

Return of Private Foundation

or Section 4947(a)(1) Trust Treated as Private Foundation

2018

Department of the Treasury
Internal Revenue Service

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▶ Go to www.irs.gov/Form990PF for instructions and the latest information.

Open to Public Inspection

For calendar year 2018 or tax year beginning

, and ending

Name of foundation Robert W. Woodruff Foundation, Inc.		A Employer identification number 58-1695425
Number and street (or P.O. box number if mail is not delivered to street address) 191 Peachtree Street, NE	Room/suite 3540	B Telephone number 4045226755
City or town, state or province, country, and ZIP or foreign postal code Atlanta, GA 30303-1799		C If exemption application is pending, check here ... <input type="checkbox"/>
G Check all that apply: <input type="checkbox"/> Initial return <input type="checkbox"/> Initial return of a former public charity <input type="checkbox"/> Final return <input type="checkbox"/> Amended return <input type="checkbox"/> Address change <input type="checkbox"/> Name change		D 1. Foreign organizations, check here ... <input type="checkbox"/> 2. Foreign organizations meeting the 85% test, check here and attach computation ... <input type="checkbox"/>
H Check type of organization: <input checked="" type="checkbox"/> Section 501(c)(3) exempt private foundation <input type="checkbox"/> Section 4947(a)(1) nonexempt charitable trust <input type="checkbox"/> Other taxable private foundation		E If private foundation status was terminated under section 507(b)(1)(A), check here ... <input type="checkbox"/>
I Fair market value of all assets at end of year (from Part II, col. (c), line 16) ▶ \$ 3,281,308,618.	J Accounting method: <input checked="" type="checkbox"/> Cash <input type="checkbox"/> Accrual <input type="checkbox"/> Other (specify) _____ (Part I, column (d) must be on cash basis.)	
		F If the foundation is in a 60-month termination under section 507(b)(1)(B), check here ... <input type="checkbox"/>

Part I Analysis of Revenue and Expenses <small>(The total of amounts in columns (b), (c), and (d) may not necessarily equal the amounts in column (a).)</small>		(a) Revenue and expenses per books	(b) Net investment income	(c) Adjusted net income	(d) Disbursements for charitable purposes (cash basis only)
1 Contributions, gifts, grants, etc., received				N/A	
2 Check <input checked="" type="checkbox"/> if the foundation is not required to attach Sch. B					
3 Interest on savings and temporary cash investments		1,727,155.	1,727,155.		Statement 1
4 Dividends and interest from securities		99,725,870.	99,725,870.		Statement 2
5a Gross rents					
b Net rental income or (loss)					
6a Net gain or (loss) from sale of assets not on line 10		14,915,780.			
b Gross sales price for all assets on line 6a		79,569,421.			
7 Capital gain net income (from Part IV, line 2)			14,915,780.		
8 Net short-term capital gain					
9 Income modifications					
10a Gross sales less returns and allowances					
b Less: Cost of goods sold					
c Gross profit or (loss)					
11 Other income		1.	0.		Statement 3
12 Total. Add lines 1 through 11		116,368,806.	116,368,805.		
Operating and Administrative Expenses	13 Compensation of officers, directors, trustees, etc.	456,135.	115,691.		340,444.
	14 Other employee salaries and wages	352,804.	17,465.		335,339.
	15 Pension plans, employee benefits	185,305.	14,662.		170,644.
	16a Legal fees				
	b Accounting fees	32,362.	1,618.		30,744.
	c Other professional fees	1,008,725.	996,311.		12,414.
	17 Interest				
	18 Taxes	1,140,000.	0.		0.
	19 Depreciation and depletion	13,776.	689.		
	20 Occupancy	100,356.	5,018.		95,338.
	21 Travel, conferences, and meetings	17,385.	905.		16,480.
	22 Printing and publications	331.	17.		314.
	23 Other expenses	94,487.	3,560.		90,927.
24 Total operating and administrative expenses. Add lines 13 through 23	3,401,666.	1,155,936.		1,092,644.	
25 Contributions, gifts, grants paid	179,684,027.			179,684,027.	
26 Total expenses and disbursements. Add lines 24 and 25	183,085,693.	1,155,936.		180,776,671.	
27 Subtract line 26 from line 12:					
a Excess of revenue over expenses and disbursements	-66,716,887.				
b Net investment income (if negative, enter -0-)		115,212,869.			
c Adjusted net income (if negative, enter -0-)			N/A		

Part II Balance Sheets		Attached schedules and amounts in the description column should be for end-of-year amounts only.		
		Beginning of year	End of year	
		(a) Book Value	(b) Book Value	(c) Fair Market Value
Assets	1 Cash - non-interest-bearing	5,492.	5,885.	5,885.
	2 Savings and temporary cash investments	64,506,993.	123,835,962.	123,985,410.
	3 Accounts receivable			
	Less: allowance for doubtful accounts			
	4 Pledges receivable			
	Less: allowance for doubtful accounts			
	5 Grants receivable			
	6 Receivables due from officers, directors, trustees, and other disqualified persons			
	7 Other notes and loans receivable			
	Less: allowance for doubtful accounts			
	8 Inventories for sale or use			
	9 Prepaid expenses and deferred charges			
	10a Investments - U.S. and state government obligations			
	b Investments - corporate stock Stmt 8	487,102,346.	508,080,206.	312,674,719.
	c Investments - corporate bonds			
	Liabilities	11 Investments - land, buildings, and equipment: basis		
Less: accumulated depreciation				
12 Investments - mortgage loans				
13 Investments - other				
14 Land, buildings, and equipment: basis 22,042,895.				
Less: accumulated depreciation 654,209.		21,402,462.	21,388,686.	30,274,707.
15 Other assets (describe Statement 9)		199,589.	224,179.	295,424.
16 Total assets (to be completed by all filers - see the instructions. Also, see page 1, item I)		573,216,882.	653,534,918.	328,130,861.
17 Accounts payable and accrued expenses				
18 Grants payable				
19 Deferred revenue				
20 Loans from officers, directors, trustees, and other disqualified persons				
21 Mortgages and other notes payable				
22 Other liabilities (describe Statement 10)	16,838.	16,932.		
23 Total liabilities (add lines 17 through 22)	16,838.	16,932.		
Net Assets or Fund Balances	Foundations that follow SFAS 117, check here <input checked="" type="checkbox"/> and complete lines 24 through 26, and lines 30 and 31.			
	24 Unrestricted	573,200,044.	653,517,986.	
	25 Temporarily restricted			
	26 Permanently restricted			
	Foundations that do not follow SFAS 117, check here <input type="checkbox"/> and complete lines 27 through 31.			
	27 Capital stock, trust principal, or current funds			
	28 Paid-in or capital surplus, or land, bldg., and equipment fund			
29 Retained earnings, accumulated income, endowment, or other funds				
30 Total net assets or fund balances	573,200,044.	653,517,986.		
31 Total liabilities and net assets/fund balances	573,216,882.	653,534,918.		

Part III Analysis of Changes in Net Assets or Fund Balances

1 Total net assets or fund balances at beginning of year - Part II, column (a), line 30 (must agree with end-of-year figure reported on prior year's return)	1	573,200,044.
2 Enter amount from Part I, line 27a	2	-66,716,887.
3 Other increases not included in line 2 (itemize) Gain on stock grants	3	147,034,829.
4 Add lines 1, 2, and 3	4	653,517,986.
5 Decreases not included in line 2 (itemize)	5	0.
6 Total net assets or fund balances at end of year (line 4 minus line 5) - Part II, column (b), line 30	6	653,517,986.

Part IV Capital Gains and Losses for Tax on Investment Income

(a) List and describe the kind(s) of property sold (for example, real estate, 2-story brick warehouse; or common stock, 200 shs. MLC Co.)	(b) How acquired P - Purchase D - Donation	(c) Date acquired (mo., day, yr.)	(d) Date sold (mo., day, yr.)
1a publicly traded securities		Various	Various
b			
c			
d			
e			

(e) Gross sales price	(f) Depreciation allowed (or allowable)	(g) Cost or other basis plus expense of sale	(h) Gain or (loss) ((e) plus (f) minus (g))
a 79,569,421.		64,653,641.	14,915,780.
b			
c			
d			
e			

Complete only for assets showing gain in column (h) and owned by the foundation on 12/31/69.			(l) Gains (Col. (h) gain minus col. (k), but not less than -0-) or Losses (from col. (h))
(i) FMV as of 12/31/69	(j) Adjusted basis as of 12/31/69	(k) Excess of col. (i) over col. (j), if any	
a			14,915,780.
b			
c			
d			
e			

2 Capital gain net income or (net capital loss)	{ If gain, also enter in Part I, line 7 If (loss), enter -0- in Part I, line 7 }	2	14,915,780.
3 Net short-term capital gain or (loss) as defined in sections 1222(5) and (6): If gain, also enter in Part I, line 8, column (c). If (loss), enter -0- in Part I, line 8		3	N/A

Part V Qualification Under Section 4940(e) for Reduced Tax on Net Investment Income

(For optional use by domestic private foundations subject to the section 4940(a) tax on net investment income.)

If section 4940(d)(2) applies, leave this part blank.

Was the foundation liable for the section 4942 tax on the distributable amount of any year in the base period? Yes No
 If "Yes," the foundation doesn't qualify under section 4940(e). Do not complete this part.

1 Enter the appropriate amount in each column for each year; see the instructions before making any entries.

(a) Base period years Calendar year (or tax year beginning in)	(b) Adjusted qualifying distributions	(c) Net value of noncharitable-use assets	(d) Distribution ratio (col. (b) divided by col. (c))
2017	149,252,357.	3,089,151,826.	.048315
2016	141,816,187.	2,991,214,076.	.047411
2015	141,940,072.	2,899,458,838.	.048954
2014	122,576,318.	2,921,029,557.	.041963
2013	155,879,876.	2,921,104,556.	.053363

2 Total of line 1, column (d)	2	.240006
3 Average distribution ratio for the 5-year base period - divide the total on line 2 by 5.0, or by the number of years the foundation has been in existence if less than 5 years	3	.048001
4 Enter the net value of noncharitable-use assets for 2018 from Part X, line 5	4	3,122,961,274.
5 Multiply line 4 by line 3	5	149,905,264.
6 Enter 1% of net investment income (1% of Part I, line 27b)	6	1,152,129.
7 Add lines 5 and 6	7	151,057,393.
8 Enter qualifying distributions from Part XII, line 4	8	180,776,671.

If line 8 is equal to or greater than line 7, check the box in Part VI, line 1b, and complete that part using a 1% tax rate. See the Part VI instructions.

Part VI Excise Tax Based on Investment Income (Section 4940(a), 4940(b), 4940(e), or 4948 - see instructions)

1a Exempt operating foundations described in section 4940(d)(2), check here <input type="checkbox"/> and enter "N/A" on line 1. Date of ruling or determination letter: _____ (attach copy of letter if necessary-see instructions)			
b Domestic foundations that meet the section 4940(e) requirements in Part V, check here <input checked="" type="checkbox"/> and enter 1% of Part I, line 27b		1	1,152,129.
c All other domestic foundations enter 2% of line 27b. Exempt foreign organizations, enter 4% of Part I, line 12, col. (b).			
2 Tax under section 511 (domestic section 4947(a)(1) trusts and taxable foundations only; others, enter -0-)		2	0.
3 Add lines 1 and 2		3	1,152,129.
4 Subtitle A (income) tax (domestic section 4947(a)(1) trusts and taxable foundations only; others, enter -0-)		4	0.
5 Tax based on investment income. Subtract line 4 from line 3. If zero or less, enter -0-		5	1,152,129.
6 Credits/Payments:			
a 2018 estimated tax payments and 2017 overpayment credited to 2018	6a	1,166,188.	
b Exempt foreign organizations - tax withheld at source	6b	0.	
c Tax paid with application for extension of time to file (Form 8868)	6c	0.	
d Backup withholding erroneously withheld	6d	0.	
7 Total credits and payments. Add lines 6a through 6d	7	1,166,188.	
8 Enter any penalty for underpayment of estimated tax. Check here <input checked="" type="checkbox"/> if Form 2220 is attached	8	0.	
9 Tax due. If the total of lines 5 and 8 is more than line 7, enter amount owed	9		
10 Overpayment. If line 7 is more than the total of lines 5 and 8, enter the amount overpaid	10	14,059.	
11 Enter the amount of line 10 to be: Credited to 2019 estimated tax <input checked="" type="checkbox"/> 14,059. Refunded <input type="checkbox"/>	11	0.	

