

Searches for Ivory-billed Woodpecker (*Campephilus principalis*) in the Apalachicola River basin of Florida in 2003

Timothy Spahr

Harvard-Smithsonian

Center for Astrophysics

60 Garden Street

Cambridge, Massachusetts 02138

(email: tspahr@cfa.harvard.edu)

ABSTRACT

This paper summarizes searches for evidence of Ivory-billed Woodpecker (*Campephilus principalis*) in the western Florida counties of Gulf, Liberty, Wakulla, Franklin, and Calhoun, particularly in larger tracts of older-growth bottomland forest within the Apalachicola National Forest, Apalachicola River Wildlife and Environmental Area, and Apalachicola

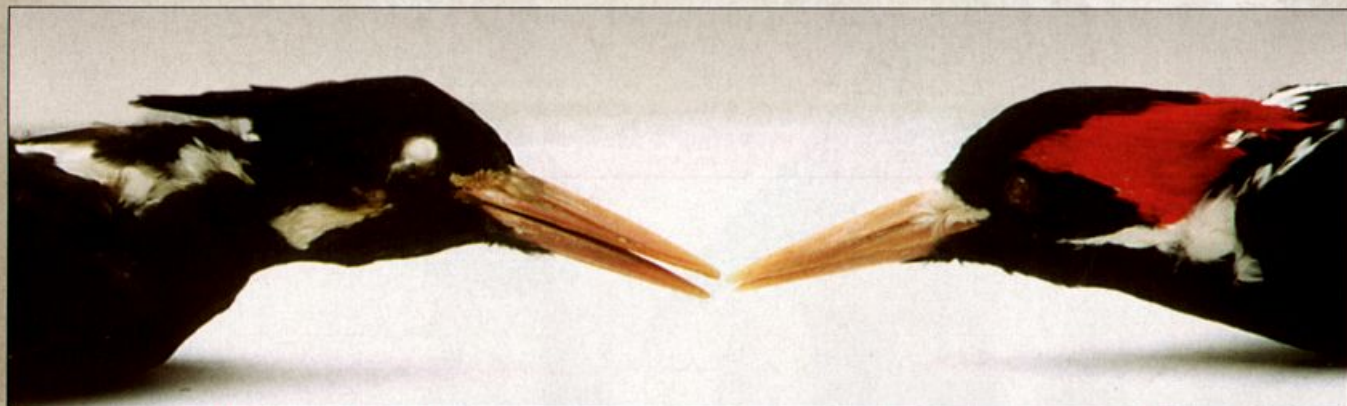
Wildlife Management Area. Twenty-five person-days were spent in late winter 2003 in forested habitats that were identified as having potential for this species, chiefly in hammock or bottomland areas, although five days were spent in pinewoods. No certain evidence of Ivory-billed Woodpeckers was obtained, but the habitat appeared to hold potential, with an abundance of large trees, dead and dying trees, and Pileated Woodpeckers (*Dryocopus pileatus*).

Background and effort

From 13 January through 3 March 2003, 25 full person-days were spent by myself, sometimes accompanied by Greg Spahr or Jim Fitzpatrick, in forested habitats that were identified as having potential for Ivory-billed Woodpecker (*Campephilus principalis*), chiefly in hammock or bottomland areas but also in pinewoods in the Apalachicola drainage and vicinity in the Florida panhandle. Search activity gener-

ally consisted of arriving at specific areas in the morning to listen for woodpecker activity for the first hour or so after sunrise. After this, we walked transects, looking and listening for evidence of large woodpeckers, specifically large roost holes and scaled trees, and counting Pileated Woodpeckers (*Dryocopus pileatus*). While most of the time was spent in the bottomland habitats, parts of five days were spent investigating the more upland pine forests. Two days were spent canoeing the Apalachicola River and Chipola River, evaluating habitat and looking and listening for large woodpeckers.

The areas visited were selected primarily for historical reasons. Ivory-billed Woodpeckers continued to be reported from the Apalachicola River basin well after the species had ceased to be reported from other parts of the species' range. Sight reports of the species that we feel simply cannot be discounted (but for which we know of no



Ivory-billed Woodpeckers, male (right) and female; specimens in the collections of the United States National Museum. Photograph by Greg Spahr.

