DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

MISCELLANEOUS FIELD STUDIES
MAP MF–1879
PAMPHLET ACCOMPANIES MAP

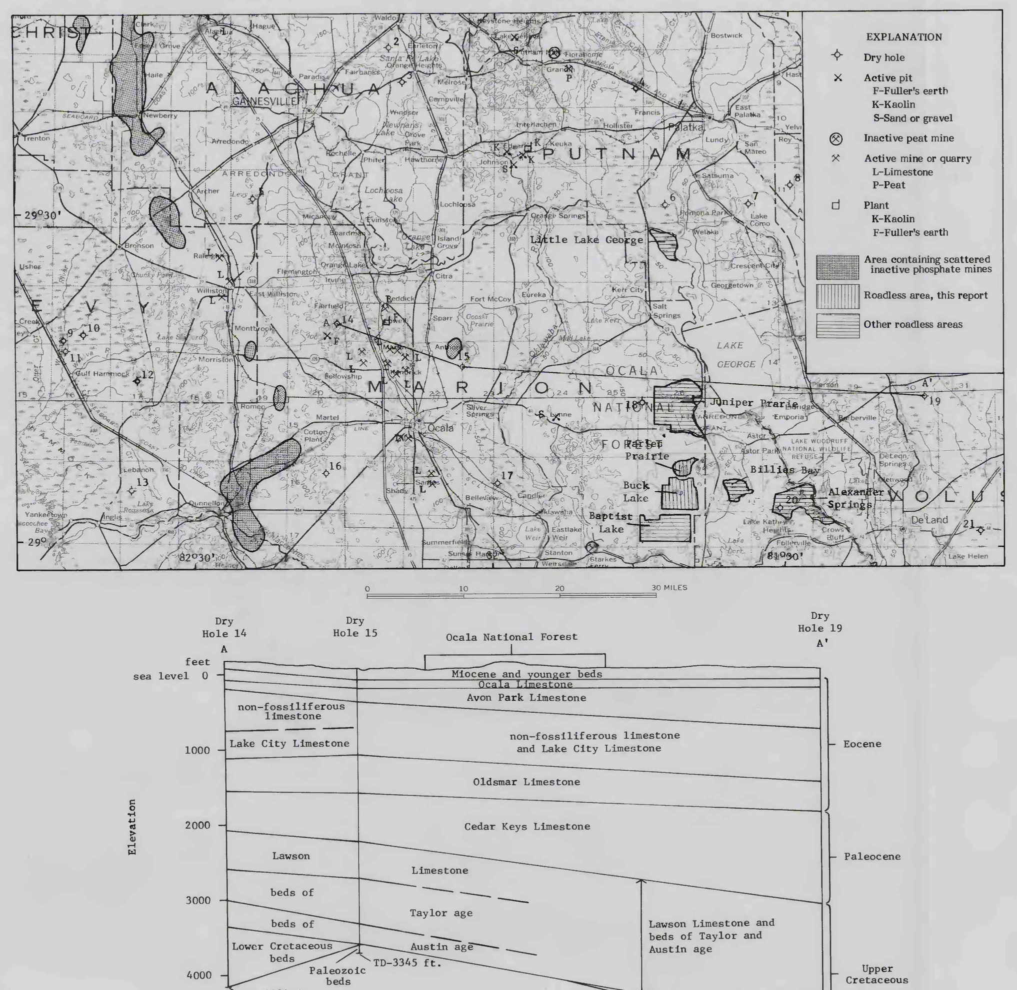


Figure 1.—Location of the Billies Bay, Alexander Springs, Little Lake George, and Juniper Prairie Wildernesses, the Baptist Lake Roadless Area, other roadless areas, dry holes, pits, mines, and quarries in the region of the Ocala National Forest.

