

RECENT DEVELOPMENTS AND NEEDS IN GAME AND GAME HABITAT RESEARCH IN CONNECTION WITH PINE SITE PREPARATION

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The 131 million acres of commercial forests in the Southeast devoted primarily to the production of timber, wood products, or fiber, also annually produce 38,000 to 40,000 big game and several million small game animals for southern sportsmen. Experiments with new methods of forest land management to produce greater yields of forest products are a normal outgrowth of the increasing demands for wood products.

This experimental, specialized management of areas so important also for the production of wildlife is of interest and immediate concern to wildlife conservationists and other natural resource managers. The concern stems from the fact that the use of modern techniques results in basic modifications of forest habitats, with potentially drastic, although difficult to predict, effects on wildlife populations.

Some 2 million acres of southern timber land are planted or direct-seeded annually to produce new timber crops. A large part of this area lies in the Southeast. By 1984 it is estimated that 18 million acres of outplanted pine forests will exist in the Southeast. This represents about 14 percent of the present commercial forest and a land area almost as large as South Carolina.

Before seed or seedlings are planted to produce the new forest, some type of preparation is generally necessary to fit the land's surface and soil for its newest production tasks. Site preparation may entail the use of mechanical or chemical means to remove existing unwanted understory cover and overstory vegetation. The use of fire to consume logging wastes and potentially competitive vegetation is a common practice. Many combinations of heavy equipment are used to prepare the land for direct seeding or seedling planting, depending on location and available equipment. Since site preparation for planting is a relatively new technique, it is not known how successful the planted slash pine may be on varying sites with different pre- and post-treatment plant complexes and densities. Pulp and paper companies of the Southeast have requested the assistance of research personnel of the Southeastern Forest Experiment Station, the Georgia Forestry Research Council, and the Georgia Forestry Commission to help develop and improve techniques of site preparation and stand establishment. The Lake City Research Center, of the Southeastern Forest Experiment Station, Lake City, Florida, started studies in the spring of 1959 to collect and analyze information dealing with the planting of slash pine on prepared flatwood sites in southeast Georgia and north Florida. Results will be generally applicable throughout the lower Coastal Plains.

The Forest Game Research Committee of the Southeastern Section of The Wildlife Society set about to establish a supplemental study to determine the effect of site preparation on the density and composition of the habitat in the flatwoods in cooperation with the Southeastern Forest Experiment Station. This study emphasizes elements of floristic composition that affect deer, quail, and turkey in the gallberry and sawpalmetto types. Initially, at least, the same field plots established for the parent Lake City study will be used for wildlife habitat evaluation. Information will be recorded on 20 shrubs and trees, five forbs, four grasses, and three miscellaneous food plants recognized as important food or cover plants for deer, turkey, quail, and other wildlife species. Stoddard (1957) has shown the importance of such species as lespedezas, paspalum, and runner oak for quail habitat in the flatwoods. Work done by Stoddard and others on the wild turkey has indicated the importance of lespedezas, oak, and partridge pea on turkey habitat. Deer make use of a variety of plants. The more important ones that may be affected by site preparation practices include fetterbush, blackberry, titi, green brier,

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and oaks. Thus, over a period of years, this cooperative study should reflect the fate of important wildlife plants and indicate potential general effects that may accrue in wildlife population changes. Representatives of the Florida and Georgia Game Department; the University of Florida, Forestry and Wildlife Department; the Southeastern Forest Experiment Station, Division of Range, Wildlife, and Watershed Management; and the Bureau of Sport Fisheries and Wildlife met with Committee members at the Lake City Research Center in July 1959. The two Game Departments agreed to furnish manpower to collect needed vegetational data.

The effect changes in food and cover condition may have on present and future wildlife populations inhabiting the areas undergoing treatment is being measured. The Bureau of Sport Fisheries and Wildlife, cooperating with the U. S. Forest Service, is responsible for this phase of the research. The senior author, stationed at the Southeastern Forest Experiment Station, is conducting and coordinating field work in this area. Dr. Stephen Beckwith, Associate Professor of Wildlife, School of Forestry, University of Florida as a cooperator, has established a project to appraise the effects of site preparation on certain present and future wildlife populations in the north Florida flatwoods and the sandhill type of central Florida. Additional study areas have been established by the senior author to appraise results of site preparation on areas in southern Georgia.

It has been demonstrated that changes in habitat markedly influence populations in many areas. Deer numbers and condition have been affected by forest management procedures as have wild turkey populations. Quail numbers have benefitted from the use of fire to remove heavy roughs and to encourage the production of native legumes. It may be many years before we can determine the full effects of site preparation methods.