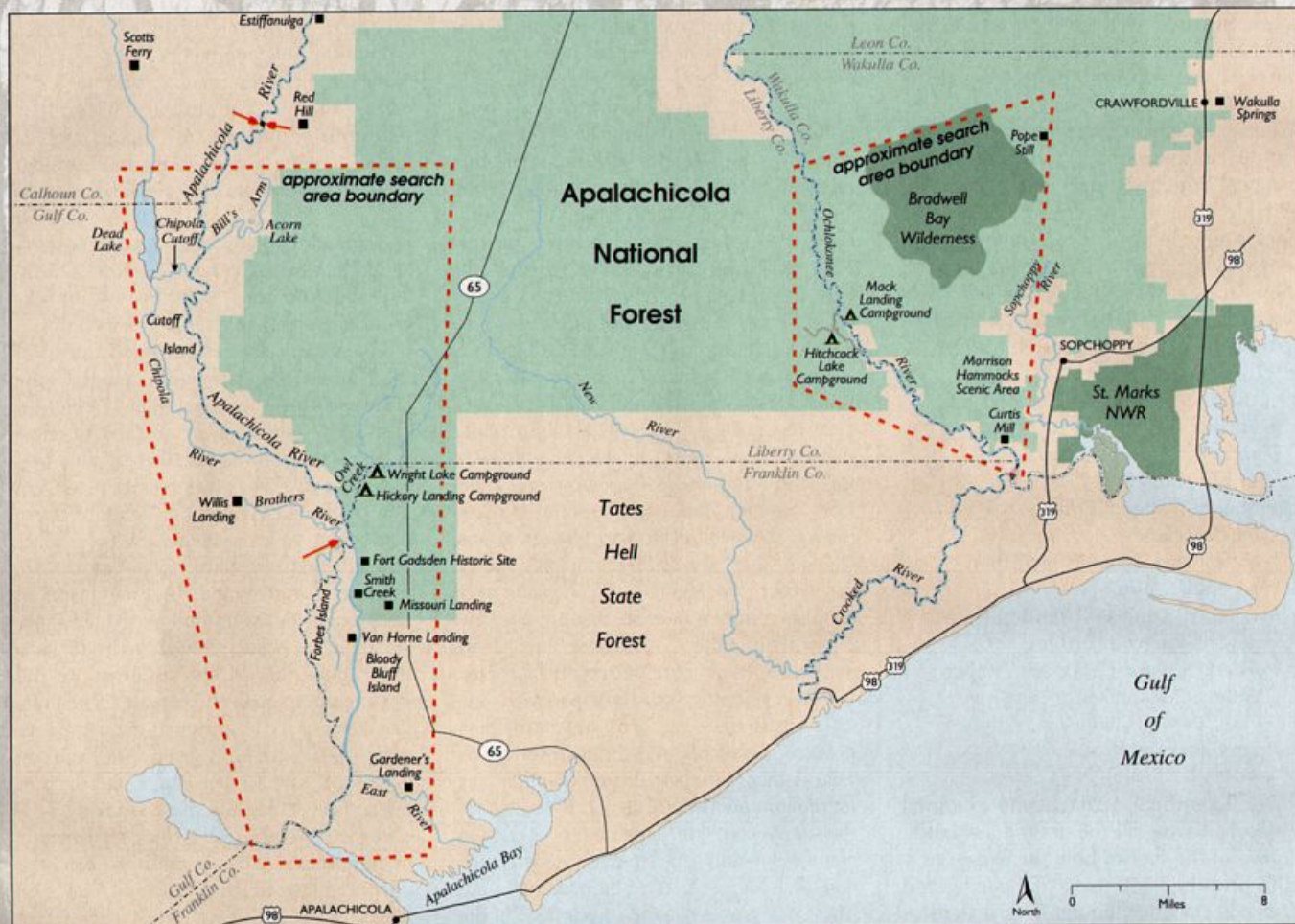


Figure 1. Areas searched on foot, by car, and by canoe in the Apalachicola River basin and adjacent areas of western Florida in 2003. The shaded areas were explored piecemeal, as road and river access permitted. Single arrow on the Brothers River and double arrows west of Red Hill indicate approximate locations of Ivory-billed Woodpeckers reported by local people in recent years. Map by Virginia Maynard.