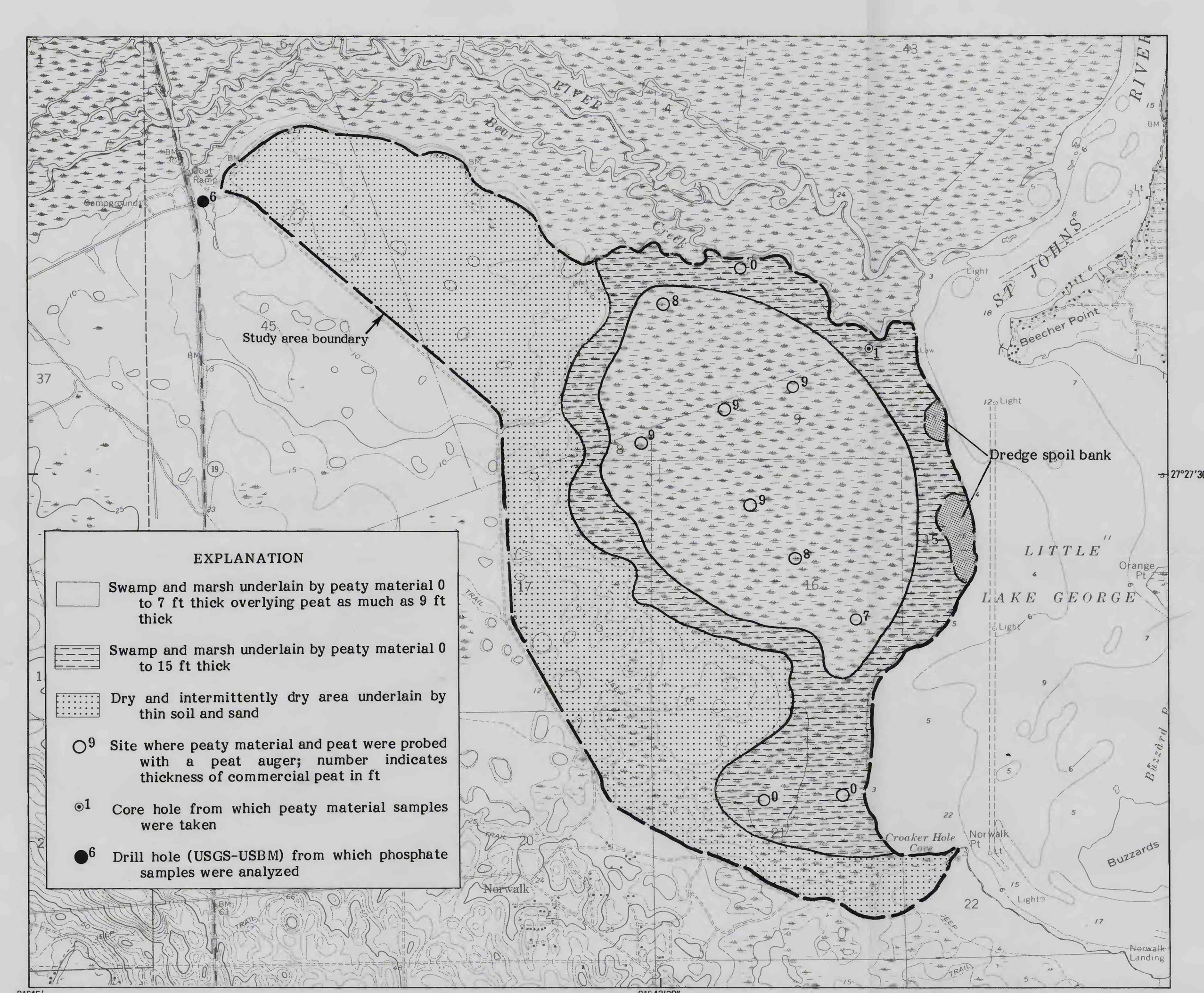


Figure 2.—Surficial geology of the Little Lake George Wilderness.

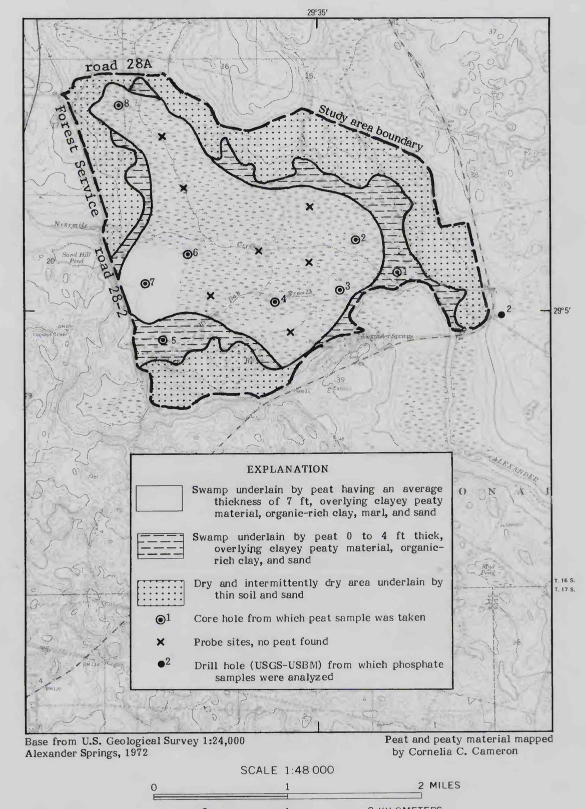


Figure 3.—Surficial geology of the Billies Bay Wilderness.