Part VII-A Statements Regarding Activities

	Yes	No
1a During the tax year, did the foundation attempt to influence any national, state, or local legislation or did it participate or intervene in any political campaign?		X
b Did it spend more than \$100 during the year (either directly or indirectly) for political purposes? See the instructions for the definition If the answer is "Yes" to 1a or 1b, attach a detailed description of the activities and copies of any materials published or distributed by the foundation in connection with the activities.		X
c Did the foundation file Form 1120-POL for this year?		X
d Enter the amount (if any) of tax on political expenditures (section 4955) imposed during the year: (1) On the foundation. <input checked="" type="checkbox"/> \$ 0. (2) On foundation managers. <input checked="" type="checkbox"/> \$ 0.		
e Enter the reimbursement (if any) paid by the foundation during the year for political expenditure tax imposed on foundation managers. <input checked="" type="checkbox"/> \$ 0.		
2 Has the foundation engaged in any activities that have not previously been reported to the IRS? If "Yes," attach a detailed description of the activities.		X
3 Has the foundation made any changes, not previously reported to the IRS, in its governing instrument, articles of incorporation, or bylaws, or other similar instruments? If "Yes," attach a conformed copy of the changes		X
4a Did the foundation have unrelated business gross income of \$1,000 or more during the year?	X	
b If "Yes," has it filed a tax return on Form 990-T for this year?	X	
5 Was there a liquidation, termination, dissolution, or substantial contraction during the year? If "Yes," attach the statement required by <i>General Instruction T</i> .		X
6 Are the requirements of section 508(e) (relating to sections 4941 through 4945) satisfied either: • By language in the governing instrument, or • By state legislation that effectively amends the governing instrument so that no mandatory directions that conflict with the state law remain in the governing instrument?	X	
7 Did the foundation have at least \$5,000 in assets at any time during the year? If "Yes," complete Part II, col. (c), and Part XV	X	
8a Enter the states to which the foundation reports or with which it is registered. See instructions. <input checked="" type="checkbox"/> <u>GA</u>		
b If the answer is "Yes" to line 7, has the foundation furnished a copy of Form 990-PF to the Attorney General (or designate) of each state as required by <i>General Instruction G</i> ? If "No," attach explanation	X	
9 Is the foundation claiming status as a private operating foundation within the meaning of section 4942(j)(3) or 4942(j)(5) for calendar year 2018 or the tax year beginning in 2018? See the instructions for Part XIV. If "Yes," complete Part XIV		X
10 Did any persons become substantial contributors during the tax year? If "Yes," attach a schedule listing their names and addresses		X

Part VII-A Statements Regarding Activities (continued)

Table with 3 columns: Question, Yes, No. Rows 11-16 regarding foundation activities and interest in foreign countries.

Part VII-B Statements Regarding Activities for Which Form 4720 May Be Required

File Form 4720 if any item is checked in the "Yes" column, unless an exception applies.

Table with 3 columns: Question, Yes, No. Rows 1a-4b regarding Form 4720 exceptions and taxes on failure to distribute income.

Part VII-B Statements Regarding Activities for Which Form 4720 May Be Required (continued)

5a During the year, did the foundation pay or incur any amount to:			Yes	No
(1)	Carry on propaganda, or otherwise attempt to influence legislation (section 4945(e))?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
(2)	Influence the outcome of any specific public election (see section 4955); or to carry on, directly or indirectly, any voter registration drive?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
(3)	Provide a grant to an individual for travel, study, or other similar purposes?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
(4)	Provide a grant to an organization other than a charitable, etc., organization described in section 4945(d)(4)(A)? See instructions	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		
(5)	Provide for any purpose other than religious, charitable, scientific, literary, or educational purposes, or for the prevention of cruelty to children or animals?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
b	If any answer is "Yes" to 5a(1)-(5), did any of the transactions fail to qualify under the exceptions described in Regulations section 53.4945 or in a current notice regarding disaster assistance? See instructions		5b	X
	Organizations relying on a current notice regarding disaster assistance, check here	<input type="checkbox"/>		
c	If the answer is "Yes" to question 5a(4), does the foundation claim exemption from the tax because it maintained expenditure responsibility for the grant?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		
	If "Yes," attach the statement required by Regulations section 53.4945-5(d).			
6a	Did the foundation, during the year, receive any funds, directly or indirectly, to pay premiums on a personal benefit contract?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
b	Did the foundation, during the year, pay premiums, directly or indirectly, on a personal benefit contract?		6b	X
	If "Yes" to 6b, file Form 8870.			
7a	At any time during the tax year, was the foundation a party to a prohibited tax shelter transaction?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
b	If "Yes," did the foundation receive any proceeds or have any net income attributable to the transaction?	N/A	7b	
8	Is the foundation subject to the section 4960 tax on payment(s) of more than \$1,000,000 in remuneration or excess parachute payment(s) during the year?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		

Part VIII Information About Officers, Directors, Trustees, Foundation Managers, Highly Paid Employees, and Contractors

1 List all officers, directors, trustees, and foundation managers and their compensation.

(a) Name and address	(b) Title, and average hours per week devoted to position	(c) Compensation (If not paid, enter -0-)	(d) Contributions to employee benefit plans and deferred compensation	(e) Expense account, other allowances
TRUSTEES-see attached detail listing	TRUSTEES			
	12.00	135,833.	6,632.	0.
OFFICERS-see attached detail listing	OFFICERS			
	34.00	320,302.	77,450.	1,579.

2 Compensation of five highest-paid employees (other than those included on line 1). If none, enter "NONE."

(a) Name and address of each employee paid more than \$50,000	(b) Title, and average hours per week devoted to position	(c) Compensation	(d) Contributions to employee benefit plans and deferred compensation	(e) Expense account, other allowances
Elizabeth Smith - 191 Peachtree St NE, #3540, Atlanta, GA 30303	Grants Program Director	66,188.	14,977.	620.
Sarah Tablan - 191 Peachtree St NE, #3540, Atlanta, GA 30303	Controller	54,105.	17,051.	619.
Carrie Conway - 191 Peachtree St NE, #3540, Atlanta, GA 30303	Senior Program Officer	45,989.	16,692.	619.
Katrina Voegtlin - 191 Peachtree St NE, #3540, Atlanta, GA 30303	Assistant Controller	39,388.	15,647.	626.
Joan McKelvey- retired 7/31/18 - 191 Peachtree St NE, #3540, Atlanta, GA	Grants Administrator	43,488.	10,652.	368.
Total number of other employees paid over \$50,000				0

Part VIII Information About Officers, Directors, Trustees, Foundation Managers, Highly Paid Employees, and Contractors (continued)

3 Five highest-paid independent contractors for professional services. If none, enter "NONE."

(a) Name and address of each person paid more than \$50,000	(b) Type of service	(c) Compensation
GANNETT WELSH & KOTLER, LLC - 222 BERKELEY STREET, 15TH FLOOR, BOSTON, MA 02116	INVESTMENT MANAGER	305,229.
T. ROWE PRICE ASSOCIATES P.O. BOX 64043, BALTIMORE, MD 21264	INVESTMENT MANAGER	285,123.
SUNTRUST BANK 303 PEACHTREE ST, ATLANTA, GA 30308	INVESTMENT ADVISOR	249,147.
PARAMETRIC P.O. BOX 398212, SAN FRANCISCO, CA 94139	INVESTMENT MANAGER	151,491.
Total number of others receiving over \$50,000 for professional services		0

Part IX-A Summary of Direct Charitable Activities

List the foundation's four largest direct charitable activities during the tax year. Include relevant statistical information such as the number of organizations and other beneficiaries served, conferences convened, research papers produced, etc.	Expenses
1 N/A	
2	
3	
4	

Part IX-B Summary of Program-Related Investments

Describe the two largest program-related investments made by the foundation during the tax year on lines 1 and 2.	Amount
1 N/A	
2	
All other program-related investments. See instructions.	
3	
Total. Add lines 1 through 3	0.

Part X Minimum Investment Return (All domestic foundations must complete this part. Foreign foundations, see instructions.)

1 Fair market value of assets not used (or held for use) directly in carrying out charitable, etc., purposes:			
a	Average monthly fair market value of securities	1a	3,090,245,867.
b	Average of monthly cash balances	1b	79,949,831.
c	Fair market value of all other assets	1c	323,362.
d	Total (add lines 1a, b, and c)	1d	3,170,519,060.
e	Reduction claimed for blockage or other factors reported on lines 1a and 1c (attach detailed explanation)	1e	81,997,357.
2	Acquisition indebtedness applicable to line 1 assets	2	0.
3	Subtract line 2 from line 1d	3	3,170,519,060.
4	Cash deemed held for charitable activities. Enter 1 1/2% of line 3 (for greater amount, see instructions)	4	47,557,786.
5	Net value of noncharitable-use assets. Subtract line 4 from line 3. Enter here and on Part V, line 4	5	3,122,961,274.
6	Minimum investment return. Enter 5% of line 5	6	156,148,064.

Part XI Distributable Amount (see instructions) (Section 4942(j)(3) and (j)(5) private operating foundations and certain foreign organizations, check here and do not complete this part.)

1	Minimum investment return from Part X, line 6	1	156,148,064.
2a	Tax on investment income for 2018 from Part VI, line 5	2a	1,152,129.
b	Income tax for 2018. (This does not include the tax from Part VI.)	2b	4,028.
c	Add lines 2a and 2b	2c	1,156,157.
3	Distributable amount before adjustments. Subtract line 2c from line 1	3	154,991,907.
4	Recoveries of amounts treated as qualifying distributions	4	0.
5	Add lines 3 and 4	5	154,991,907.
6	Deduction from distributable amount (see instructions)	6	0.
7	Distributable amount as adjusted. Subtract line 6 from line 5. Enter here and on Part XIII, line 1	7	154,991,907.

Part XII Qualifying Distributions (see instructions)

1 Amounts paid (including administrative expenses) to accomplish charitable, etc., purposes:			
a	Expenses, contributions, gifts, etc. - total from Part I, column (d), line 26	1a	180,776,671.
b	Program-related investments - total from Part IX-B	1b	0.
2	Amounts paid to acquire assets used (or held for use) directly in carrying out charitable, etc., purposes	2	
3	Amounts set aside for specific charitable projects that satisfy the:		
a	Suitability test (prior IRS approval required)	3a	
b	Cash distribution test (attach the required schedule)	3b	
4	Qualifying distributions. Add lines 1a through 3b. Enter here and on Part V, line 8; and Part XIII, line 4	4	180,776,671.
5	Foundations that qualify under section 4940(e) for the reduced rate of tax on net investment income. Enter 1% of Part I, line 27b	5	1,152,129.
6	Adjusted qualifying distributions. Subtract line 5 from line 4	6	179,624,542.

Note: The amount on line 6 will be used in Part V, column (b), in subsequent years when calculating whether the foundation qualifies for the section 4940(e) reduction of tax in those years.

Part XIII Undistributed Income (see instructions)

	(a) Corpus	(b) Years prior to 2017	(c) 2017	(d) 2018
1 Distributable amount for 2018 from Part XI, line 7				154,991,907.
2 Undistributed income, if any, as of the end of 2018:				
a Enter amount for 2017 only			145,100,514.	
b Total for prior years:		0.		
3 Excess distributions carryover, if any, to 2018:				
a From 2013				
b From 2014				
c From 2015				
d From 2016				
e From 2017				
f Total of lines 3a through e	0.			
4 Qualifying distributions for 2018 from Part XII, line 4: ▶ \$180,776,671.				
a Applied to 2017, but not more than line 2a			145,100,514.	
b Applied to undistributed income of prior years (Election required - see instructions)		0.		
c Treated as distributions out of corpus (Election required - see instructions)	0.			
d Applied to 2018 distributable amount				35,676,157.
e Remaining amount distributed out of corpus	0.			
5 Excess distributions carryover applied to 2018 (If an amount appears in column (d), the same amount must be shown in column (a).)	0.			0.
6 Enter the net total of each column as indicated below:				
a Corpus. Add lines 3f, 4c, and 4e. Subtract line 5	0.			
b Prior years' undistributed income. Subtract line 4b from line 2b		0.		
c Enter the amount of prior years' undistributed income for which a notice of deficiency has been issued, or on which the section 4942(a) tax has been previously assessed		0.		
d Subtract line 6c from line 6b. Taxable amount - see instructions		0.		
e Undistributed income for 2017. Subtract line 4a from line 2a. Taxable amount - see instr.			0.	
f Undistributed income for 2018. Subtract lines 4d and 5 from line 1. This amount must be distributed in 2019				119,315,750.
7 Amounts treated as distributions out of corpus to satisfy requirements imposed by section 170(b)(1)(F) or 4942(g)(3) (Election may be required - see instructions)	0.			
8 Excess distributions carryover from 2013 not applied on line 5 or line 7	0.			
9 Excess distributions carryover to 2019. Subtract lines 7 and 8 from line 6a	0.			
10 Analysis of line 9:				
a Excess from 2014				
b Excess from 2015				
c Excess from 2016				
d Excess from 2017				
e Excess from 2018				

Part XIV Private Operating Foundations (see instructions and Part VII-A, question 9) N/A

1 a If the foundation has received a ruling or determination letter that it is a private operating foundation, and the ruling is effective for 2018, enter the date of the ruling

b Check box to indicate whether the foundation is a private operating foundation described in section 4942(j)(3) or 4942(j)(5)

Table with 5 columns: (a) 2018, (b) 2017, (c) 2016, (d) 2015, (e) Total. Rows include 2a-e (Qualifying distributions) and 3a-d (Alternative tests).