corroborative photographs, recordings, or other physical evidence) were made at multiple locations in the 1930s through the early 1950s, including: at least two birds reported by George Van Hyning somewhere in the "Wakulla Resettlement Project" in 1936–1937, a vast area that is now largely designated Apalachicola National Forest (Tanner 1942); a nesting pair found by a local guide known as Kelso and reported by Whitney Eastman and others at Scotts Ferry, Calhoun County, along the Chipola River from March 1949 through at least early 1951 (Finlay 1950, Crompton 1950, Eastman 1958, Stevenson and Anderson 1994); one reported by Alexander Sprunt, Jr. in early March 1952 in the same general area (Cokinos 2000); and one seen in flight across Route 363 between St. Marks and Wakulla [Station], Wakulla County by Sam Grimes and Roy Hallman on 10 July 1952 (Stevenson and Anderson 1994, Jackson 2002). Between 1953 and 2002, there have been eight brief searches in this area for Ivory-billeds of which I am aware: one in

1967 (Sykes 1967, in Jackson 2004); four between 1970 and 1975 by Lucy and Bob Duncan; and three in 1987–1988 (Jackson 2004). None of these searches produced a report of the species.

Four post-1952 reports of Ivory-billed Woodpecker in Florida come from widely separated areas: Jefferson County (1959; one bird 2.6 km west of the Aucilla River, reported by William Rhein; Jackson 2002); Citrus County (9 April 1955; a pair 12.8 km south of Homosassa Springs reported by John K. Terres; Jackson 2002); west of Sebring, Highlands County (11 different dates 1967–1969; two birds on a private ranch, reported by H. Norton Agey, George Heinzmann, and party; Agey and Heinzmann 1971a, 1971b; Dennis 1979; Stevenson and Anderson 1994); and Martin County (30 April 1985; one male at Jonathan Dickinson State Park, watched for 15 minutes at very close range; reported by Dennis G. Garratt; Jackson 2004). A sight report in Okaloosa County (28 August 1966; a pair reportedly observed

scaling dead pine trees for 16 minutes near the margins of Eglin Air Force Base, reported by Bedford P. Brown, Jr., and Jeffrey R. Sanders; Dennis 1979) remains unsupported. Specific data that include date and location are not available for several other word-of-mouth Florida sightings (apparently in the counties of Collier and Polk) mentioned in Jackson (2004). Specific data on a pair said to be on a private ranch in central Florida in 1974 have never been published; the late Hal Scott and the late Henry M. Stevenson, who knew the location, did not discuss it openly. As is the case elsewhere, all sight reports of the species from Florida have been regarded with appropriate skepticism by the ornithological community.

In addition to the obvious criterion of a prospective search site's proximity to past sight reports, we considered the size, type, and age of forest parcels; if evidence of extensive recent tree mortality was found, whether owing to insect infestations, wind throw, or fires, we privileged such areas in

particular. Public, protected lands were chosen largely for the ease of obtaining permission to them; however, in many southern states, over half the forested landscape is in private ownership. (For the purposes of this paper, a "protected area" is defined here as simply as land owned by the state or federal government, to include entities designated as National Forest, National Wildlife Refuge, State Forest, and Wildlife Management Area; "protected" is not meant to imply that consumptive activities such as logging do not take place on these lands, just that they are not privately owned.) We used several web-based resources to narrow our search further:

- **Terraserver**
(<http://terraserver.microsoft.com>)
- **Earth Explorer**
(<http://edcns17.cr.usgs.gov/EarthExplorer>)
- **Map of National Forests and Grasslands**
(<http://www.fs.fed.us/recreation/mapfinder.shtml>)
- **Forested Land Distribution Data**
(now no longer available)
- **The U.S. Forest Service's Timber Products Mapmaker**
(<http://www.fs.fed.us/recreation/mapfinder.shtml>)

We identified Apalachicola National Forest as having all the desired attributes: reports of the species from the mid-twentieth century; extensive forested land (228,639 ha), including both extensive areas of bottomland hardwoods and pinewoods, some stands being over 60 years old, with several large, recently burned areas (especially around the Bradwell Bay Wilderness, burned as recently as 1998) and wind throws (apparently from Hurricane *Kate* in 1985); and relative accessibility. There are two major geologic regions—the Woodville Karst Plain and the Apalachicola Coastal Lowlands (or "Flat Woods")—that break the National Forest into eastern and western sections, respectively, the former characterized by a thick layer of surface sand above a layer of limestone, the latter having a thick layer of sandy clay and peat between the sandy soil and underlying limestone (Mitchell et al., in ms.). The high water table keeps surface areas mostly wet, and travel on foot is moderately to very difficult in bottomland hardwood swamps, and there are areas of soft substrate that can give way quickly underfoot. Most of the hardwood forests are associated with the Apalachicola River, in the Karst Plain; the Ochlockonee River and Sopchoppy River are also large enough to have associated floodplains with hardwood corridors up to 2 km wide. The

Apalachicola floodplain is 5–10 km wide and 50–100 km long in the areas of protected habitat, and perhaps more is available in the upper part and extreme lower areas (also protected) where several rivers eventually discharge into bays of the Gulf of Mexico. Pockets of hardwoods are sporadic but widespread in the low-lying areas within the pine forests. Riparian areas are relatively easy to access by landings and launches, but only a small portion (far less than 1%) of potential habitat in the National Forest can be surveyed comfortably by watercraft. Travel in pairs or in small parties is essential for safety reasons.