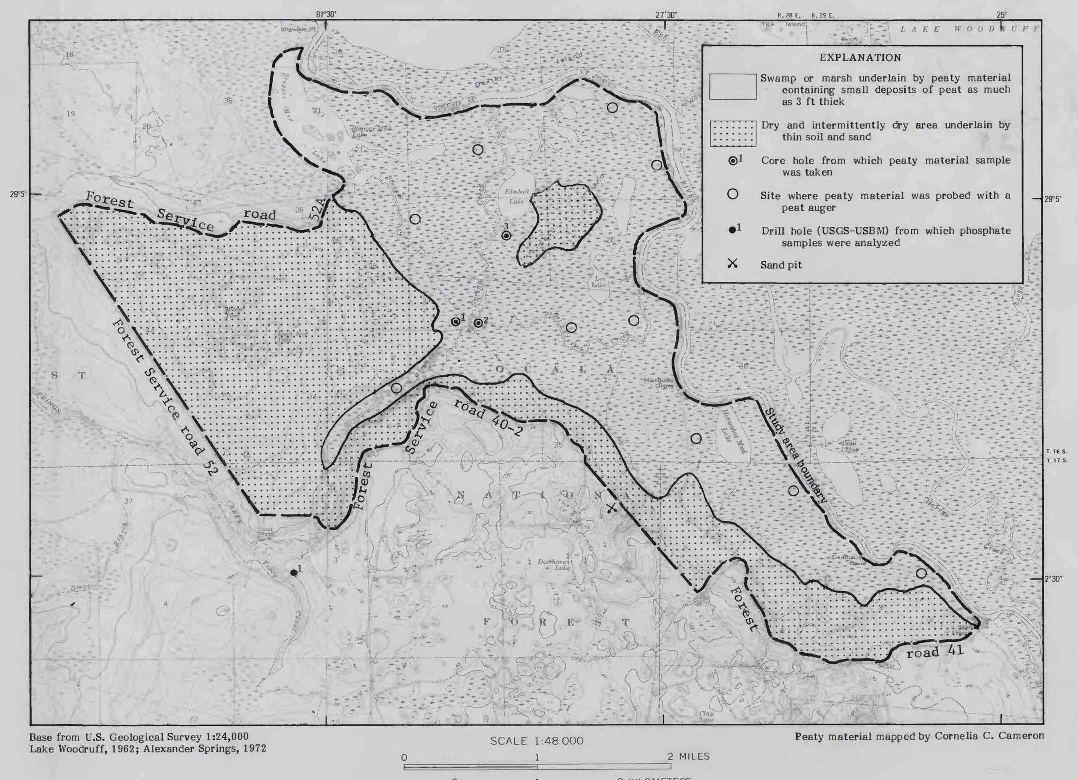


Figure 4.—Surficial geology of the Alexander Springs Wilderness.

Table 1.—*Selected exploratory oil and gas data for the Ocala National Forest and surrounding region*

Source: Florida Bureau of Geology, oil and gas reports and records

Florida Bureau of Geology Number	Dry hole Number (fig. 1)	Company or owner name	Dry hole or farm name	County	Sec	T.	R.	Year of Completion	Elevation of Derrick floor	Total Depth of hole (ft)
49	1	Tidewater Associated Oil Co.	R. H. Cato #1	Alachua	23	8S	18E	1947	112	3,150
709	2	Chevron Oil Co.	#1 Fred S. Donaldson et al. and Container Corp. of America	Alachua	34	8S	21E	1974	150	3,340
52	3	Tidewater Associated Oil Co.	#1 J. A. Phifer	Alachua	24	9S	21E	1947	132	3,288[1]
58	4	Sun Oil Co.—Seaboard Oil Co.	Q. I. Roberts	Putnam	19	9S	25E	1947	206	3,327[1]
238	5	The Texas Co.	#1 Albert M. Creighton	Alachua	16	11S	19E	1955	77	3,527
96	6	Sun Oil Co.	#1 H. E. Westburg et al	Putnam	27	11S	26E	1949	32	3,892[1]
607	7	Gilbert E. Thayer and Sam Davis	Johnson-Malphure, Inc. #1	Putnam	27	11S	27E	1972	34	5,572
44	8	Humble Oil and Refining Company	J. W. Campbell et ux	Flagler	8	11S	28E	1947	31	4,633[1]
199	9	Sphinx Syndicate	Prudential Timber Co.	Levy	31	13S	16E	1954	26	3,857
110	10	J. A. Abbott, Trustee	Prudential Timber Co.	Levy	34	13S	16E	1950	18	2,013
69	11	Carl M. Bruken-feld Syndicate	Levy-Lennon	Levy	5	14S	16E	1949	17	2,173
13	12	Sun Oil Co.	J. T. Goethe #1	Levy	31	14S	17E	1946	44	3,997[1]
105	13	Humble Oil and Refining Company	#1 C. E. Robinson et ux	Levy	19	16S	17E	1949	46	4,609
W901	14	J. S. Cosden	W. L. Lawson #1	Marion	25	13S	20E	1928	195	4,334[1]
101	15	Sun Oil Co.	H. T. Parker	Marion	24	14S	22E	1949	79	3,845[1]
W18	16	Ocala Oil Co.	Clark-Ray Johnson (York)	Marion	10	16S	20E	1928	80	6,180[1]
53	17	Sun Oil Co.	#1 Henry N. Camp	Marion	16	16S	23E	1947	74	4,637[1]
785	18	Amoco Production Company	#1 U.S.A. (6-4)	Marion	6	15S	25E	1975	76	4,102
78	19	Grace Drilling Co.	Retail Lumber Co.	Volusia	2	15S	30E	1949	44	5,424[1]
795	20	Amoco Production Company	#1 U.S.A. 44 (29-13)	Lake	irreg. tract 44			1975	56	5,893
19	21	Sun Oil Co.	#1 Powell Land Co.	Volusia	—	17S	31E	1946	48	5,958[1]