Part XV Supplementary Information (Complete this part only if the foundation had \$5,000 or more in assets at any time during the year-see instructions.)

1 Information Regarding Foundation Managers:

a List any managers of the foundation who have contributed more than 2% of the total contributions received by the foundation before the close of any tax year (but only if they have contributed more than \$5,000).

None

b List any managers of the foundation who own 10% or more of the stock of a corporation (or an equally large portion of the ownership of a partnership or other entity) of which the foundation has a 10% or greater interest.

None

2 Information Regarding Contribution, Grant, Gift, Loan, Scholarship, etc., Programs:

Check here if the foundation only makes contributions to preselected charitable organizations and does not accept unsolicited requests for funds.

a The name, address, and telephone number or email address of the person to whom applications should be addressed:

See attached schedule

b The form in which applications should be submitted and information and materials they should include:

See attached schedule

c Any submission deadlines:

See attached schedule

d Any restrictions or limitations on awards, such as by geographical areas, charitable fields, kinds of institutions, or other factors:

See attached schedule

Part XV Supplementary Information *(continued)*

3 Grants and Contributions Paid During the Year or Approved for Future Payment				
Recipient	If recipient is an individual, show any relationship to any foundation manager or substantial contributor	Foundation status of recipient	Purpose of grant or contribution	Amount
Name and address (home or business)				
a Paid during the year				
See attached schedule				179,684,027.
Total				▶ 3a 179,684,027.
b Approved for future payment				
See attached schedule				14,250,000.
Total				▶ 3b 14,250,000.

Underpayment of Estimated Tax by Corporations

Department of the Treasury
Internal Revenue Service

▶ Attach to the corporation's tax return. **Form 990-PF**

▶ Go to www.irs.gov/Form2220 for instructions and the latest information.

2018

Name **Robert W. Woodruff Foundation, Inc.** Employer identification number **58-1695425**

Note: Generally, the corporation is not required to file Form 2220 (see Part II below for exceptions) because the IRS will figure any penalty owed and bill the corporation. However, the corporation may still use Form 2220 to figure the penalty. If so, enter the amount from page 2, line 38, on the estimated tax penalty line of the corporation's income tax return, but **do not** attach Form 2220.

Part I Required Annual Payment			
1	Total tax (see instructions)	1	1,152,129.
2a	Personal holding company tax (Schedule PH (Form 1120), line 26) included on line 1	2a	
2b	Look-back interest included on line 1 under section 460(b)(2) for completed long-term contracts or section 167(g) for depreciation under the income forecast method	2b	
2c	Credit for federal tax paid on fuels (see instructions)	2c	
2d	Total. Add lines 2a through 2c	2d	
3	Subtract line 2d from line 1. If the result is less than \$500, do not complete or file this form. The corporation does not owe the penalty	3	1,152,129.
4	Enter the tax shown on the corporation's 2017 income tax return. See instructions. Caution: If the tax is zero or the tax year was for less than 12 months, skip this line and enter the amount from line 3 on line 5	4	1,593,213.
5	Required annual payment. Enter the smaller of line 3 or line 4. If the corporation is required to skip line 4, enter the amount from line 3	5	1,152,129.

Part II Reasons for Filing - Check the boxes below that apply. If any boxes are checked, the corporation **must** file Form 2220 even if it does not owe a penalty. See instructions.

6	<input type="checkbox"/> The corporation is using the adjusted seasonal installment method.
7	<input checked="" type="checkbox"/> The corporation is using the annualized income installment method.
8	<input checked="" type="checkbox"/> The corporation is a "large corporation" figuring its first required installment based on the prior year's tax.

Part III Figuring the Underpayment

	(a)	(b)	(c)	(d)	
9 Installment due dates. Enter in columns (a) through (d) the 15th day of the 4th (Form 990-PF filers: Use 5th month), 6th, 9th, and 12th months of the corporation's tax year	9	05/15/18	06/15/18	09/15/18	12/15/18
10 Required installments. If the box on line 6 and/or line 7 above is checked, enter the amounts from Sch A, line 38. If the box on line 8 (but not 6 or 7) is checked, see instructions for the amounts to enter. If none of these boxes are checked, enter 25% (0.25) of line 5 above in each column	10	50,223.	56,655.	394,928.	333,985.
11 Estimated tax paid or credited for each period. For column (a) only, enter the amount from line 11 on line 15. See instructions	11	106,188.	100,000.	300,000.	610,000.
Complete lines 12 through 18 of one column before going to the next column.					
12 Enter amount, if any, from line 18 of the preceding column	12		55,965.	99,310.	4,382.
13 Add lines 11 and 12	13		155,965.	399,310.	614,382.
14 Add amounts on lines 16 and 17 of the preceding column	14				
15 Subtract line 14 from line 13. If zero or less, enter -0-	15	106,188.	155,965.	399,310.	614,382.
16 If the amount on line 15 is zero, subtract line 13 from line 14. Otherwise, enter -0-	16		0.	0.	
17 Underpayment. If line 15 is less than or equal to line 10, subtract line 15 from line 10. Then go to line 12 of the next column. Otherwise, go to line 18	17				
18 Overpayment. If line 10 is less than line 15, subtract line 10 from line 15. Then go to line 12 of the next column	18	55,965.	99,310.	4,382.	

Go to Part IV on page 2 to figure the penalty. Do not go to Part IV if there are no entries on line 17 - no penalty is owed.
LHA For Paperwork Reduction Act Notice, see separate instructions. Form 2220 (2018)

Part IV Figuring the Penalty

	(a)	(b)	(c)	(d)
19 Enter the date of payment or the 15th day of the 4th month after the close of the tax year, whichever is earlier. (C corporations with tax years ending June 30 and S corporations: Use 3rd month instead of 4th month. Form 990-PF and Form 990-T filers: Use 5th month instead of 4th month.) See instructions	19			
20 Number of days from due date of installment on line 9 to the date shown on line 19	20			
21 Number of days on line 20 after 4/15/2018 and before 7/1/2018	21			
22 Underpayment on line 17 x $\frac{\text{Number of days on line 21} \times 5\% (0.05)}{365}$	22 \$	\$	\$	\$
23 Number of days on line 20 after 06/30/2018 and before 10/1/2018	23			
24 Underpayment on line 17 x $\frac{\text{Number of days on line 23} \times 5\% (0.05)}{365}$	24 \$	\$	\$	\$
25 Number of days on line 20 after 9/30/2018 and before 1/1/2019	25			
26 Underpayment on line 17 x $\frac{\text{Number of days on line 25} \times 5\% (0.05)}{365}$	26 \$	\$	\$	\$
27 Number of days on line 20 after 12/31/2018 and before 4/1/2019	27			
28 Underpayment on line 17 x $\frac{\text{Number of days on line 27} \times 6\% (0.06)}{365}$	28 \$	\$	\$	\$
29 Number of days on line 20 after 3/31/2019 and before 7/1/2019	29			
30 Underpayment on line 17 x $\frac{\text{Number of days on line 29} \times \%}{365}$	30 \$	\$	\$	\$
31 Number of days on line 20 after 6/30/2019 and before 10/1/2019	31			
32 Underpayment on line 17 x $\frac{\text{Number of days on line 31} \times \%}{365}$	32 \$	\$	\$	\$
33 Number of days on line 20 after 9/30/2019 and before 1/1/2020	33			
34 Underpayment on line 17 x $\frac{\text{Number of days on line 33} \times \%}{365}$	34 \$	\$	\$	\$
35 Number of days on line 20 after 12/31/2019 and before 3/16/2020	35			
36 Underpayment on line 17 x $\frac{\text{Number of days on line 35} \times \%}{366}$	36 \$	\$	\$	\$
37 Add lines 22, 24, 26, 28, 30, 32, 34, and 36	37 \$	\$	\$	\$
38 Penalty. Add columns (a) through (d) of line 37. Enter the total here and on Form 1120, line 34; or the comparable line for other income tax returns	38			\$ 0.

* Use the penalty interest rate for each calendar quarter, which the IRS will determine during the first month in the preceding quarter. These rates are published quarterly in an IRS News Release and in a revenue ruling in the Internal Revenue Bulletin. To obtain this information on the Internet, access the IRS website at www.irs.gov. You can also call 1-800-829-4933 to get interest rate information.

Schedule A Adjusted Seasonal Installment Method and Annualized Income Installment Method

See instructions.

Form 1120S filers: For lines 1, 2, 3, and 21 "taxable income" refers to excess net passive income or the amount on which tax is imposed under section 1374(a), whichever applies.

Part I Adjusted Seasonal Installment Method

Caution: Use this method only if the base period percentage for any 6 consecutive months is at least 70%. See instructions.

		(a)	(b)	(c)	(d)
		First 3 months	First 5 months	First 8 months	First 11 months
1 Enter taxable income for the following periods.					
a Tax year beginning in 2015	1a				
b Tax year beginning in 2016	1b				
c Tax year beginning in 2017	1c				
2 Enter taxable income for each period for the tax year beginning in 2018. See the instructions for the treatment of extraordinary items	2				
3 Enter taxable income for the following periods.		First 4 months	First 6 months	First 9 months	Entire year
a Tax year beginning in 2015	3a				
b Tax year beginning in 2016	3b				
c Tax year beginning in 2017	3c				
4 Divide the amount in each column on line 1a by the amount in column (d) on line 3a	4				
5 Divide the amount in each column on line 1b by the amount in column (d) on line 3b	5				
6 Divide the amount in each column on line 1c by the amount in column (d) on line 3c	6				
7 Add lines 4 through 6	7				
8 Divide line 7 by 3.0	8				
9a Divide line 2 by line 8	9a				
b Extraordinary items (see instructions)	9b				
c Add lines 9a and 9b	9c				
10 Figure the tax on the amt on ln 9c using the instr for Form 1120, Sch J, line 2, or comparable line of corp's return ...	10				
11a Divide the amount in columns (a) through (c) on line 3a by the amount in column (d) on line 3a	11a				
b Divide the amount in columns (a) through (c) on line 3b by the amount in column (d) on line 3b	11b				
c Divide the amount in columns (a) through (c) on line 3c by the amount in column (d) on line 3c	11c				
12 Add lines 11a through 11c	12				
13 Divide line 12 by 3.0	13				
14 Multiply the amount in columns (a) through (c) of line 10 by columns (a) through (c) of line 13. In column (d), enter the amount from line 10, column (d)	14				
15 Enter any alternative minimum tax for each payment period. See instructions	15				
16 Enter any other taxes for each payment period. See instr.	16				
17 Add lines 14 through 16	17				
18 For each period, enter the same type of credits as allowed on Form 2220, lines 1 and 2c. See instructions	18				
19 Total tax after credits. Subtract line 18 from line 17. If zero or less, enter -0-	19				

Part II Annualized Income Installment Method

		(a)	(b)	(c)	(d)
		First <u>2</u> months	First <u>3</u> months	First <u>6</u> months	First <u>9</u> months
20	Annualization periods (see instructions)				
21	Enter taxable income for each annualization period. See instructions for the treatment of extraordinary items	3,348,172.	5,343,879.	33,453,707.	62,684,481.
22	Annualization amounts (see instructions)	6.000000	4.000000	2.000000	1.333330
23a	Annualized taxable income. Multiply line 21 by line 22	20,089,032.	21,375,516.	66,907,414.	83,579,099.
23b	Extraordinary items (see instructions)				
23c	Add lines 23a and 23b	20,089,032.	21,375,516.	66,907,414.	83,579,099.
24	Figure the tax on the amount on line 23c using the instructions for Form 1120, Schedule J, line 2, or comparable line of corporation's return	200,890.	213,755.	669,074.	835,791.
25	Enter any alternative minimum tax for each payment period (see instructions)				
26	Enter any other taxes for each payment period. See instr.				
27	Total tax. Add lines 24 through 26	200,890.	213,755.	669,074.	835,791.
28	For each period, enter the same type of credits as allowed on Form 2220, lines 1 and 2c. See instructions				
29	Total tax after credits. Subtract line 28 from line 27. If zero or less, enter -0-	200,890.	213,755.	669,074.	835,791.
30	Applicable percentage	25%	50%	75%	100%
31	Multiply line 29 by line 30	50,223.	106,878.	501,806.	835,791.