After defining our search areas (Figure 1), we privileged searches in hardwood areas near rivers, as most of the sightings in this area were made in such habitats. In the bottomland areas, Water Tupelos (*Nyssa aquatica*) and various oaks (*Quercus* spp.) are most common, followed closely by Baldcypress (*Taxodium distichum*). Sweet Gums (*Liquidambar styraciflua*), maples (*Acer* spp.), bayberry (*Myrica*), and *Magnolia* trees are also common in areas that are not permanently inundated. American Elm (*Ulmus americana*) is present in several locations. Hackberry (*Celtis* spp.) is apparently rare. The largest trees are large, hollow Baldcypresses, likely cull trees from historic harvests. Other than these, Laurel Oak (*Quercus laurifolia*) and Water Oak (*Q. palustris*) are the most common large trees, averaging about 0.8 m dbh (diameter at breast height), and often found clustered on higher ground. These oak groves usually appear deep in the bottomlands but in slightly drier areas called second bottoms. The eastern shore of Forbes Island (see Figure 1) has a conspicuous grove of large Nuttall's Oaks (*Q. nuttallii*). The western shore of the Brother's River has a grove of large Swamp White Oak (*Q. bicolor*). (In both cases, "large" means approximately 0.75 m dbh.) River Birch (*Betula nigra*) was present along a few of the rivers, and these trees were noted to be dying extensively in several areas.

Most of the trees in the bottomlands appeared to average perhaps 0.4–0.5 m dbh, but this quantification simply represents our best effort to estimate dbh of trees (few of which were actually measured) while searching for woodpeckers. There are numerous trees in the 0.2 m dbh range, and these were noted to be closely spaced and dying at a fairly high rate. Occasional trees >0.8 m dbh were noted, most of them oaks. A few pockets of larger trees, mostly tupelos, oaks, and cypresses were found along the western shore of the Brother's River. These trees averaged roughly 0.6–0.8 m dbh. A few stands of old-looking mixed forest and hammock were found within 2 km of the Sopchoppy

River. Pines >1 m dbh were mixed with large cypress trees, and very large water oaks and laurel oaks of >2 m dbh were also recorded. However, little of this area around the Sopchoppy River was searched. Some virgin forest may remain in small areas, but this is probably unlikely. It is notoriously difficult, as Tanner (1942) noted, to get accurate information on logging history on small scales and thus to arrive at estimates of stand age without core-sampling the trees. A reasonable average for hardwood stands, however, is probably about 60 years, with very small pockets of forest perhaps 80–100 years old.

Pine forests cover about three-fourths of the National Forest, largely Longleaf Pine (*Pinus palustris*) and Slash Pine (*P. elliotii*), and many stands can be credited to reforestation projects undertaken by the U.S. Forest Service. The pines average 0.3–0.5 m dbh, with much variation. Some trees are planted in rows, evidence of the timber industry that was active in the area. Also, there are natural stands in a few places of trees averaging 0.6 m dbh or greater. Pines are dying at what seemed to us to be a tremendous rate in several areas (we did not attempt to quantify this rate). The practice of prescribed burning of the entire area every 5–6 years has been practiced on behalf of wildlife and forest health, and researchers, especially those studying Red-cockaded Woodpeckers (*Picoides borealis*) in pinewoods, have carefully studied the relations between the species and fires (e.g., James et al. 2001). In areas where trees were planted close together, fires appear to have made weaker trees more susceptible to damage by beetles and fungi. In the pine forests, >40 years is probably a good value for stand age, with some areas probably exceeding 100 years old. If Ivory-billeds are present in the National Forest, it seems likely that they would forage in pines, especially when stands are dying. There are several reports of Ivory-billeds in Florida scaling pine trees (Jackson 2002, 2004), and the species frequented pine forests in Cuba (Garrido and Kirkconnell 2000).

