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Vexar seedling protectors were tested for preventing nutria damage to baldcypress (Taxodium distichum (L.) Rich) *seedlings planted in Louisiana swamp forests. Five areas were planted with 1-year-old baldcypress seedlings. Half the seedlings in each area were protected with Vexar seedling protectors. The protectors slowed down the rate of destruction in some areas, but after 3 months, 85% of the guarded seedlings and 87% of the unguarded seedlings were destroyed.* Tree Planters' Notes 38(3):26-29; 1987.

Recent articles by Sternitzke (15) and Williston et al. (16) indicate that there are large reserves of baldcypress (*Taxodium distichum* (L.) Rich. and pondcypress (T. *distichum* var. *nutans* (Ait.) Sweet) in the southeastern United States. With proper management, the swamplands of the south may once again supply the United States with this valuable wood product (15, 16).

Unfortunately, very little is known about the silvicultural practices best suited for cypress management. One area of particular concern is regeneration of this species in its natural environment. Baldcypress is very exacting in its requirements for successful germination and seedling establishment, including an abundant supply of moisture and overhead light. However, seedlings must reach sufficient height to stay above floodwater (13) because they will die after total submergence for even a short length of time during the growing season (9, 12). As a result of the erratic flooding patterns found in most swamp areas, natural regeneration of baldcypress is generally unreliable (8). One way to ensure the proper stocking of baldcypress is to plant seedlings that are already tall enough to be above floodwaters (5).

Special attention needs to be focused on the role of the nutria (*Myocastor coypu*), an aquatic rodent, in preventing baldcypress regeneration. Nutria often clip or uproot newly planted cypress seedlings before the root systems are fully established, thus destroying the whole seedling. In the 1960's, the Soil Conservation Service found that as much as 90% of their planted baldcypress seedlings were damaged, prompting them to recommend the cessation of baldcypress planting until better nutria control measures were found (4).

Several alternatives have been proposed to prevent nutria from eating newly planted baldcypress seedlings. Eradicating nutria is one alternative to the problem, but this method is expensive and requires constant vigilance to keep the animal population in an area under control. In pilot studies conducted by the authors, fencing kept nutria out of planted areas; but workers in other parts of the country have shown fencing to be costly and esthetically displeasing (11, 14). It is often easier to protect seedlings by using a repellant rather than controlling the animal itself (3, 4). However, chemical repellants are usually limited by their short-term persistence (1), and research into nutria repellents is non-existent.

Vexar plastic seedling protectors have provided excellent protection for conifer specifies from predation by animals in the northwestern United States. These relatively inexpensive, lightweight, photodegradable polypropylene plastic tubes (fig. 1) have been tested and used to prevent damage by deer, rabbits, elk, and pocket gophers (1, 2, 6, 10). Anthony et al. (2) reported that even though pocket gophers could easily chew through the Vexar plastic mesh, the protectors nevertheless were highly effective in reducing seedling losses.

The objective of this study was to test the effectiveness of Vexar tubes in protecting planted baldcypress seedlings from nutria.

Table 1—*Characteristics of the baldcypress-tupelo stands and survival of baldcypress seedlings 3 months after underplanting*

Site	Overstory		No. seedlings planted	% Survival	
	No. trees/ha	Basal area (m^2/ha)		Guarded[1]	Unguarded
1	397	20.4	600	8	10
2	442	26.6	400	16	5
3	442	44.2	300	96	87
4	542	25.4	150	0	0
5	385	23.1	150	0	0

[1]Guarded by Vexar plastic mesh seedling protector.

Methods

Baldcypress seedlings were underplanted in five flooded stands typical of baldcypress-tupelo stands in southeastern Louisiana. Characteristics of the overstory trees are listed in table 1. Sites 1 to 4 had been logged 1 year before planting and are normally free of standing water only during the late summer months. Site 5 has been permanently flooded for nearly 30 years. It has not been logged but much of the overstory has died (7). All test sites had standing water on them at the time of planting in February-early March 1985 (average water level 45 ± 10 cm). One-year-old barerooted baldcypress seedlings with their tap roots pruned to 20 cm and their lateral roots pruned to 3 cm were planted by holding the seedling at the root collar and inserting it into the soft swamp sediment. The seedlings averaged 70 ± 5 cm in height and 10 ± 1 mm in diameter at the root collar. Fifty to 100 seedlings were planted in each of three to six 0.1-ha plots established on each of the five sites.

Because nutria were known to exist in the study areas, half the seedlings were enclosed in 3.8-cm diameter by 24-strand Vexar photodegradable seedling protectors. The protectors were wired to the ground with two 45-cm wire stakes. Seedling survival was monitored monthly for 3 consecutive months and at the end of the ninth month.

Results and Discussion

Nutria damage to the seedlings was quick and severe in most cases. After 3 months, 86% of the seedlings had been clipped, uprooted, and destroyed (table 1). Nutria seemed to have very little trouble getting into the Vexar tubes. It appeared that they chewed a hole through the plastic netting at water level, clipped the seedling, and then pulled the tap root through the hole (fig. 1). In nearly every case, the stem of the seedling was left in the tube or adjacent to the tube. Rarely was anything except the bark of the tap root and root collar eaten.