Part III Required Installments

		1st	2nd	3rd	4th
		installment	installment	installment	installment
Note: Complete lines 32 through 38 of one column before completing the next column.					
32	If only Part I or Part II is completed, enter the amount in each column from line 19 or line 31. If both parts are completed, enter the smaller of the amounts in each column from line 19 or line 31	50,223.	106,878.	501,806.	835,791.
33	Add the amounts in all preceding columns of line 32. See instructions		50,223.	106,878.	501,806.
34	Adjusted seasonal or annualized income installments. Subtract line 33 from line 32. If zero or less, enter -0-	50,223.	56,655.	394,928.	333,985.
35	Enter 25% (0.25) of line 5 on page 1 of Form 2220 in each column. Note: "Large corporations," see the instructions for line 10 for the amounts to enter	288,032.	288,033.	288,032.	288,032.
36	Subtract line 38 of the preceding column from line 37 of the preceding column		237,809.	469,187.	362,291.
37	Add lines 35 and 36	288,032.	525,842.	757,219.	650,323.
38	Required installments. Enter the smaller of line 34 or line 37 here and on page 1 of Form 2220, line 10. See instructions	50,223.	56,655.	394,928.	333,985.

Form 2220 (2018)

**** Annualized Income Installment Method Using Standard Option**

Form 990-PF Interest on Savings and Temporary Cash Investments Statement 1

Source	(a) Revenue Per Books	(b) Net Investment Income	(c) Adjusted Net Income
Cash equivalents	1,727,155.	1,727,155.	
Total to Part I, line 3	1,727,155.	1,727,155.	

Form 990-PF Dividends and Interest from Securities Statement 2

Source	Gross Amount	Capital Gains Dividends	(a) Revenue Per Books	(b) Net Invest- ment Income	(c) Adjusted Net Income
Dividends	99,725,870.	0.	99,725,870.	99,725,870.	
To Part I, line 4	99,725,870.	0.	99,725,870.	99,725,870.	

Form 990-PF Other Income Statement 3

Description	(a) Revenue Per Books	(b) Net Invest- ment Income	(c) Adjusted Net Income
Ichauway, Inc. rent	1.	0.	
Total to Form 990-PF, Part I, line 11	1.	0.	

Form 990-PF Accounting Fees Statement 4

Description	(a) Expenses Per Books	(b) Net Invest- ment Income	(c) Adjusted Net Income	(d) Charitable Purposes
Audit fees	32,362.	1,618.		30,744.
To Form 990-PF, Pg 1, ln 16b	32,362.	1,618.		30,744.

Form 990-PF	Other Professional Fees			Statement	5
Description	(a) Expenses Per Books	(b) Net Invest- ment Income	(c) Adjusted Net Income	(d) Charitable Purposes	
Consultant fees	4,667.	4,667.		0.	
Investment fees	990,990.	990,990.		0.	
Benefit Consultants	13,068.	654.		12,414.	
To Form 990-PF, Pg 1, ln 16c	1,008,725.	996,311.		12,414.	

Form 990-PF	Taxes			Statement	6
Description	(a) Expenses Per Books	(b) Net Invest- ment Income	(c) Adjusted Net Income	(d) Charitable Purposes	
Excise Tax	1,140,000.	0.		0.	
To Form 990-PF, Pg 1, ln 18	1,140,000.	0.		0.	

Form 990-PF	Other Expenses			Statement	7
Description	(a) Expenses Per Books	(b) Net Invest- ment Income	(c) Adjusted Net Income	(d) Charitable Purposes	
Computer	32,766.	1,638.		31,128.	
Office Insurance	12,824.	641.		12,182.	
Office Equipment	1,906.	95.		1,811.	
Supplies	2,229.	111.		2,118.	
Organization Dues	37,502.	712.		36,790.	
Postage	1,477.	74.		1,403.	
Repairs/Maintenance	2,721.	136.		2,585.	
Telephone	2,777.	139.		2,638.	
Miscellaneous	285.	14.		272.	
To Form 990-PF, Pg 1, ln 23	94,487.	3,560.		90,927.	

Form 990-PF	Corporate Stock	Statement	8
<u>Description</u>		<u>Book Value</u>	<u>Fair Market Value</u>
various - see attached detail		508,080,206.	3,126,747,192.
Total to Form 990-PF, Part II, line 10b		508,080,206.	3,126,747,192.

Form 990-PF	Other Assets	Statement	9
<u>Description</u>	<u>Beginning of Yr Book Value</u>	<u>End of Year Book Value</u>	<u>Fair Market Value</u>
457(b) Plan Benefit Plans	192,382. 7,207.	216,819. 7,360.	288,064. 7,360.
To Form 990-PF, Part II, line 15	199,589.	224,179.	295,424.

Form 990-PF	Other Liabilities	Statement	10
<u>Description</u>		<u>BOY Amount</u>	<u>EOY Amount</u>
457(b) Plan Flex Plan		16,838. 0.	16,838. 94.
Total to Form 990-PF, Part II, line 22		16,838.	16,932.

ROBERT W. WOODRUFF FOUNDATION, INC. - #58-1695425

Form 990-PF, Year 2018, Part I, Line 19a and Part II, Line 14

Asset Description	In service	Life	Cost	Depreciation Expense	Accumulated Depreciation	Net Book Value
Asset Class- 5-Year Property (Computers)						
AV Equipment	7/1/11	5	6,096	0	6,096	0
AV for sitting room	3/1/12	5	1,410	-	1,410	0
AV for sitting room	3/1/12	5	482	-	482	0
Class totals			7,988	-	7,988	0
Asset Class- 7-Year Property (Furniture, Telephones, Copiers)						
Board Table	7/1/11	7	13,554	968	13,554	0
Card Access	7/1/11	7	1,705	122	1,705	0
Card Access	7/1/11	7	756	54	756	0
Chairs	7/1/11	7	18,907	1,350	18,907	0
Credenza	7/1/11	7	514	37	514	0
Desk Chairs	7/1/11	7	2,112	151	2,112	0
Desks and Credenzas	7/1/11	7	40,533	2,895	40,533	0
File Cabinets	7/1/11	7	12,563	897	12,563	0
File Cabinets	7/1/11	7	73	5	73	0
Furniture Installation	7/1/11	7	162	12	162	0
Furniture Installation	7/1/11	7	73	5	73	0
Furniture Installation	7/1/11	7	876	63	876	0
Furniture Installation	7/1/11	7	4,095	293	4,095	0
Guest Chairs	7/1/11	7	1,868	134	1,868	0
Rug	7/1/11	7	3,654	261	3,654	0
Rugs	7/1/11	7	6,080	434	6,080	0
Sitting Room Table	7/1/11	7	812	58	812	0
Breakroom tables	10/1/11	7	511	55	511	0
Drapery	10/1/11	7	2,008	215	2,008	0
Rug	10/1/11	7	1,751	188	1,751	0
Art- Photography	10/1/11	7	2,122	227	2,122	0
Art- Photography	10/1/11	7	593	64	593	0
Credenza and Installation	11/1/11	7	1,108	132	1,108	0
President's Desk	12/1/11	7	3,242	425	3,242	0
Leather Chair	3/1/12	7	711	102	694	17
Sitting room artwork	4/1/12	7	2,737	391	2,639	98
Art- Photography	8/1/12	7	1,399	200	1,283	116
Class totals			124,516	9,738	124,288	228
Asset Class- 15-Year Leasehold Improvements						
Leasehold Improvements	7/1/11	15	45,930	3,061	22,964	22,966
Construction Admin	7/1/11	15	879	59	439	440
Media and display casework	3/1/12	15	5,974	398	2,722	3,252
Media and display casework	3/1/12	15	6,171	410	2,810	3,361
Electrical for sitting rm	3/1/12	15	986	66	449	537
Film to offices	6/1/12	15	662	44	291	371
Class totals			60,602	4,038	29,675	30,927
Ichauway, Baker County, Georgia - depreciation was taken for 10 years on assets used directly in carrying out charitable purposes.						
Land			21,357,531		0	21,357,531
Buildings			492,259		492,259	0
Class totals			21,849,790	0	492,259	21,357,531
GRAND TOTAL			22,042,895	13,776	654,209	21,388,686

ROBERT W. WOODRUFF FOUNDATION, INC. - #58-1695425

Form 990-PF, Year 2018, Part I, Line 25 and Part XV, Line 3a

GRANTS PAID IN 2018

Recipient	Foundation Status	Purpose of Grant	Amount
<u>ARTS & CULTURE</u>			
Buffalo Bill Memorial Association 720 Sheridan Avenue Cody, WY 82414	PC	Renovation and reinstallation of the Cody Firearms Museum.	1,000,000
<u>COMMUNITY DEVELOPMENT</u>			
Atlanta Police Foundation 191 Peachtree Street, NE, Suite 191 Atlanta, GA 30303	PC	\$35 million campaign to support a comprehensive public safety strategy to reduce crime in Atlanta.	1,000,000
Bobby Jones Golf Course Foundation 2560 Brookdale Drive, NW Atlanta, GA 30305	PC	\$17.4 million Phase I renovation of the Bobby Jones Golf Course property.	5,000,000
Foundation Center 32 Old Slip, 24th Floor New York, NY 10005	PC	Two-year program support of the Foundation Center Atlanta.	275,000
Georgia Center for Nonprofits 100 Peachtree Street, Suite 1500 Atlanta, GA 30303	PC	Program support and support of capacity-building effort.	300,000
Greater Atlanta Chamber Foundation 191 Peachtree Street, NE, Suite 3400 Atlanta, GA 30303	PC	Continued support of the ChooseATL campaign.	750,000
University of Georgia Foundation Milledge Centre, Suite 100 394 South Milledge Ave. Athens, GA 30602-5582	PC	Support through 2021 of the Georgia Legislative Leadership Institute, a leadership development program for freshmen members of the Georgia General Assembly.	200,000
		TOTAL COMMUNITY DEVELOPMENT	7,525,000
<u>EDUCATION</u>			
Georgia Council on Economic Education P.O. Box 1619 Atlanta, GA 30301-1619	PC	Support of programs to strengthen K-12 economics education in Georgia. Payable over three years.	200,000
Georgia Partnership for Excellence in Education 270 Peachtree Street, Suite 2200 Atlanta, GA 30303	PC	Continuation of the Woodrow Wilson Georgia Teaching Fellowship to recruit and prepare highly-qualified STEM teachers for public middle and high schools.	2,350,000
Rabun Gap-Nacoochee School 339 Nacoochee Drive Rabun Gap, GA 30568	PC	\$7 million Phase I campaign to construct a new dining hall.	2,000,000
University of Georgia Foundation Milledge Centre, Suite 100 394 South Milledge Ave. Athens, GA 30602-5582	PC	Support of the Georgia College Advising Corps to increase college access at seven underserved high schools in Georgia.	186,000
		TOTAL EDUCATION	4,736,000
<u>ENVIRONMENT</u>			
Ichauway, Incorporated 3988 Jones Center Drive Newton, GA 39870	POF	2018 capital and operating needs.	10,175,000
<u>HEALTH</u>			
Georgia Eye Bank Inc. 5605 Glenridge Drive, NE, Suite 250 Atlanta, GA 30342	PC	Purchase of equipment for expanded facilities for eye tissue transplantation and research.	100,000
Georgia State University Research Foundation P.O. Box 3999 Atlanta, GA 30302-3999	PC	Support over three years for the Georgia Health Policy Center's effort to educate and inform state legislators regarding healthcare policy.	165,000

ROBERT W. WOODRUFF FOUNDATION, INC. - #58-1695425

Form 990-PF, Year 2018, Part I, Line 25 and Part XV, Line 3a

GRANTS PAID IN 2018

Recipient	Foundation Status	Purpose of Grant	Amount
Georgia Transplant Foundation 2201 Macy Drive Roswell, GA 30076	PC	Support for the Dialysis Center Liaison Program to improve access to kidney transplantation.	100,000
Robert W. Woodruff Health Sciences Center Fund, Inc. 191 Peachtree Street NE, Suite 3540 Atlanta, GA 30303	SO II	Development of Emory University's Winship Tower Midtown and Health Sciences Research Building II.	150,000,027
		TOTAL HEALTH	150,365,027
<u>HUMAN SERVICES</u>			
CARE 151 Ellis Street, NE Atlanta, GA 30303-2440	PC	Improvements to headquarters building to significantly upgrade offices, establish a global innovation hub, and create open event space.	5,000,000
LifeLine Animal Project P.O. Box 15466 Atlanta, GA 30333	PC	Construction of the LifeLine Community Animal Center.	400,000
The Salvation Army Georgia Divisional Headquarters 1000 Center Place, NW Norcross, GA 30093	PC	Purchase of trucks (\$383,000) and supplies/training (\$100,000) for the emergency disaster services department.	483,000
		TOTAL HUMAN SERVICES	5,883,000
		TOTAL GRANTS	179,684,027
Foundation status of recipient:	PC	Public charity described in 509(a)(1) or (2)	
	POF	Private operating foundation (section 4942(j)(3)) other than an EOF	
	SO II	Type II supporting organization (sections 509(a)(3) and 509(a)(3)(B)(ii)) other than an SO-DP	