[1] hole penetrated Paleozoic strata (Puri and Vernon, 1964, plate 1)

Table 2.—*Generalized stratigraphic section in the region of the Ocala National Forest, Florida*

Era	Series or system	Formation or rock unit	Thickness in feet	Lithology
CENOZOIC	Holocene	unnamed	0–100	Sand, clayey sand, muck, and humus
	Pleistocene and Pliocene	Citronelle(?) Formation	20–90	Unconsolidated white, red, and orange sand and clayey sand
	Miocene	unnamed formation	0–70	Sandy clay and clayey sand containing shell fragments and phosphate grains
		Hawthorn Formation	0–130	Upper part is sandy clay and clayey sand with variable amounts of dolomite grains and phosphate grains; lower part is chiefly dolomite containing some phosphate grains
	Eocene	Ocala Limestone	100	Cream-colored hard limestone and chalky limestone
		Avon Park Formation	130	Dolomite and cream-colored to brown limestone
		unnamed formation	55	Cream-colored to white, hard limestone
		Lake City Limestone	550	Layers of brown and chalky tone
		Oldsmar Limestone	450	Brown and chalky limestone
	Paleocene	Cedar Keys Limestone	500	Cream to tan, hard limestone
MESOZOIC	Upper Cretaceous	Lawson Limestone	1600	Limestone and dolomite
		Beds of Taylor age		Chalk and dolomite
		Beds of Austin age		Chalk containing anhydrite and gypsum
		Atkinson Formation		Conglomerate, sandstone, and gypsum
	Lower Cretaceous	Beds of Washita age	630	Limestone and shaly sandstone
		Beds of Fredericksburg age		Dolomite
		Beds of Trinity age		Limestone and shaly sandstone
PALEOZOIC	Ordovician	Crystalline and sedimentary rocks	?	Basalt, rhyolite, diorite, tuff, quartzite, sandstone, and shale

Table 3.—*Proximate and ultimate analyses and heating value of peat samples from the Billies Bay area, Florida*

Listed according to increasing ash content.

		Proximate analysis (percent)				Ultimate analysis (percent on dry basis)						Forms of sulfur (percent dry basis)				
Sample No.	Core hole No.	Moisture as received	Ash (dry)	Volatile matter (dry)	Fixed carbon (dry)	Hydrogen	Carbon	Nitrogen	Sulfur	Oxygen	Heating value Btu dry	Sulfate	Pyrite	Organic	Residual moisture (percent)	Air-dry loss (percent)
34	6	89.81	2.63	62.05	35.32	2.82	57.49	1.21	0.60	35.25	9942	0.03	0.01	0.56	9.93	88.68
36	6	85.09	4.80	58.54	36.66	4.25	60.11	1.34	1.19	28.31	9851	0.05	0.00	1.14	8.38	83.73
11	2	92.15	5.71	63.75	30.54	5.24	57.73	1.30	1.95	28.07	9857	0.07	0.00	1.88	7.60	91.50
9	2	90.18	7.42	64.21	28.37	5.08	57.19	2.27	1.18	26.86	9838	0.05	0.01	1.12	9.15	89.19
42	8	88.06	10.90	57.58	31.52	4.77	59.16	1.73	2.45	20.99	10084	0.12	0.25	2.08	10.93	86.65
16	3	89.42	11.56	57.50	30.94	4.67	56.28	1.86	2.62	23.61	9218	0.16	0.07	2.39	12.12	87.97
40	8	90.06	12.52	60.85	26.63	4.92	57.12	2.06	2.57	20.81	9769	0.23	0.46	1.88	10.53	88.83
18	3	87.60	19.14	58.16	22.70	4.61	51.37	2.13	3.57	19.78	8442	0.19	0.25	3.13	11.20	86.04
3	1	82.46	42.78	39.72	17.50	3.26	36.87	1.62	1.80	13.67	6374	0.22	0.44	1.14	7.93	80.95