In site 1, four plots were planted on March 2. Three days later when we returned to finish planting two additional plots, 88% of the previously planted seedlings had been destroyed. All seedlings planted on this site were destroyed by the end of the month. In site 2, all of the unguarded seedlings were destroyed during the first month after planting, and the guarded seedlings were destroyed during the second month of the study. In sites 4 and 5, nutria destroyed all of the seedlings within 2 months.

In site 3, the pattern was different from the other plots. Of the 6 plots planted in this area, 2 were destroyed except for 3 unguarded seedlings. In the other 4 plots, only 4 guarded seedlings and 12 unguarded seedlings were eaten after 9 months. The only observed difference among the sites was that there were fewer resting and feeding mounds in the relatively untouched plots (only one mound in the four plots) than in the heavily damaged sites (eight mounds per plot). Assuming that mounds are an indication of the nutria popu-

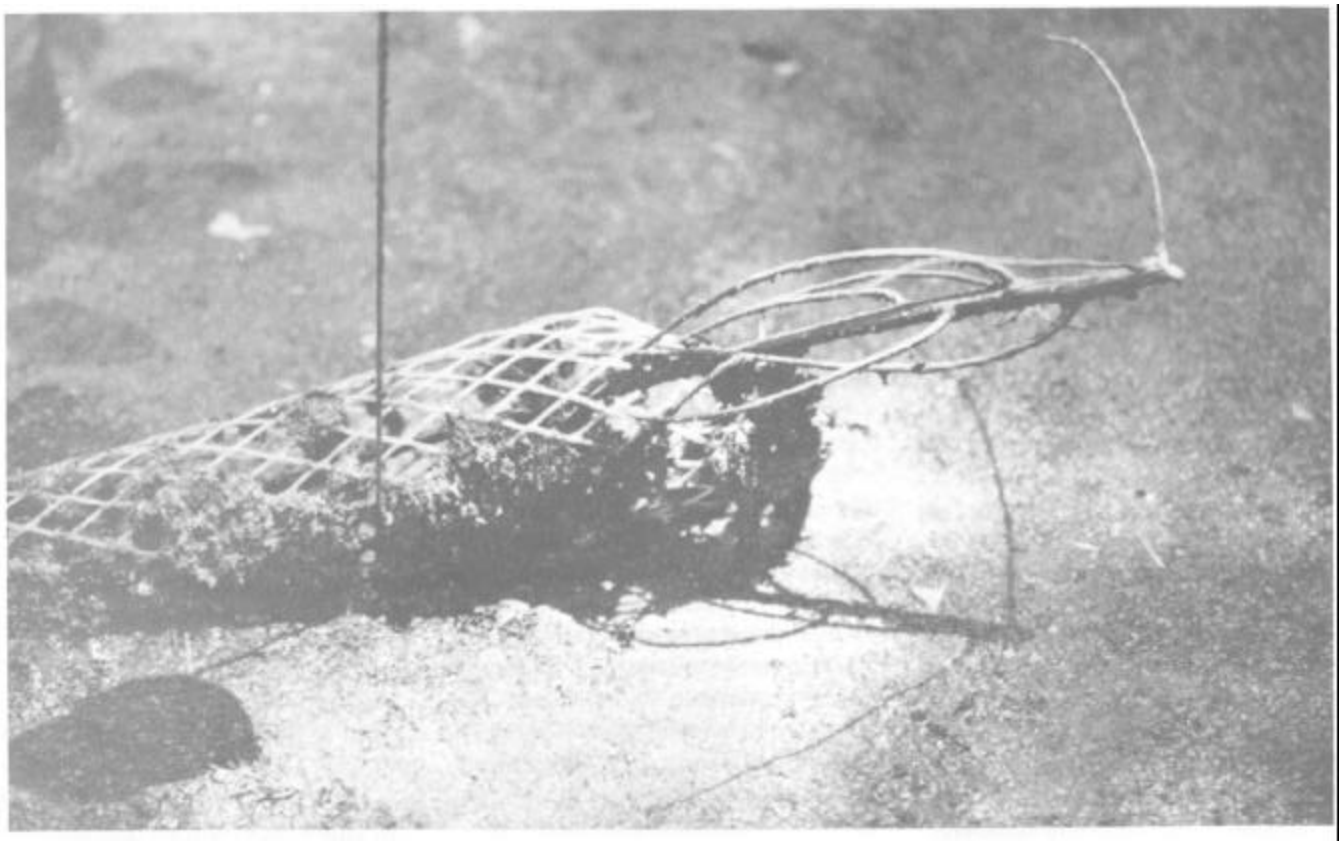

Figure 1—*Nutria-damaged baldcypress seedling enclosed in a Vexar plastic protector.*

lation in a given area, it appears that adequate seedling survival is dependent on the number of nutria in close proximity to the planted areas. However, Vexar seedling protectors provided little protection against nutria. If artificial regeneration of baldcypress is expected to succeed in areas densely populated with nutria, some other method of protection needs to be devised.

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