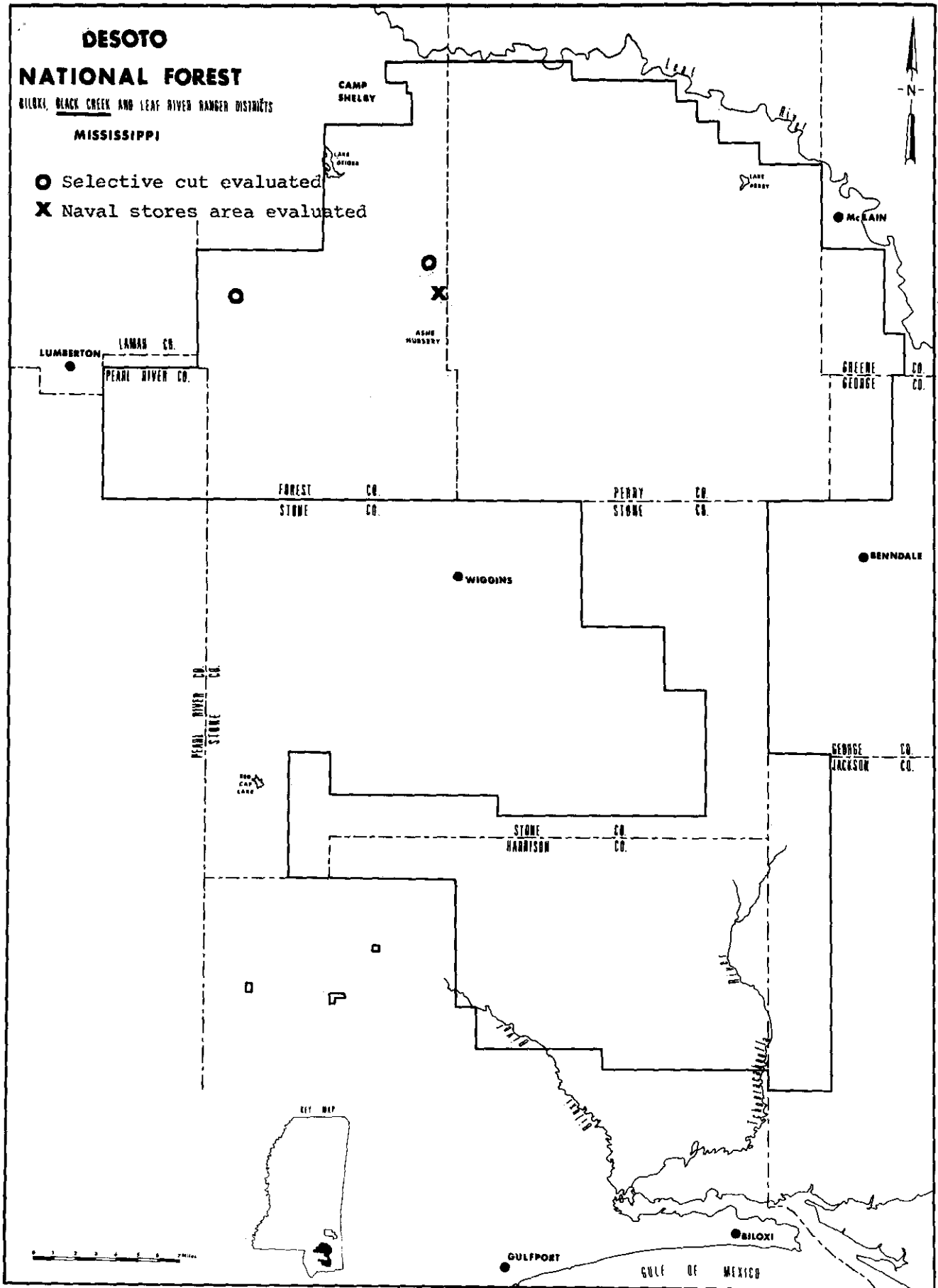


Fig. 3. Location of areas evaluated for black turpentine beetle infestations, Black Creek District, DeSoto National Forest Mississippi-October 1955