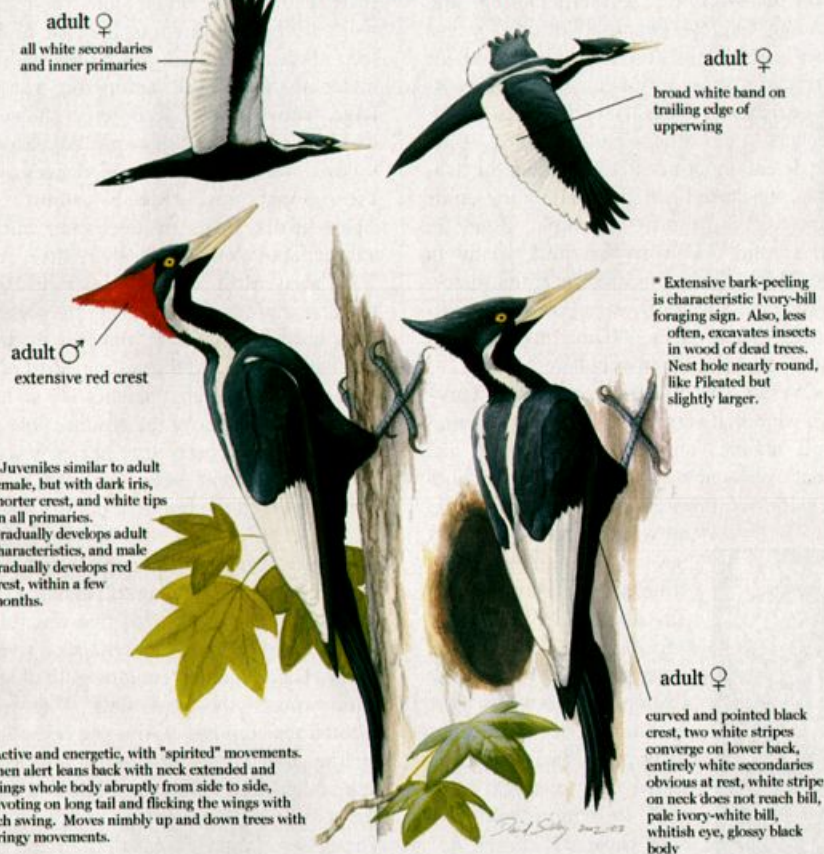
Some sources (e.g., Tanner [1942]) are quite vague as to sighting locations, and it was necessary to research the history of the area and some locality names that do not exist on modern maps. The area that is now Apalachicola National Forest was deeded to John Forbes & Co. by the Seminole Indians in 1803–1804 and remained in private hands in the nineteenth through the early twentieth century. Between 1913 and 1927, the Graves Brothers Lumber Company clear-cut much of this area, but enough trees were retained to regenerate the second forest that occurs there today (Mitchell et al., in ms.). In 1930, after

A very rare resident of old-growth hardwood forest (especially oak-sweet gum forest) and long-leaf pine savanna, where it feeds mainly on beetle larvae obtained by peeling sheets of bark from recently dead trees. Usually in pairs year-round.

Ivory-billed Woodpecker
Campephilus principalis
L 19" WS 33" WT 18 Oz (520g)

Larger and more slender than Pileated, with thinner wings, longer and more pointed tail, and longer neck. All white secondaries and pale bill distinctive.

* Flight similar to Pileated but more direct, steady with rowing wingbeats and no undulation swooping up to land; slender shape may recall ducks such as Northern Pintail.



Voice: Common call a harsh, nasal kent reminiscent of the call of the Red-breasted Nuthatch but much stronger; may be single or doubled and given repeatedly kent, kent-kent, kent.... Another common call is a more drawn-out, upslurred kweent-kweent-kweent given in series; with same nasal quality as kent call. All calls not very loud but far-carrying. The shorter kent calls often given along with strong single or double raps on resonant tree. Never gives rapid drumming like other woodpeckers. Wingbeats very noisy, producing a loud, wooden, fluttering sound.