Table 4.—*Amounts of ash in air-dried peat samples and trace elements on whole-sample basis, Billies Bay area, Florida*

Listed according to increasing ash content; n.d., not detectable; ash in percent; trace elements in parts per million

Core hole No.	Sample No.	Material	Ash percent in air-dried peat sample	Ag	B	Ba	Co	Cr	Cu	Ga	La	Mn	Mo	Na	Pb	Sc	Sn	Sr	Th	V	Y	Yb	Zn	Zr
6	CC84-35	Reed-sedge peat	1.5	0.008	2.0	8.7	0.3	0.4	0.8	0.9	0.9	0.6	0.3	0.5	0.3	0.1	1.3	48.0	1.3	1.3	0.2	0.2	3.0	1.7
6	37	Humus peat	1.7	.003	0.1	7.7	0.1	0.3	0.6	0.6	0.8	0.9	1.6	0.4	0.2	0.9	0.8	34.0	1.1	1.2	0.3	0.0	2.7	2.9
7	38	Reed-sedge peat	1.7	.003	4.3	7.5	0.9	0.6	0.7	1.1	0.5	0.9	0.5	0.9	1.0	0.4	1.0	4.1	n.d.	1.4	0.2	0.2	27.8	1.1
8	39	....do	3.3	.005	2.0	3.3	2.2	1.1	0.8	n.d.	1.5	2.0	1.0	0.7	3.1	1.8	n.d.	46.2	2.4	0.7	0.4	0.3	5.9	1.7
2	10	....do	5.0	.015	7.2	15.5	0.4	2.2	4.8	0.8	5.5	5.5	6.0	2.4	2.9	0.7	0.6	60.0	3.7	3.9	2.0	0.2	1.8	6.5
2	8	....do	6.4	.019	4.3	19.8	5.5	2.0	2.4	0.8	5.1	8.3	1.4	2.6	4.6	0.6	0.6	60.0	4.1	4.5	1.8	0.1	14.7	7.0
8	43	Humus peat	9.2	.009	10.2	6.4	0.8	3.6	4.9	0.3	4.7	9.2	7.7	2.7	0.9	0.6	n.d.	147.2	7.1	4.5	1.6	1.7	n.d.	6.3
3	17	Reed-sedge peat	11.6	n.d.	11.6	16.4	0.4	4.0	3.4	0.5	n.d.	17.4	4.3	1.7	n.d.	0.6	0.9	4.1	7.7	6.1	0.6	0.1	20.9	2.8
8	41	....do	12.7	.013	9.5	5.8	1.2	4.3	2.4	n.d.	5.0	6.9	6.2	2.7	n.d.	0.3	n.d.	152.4	9.5	1.3	0.9	0.5	12.6	2.3
1	2	Humus peat	18.7	.026	67.0	29.9	0.5	8.4	5.0	1.0	24.3	7.5	7.7	9.4	3.7	2.0	1.5	147.7	12.0	11.8	10.7	0.7	26.2	3.2
3	19	Reed-sedge peat	20.2	n.d.	15.0	30.3	0.3	8.7	3.0	0.6	8.9	46.5	5.9	3.6	n.d.	n.d.	1.3	848.4	14.1	13.1	1.0	0.2	40.4	50.5
1	4	Peaty clay	83.5	n.d.	n.d.	n.d.	n.d.	0.2	n.d.	1.8	21.7	13.4	1.0	1.7	n.d.	1.6	n.d.	25.9	n.d	6.0	47.6	3.3	11.7	35.9