ROBERT W. WOODRUFF FOUNDATION, INC. - #58-1695425

Form 990-PF, Year 2018, Part II, Line 10b

CORPORATE STOCK

SECURITY NAME	QUANTITY	COST	MARKET
1 800 FLOWERS COM INC	1,655	17,511	20,241
1ST SOURCE CORP	733	26,706	29,569
2U INC	1,990	79,846	98,943
3-D SYSTEMS CORP	391	4,954	3,976
3M CO	4,407	708,396	839,710
51JOB INC SPONSORED	295	28,099	18,420
58.COM INC SPONSORED	264	17,688	14,311
A.P. MOLLER-MAERSK UNSPONSORED	1,466	13,223	9,148
AAC TECH HOLDINGS UNSPONSORED	2,000	28,742	11,400
AAR CORP	1,243	41,093	46,414
AARONS INC	2,335	60,159	98,187
ABB LTD SPONSORED	2,013	49,465	38,267
ABBOTT LABS	13,276	589,266	960,253
ABBVIE INC	11,515	661,000	1,061,568
ABERCROMBIE & FITCH CO-CL A	2,749	50,211	55,117
ABIOMED INC	311	121,993	101,087
ACADIA HEALTHCARE	16,798	764,343	431,877
ACCENTURE PLC CL A	4,845	548,831	683,193
ACCOR SA SPONSORED	2,462	24,133	21,124
ACS ACTIVIDADES DE CONS UNSPONSORED	3,728	26,494	28,706
ACTIVISION BLIZZARD, INC	5,759	268,491	268,197
ACTIVISION BLIZZARD, INC	7,900	559,879	367,903
ADDUS HOMECARE CORP	279	9,667	18,939
ADECCO GROUP AG UNSPONSORED	496	19,243	11,656
ADIDAS AG SPONSORED	447	51,438	46,640
ADOBE INC	3,684	349,417	833,468
ADTALEM GLOBAL EDUCATION INC	2,290	59,050	108,363
ADVANCED AUTO PARTS	534	104,340	84,084
ADVANCED MICRO DEVICES INC	6,574	103,280	121,356
ADVANSIX INC	1,142	50,310	27,796
AEGON NV	4,180	24,332	19,437
AERCAP HOLDINGS NV	537	27,008	21,265
AEROVIRONMENT INC	50	4,786	3,398
AES CORP	4,773	50,546	69,018
AFFILIATED MANAGERS GROUP INC	404	69,700	39,366
AFLAC INC	5,714	182,641	260,330
AG MORTGAGE INVESTMENT TRUST	1,101	17,328	17,539
AGEAS SPONSORED	1,255	60,813	56,111
AGILENT TECHNOLOGIES INC	2,323	87,340	156,710
AGNICO EAGLE MINES LTD	530	23,759	21,412
AGREE REALTY CORP	902	43,095	53,326
AGRICULTURAL BANK CHINA UNSPONSORED	1,730	20,390	18,684
AGROFRESH SOLUTIONS INC	1,573	9,299	5,962
AIA GROUP LTD SPONSORED	4,717	145,359	155,095
AIR LEASE CORP	3,685	132,811	111,324
AIR PRODUCTS & CHEMICALS INC	1,714	229,087	274,326
AIRBUS SE UNSPONSORED	3,174	73,981	75,478
AIRCASTLE LTD	2,069	46,131	35,670

ROBERT W. WOODRUFF FOUNDATION, INC. - #58-1695425

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CORPORATE STOCK

AKAMAI TECHNOLOGIES INC	1,239	77,197	75,678
AKBANK T.A.S SPONSORED	4,461	25,365	11,041
AKTIEBOLAGET ELECTROLUX SPONSORED	387	27,251	16,397
AKZO NOBEL NV SPONSORED	1,314	40,838	34,998
ALAMO GROUP INC	347	22,576	26,830
ALASKA AIR GROUP INC	893	58,563	54,339
ALBEMARLE CORP	799	63,377	61,579
ALEXANDRIA REAL ESTATE EQUITIES INC	850	95,887	97,954
ALEXION PHARMACEUTICALS INC	1,613	271,789	157,042
ALEXION PHARMACEUTICALS INC	4,925	695,874	479,498
ALFA LAVAL AB UNSPONSORED	1,110	26,728	23,865
ALIBABA GROUP HOLDING LTD SPONSORED	10,550	1,296,859	1,446,089
ALIBABA GROUP HOLDING LTD SPONSORED	1,299	230,140	178,054
ALIGN TECHNOLOGY INC	521	75,686	109,113
ALLEGION PLC	687	51,309	54,761
ALLERGAN PLC	2,379	669,869	317,977
ALLIANCE DATA SYSTEMS CORP	349	103,988	52,378
ALLIANT CORP	1,670	67,468	70,558
ALLIANZ SE SPONSORED	5,678	125,176	114,355
ALLSTATE CORP	2,612	162,467	215,830
ALPHABET INC CL A	2,270	1,734,953	2,372,059
ALPHABET INC CL A	3,978	3,245,424	4,156,851
ALPHABET INC CL C	2,336	1,761,427	2,419,185
ALPHABET INC CL C	1,955	1,468,160	2,024,618
ALTERYX INC CL A	907	27,781	53,939
ALTRIA GROUP INC	14,194	876,660	701,042
ALUMINA LTD SPONSORED	2,499	17,310	16,119
ALUMINUM CORP OF CHINA LTD SPONSORED	1,129	23,104	8,829
AMADEUS IT GROUP S.A. UNSPONSORED	672	46,079	47,050
AMAG PHARMACEUTICALS INC	1,350	48,291	20,507
AMAZON.COM INC	3,117	2,245,034	4,681,640
AMAZON.COM INC	4,735	3,393,793	7,111,828
AMBEV SA SPONSORED	5,753	34,566	22,552
AMCOR LTD SPONSORED	967	48,814	35,968
AMEDISYS INC	564	65,655	66,050
AMEREN CORP	1,754	76,492	114,413
AMERICA MOVIL SAB DE CD SPONSORED	1,255	23,194	17,884
AMERICAN AIRLINES GROUP INC	3,133	144,143	100,601
AMERICAN CAMPUS COMMUNITIES INC	30,453	1,455,711	1,260,450
AMERICAN EAGLE OUTFITTERS INC	6,417	136,013	124,041
AMERICAN ELEC PWR INC	3,705	220,788	276,912
AMERICAN EQUITY INVT LIFE HL	3,664	110,410	102,372
AMERICAN EXPRESS CO	5,303	393,125	505,482
AMERICAN INTL GROUP INC	6,530	413,021	257,347
AMERICAN NATIONAL INSURANCE	311	32,881	39,572
AMERICAN PUBLIC EDUCATION INC	625	15,850	17,788
AMERICAN TOWER CORP	3,333	351,922	527,247
AMERICAN WATER WORKS CO INC	1,289	87,536	117,003
AMERICAN WATER WORKS CO INC	4,444	370,957	403,382

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CORPORATE STOCK

AMERICAN WOODMARK CORP	531	39,120	29,566
AMERICA'S CAR-MART INC	266	9,252	19,272
AMERIPRISE FINANCIAL INC	1,084	6,150	113,137
AMERISOURCEBERGEN CORP	1,172	113,903	87,197
AMETEK INC	1,668	90,742	112,924
AMGEN INC	4,926	797,777	958,944
AMKOR TECHNOLOGY INC	4,833	40,810	31,704
AMN HEALTHCARE SVCS INC	1,816	120,596	102,895
AMNEAL PHARMACEUTICALS INC CL A	20,244	424,067	273,901
AMPHENOL CORP	2,208	120,080	178,892
ANADARKO PETROLEUM CORPORATION	4,050	264,880	177,552
ANALOG DEVICES INC	2,905	201,344	249,336
ANDERSONS INC	989	36,457	29,561
ANGI HOMESERVICES INC CL A	1,992	20,389	32,011
ANGIODYNAMICS INC	1,628	23,831	32,772
ANGLO AMERICAN PLC SPONSORED	3,628	35,578	40,053
ANGLOGOLD ASHANTI LIMITED SPONSORED	1,662	15,546	20,858
ANHEUSER BUSCH INBEV SPONSORED	961	111,769	63,243
ANIXTER INTERNATIONAL INC	1,156	100,604	62,782
ANNALY CAPITAL MANAGEMENT INC	1,558	16,378	15,300
ANSYS INC	613	74,638	87,622
ANSYS INC	4,597	565,726	657,095
ANTHEM INC	1,970	283,811	517,381
ANTHEM INC	4,491	882,127	1,179,471
ANWORTH MTG ASSET CORP	3,623	17,318	14,637
AON PLC	1,838	173,492	267,172
APACHE CORP	2,754	127,621	72,293
APARTMENT INVT & MGMT CO CL A	1,135	46,861	49,804
APOLLO COMMERCIAL REAL ESTATE	4,130	72,763	68,806
APPFOLIO INC CL A	363	17,853	21,497
APPIAN CORP CL A	503	13,558	13,435
APPLE INC	34,182	4,108,790	5,391,869
APPLE INC	8,493	1,144,947	1,339,686
APPLIED MATERIALS INC	7,709	153,291	252,393
APPTIO INC CL A	721	20,830	27,369
APTARGROUP INC	6,612	569,030	621,991
APTIV PLC	1,929	137,587	118,769
APTIV PLC	15,747	1,393,615	969,543
ARBOR REALTY TRUST INC	2,160	14,835	21,751
ARCBEST CORP	952	24,642	32,616
ARCELORMITTAL SA SPONSORED	753	20,172	15,565
ARCH COAL INC CL A	800	63,490	66,392
ARCHER DANIELS MIDLAND CO	4,066	189,079	166,584
ARCONIC INC	3,654	76,887	61,606
ARCOSA INC	1,894	39,767	52,445
ARDMORE SHIPPING CORP	1,090	15,652	5,090
ARES COMMERCIAL REAL ESTATE CORP	1,083	13,423	14,122
ARISTA NETWORKS INC	404	119,418	85,123
ARKEMA SPONSORED	302	36,369	25,662

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CORPORATE STOCK

ARLINGTON ASSET INVESTMENT CORP	975	12,451	7,059
ARMOUR RESIDENTIAL REIT INC	1,603	29,596	32,862
ARMSTRONG FLOORING INC	817	15,288	9,673
ARRAY BIOPHARMA INC	7,911	110,878	112,732
ARTISAN PARTNERS	13,806	426,800	305,251
ASCENA RETAIL GROUP INC	6,933	69,329	17,402
ASGN INC	1,996	162,689	108,782
ASHAI KASEI CORP UNSPONSORED	1,582	39,562	32,478
ASHFORD HOSPITALITY TRUST	3,330	20,204	13,320
ASHLAND GLOBAL HOLDINGS INC	2,387	159,707	169,382
ASHTREAD GROUP PLC UNSPONSORED	113	13,980	9,476
ASML HOLDING NV	2,200	239,152	342,364
ASML HOLDING NV	339	56,544	52,755
ASPEN PHARMACARE HLDGS UNSPONSORED	794	18,287	7,444
ASPEN TECHNOLOGY INC	2,791	251,043	229,364
ASSA ABLOY UNSPONSORED	3,296	36,059	29,236
ASSOC BRITISH FOODS LMTD UNSPONSORED	910	40,140	23,524
ASSOCIATED BANC CORP	5,228	110,510	103,462
ASSURANT INC	390	31,750	34,882
ASTELLAS PHARMA INC UNSPONSORED	2,574	33,479	32,278
ASTRAZENECA PLC SPONSORED	2,757	90,335	104,711
AT&T INC	55,300	795,777	1,578,262
ATLANTIA S.P.A UNSPONSORED	2,978	48,061	31,001
ATLAS AIR WORLDWIDE HLDGS INC	991	45,686	41,810
ATLAS COPCO AB SPONSORED	813	33,385	19,455
ATLAS CORPCO AB SPONSORED	651	16,958	14,237
ATOS ORIGIN SA UNSPONSORED	938	29,400	15,252
AU OPTRONICS CORP SPONSORED	17,422	73,790	68,643
AUSTRALIA & NEW ZEALAND SPONSORED	3,970	95,560	67,689
AUTODESK INC	1,584	118,510	203,718
AUTOHOME INC SPONSORED	298	19,507	23,313
AUTOMATIC DATA PROCESSING INC	3,370	302,914	441,874
AUTOZONE INC	203	158,304	170,183
AVALONBAY COMMUNITIES INC	998	177,008	173,702
AVAYA HOLDINGS CORP	3,981	91,300	57,963
AVERY DENNISON CORP	639	53,167	57,401
AVIVA PLC SPONSORED	3,241	44,649	30,595
AVNET INC	4,710	191,087	170,031
AVX CORP	1,789	24,272	27,282
AXA SPONSORED	1,967	58,194	42,074
AXOGEN INC	1,113	12,768	22,739
AXON ENTERPRISE INC	2,021	84,109	88,419
AXOS FINANCIAL INC	2,097	85,709	52,802
B. RILEY FINANCIAL INC	586	9,698	8,321
BAE SYSTEMS PLC SPONSORED	1,103	37,732	25,832
BAIDU INC SPONSORED	298	69,971	47,263
BAKER HUGHES, A GE CO	4,283	191,096	92,085
BALL CORP	2,543	94,337	116,927
BANC OF CALIFORNIA, INC	1,595	29,451	21,229