Although no living bird artist has seen a live Ivory-billed Woodpecker, several have made intensive studies of specimen material and photographs with the intention of providing accurate, field-reliable characters for identification. In 2003, The Nature Conservancy published this plate by David Sibley. The elegant, elongate quality of the bird—in head, bill, tail, and wings—is more evident here than in many more stylized renderings. This plate can be downloaded free on David Sibley's website, <www.sibleyart.com>.

extensive tracts had been commercially logged, the federal government purchased and managed the land under the Resettlement Administration, and National Forest designation came on 31 May 1936. It was at this time that biologist George Van Hynning reported several Ivory-billeds in the area, but apparently no specific information survives on their precise location (Tanner 1942). Local forest managers now credit ornithologist Herbert L. Stoddard,

Sr. and his co-worker Leon Neel—who worked as forestry consultants in this area and were successful advocates of long rotation cycles and other pro-wildlife practices—for preserving many of western Florida's forests (Mitchell et al., in ms.). Stoddard, who spent a tremendous amount of time in Ivory-billed habitat over his lifetime and who had seen perhaps dozen or more as a youngster in Florida between 1896 and 1900, reportedly saw three Ivory-

billeds between 1954 and 1969 (Stoddard 1969); at least two of those sightings were believed to have been in central Georgia (Jackson 2002).

RESULTS

Woodpecker detection

In our limited search areas, woodpecker densities appeared to be high, although no standardized point counts or transects were conducted that would provide baseline data to compare with other sites. Nonetheless, daily counts were kept to determine overall abundance, and a GPS unit was used to track location and effort. Red-bellied Woodpecker was by far the most numerous species detected, followed, in order of declining abundance, by Pileated Woodpecker (*Dryocopus pileatus*), Yellow-bellied Sapsucker (*Sphyrapicus varius*), Northern Flicker (*Colaptes auratus*), Downy Woodpecker (*Picoides pubescens*), Red-cockaded Woodpecker, and Red-headed Woodpecker (*Melanerpes erythrocephalus*). Yellow-bellied Sapsuckers and Pileated Woodpeckers were very close in abundance, whereas flickers and Downy Woodpeckers were well below those levels. Seven Red-cockaded Woodpeckers were observed in four locations, and just one Red-headed Woodpecker was seen.

Woodpeckers were especially common in the pine forests with high tree mortality from prescribed and other burns. One small burn area had 8 Pileated Woodpeckers in a 200 m by 200 m section. Pileateds were seen to scale large pines, one bark flake at a time, by prying loose the bark. Especially in the pine forests, woodpeckers were seen making rather long flights over more or less open areas. Single Pileateds and flickers were seen in Bradwell Bay in Wakulla County (ca. 30° 10.25' N, 84° 35.17' W), the largest burned area, traveling on single flights of more than one km at a stretch. One pair of Pileateds was seen on a flight from one open pine area to another, traveling at least 5 km in total. Smaller woodpecker species, including Red-cockaded, were also seen flying above the pine canopy on fairly long flights.

We present five examples of searches below, along with the number of Pileateds counted in each:

- 1 • A 4-km walk with Greg Spahr on the west side of the Brother's River, down to the river's edge, through a deeply flooded swampwood 2 February 2003 beginning at 29.86065° N, 85.057583° W and ending at 29.86900° N, 85.05490° W, on which 20 Pileateds were detected in 6 hours;
- 2 • A 1.6-km walk on Forbes Island 31 January 2003 beginning at 29.86413° N,

85.01492° W and ending at 29.86337° N, 85.01863° W, on which 12 Pileateds were detected in 3.5 hours;

- 3 • A stationary morning count at Van Horne Landing (ca. 29.900° N, 85.017° W) 14 February 2003 on the bank of the Apalachicola River, on which 5 Pileateds were detected in 35 minutes;
- 4 • A stationary morning count at Bloody Bluff Landing 22 January 2003 (ca. 29.873° N, 85.011° W), along the Apalachicola River east of Forbes Island, on which 4 Pileateds were detected in 45 minutes; and
- 5 • A two-day, 58-km canoe trip with Jim Fitzpatrick 3 and 4 March 2003, on which 60 Pileateds were detected. The transit began at Owl Creek (ca. 29.983° N, 85.025° W) and continued past Graham Creek, ending at the FL 65 bridge (ca. 29.85° N, 84.97° W); the following day, the transit began near Larkin Fish Camp (ca. 30.15° N, 85.09° W), passed Acorn Lake and Bill's Arm, to the Apalachicola River briefly before taking the Chipola Cutoff to the Chipola River at the southern end of the Dead Lake area, around Cutoff Island, back to Owl Creek (start point of first day).