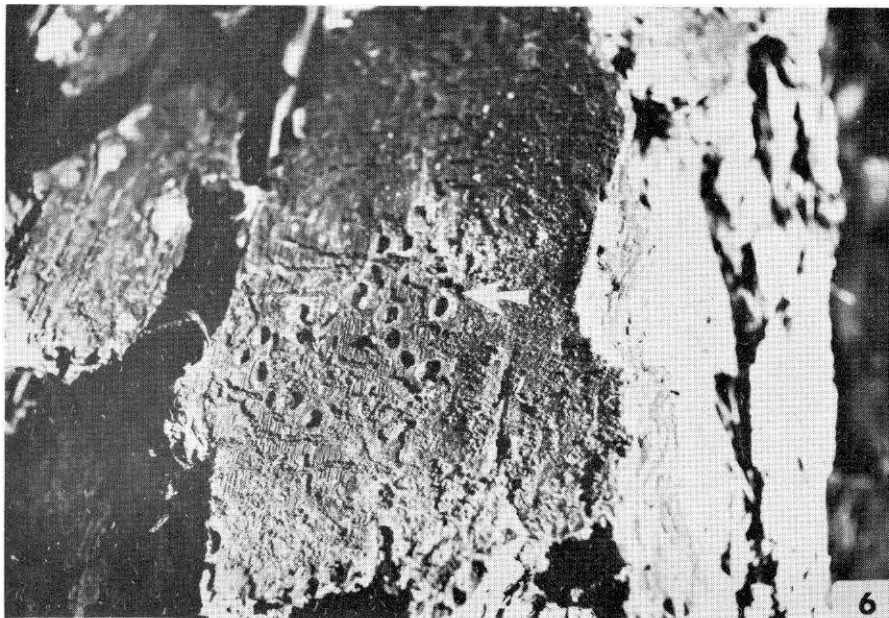
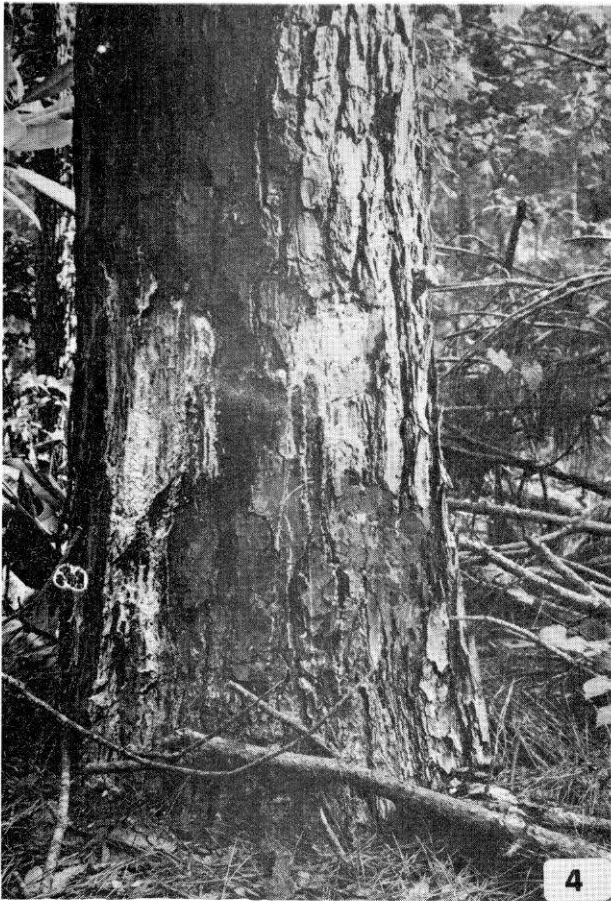


Fig. 4 Pine tree showing typical evidence of mechanical injury resulting from logging operations. Mississippi Nat. Forests. October 1968.

Fig. 5 Moderately heavy black turpentine beetle attack. A maximum of 10 attacks were examined in trees like this to determine the proportion of successful attacks. Mississippi National Forests. October 1968.

Fig. 6 Successful black turpentine beetle attack. Arrow points to one of several oval pupal cells which was excavated by a larva in the phloem and inner bark of this pine tree. Mississippi National Forests. October 1968.

A naval stores area on the Black Creek District was inspected in a similar fashion to the above. Additional information with respect to *D. terebrans* was also collected on all Districts by examining freshly cut stumps and by observing recently disturbed rights-of-way logging roads, and loading areas.