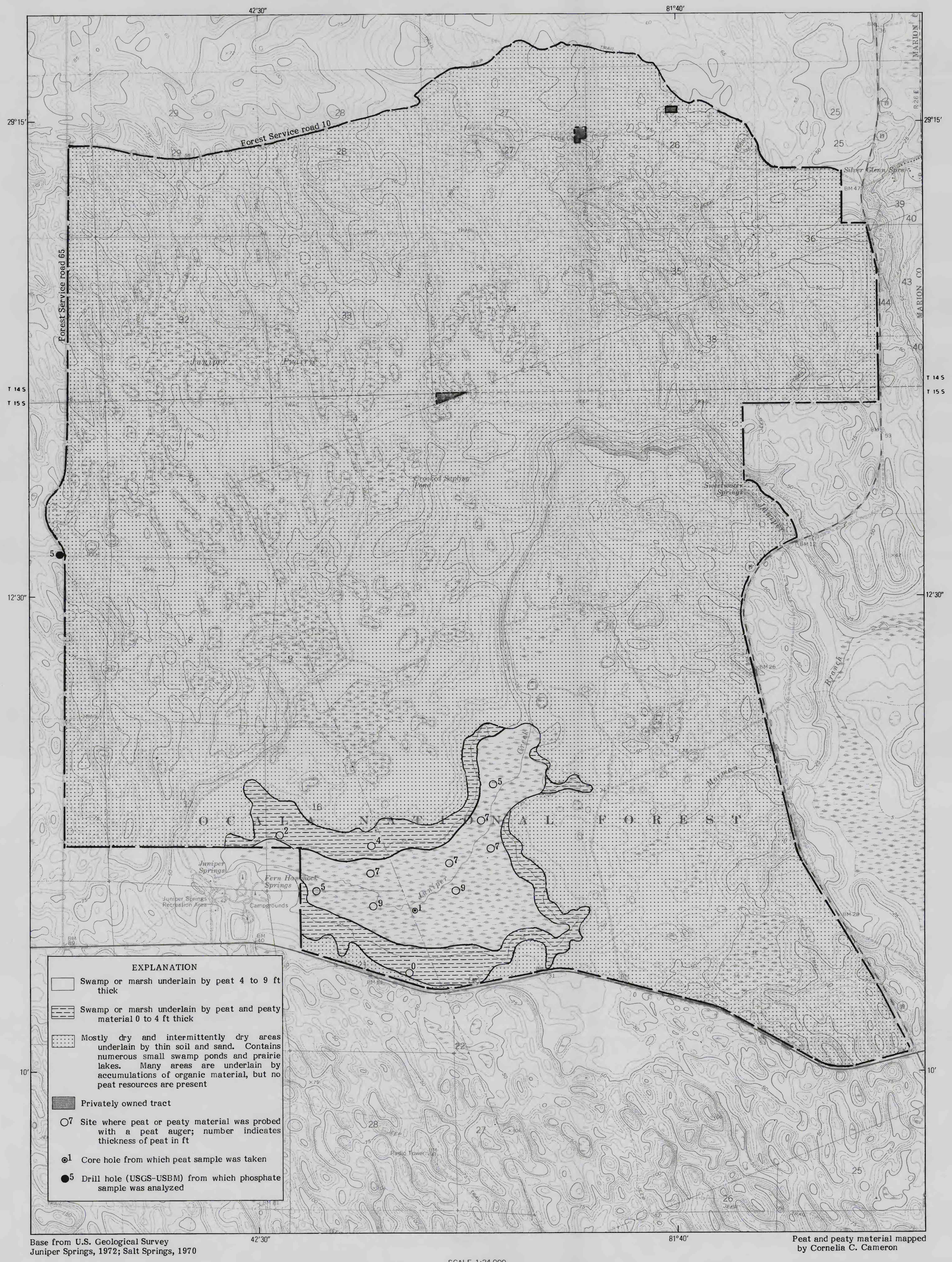


Figure 5.—Surficial geology of the Juniper Prairie Wilderness.

Figure 6.—Surficial geology of the Baptist Lake Roadless Area.