Present wildlife populations are generally low in flatwoods areas. Many of the current techniques employed to determine wildlife populations do not adequately measure small increases or decreases resulting from habitat changes. Improved techniques, such as the system of deer track counts, are being developed that may implement these studies. At a minimum, population trend figures are required that will supplement information from the vegetative studies to permit appraisal of the various land management systems and patterns. Techniques used to determine wildlife population levels will include use of imprint plots, bait and scent post stations, live trapping and marking, whistling quail call stations, dove call stations, and bird dog census strips.

For the purpose of comparison, population fluctuations of wildlife species will be recorded in established "control areas" where possible. Certain other areas, where the entire land type is converted, require a before-and-after evaluation technique.

Areas converted by site preparation vary greatly in size and cover composition. In many areas most of the existing type will be completely converted by site preparation, while in others the conversion is proceeding in such a manner that blocks may remain untreated for many years.

One of the most important objectives of the studies is to determine the amounts and quality of food for wildlife that will be produced in the understory. The usual crop rotation period for slash pine pulpwood is between 30 and 35 years. As long as the site preparation areas are small in size and new areas are created annually, wildlife may benefit from the program. However, some dangers exist because in pine stands of 12 to 15 years much of the understory and ground cover will be shaded out. Observations of slash pine stands on the Olustee Experimental Forest and nearby pulp and paper company lands revealed overhead canopy shading effect plus competition from wiregrass (*Aristida* sp.), and carpetgrass (*Axonopus affinis*) had practically eliminated wildlife food plants from the understory. This suggests that unless periodic winter or spring burning is employed to reduce ground fuel, wildlife foods will be largely crowded out. Not all of the areas will be treated by site preparation methods. The bays, swamps, and fingers of water present in some areas will prevent the use of heavy equipment. In such areas, hardwoods and some pines will provide food and cover. Turkeys and deer will undoubtedly occupy these areas, but they will probably be more vulnerable there to poaching and hunting. It is anticipated that the effects of

site preparation may be most noticeable on wild turkeys because of their more specific habitat requirements; but there is, as noted earlier, concern also for quail and deer.

The creation of vast conifer plantings invites the buildup of insects and tree diseases already present in the mixed hardwood pine forests in a lesser degree. Eradication of the hardwoods may destroy the habitat of birds and beneficial insects that prey on the destructive insects. Fusiform rust, pitch canker fungus, *Fomes annosus* and other tree diseases may find ideal conditions existing and become of epidemic proportions.

Gross changes are constantly occurring in our national economy as a result of public need and technological advance, and it appears highly important that those of us in wildlife conservation encourage our friends in related resource fields to examine thoroughly the means that can be used to meet market needs and public demand for various land products, including wildlife.

Karl R. Bendetsen (1960) reporting at the Annual Southern Pulpwood Conservation Association meeting, June 13, 1960, Atlanta, Georgia, stated, "During the period 1920-1958, softwood pulpwood consumption increased from 5.2 million cords to 23.6 million cords. Two-thirds of this was southern pine. Hardwood consumption increased from 700,000 cords to 6.2 million cords during the same period." Total softwood consumption increased 8.8 times for the same period. Philip A. Briegleb (1960), at the same meeting, predicted that the pulpwood requirements of softwoods would increase 150 percent by 1975 and hardwoods by 270 percent. With the advent of chipping pulpwood in the woods, smaller and less desirable hardwood species can be used. This may encourage the private fiber producers to take a closer look to the conversion of hardwood sites to pure pine forests.

There is no question of the need to get the most from each acre from the standpoint of any resource—water, forest, wildlife. The question is how to get the most of all three simultaneously without detriment to any resource. It is not a matter of questioning the merits of site preparation, but rather one of encouraging research that may lead to modifications in the technique or the way it is applied so that no resource will suffer.

The studies reported here merely scratch the surface of the research job required if satisfactory recommendations as to ways of producing wildlife along with timber are to be made. With several thousand acres of land in flatwoods country and other forest types being prepared for pine planting or seeding, it is important that these studies be complemented with other similar studies to determine the full effect of site preparation techniques on wildlife.

Our expanding population, shorter working hours, and rapid means of transportation are placing a greater burden on the game producing habitat, and the demands will increase in the years to come. We cannot afford to lose any potential wildlife habitat where multiple-use management can secure it. We shall be forced to use what we have to a greater degree. The 1960 National Survey of Fishing and Hunting reports 6,805,000 hunters and fishermen from Virginia to Texas used the South and Southeast field, forests, and streams to satisfy their out-of-door recreational needs. They, too, have an important stake in what is happening in the forest lands of the South.

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