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CORPORATE STOCK

BANCO BILBAO VIZCAYA SPONSORED	6,606	58,806	34,946
BANCO BRADESCO SPONSORED	3,466	35,884	34,279
BANCO DE CHILE SPONSORED	597	17,257	17,074
BANCO DO BRASIL SPONSORED	2,071	22,091	24,666
BANCO SANTANDER BRASIL SPONSORED	2,929	25,714	32,600
BANCO SANTANDER CHILE SPONSORED	593	17,628	17,731
BANCO SANTANDER SA SPONSORED	16,373	110,358	73,351
BANCOLOMBIA S.A. SPONSORED	448	20,375	17,069
BANCORP INC	2,098	17,786	16,700
BANK MONTREAL QUEBEC	658	49,375	43,000
BANK OF AMERICA CORP	69,571	1,110,909	1,714,229
BANK OF CHINA LTD UNSPONSORED	4,598	56,566	49,153
BANK OF NEW YORK MELLON CORP	6,943	296,374	326,807
BANK OF NOVA SCOTIA HALIFAX	1,072	67,707	53,461
BANKFINANCIAL CORP	589	8,492	8,806
BARCLAYS PLC SPONSORED	5,109	51,662	38,522
BARNES & NOBLE EDUCATION INC	1,494	19,839	5,991
BARRICK GOLD CORP	2,775	33,710	37,574
BASF SE SPONSORED	3,145	82,089	55,321
BASSETT FURNITURE INDS INC	329	10,518	6,593
BAUSCH HEALTH COMPANIES INC	762	10,665	14,074
BAXTER INTL INC	3,623	135,135	238,466
BAYER AG SPONSORED	3,406	111,875	59,843
BAYERISCHE MOTOREN WERKE SPONSORED	702	23,591	18,933
BB&T CORPORATION	5,841	218,983	253,032
BEAZER HOMES USA INC	1,237	14,884	11,727
BECTON DICKINSON & CO	2,017	327,632	454,470
BECTON DICKINSON & CO	7,932	1,535,891	1,787,238
BENCHMARK ELECTRONICS INC	1,864	40,191	39,480
BERKSHIRE HATHAWAY INC-CL B	14,768	2,125,119	3,015,330
BERKSHIRE HILLS BANCORP INC	1,343	41,570	36,221
BERRY GLOBAL GROUP INC	18,143	993,245	862,337
BEST BUY COMPANY INC	1,918	63,209	101,577
BHP BILLITON PLC SPONSORED	822	29,928	34,434
BHP GROUP LTD SPONSORED	1,940	82,165	93,683
BIDVEST GROUP LTD SPONSORED	689	17,332	19,388
BIG LOTS INC	1,659	78,696	47,978
BIGLARI HOLDINGS INC CL A	4	5,034	2,351
BIGLARI HOLDINGS INC CL B	40	10,332	4,543
BIO RAD LABORATORIES CL A	2,905	911,199	674,599
BIOGEN INC	1,503	405,905	452,283
BJ'S RESTAURANTS	14,133	423,623	714,706
BLACKBAUD INC	7,969	665,147	501,250
BLACKBERRY LIMITED	1,308	12,835	9,300
BLACKROCK INC	934	332,997	366,894
BLACKSTONE MTG TR INC	3,068	86,873	97,746
BLOCK H & R INC	1,511	53,715	38,334
BLUCORA INC	1,816	30,338	48,378
BLUE HILLS BANCORP INC	1,053	14,958	22,471

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CORPORATE STOCK

BNP PARIBAS SPONSORED	2,339	92,614	52,721
BOEING CO	4,000	601,330	1,290,000
BOEING CO	13,534	2,458,700	4,364,715
BOINGO WIRELESS INC	1,504	34,090	30,937
BOISE CASCADE CO	1,467	40,397	34,988
BOOKING HOLDINGS INC	365	525,252	628,683
BOOKING HOLDINGS INC	911	1,326,198	1,569,125
BOOT BARN HOLDINGS INC	724	14,451	12,330
BOOZ ALLEN HAMILTON HLDG	29,288	1,074,219	1,320,010
BORG WARNER AUTOMOTIVE INC	1,434	61,513	49,817
BOSTON PROPERTIES INC	1,115	137,315	125,493
BOSTON SCIENTIFIC CORP	10,617	208,486	375,205
BP PLC SPONSORED	3,472	129,659	131,658
BRAMBLES LTD SPONSORED	3,992	61,113	56,527
BRASKEM SA SPONSORED	372	10,457	9,099
BRENNTAG AG UNSPONSORED	3,225	35,503	28,090
BRF SA SPONSORED	1,210	18,019	6,873
BRIDGESTONE CORPORATION UNSPONSORED	2,032	46,039	38,994
BRIGHTHOUSE FINANCIAL INC	693	42,780	21,123
BRISTOL MYERS SQUIBB CO	12,172	116,203	632,701
BRISTOW GROUP INC	1,226	19,934	2,979
BRITISH AMERN TOB PLC SPONSORED	2,777	169,105	88,475
BROADCOM INC	3,250	476,329	826,410
BROADRIDGE FINL SOLUTIONS INC	967	110,615	93,074
BROOKFIELD ASSET MANAGE-CL A	1,756	71,513	67,343
BROOKS AUTOMATION INC	2,734	42,207	71,576
BROWN FORMAN CORP CLASS B	1,265	58,457	60,189
BT GROUP PLC SPONSORED	1,207	23,632	18,346
BUILDERS FIRSTSOURCE	4,305	56,052	46,968
BUNZL PLC SPONSORED	1,140	34,962	35,021
BURBERRY GROUP PLC SPONSORED	767	18,480	16,985
BURLINGTON STORES INC	10,343	922,460	1,682,496
BYD CO LTD UNSPONSORED	1,108	19,577	13,961
CABOT MICROELECTRONICS CORP	63	6,376	6,007
CABOT OIL & GAS CORP	3,343	70,424	74,716
CACI INTERNATIONAL INC CLASS A	950	100,232	136,829
CADENCE DESIGN SYSTEMS INC	2,025	77,510	88,047
CAE INC	2,624	43,257	48,150
CAI INTERNATIONAL INC	571	21,225	13,264
CALAVO GROWERS INC	190	9,843	13,862
CALERES INC	1,707	50,879	47,506
CALLAWAY GOLF CO	3,643	40,976	55,738
CALLON PETROLEUM CO	72,175	815,960	468,416
CAMDEN NATIONAL CORP	526	19,507	18,920
CAMECO CORP	1,713	17,242	19,443
CAMPBELL SOUP CO	1,402	72,366	46,252
CAMPING WORLD HOLDINGS INC	829	36,774	9,509
CANADIAN NATIONAL RAILWAY CO	929	75,944	68,848
CANADIAN NATURAL RESOURCES	1,613	53,773	38,922

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CORPORATE STOCK

CANADIAN PACIFIC RAILWAY LTD	223	36,321	39,609
CANON INC SPONSORED	2,843	96,878	78,467
CAPGEMINI SE UNSPONSORED	846	20,187	16,522
CAPITAL ONE FINANCIAL CORP	3,708	302,622	280,288
CAPSTEAD MTG CORP	3,487	31,923	23,258
CARBONITE INC	841	17,820	21,244
CARDINAL HEALTH INC	2,287	189,083	102,000
CARE.COM INC	688	6,199	13,285
CAREER EDUCATION CORP	2,607	19,723	29,772
CARLSBERG A/S SPONSORED	1,251	28,521	26,584
CARMAX INC	1,325	77,165	83,117
CARNIVAL CORP	2,948	157,794	145,336
CARNIVAL PLC SPONSORED	583	37,590	28,410
CAROLINA FINANCIAL CORP	455	16,445	13,463
CARREFOUR SA SPONSORED	7,042	27,798	23,379
CARS.COM INC	2,687	69,424	57,771
CARTERS INC	9,672	943,836	789,429
CATALENT INC	27,275	1,071,095	850,435
CATERPILLAR INC	4,434	336,711	563,428
CAVCO INDUSTRIES INC	317	49,021	41,330
CAVCO INDUSTRIES INC	6,284	879,151	819,308
CBOE GLOBAL MARKETS INC	815	64,637	79,731
CBRE GROUP INC	2,174	81,528	87,047
CBS CORPORATION CLASS B	2,632	120,605	115,071
CDN IMPERIAL BK OF COMMERCE	380	33,245	28,325
CELANESE CORP COMMON	1,052	91,419	94,648
CELGENE CORP	5,256	651,963	336,857
CEMEX SOUTH AMERICA SPONSORED	2,114	19,769	10,189
CENOVUS ENERGY INC	1,976	19,864	13,891
CENTENE CORP	1,603	119,022	184,826
CENTENE CORP	4,618	506,501	532,455
CENTERPOINT ENERGY INC	3,716	74,063	104,903
CENTERSTATE BANK CORP	2,851	52,636	59,985
CENTRAIS ELETRICAS BRASIL SPONSORED	2,646	15,432	16,802
CENTRAL GARDEN & PET CL A	1,314	24,962	41,063
CENTRAL GARDEN & PET CO	388	13,138	13,367
CENTRAL JAPAN RAI UNSPONSORED	1,863	37,302	39,393
CENTRAL VALLEY COMMUNITY BANCORP	372	7,911	7,020
CENTRICA PLC SPONSORED	2,555	25,050	17,553
CENTURY ALUMINUM COMPANY	1,901	32,921	13,896
CENTURY BANCORP INC CL A	107	8,588	7,247
CENTURY COMMUNITIES INC	985	24,556	17,001
CENTURYLINK INC	7,064	174,471	107,020
CERNER CORP	2,660	175,155	139,490
CF INDUSTRIES HOLDINGS INC	1,686	87,431	73,358
CGI GROUP INC	247	13,090	15,114
CH ROBINSON WORLDWIDE INC	1,014	67,380	85,267
CHARLES SCHWAB CORP	9,012	287,579	374,268
CHARLES SCHWAB CORP	35,212	1,797,713	1,462,354