In none of the above searches was it trivial for us to estimate the density of Pileated

assume that territorial drumming indicated a territory occupied by a pair, although that may well have been the case in most instances. If one assumes that Pileated's drumming can be detected out to 400 m, then one might extrapolate that a forested area of about 40 km² was involved in the two-day canoe search (see above), for instance. Sixty detections of Pileated Woodpecker along that transect would give a moderate density, about 1.5 individuals/km² (about 4/mi²). Tanner (1942) noted a density of about six pairs/mi² in the Singer Tract (and the same for "northern Florida" and the Big Cypress swamp, Florida), but he does not clearly describe his method for arriving at those estimates. If one attempts to estimate the density of Pileated Woodpeckers in our other examples above, using the detection radius of 400 m, then the densities appear to be higher than on the canoe trip (8/mi² in the first example, 12/mi² in the second, 13/mi² in the third, 10/mi² in the fourth). It is almost certain that detection of this species by ear is possible at distances greater than 400 m; thus we offer these estimates tentatively here.

Overall, the highest woodpecker densities we noted seemed to be in the bottomland habitat, and several locations had what appeared to us to be especially high densities of Pileated Woodpeckers, places in which one could detect several Pileated territories from a single spot. At one site along the west shore of the Brother's River (the location noted in the first example above), for instance, six different drumming birds could be heard from a single location. In a more southerly spot (near 29° 55' N, 85° 01' W), we walked about one km in the morning, stopping every 100 m or so, and it was common to hear three Pileateds per stop (with likely duplication of individuals, of course). Whatever the actual average density of the species at these locations, it seemed to us to be higher than at any other sites we have visited, in any state, and probably close to what Tanner (1942) describes for several Florida locations and for the Singer Tract.

Woodpeckers were seen feeding in the tops of dead pines, as well as feeding on the dead lowest limbs of large pine trees in several places. Almost all dead trees showed evidence of woodpecker work including

small, conical feeding pits and the larger rectangular excavation pits of Pileateds. Sapwells were also observed, mostly in hammock and bottomland areas. Several trees had thousands of sapwells, from ground up to 10 m or more above the ground. Dead pines were routinely stripped of bark by weather, although Pileateds had clearly contributed to some of this in some cases. In prising the bark from a few dead pines, one could see an abundance of termites and centipedes.

In the hammock and bottomland areas, there seemed to be much more woodpecker work all the way down to the base of dead trees. Several Pileateds were seen within a meter of the ground, hammering away on large trunks. Most dead trees showed a diversity of woodpecker work. We observed a few dozen thoroughly scaled trees along the Sopchoppy River, along the Apalachicola River in one spot, and in another spot along the Brother's River some 5 km away. Most of these trees were 10–30 cm dbh, but all showed long, deeply chiseled, horizontal grooves, the only evidence of whatever bird did the scaling. Most of the scaled trees had scaled patches 1–3 m long, usually 2–10 m above the ground. One particular tree was observed to be newly scaled on three different occasions, though we never observed the bird that did the scaling; by the time of our last observation, the trunk was a mass of huge bark and wood flakes 10+ cm long, many still hanging from the trunk (Figure 2). This tree was full of termites and borers. Another scaled tree on Forbes Island had a 5-cm long grub of some kind exposed by the scaling. I generally ignored scaled pines, as this can be done by weather, but two scaled dying pines (and one scaled dead oak) were seen in a small area (<100 m²) near the Sopchoppy River. These were large (60-cm dbh) trees, with bark impossible to pry off with even two hands. Piled at the base of these trees were large bark chips about 5 cm wide and 30 cm long, almost all chips the same size. Several trees that lacked bark also lacked markings associated with large woodpecker work, but the boring galleries of wood-boring insects were nonetheless visible in the exposed wood; it would be incorrect to call these "scaled" trees, perhaps, though it is conceivable that evidence of woodpecker work was not apparent on trees that were in fact scaled by woodpeckers.

No woodpecker was observed in the act of scaling in the bottomland or hammock areas. All woodpeckers were seen to feed on snags, or dead limbs of larger trees, and usually this feeding was on trees long dead. One pair of Pileateds was observed to feed early in the morning on almost all types of trees, but invariably this work involved



Figure 2. One example of a tree actively and heavily scaled and pitted during the search in March 2003; the bird (or birds) that scaled this tree was not observed. Photograph by Timothy Spahr.

Woodpecker, an index discussed in Tanner (1942) and one often mentioned by later writers in the context of looking for suitable Ivory-billed habitat. It was particularly difficult in riparian habitats, where the waterways' sinuous curves make even counting individual birds problematic. We were conservative in counting and tried not to double-count individual birds; we also did not



digging deep foraging pits in the tree. Woodpeckers were heard calling and drumming with increasing frequency toward the end of the trip, as nesting season drew near.