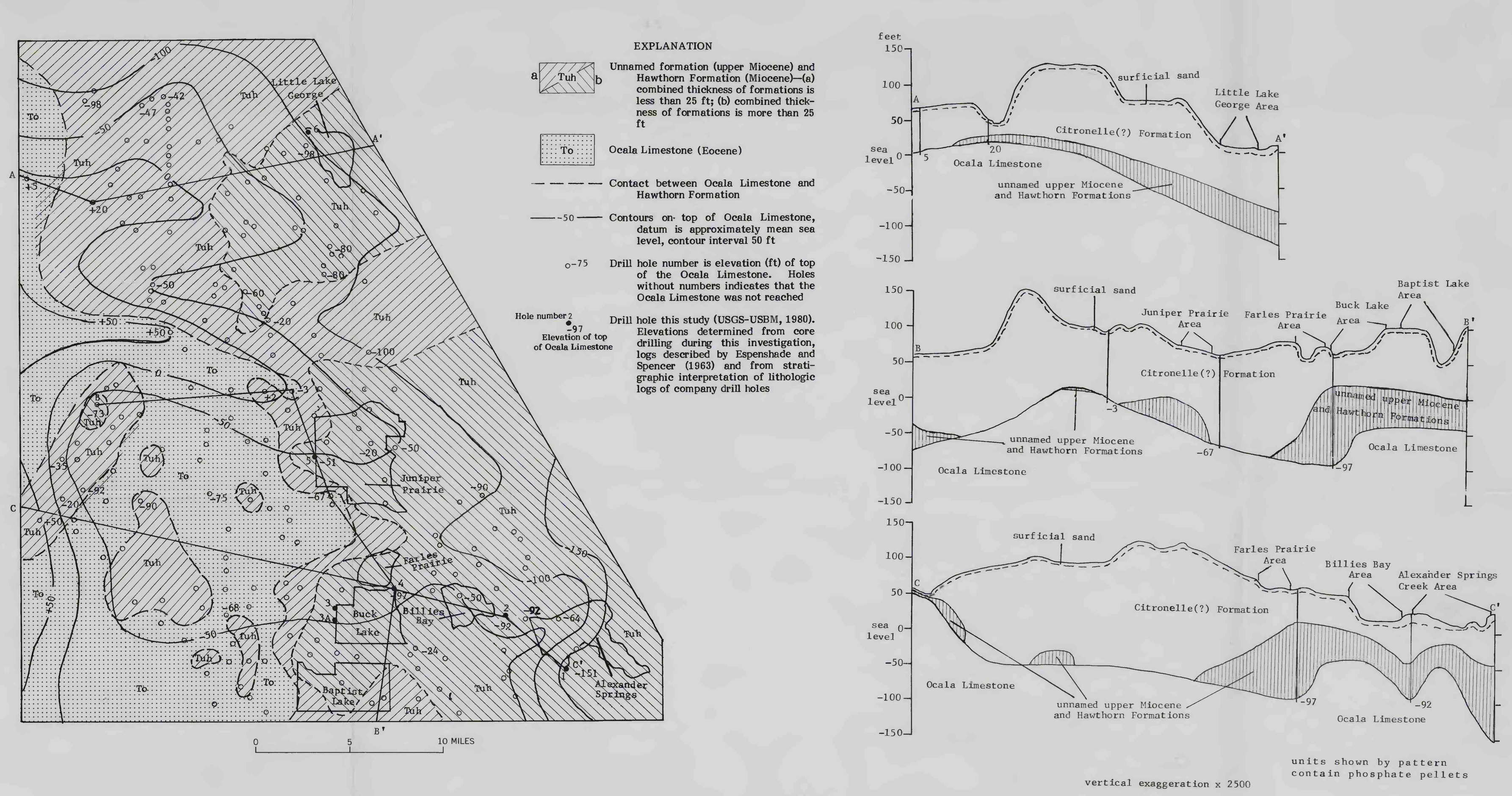


Figure 7.—The extent of the phosphate-bearing unnamed upper Miocene Formation and the Hawthorn Formation, the Ocala Limestone, locations of drill holes, and structure-contour map of part of the Ocala National Forest.

Table 5.—*Analytical data of phosphate samples, from the Ocala National Forest*

Chemical analysis by Pembroke Laboratories, Bartow, Fla.

				Analytical data, in percent								Ratios	
Drill hole number	Depth (ft)	Size fraction	Weight percent	P_2O_4	A.I.[1]	Fe_2O_3	Al_2O_3	CaO	MgO	Co	F	F/P_2O_5	CaO/P_2O_5
1 (fig. 4)	125-144	+20	22.7	10.13	54.38	1.64	0.31	25.47	0.60	7.07	1.52	0.151	2.51
	125-144	-20+50(conc.)	7.8	21.81	2.70	2.26	.52	47.65	.80	6.65	3.09	.136	2.18
	144-168	+20	3.4	12.26	50.15	1.55	.49	26.42	2.62	6.25	1.61	.131	2.15
	144-168	-20+150	14.4	29.54	3.02	2.63	.66	49.50	0.90	5.02	3.62	.122	1.55
2 (fig. 3)	101-111	+20	27.07	14.20	38.38	1.76	1.18	28.24	2.37	5.36	2.06	.145	1.99
	101-111	-20+50	23.2	31.23	9.12	1.29	0.39	47.70	0.39	3.75	3.68	.118	1.52
5 (fig. 5)	61-75	+20	7.9	15.31	24.17	1.09	.62	35.65	5.22	13.50	2.00	.131	2.33
	61-75	-20+50	7.7	27.94	4.18	1.29	.71	47.78	1.60	7.72	3.17	.114	1.71
6 (fig. 2)	90-93	+20	4.7	18.67	17.61	1.89	.49	40.84	1.47	12.63	1.99	.107	2.19
	90-93	-20+150	4.3	27.41	6.47	3.24	.64	45.78	0.80	6.65	3.09	.113	1.67
	93-102	+20	4.4	9.88	16.70	1.20	.97	42.55	2.18	22.88	1.20	.121	4.31
	99-102	-20+150	10.3	26.60	8.22	1.80	.76	46.42	0.99	6.67	2.96	.111	1.75

[1] Acid insoluble.