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CORPORATE STOCK

CHART INDUSTRIES INC	1,192	40,208	77,516
CHARTER COMMUNICATIONS INC CL A	1,371	387,441	390,694
CHEFS WAREHOUSE	791	19,443	25,296
CHEGG INC	3,205	52,404	91,086
CHEMED CORP	620	103,845	175,634
CHEMICAL FINL CORP	2,760	122,075	101,044
CHERRY HILL MORTGAGE INVT CORP	439	8,363	7,700
CHEVRON CORP	14,481	1,347,214	1,575,388
CHICOS FAS INC	4,870	49,557	27,369
CHILDRENS PL INC NEW	685	72,648	61,712
CHIMERA INVESTMENT CORP	7,153	115,287	127,466
CHINA CONSTR BK CORP UNSPONSORED	6,016	103,648	98,061
CHINA LIFE INSURANCE CO SPONSORED	2,578	39,305	27,043
CHINA MERCHANTS BANK UNSPONSORED	844	15,715	15,243
CHINA MOBILE LIMITED SPONSORED	1,309	67,165	62,832
CHINA OVERSEAS LD & INVT UNSPONSORED	5,114	87,300	86,273
CHINA PETE & CHEM CORP SPONSORED	407	30,915	28,734
CHINA SOUTHERN AIRLINES CO SPONSORED	348	13,196	10,565
CHINA TELECOM CORP LTD SPONSORED	353	17,685	17,908
CHINA UNICOM HONG KONG LTD SPONSORED	1,930	27,910	20,574
CHIPOTLE MEXICAN GRILL INC	181	117,687	78,154
CHR HANSEN HOLDINGS SPONSORED	614	27,254	27,240
CHUBB LTD	3,543	406,707	457,685
CHUNGHWA TELECOM LTD SPONSORED	2,453	83,958	87,793
CHURCH & DWIGHT INC	1,804	76,995	118,631
CIA CERVECERIAS UNIDAS SPONSORED	1,234	33,541	31,010
CIA DE MINAS BUENAVENTUR SPONSORED	805	10,291	13,057
CIA SANEAMIENTO BASICO DE SPONSORED	1,654	17,618	13,348
CIE FINANCIERE RICH UNSPONSORED	5,943	52,749	38,332
CIELO SA SPONSORED	3,554	12,202	8,316
CIGNA CORP	2,836	434,330	538,650
CIGNA CORP	12,907	2,220,258	2,451,297
CIMAREX ENERGY CO	689	80,590	42,477
CINCINNATI FINL CORP	1,079	66,402	83,536
CINTAS CORP	617	68,393	103,650
CISCO SYSTEMS INC	34,227	1,008,615	1,483,056
CITI TRENDS INC	478	12,705	9,746
CITIGROUP INC	18,941	1,023,472	986,068
CITIZENS FINANCIAL GROUP INC	3,619	76,940	107,593
CITRIX SYSTEMS INC	1,040	69,378	106,558
CK HUTCHISON HOLDING UNSPONSORED	7,223	93,073	68,474
CLEARWAY ENERGY INC CL A	1,318	23,907	22,301
CLEARWAY ENERGY INC CL C	2,392	39,043	41,262
CLOROX COMPANY	933	114,253	143,813
CME GROUP INC	2,721	283,852	511,875
CMS ENERGY CORP	2,038	72,958	101,187
CNO FINANCIAL GROUP, INC	6,700	137,428	99,696
CNOOC LTD SPONSORED	346	42,359	52,748
CNX RESOURCES CORPORATION	7,673	109,804	87,626

ROBERT W. WOODRUFF FOUNDATION, INC. - #58-1695425

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CORPORATE STOCK

COCA COLA AMATIL LTDSPONSORED	6,754	43,352	38,363
COCA COLA CO	55,875,147	50,286,016	2,645,688,210
COCA-COLA FEMSA SAB DE CV SPONSORED	295	22,029	17,948
COGNEX CORP	27,156	1,491,130	1,050,123
COGNIZANT TECHNOLOGY SOLUTIONS CORP	4,269	290,922	270,996
COHU INC	1,484	36,714	23,848
COLGATE PALMOLIVE CO	6,701	459,499	398,844
COLOPLAST A/S UNSPONSORED	2,110	17,043	19,518
COLUMBUS MCKINNON CORP NY	763	28,185	22,997
COMCAST CORP-CL A	34,526	1,080,839	1,175,610
COMERICA INC	1,272	59,372	87,374
COMMERCIAL METALS CO	4,709	73,896	75,438
COMMERCIAL VEHICLE GROUP INC	1,006	8,480	5,734
COMMERZBANK AG SPONSORED	2,276	29,784	15,158
COMMONWEALTH BK SPONSORED	2,257	137,020	114,870
COMPAGNIE DE ST GOBAIN UNSPONSORED	2,704	30,303	17,819
COMPANHIA BRASILEIRA SPONSORED	680	17,076	14,124
COMPANHIA ENERGETICA MINAS SPONSORED	4,064	6,618	14,468
COMPASS GROUP PLC SPONSORED	2,162	47,904	45,186
COMTECH TELECOMMUNICATIONS CORP	884	18,929	21,517
CONAGRA BRANDS INC	3,646	116,347	77,879
CONCERT PHARMACEUTICALS INC	545	10,197	6,840
CONCHO RESOURCES	1,520	181,145	156,241
CONDUENT INC	7,603	119,529	80,820
CONNS INC	1,013	27,969	19,105
CONOCOPHILLIPS	8,797	458,882	548,493
CONSOLIDATED EDISON INC	2,239	151,755	171,194
CONSTELLATION BRANDS INC	1,243	173,538	199,899
CONTINENTAL AG SPONSORED	1,800	44,878	24,804
CONTROL4 CORP	728	20,704	12,813
COOPER COS INC	353	65,132	89,839
COPART INC	1,703	96,335	81,369
CORCEPT THERAPEUTICS INC	3,735	37,608	49,900
COREENERGY INFRASTRUCTURE TRUST	545	16,711	18,029
CORESITE REALTY CORP	7,851	881,842	684,843
CORNING INC	6,529	122,447	197,241
COSTCO WHOLESALE CORP	3,302	527,104	672,650
COTY INC	3,409	78,816	22,363
COVESTRO AG SPONSORED	515	23,017	12,875
COWEN INC CL A	1,097	17,233	14,634
CRA INTERNATIONAL INC	304	7,117	12,935
CREDICORP LIMITED	172	35,361	38,127
CREDIT AGRICOLE S.A. UNSPONSORED	3,507	31,433	18,692
CREDIT SUISSE GROUP-SPONSORED	2,956	46,090	32,102
CRESCENT POINT ENERGY CORP	2,324	17,881	7,018
CRH PLC	1,415	50,912	37,285
CROCS INC	2,622	41,944	68,120
CROWN CASTLE INTL CORP NEW	3,168	282,950	344,140
CSL LTD SPONSORED	1,435	78,163	92,859

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CORPORATE STOCK

CSX CORP	6,083	165,576	377,937
CTRIP.COM INTERNATIONAL LTD	791	42,285	21,404
CUMMINS INC	1,139	117,679	152,216
CUTERA INC	525	20,584	8,936
CVS HEALTH CORP	9,766	944,596	639,868
D R HORTON INC	2,462	75,703	85,333
DAI NIPPON PRINT SPONSORED	2,973	36,019	31,023
DAIICHI SANKYO CO SPONSORED	1,233	28,246	39,579
DAIKIN INDUSTRIES UNSPONSORED	5,387	54,277	57,156
DAIMLER AG UNSPONSORED	3,161	61,906	41,441
DAITO TRUST CONSTRUCTION SPONSORED	2,276	101,352	77,896
DAIWA HOUSE UNSPONSORED	3,097	106,371	98,485
DAIWA SECURITIES GROUP INC SPONSORED	3,089	18,894	15,476
DANAHER CORP	4,644	343,551	478,889
DANONE SPONSORED	3,343	53,200	46,735
DANSKE BANK A/S SPONSORED	1,563	29,096	15,614
DARDEN RESTAURANTS INC	906	55,664	90,473
DARLING INGREDIENTS INC	6,625	96,066	127,465
DASSAULT SYS S A SPONSORED	273	27,912	32,038
DAVITA INC	1,106	85,683	56,915
DBS GROUP HLDGS LTD SPONSORED	1,241	75,257	86,529
DECKERS OUTDOOR CORP	1,202	79,451	153,796
DEERE & CO	2,463	222,026	367,406
DELEK US HOLDINGS INC	2,819	74,239	91,646
DELTA AIR LINES INC	4,815	242,448	240,269
DENBURY RESOURCES INC	15,313	49,543	26,185
DENSO CORPORATION UNSPONSORED	1,749	43,074	39,204
DENTSPLY SIRONA INC	1,659	98,766	61,731
DEUTSCHE BANK AG	2,168	35,612	17,669
DEUTSCHE BOERSE AG UNSPONSORED	4,649	52,468	55,463
DEUTSCHE POST AG SPONSORED	1,988	84,997	54,332
DEUTSCHE TELEKOM AG SPONSORED	2,238	40,626	38,001
DEVON ENERGY CORPORATION	3,800	124,894	85,652
DFA U.S. LARGE CAP VALUE PORTFOLIO	2,278,218	85,846,682	73,221,931
DFA U.S. SMALL CAP VALUE PORTFOLIO	479,542	19,030,507	14,386,247
DIAGEO PLC SPONSORED	689	90,336	97,700
DIAMONDBACK ENERGY INC	1,243	137,214	115,226
DIGI INTL INC	1,172	14,135	11,825
DIGITAL REALTY TRUST INC	1,479	152,702	157,587
DILLARDS INC	788	42,410	47,524
DISCOVER FINL SVCS	2,691	153,832	158,715
DISCOVERY INC SER A	1,546	45,669	38,248
DISCOVERY INC SER C	3,005	76,001	69,355
DISH NETWORK CORP CL A	1,646	102,145	41,101
DISNEY WALT CO NEW	11,212	1,249,246	1,229,396
DMC GLOBAL INC	530	10,756	18,614
DNB ASA SPONSORED	1,461	28,574	23,354
DOLBY LABORATORIES INC	2,195	111,077	135,739
DOLLAR GENERAL CORP	2,036	144,233	220,051

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CORPORATE STOCK

DOLLAR GENERAL CORP	10,100	746,214	1,091,608
DOLLAR TREE INC	1,712	110,210	154,628
DOMINION ENERGY INC	4,974	260,932	355,442
DOMTAR CORPORATION	2,499	101,980	87,790
DON QUIJOTE HLDNGS CO UNSPONSORED	1,500	18,386	23,175
DORMAN PRODUCTS	14,305	1,014,603	1,287,736
DOVER CORP	1,125	56,922	79,819
DOWDUPONT INC	17,484	939,965	935,044
DR REDDYS LABS LTD SPONSORED	1,856	65,634	69,971
DRIL-QUIP INC	6,453	281,262	193,784
DSV AS UNSPONSORED	1,374	53,116	45,273
DTE ENERGY CO	1,297	106,386	143,059
DUCOMMUN INC	425	14,758	15,436
DUKE ENERGY CORP	5,360	212,866	462,568
DUKE REALTY CORPORATION	2,571	71,310	66,589
DXC TECHNOLOGY CO	2,058	120,355	109,424
DYNEX CAP INC	2,240	13,237	12,813
E ON SE SPONSORED	3,926	44,466	38,750
E TRADE FINANCIAL CORP	1,988	54,328	87,233
EAGLE MATERIALS INC	9,728	944,320	593,700
EAST JAPAN RAILWAY CO UNSPONSORED	3,036	45,863	44,371
EASTERLY GOVERNMENT PROPERTIES	49,057	980,736	769,214
EASTMAN CHEMICAL CO	1,047	76,696	76,546
EATON CORP PLC	3,215	158,639	220,742
EBAY INC	7,195	208,272	201,964
ECHOSTAR HOLDING CORP	1,801	98,836	66,133
ECOLAB INC	1,883	225,566	277,460
ECOPETROL SPONSORED	1,502	18,467	23,852
EDF UNSPONSORED	8,215	22,121	24,809
EDISON INTERNATIONAL	2,355	143,789	133,693
EDP-ENERGIAS DE PORTUGAL SPONSORED	576	22,286	20,074
EDWARDS LIFESCIENCES CORP	1,526	118,183	233,737
EISAI LTD SPONSORED	552	28,755	43,194
ELBIT SYSTEMS LTD	302	42,330	34,434
ELDORADO RESORTS INC	2,282	47,642	82,631
ELECTRO SCIENTIFIC INDS INC	1,305	11,424	39,098
ELECTRONIC ARTS INC	2,232	178,715	176,127
EMBRAER SA SPONSORED	443	10,287	9,804
EMCOR GROUP INC	2,194	129,889	130,960
EMERGENT BIOSOLUTIONS INC	1,388	46,838	82,281
EMERSON ELEC CO	4,626	227,579	276,404
ENAGAS UNSPONSORED	1,873	27,003	25,295
ENANTA PHARMACEUTICALS INC	552	52,203	39,098
ENBRIDGE INC	2,240	88,592	69,619
ENCANA CORP	2,506	28,346	14,485
ENCORE CAPITAL GROUP INC	888	41,434	20,868
ENDO INTERNATIONAL PLC	7,878	106,555	57,509
ENEL AMERICAS SA SPONSORED	2,228	20,007	19,874
ENEL CHILE SA SPONSORED	2,525	15,179	12,499