RESULTS

Survey results are compiled according to District and type of cutting unit, i.e., selective or seed tree cut (Table 1). In all, a total of 282 trees were examined. The rate of black turpentine beetle attack did not vary to a large degree between either District or Forest; of all trees examined on the Homochitto and DeSoto Forests, 16 percent and 18.8 percent respectively, showed signs of attack. On the other hand, the percent of trees with successful attacks was considerably higher on the Black Creek (6.6 percent) than on any other District (less than 3 percent).

The number of attacks per tree ranged from one attack to over 100 attacks, with a marked preference on the part of *D. terebrans* to attack weakened or damaged trees.

The incidence of beetle attack on apparently undamaged trees was considerably higher on the DeSoto National Forest than in seed tree cuttings on the Homochitto National Forest. In this connection, the rate of attack to apparently undamaged trees on the Homochitto was 2.7 percent of all trees, as compared to 10.1 percent on the DeSoto.

The Chickasawhay District had the highest percentage of apparently undamaged trees being attacked by *D. terebrans* (11.2 percent). However, a high incidence of fusiform rust, *Cronartium fusiforme* (A. and K.) was evidenced in the slash and loblolly pines on the Districts in the areas examined.

The Black Creek District also showed a high level of attack to undamaged trees (5.5 percent). The incidence of attacking black turpentine beetle was most evident along skid trails and also adjacent to loading areas. One loading area in particular, Compartment No. 298, was the center of the highest level of turpentine beetle infestation observed. The degree of logging damage on the Black Creek District (25 percent) was appreciably higher than on the Chickasawhay District (17 percent).

Tabulated results collected from a naval stores area on the Black Creek District are not included in this report. Nevertheless, observations showed a "moderate" level of infestation. Other than three trees apparently killed by *Ips* beetles following a lightning strike, no mortality could be attributed to the black turpentine beetle. However, two heavily attacked trees were also being invaded

Table 1. Intensity of black turpentine beetle infestations on the National Forests in Mississippi--October 1968.

Forest	District	Type of Cutting	No.	%	Trees Attacked (%)			%	%
			Trees Exam.	Trees Damaged	Dam.	Undam.	Total	Trees With Succ. Attacks	Attacks Successful
	Bude	Seed Tree	39	41.0	10.2	2.6	12.8	2.6	20.0
Homochitto									
	Homochitto	Seed Tree	36	41.7	16.6	2.8	19.4	2.8	11.8
Overall			75	41.3	13.3	2.7	16.0	2.7	13.6
	Black Creek	Selection	91	25.3	9.9	5.5	15.4	6.6	27.6
DeSoto									
	Chickasawhay	Selection	116	17.2	10.4	11.2	21.6	1.7	4.5
Overall			207	20.8	8.7	10.1	18.8	4.8	13.6

by the beetle *Platypus flavicornis* (F.), and although the trees were green, they could not be expected to survive the season.

DISCUSSION

A higher incidence of damage to residual trees resulted from logging operations on the Homochitto National Forest (41 percent) than on the DeSoto (21 percent). This difference is understandable and presumably due to the more destructive nature of logging in seed tree cuts.

Despite this difference in degree of logging damage on the two National Forests, the proportion of trees attacked by the black turpentine beetle was practically the same in the two areas. However, on the DeSoto National Forest, the higher incidence of successful attacks combined with the higher ratio of attack to apparently undamaged trees is possibly indicative of a more aggressive black turpentine beetle population.

Overall, the incidence of successful attacks was very low. In addition, no tree mortality was observed. Therefore, the continuation of chemical control is not recommended.

RECOMMENDATIONS

1. Chemical control operations directed against the black turpentine beetle should be terminated due to the low level of activity.
2. Whenever possible, clearcut units should be located in a manner which will permit direct skidding to an access road and thus avoid skidding through forest areas not yet scheduled for cutting. This should reduce unnecessary tree damage and black turpentine beetle infestations.
3. When it is not possible to skid directly to an access road, trees along skid trails which suffer severe root injury or skinning should be removed prior to closing out the timber sale.
4. Trees which suffer repeated root injury and severe bark skinning as a result of their proximity to logging roads should be removed.
5. Surveillance should be maintained in all cutting units; any unusual beetle activity should be reported to the Alexandria Office of the Division of Forest Pest Control, Pineville, Louisiana.
6. A re-evaluation of black turpentine beetle infestations on the Homochitto and DeSoto National Forests should be made by Forest Pest Control personnel during September-October 1969.

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