Table 6.—*Summary of uranium content of samples of phosphate rock, Ocala National Forest*

Analyses in ppm uranium; Analysts: L. J. Sherlock and N. J. Nelson, Branch of Exploratory Research, USGS

Unit	Number of samples	Uranium ppm Range	Average
Head (Total rock samples)			
Unnamed Upper Miocene Formation	2	7–29	18
Hawthorn Formation	5	4–120	31
Pebble (+20 mesh = +1mm)			
Unnamed Upper Miocene Formation	2	43–160	102 (101.5)
Hawthorn Formation	7	38–150	96
Concentrate (-20 + 150 mesh = -1mm + 0.1mm)			
Unnamed Upper Miocene Formation	2	74–90	82
Hawthorn Formation	11	33–130	75
Slime (-150 mesh = -0.1mm)			
Unnamed Upper Miocene Formation	2	4–27	16 (15.5)
Hawthorn Formation	6	3–110	28

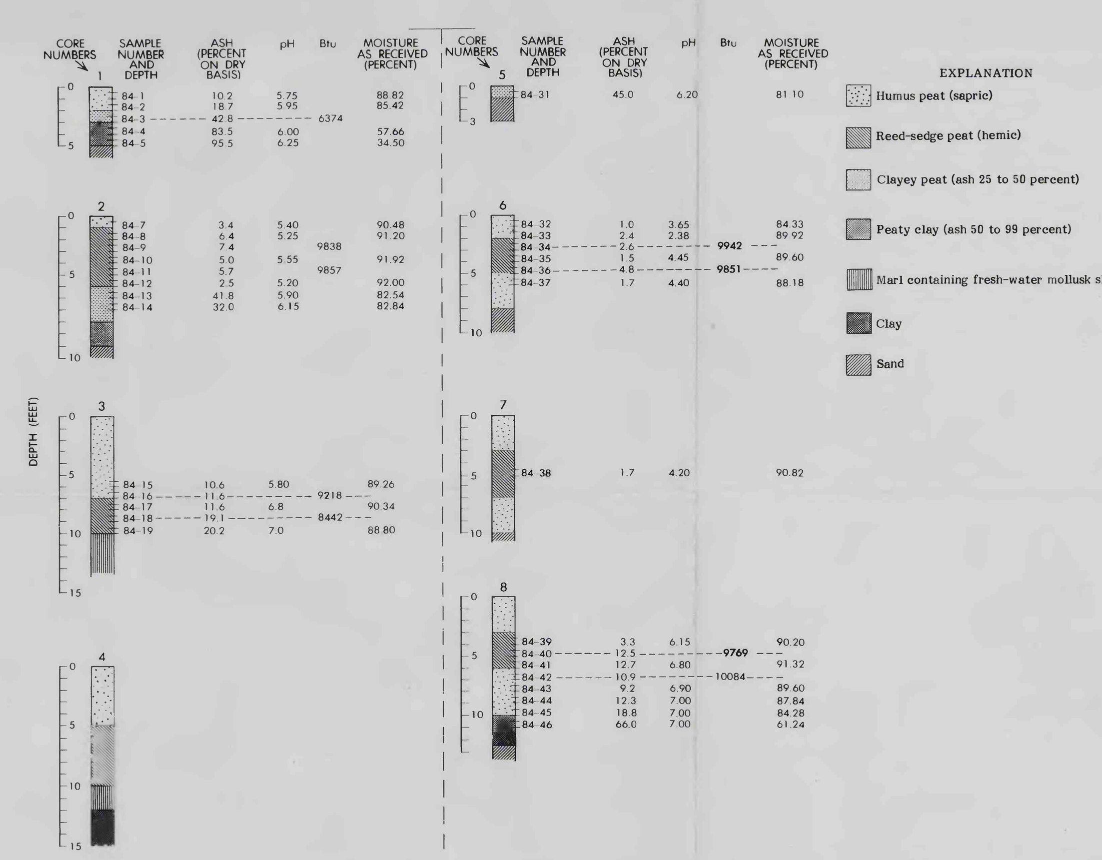
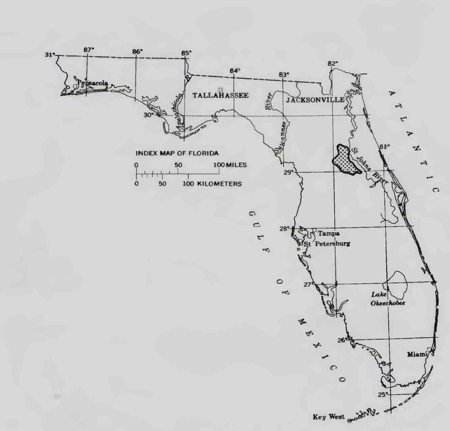


Figure 8.—Cores from the Billies Bay Wilderness area showing stratigraphy, location of analyzed samples, and the relationship of ash content, pH, British thermal units, and as-received moisture to stratigraphy.



Index map showing the location of the Ocala National Forest, Florida.

GEOLOGY AND MINERAL RESOURCE POTENTIAL OF THE BILLIES BAY, ALEXANDER SPRINGS, LITTLE LAKE GEORGE, AND JUNIPER PRAIRIE WILDERNESSES, AND THE BAPTIST LAKE ROADLESS AREA, LAKE, MARION, AND PUTNAM COUNTIES, FLORIDA

By
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