All of the woodpecker activity detected was easily attributed to the aforementioned species, with a few exceptions:

- **14 January 2003** • Near 29° 49.025' N, 84° 59.190', along the East River near Gardener's Landing. I heard repeated loud raps of a large woodpecker with a rhythm unlike any other tapping or rapping sounds heard during the trip, being a repeated series of double raps. The blows were usually pretty close together, and always the second blow exceeded the first blow in volume, unlike in typical *Campephilus* double raps. This was in good bottomland habitat.
- **31 January 2003** • Near 29° 51.790' N, 85° 01.358' on Forbes Island. Greg Spahr and I heard high-pitched calls, probably belonging to a bird, for a two- or three-minute period, repeated at 10–15 seconds intervals. The sound closely resembled the single, isolated high-pitched *kent* calls heard on the Tanner/Allen recordings of Ivory-billed Woodpeckers from 1935. We were probably within 100 m of the source of this sound, but the sound came from across a creek too deep to ford. At other times on the same day, we heard conspicuous single and double raps, probably of a woodpecker. These sounds were confined to the area near the high-pitched calls and seemed to move whenever we were within what appeared to be a few hundred m of the sound's source—almost as though we were being led around in circles. We were not able to locate the source of the sounds.
- **1 February 2003** • In an effort to arrive on the west side of the creek where we heard the high-pitched calls and rapping the day before, we walked north and crossed this creek at a narrow spot, and then proceeded southward. Before we made it to the area where the calls and sounds were heard the day before, we heard numerous distant single raps and at least one double rap near 29° 52.253', 85° 01.262'. One double rap was heard while listening quietly and sounded to be 200–400 m distant.

We cannot ascribe any of the sounds we heard to a woodpecker, or even strictly speaking to a bird, as we did not locate their source(s). Nevertheless, they stood out as different from other bird sounds and anthropogenic sounds (i.e., gunshots) we heard in the area.

Interviews with local people

Twenty local people were interviewed and asked about woodpeckers, much as Tanner (1942) had done in this area 14–17 March and 30 May–7 June 1939. Three people indicated that they had seen something resembling Ivory-billed Woodpeckers in this area. One man in his fifties remembered seeing them as a boy and knew it by the name “Lord God Bird.” One hunter said he knew “the large woodpecker with the black back, and the larger one with white on the back.” A very observant bass fisherman indicated he knew both types of large woodpeckers and that had seen 2 Ivory-billed Woodpeckers in the past three years. He described a very large black-and-white woodpecker, with the white patch low down on the back, perched on a dead Baldcypress tree on the Apalachicola River “about 10 miles downriver from Estifanulga [Liberty County].” By my reckoning, Estifanulga is at Mile 63 on the Apalachicola River; 10 miles downstream would be ca. Mile 53, or that point in the river due west of Red Hill (Figure 1; county uncertain, either Calhoun or Liberty, depending on the side of the river the bird was on). This area is 8 km southeast of Scotts Ferry, Calhoun County, the location of the pair reported in 1950–1951 (see above). This fisherman's other reported sighting—from the same area as the sight report of the previously mentioned hunter—was along Brother's River near its confluence with the Apalachicola River (ca. 29.845° N, 85.033° W). These latter sightings are within 5 km of above-described site where the high-pitched calls and double raps were heard 31 January and 1 February 2003.

Conclusion

A very small portion of this fine area for woodpeckers was examined. The area is vast, and because for most of the time in the area I was alone, I was not able to venture far into some of the targeted areas. The large burned areas of pinewoods in particular need much more coverage. In retrospect, aerial photography or aerial reconnaissance would improve the search by narrowing the search areas to the most promising. Because some older-looking forest tracts were found interlarded among larger areas of younger trees, it is likely that a systematic examination would reveal additional tracts of older forests. Ideally, both low-level aerial photography and infrared photography could be combined to identify and to prioritize such sites for future searches.

Acknowledgments

My brother Greg Spahr aided me on several days of the search, and Jim Fitzpatrick's help was likewise essential. Both have good ears and strong outdoor skills. Jim also brought

experience from the Pearl River search of 2002 and was able to compare the areas in terms of apparent habitat quality. My thanks to both of them. We wish to thank the Smithsonian Institution for permitting Greg Spahr to photograph specimens in their collection, whose photographs appear in this issue and as frontispiece to this article. Finally, I thank Jerome Jackson, Bill Pranty, and David Shoch for helpful comments on earlier drafts of this article.

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