floor. Only when the surface peat is smoldering, or when groves of trees explode into flaming torches or topple from having their ground support of peat charred, are firefighters able to pinpoint and smother the flames. Meanwhile they must stand by helplessly, unsure of where to direct their efforts, awaiting rain to extinguish the deep-burning fires.

Such are the possibilities facing the Okefenokee Swamp, a national wildlife refuge in southern Georgia, now reaching the end of what appears to be a 20 to 30 year drought and fire cycle. Exceptionally scanty rain is bringing the swamp to the drought conditions that preceded devastating wildfires in the 1840s, 1880s, 1930, and mid-1950s. "The water is down two feet or more, the lowest it's been since '54 and '55," says Okefenokee swamp guide Clay Purvis, "and that's when almost the whole swamp burned, burned for months. Everyone says it will happen again."

Peat is the compacted decaying layers of plant material that blanket the swamp floor and continually accumulate, building higher towards the water surface as plants die and settle to the bottom. A flammable material used for fuel in some European countries, peat covers virtually the entire sandy bottom of the Okefenokee, in some spots to a depth of 20 feet.

As a drought increases in severity and the waters recede, the areas of exposed dried peat expand and deepen. Fire, usually ignited by lightning, can burn and creep along ten feet underground, gouging out large pockets and holes as it progresses. Peat often smolders for weeks, even when it rains. Conflagrations can begin anew if dry weather then returns, scorching untouched areas or reburning others. Bald cypresses, the Okefenokee's dominant trees, usually survive the slow ground fires, unless high winds force the flames to "crown" into the treetops or if flames severely char the peat-bound roots.

Regardless of their devastating appearances, past fires helped to create and maintain the Okefenokee's "swampscapes." The "prairies," or marshlands, rely on fire to remove compacted, built-up peat that provides a firm surface for invading woody plants. If the swamp went too long without burning, the prairies could become densely forested with bald cypresses and black gums. Bays and boat trails would be filled in, and the entire swamp would slowly change to woodlands. The Okefenokee's prairies, as with prairies in other habitats, are considered by many to be a fire climax, preserved by burnings extending back as far as the Pleistocene era, when the swamp's deep-lying charcoal deposits were probably laid down.

Corings taken throughout the swamp indicate that fires often burned as much as six feet into the peat beds in the last 130 years. Fires in 1932 and 1954-55 burned the beds along the swamp's western edge so harshly that when the area refilled with water, the deep peat burns eroded and the flow of the Suwannee River increased to the point where it threatened to drain the swamp. Peat and lush aquatic vegetation normally act as a sponge, soaking up rain in the wet season and slowly releasing it under the summer sun. However, this life-giving capability is lost for a period once the peat is burned.

Nearly four-fifths of the Okefenokee's 680 square miles and some 142,000 acres of surrounding uplands flamed in the 1954 and 1955 fires. With fear of fire running rampant, the federal government undertook a damming project to keep water levels high enough to prevent extended fires in the future. A large sill was built from dredged mud near where the Suwannee River runs out of the swamp's southwestern edge. The sill slows water drainage since the Okefenokee's rain-supplied water flow in a generally southwesterly direction. The sill is crucial in this respect, for the swamp has little groundwater on which to rely during dry spells.

The results of building the sill are mixed; if the Okefenokee's water levels are low now, they would probably be disastrously low without the sill. Yet the decision to stamp out fire in the Okefenokee was equally weighty. Abundant water, coupled with fire prevention tactics, might in the long run threaten prairie maintenance. It will allow peat to build up sufficiently and provide firmer surfaces capable of supporting shrubs and trees. Natural landscape changes promoted by fire are impeded without it; for example, peat holes carved by deep-burning fires ordinarily become new gator holes, lakes, and even prairies when the seasonal flood waters return.

So far, wildlife in Okefenokee are faring quite well. Receding waters are forcing amphibians, fish, and water birds into the remaining lakes and large "gator pools" cleared by breeding and feeding alligators, but food is still plentiful. Should drought conditions worsen, however, aquatic birds are apt to leave for wetter areas, amphibians and small reptiles might hole up and wait out the drought, while small animals like raccoons and opossums could migrate out of the swamp.

The alligator population, up to 22,000 in 1975 from 11,000 in 1970, is having an easy time in feeding, as other wildlife concentrate around the remaining pools and lakes. The alligators too are beginning to congregate more than usual, since in normal times they remain dispersed throughout the Okefenokee. Males normally retain their own territories, and forced congregation is causing them to fight more, according to Purvis. Swamp officials agree that most alligators will survive a fire by running from it and submerging into the deeper pools and holes.

The Okefenokee's eastern prairies are a major year-round habitat for the endangered Florida sandhill crane, whose existence would be threatened if fire were kept from the prairies so long that woody vegetation could establish itself. Some fear that alterations of the swamp's natural cycles could point this magnificent bird down the same path as the highly endangered ivory-billed woodpecker, one of whose last refuges was the Okefenokee Swamp.—Julie Abramson, *Conservation News*

Back to the Road with Old Tires

Each year an estimated 200 million tires are discarded in the United States, creating serious disposal problems. In an effort to recycle rubber tires, the Tennessee Valley Authority (TVA) and the Federal Highway Administration (FHA) recently concluded a 2½-year test project using discarded rubber tires as part of a paving mixture for roads to remedy highway cracking, a common maintenance problem. The mixture of reclaimed rubber, asphalt, and limestone chips was applied to a section of road in TVA's outdoor center in Kentucky, Land Between the Lakes. A second section was paved with conventional asphalt. Test results showed the asphalt pavement had cracked, while the pavement covered with the new seal-coat did not. Since costs of processing and spreading the seal-coat are estimated to be 45 percent higher than the regular asphalt mix, the FHA recommends the rubber tire mixture be used only to resurface roads suffering from "fatigue" or other extensive cracking.