ROBERT W. WOODRUFF FOUNDATION, INC. - #58-1695425

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CORPORATE STOCK

ENEL SPA UNSPONSORED	13,404	81,697	77,877
ENGIE SPONSORED	1,676	28,623	24,000
ENI SPA SPONSORED	1,180	38,656	37,170
ENNIS INC	1,016	19,300	19,558
ENOVA INTERNATIONAL INC	1,263	18,830	24,578
ENSIGN GROUP INC	339	15,414	13,150
ENTERGY CORP	1,298	88,109	111,719
EOG RES INC	4,373	388,460	381,369
EPAM SYSTEMS INC	4,669	612,223	541,651
EPLUS INC	560	32,554	39,855
EQUIFAX INC	870	92,902	81,023
EQUINIX INC	622	207,428	219,292
EQUINOR ASA SPONSORED	2,000	44,741	42,340
EQUITY RESIDENTIAL PPTYS TR	2,655	202,463	175,257
ERICSSON SPONSORED	3,914	21,864	34,717
ERSTE GROUP BANK AG SPONSORED	1,885	41,107	31,159
ESSEX PROPERTY TRUST INC	477	106,117	116,965
ESSILORLUXOTTICA SA UNSPONSORED	552	35,622	34,864
ESSITY AKTIEBOLAG SPONSORED	907	24,017	22,217
ETSY INC	4,342	129,677	206,549
EURONAV SA	2,853	20,392	19,771
EVEREST RE GROUP LIMITED	297	75,913	64,675
EVERGY INC	2,246	123,749	127,505
EVERSOURCE ENERGY	2,291	116,777	149,007
EXANTAS CAPITAL CORP	1,175	14,312	11,774
EXELON CORP	7,451	228,278	336,040
EXPEDIA GROUP INC	883	113,055	99,470
EXPEDITORS INTL WASH INC	1,306	63,083	88,926
EXPERIAN GROUP LTD SPONSORED	1,371	27,499	33,117
EXPONENT INC	30,780	1,119,790	1,560,854
EXPRESS INC	3,003	46,150	15,345
EXTRA SPACE STORAGE INC	910	78,296	82,337
EXTREME NETWORKS INC	4,135	47,764	25,224
EXXONMOBIL CORP	32,150	902,934	2,192,309
EZCORP INC CL A	1,963	16,426	15,174
F5 NETWORKS INC	459	55,700	74,372
FACEBOOK INC-A	18,114	2,019,241	2,374,564
FACEBOOK INC-A	24,865	3,331,012	3,259,553
FANG HOLDINGS LTD SPONSORED	3,559	10,463	5,089
FANUC CORP UNSPONSORED	2,618	53,399	39,427
FARMLAND PARTNERS INC	1,083	10,541	4,917
FARO TECHNOLOGIES INC	640	32,386	26,010
FAST RETAILING CO UNSPONSORED	898	30,328	45,771
FASTENAL CO	2,082	81,343	108,868
FB FINANCIAL CORP	457	17,525	16,004
FEDERAL AGRIC MTG CORP-CL C	347	10,191	20,973
FEDERAL REALTY INVESTMENT TRUST	522	78,738	61,617
FEDERATED MONEY MKT OBLIGS TR	6,979,828	6,979,828	6,979,828
FEDEX CORPORATION	1,872	300,017	302,010

ROBERT W. WOODRUFF FOUNDATION, INC. - #58-1695425

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CORPORATE STOCK

FERGUSON PLC SPONSORED	4,429	29,761	28,213
FERRARI NV	309	34,810	30,727
FERROVIAL SA UNSPONSORED	1,742	36,452	36,112
FIAT CHRYSLER AUTOMOBILES NV	1,792	30,872	25,912
FIBRIA CELULOSE SA SPONSORED	791	10,460	13,613
FIDELITY NATL INFORMATION SVCS INC	2,403	176,872	246,428
FIDELITY NATL INFORMATION SVCS INC	2,963	309,112	303,856
FIFTH THIRD BANCORP	5,325	103,802	125,297
FIRST BANCORP N C	927	20,718	30,276
FIRST BANCORP PR	7,408	36,593	63,709
FIRST COMMUNITY BANKSHARES INC	571	10,987	17,975
FIRST COMWLTH FINL CORP	1,001	10,952	12,092
FIRST CTZNS BANCSHARES INC CL A	339	89,254	127,820
FIRST FINANCIAL CORP INDIANA	430	20,329	17,265
FIRST MERCHANTS CORP	1,496	39,535	51,268
FIRST NORTHWEST BANCORP	489	6,636	7,252
FIRSTENERGY CORP	3,715	117,956	139,498
FISERV INC	3,042	146,894	223,557
FIVE BELOW	2,105	88,111	215,384
FIVE BELOW	13,096	656,068	1,339,983
FIVE9 INC	1,966	34,345	85,954
FLAGSTAR BANCORP	789	19,348	20,830
FLEETCOR TECHNOLOGIES INC	710	156,264	131,861
FLIR SYSTEMS INC	981	25,526	42,713
FLOWERVE CORP	918	41,044	34,902
FLUOR CORP	1,011	47,750	32,554
FMC CORP	970	43,664	71,741
FNB CORPORATION	2,618	32,387	25,761
FOMENTO ECONOMICO MEXICANO SPONSOREI	211	20,476	18,157
FONAR CORP	232	7,658	4,696
FOOT LOCKER INC	949	60,508	50,487
FORD MOTOR CO DEL	30,661	438,053	234,557
FORESTAR GROUP INC	398	9,397	5,512
FORTESCUE METALS GROUP SPONSORED	2,041	17,443	12,144
FORTINET INC	1,079	84,511	75,994
FORTIVE CORP	2,205	111,580	149,190
FORTIVE CORP	5,343	259,497	361,507
FORTUNE BRANDS HOME & SECURITY, INC	1,113	63,274	42,283
FOSSIL GROUP INC	1,621	14,943	25,498
FOSTER LB COMPANY	361	9,434	5,740
FRANCO NEVADA CORP	302	22,948	21,191
FRANKLIN RESOURCES INC	2,378	95,660	70,531
FREEPORT-MCMORAN INC	11,048	135,131	113,905
FRESENIUS MED CARE AG & CO SPONSORED	639	31,289	20,697
FRESENIUS SE & CO KGAA SPONSORED	1,723	35,386	20,934
FRESHPET INC	872	13,556	28,044
FUCHS PETROLUB SE ADR	2,920	42,885	29,872
FUJIFILM HOLDINGS CORP UNSPONSORED	1,524	60,042	59,375
G4S PLC UNSPONSORED	932	17,371	11,990

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CORPORATE STOCK

GALLAGHER ARTHUR J & CO	1,302	69,601	95,957
GALP ENERGIA SGPS SA UNSPONSORED	2,173	20,848	16,862
GAMESTOP CORP CL A	4,183	88,115	52,789
GANNETT CO INC	4,300	41,737	36,679
GAP INC	1,587	43,135	40,881
GARDNER DENVER HOLDINGS INC	36,345	956,375	743,255
GARMIN LTD	802	28,182	50,783
GARTNER INC CL A	655	71,205	83,735
GARTNER INC CL A	11,821	1,468,148	1,511,197
GATX CORP	1,501	100,131	106,286
GDS HOLDINGS LTD SPONSORED	334	13,781	7,712
GEA GROUP AG SPONSORED	586	26,367	15,283
GEELY AUTOMOBILE HLDGS UNSPONSORED	632	40,318	21,930
GEMALTO SPONSORED	431	12,654	12,434
GENERAL DYNAMICS CORP	2,127	325,232	334,386
GENERAL ELECTRIC CORP	65,212	320,899	493,655
GENERAL MLS INC	4,663	264,230	181,577
GENERAL MOTORS CO	10,158	357,452	339,785
GENESCO INC	827	45,547	36,636
GENMAB A/S SPONSORED	835	19,185	13,757
GENUINE PARTS CO	1,061	95,803	101,877
GERDAU SA SPONSORED	2,799	10,291	10,524
G-III APPAREL GROUP LTD	1,589	59,362	44,317
GILDAN ACTIVEWEAR INC-CL A	1,072	33,018	32,546
GILEAD SCIENCES INC	9,722	1,041,810	608,111
GIVAUDAN SA UNSPONSORED	1,064	45,927	49,242
GLACIER BANCORP INC	19,234	667,385	762,051
GLAUKOS CORP	577	32,710	32,410
GLAXOSMITHKLINE PLC SPONSORED	2,601	103,594	99,384
GLENCORE PLC UNSPONSORED	6,226	58,435	45,076
GLOBAL PAYMENTS INC	1,295	105,015	133,553
GLOBAL PAYMENTS INC	9,061	899,086	934,461
GLOBUS MEDICAL INC	2,761	142,831	119,496
GMS INC	998	34,840	14,830
GOLD FIELDS LTD SPONSORED	5,414	22,428	19,057
GOLDCORP INC	1,207	14,715	11,829
GOLDEN ENTERTAINMENT INC	602	15,344	9,644
GOLDMAN SACHS GROUP INC	2,601	499,458	434,497
GOODYEAR TIRE & RUBBER CO	1,820	57,543	37,146
GRACO INC	19,314	788,290	808,291
GRAHAM HOLDINGS COMPANY	170	92,606	108,899
GRAINGER W W INC	379	78,895	107,014
GRAND CANYON EDUCATION INC	1,839	163,606	176,801
GRANITE POINT MORTGAGE TRUST	1,072	20,068	19,328
GREAT AJAX CORP	682	9,284	8,218
GREAT WESTERN BANCORP INC	2,315	71,742	72,344
GREEN BANCORP INC	781	18,109	13,386
GREEN DOT CORP CL A	1,763	38,211	140,194
GREEN PLAINS INC	1,527	38,515	20,019

ROBERT W. WOODRUFF FOUNDATION, INC. - #58-1695425

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CORPORATE STOCK

GREENBRIER COS INC	1,131	42,994	44,720
GRIFOLS S.A. SPONSORED	1,064	22,094	19,535
GROUP 1 AUTOMOTIVE INC	749	49,314	39,487
GRUBHUB INC	3,357	181,234	257,851
GRUPO AEROPORTUARIO PAC SPONSORED	235	25,082	19,164
GRUPO AEROPORTUARIO SPONSORED	182	36,296	27,409
GRUPO AVAL ACCIONES Y VAL SPONSORED	2,044	18,758	12,060
GRUPO TELEVISA SA DE CV SPONSORED	1,106	26,313	13,913
GUESS INC	2,250	36,781	46,733
H LUNDBECK SPONSORED	419	24,820	18,436
H&E EQUIPMENT SERVICES INC	1,195	41,028	24,402
HAEMONETICS CORP	2,036	160,907	203,702
HALLIBURTON CO	6,731	266,141	178,910
HAMILTON LANE INC CL A	601	25,004	22,237
HANCOCK WHITNEY CORP	3,272	108,764	113,375
HANESBRANDS INC	2,635	75,706	33,017
HANG LUNG PPTYS LTD SPONSORED	6,006	62,913	57,537
HARLEY DAVIDSON INC	1,233	59,212	42,070
HARRIS CORP DEL	866	68,989	116,607
HARTFORD FINL SVCS GROUP INC	2,633	122,126	117,037
HASBRO INC	823	62,160	66,869
HAVERTY FURNITURE COMPANIES INC	890	19,517	16,714
HCA HEALTHCARE INC	2,089	144,008	259,976
HCA HEALTHCARE INC	11,269	1,122,684	1,402,427
HCP INC	3,390	113,623	94,683
HEALTH INSURAN-A	493	10,604	13,178
HEIDELBERGCEMENT AG UNSPONSORED	1,461	27,837	17,853
HEINEKEN HOLDING NV SPONSORED	1,134	52,793	48,926
HEINEKEN NV SPONS ADR	827	41,615	36,363
HELIX ENERGY SOLUTIONS GROUP	5,212	49,352	28,197
HELMERICH & PAYNE INC	785	46,222	37,633
HENKEL AG & CO KGAA SPONSORED	373	45,753	36,688
HENKEL AG & CO KGAA SPONSORED	235	32,043	25,838
HENNES & MAURITZ AB UNSPONSORED	7,226	32,749	19,799
HENRY SCHEIN INC	1,147	86,706	90,062
HERC HOLDINGS INC	1,079	59,949	28,043
HERITAGE FINL CORP WASH COM	1,125	34,335	33,435
HERITAGE-CRYSTAL CLEAN INC	492	9,760	11,321
HERMES INTERNATIONAL UNSPONSORED	771	40,851	42,594
HERSHA HOSPITALITY TRUST	1,477	27,588	25,907
HESS CORPORATION	1,953	109,757	79,097
HEWLETT PACKARD ENTERPRISE COMPANY	11,874	100,005	156,856
HEXAGON AB UNSPONSORED	1,011	50,143	47,315
HEXCEL CORP	15,453	1,040,090	886,075
HIBBETT SPORTS INC	727	10,258	10,396
HILTON WORLDWIDE HOLDINGS INC	2,234	160,445	160,401
HILTON WORLDWIDE HOLDINGS INC	12,081	688,013	867,416
HITACHI LTD SPONSORED	1,009	71,870	53,437
HOLLYFRONTIER CORP	1,455	105,209	74,380

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CORPORATE STOCK

HOLOGIC INC	2,027	70,517	83,310
HOME DEPOT INC	8,648	1,075,227	1,485,899
HOMESTREET INC	1,091	25,180	23,162
HOMETRUST BANCSHARES INC	837	17,243	21,913
HONDA MOTOR LTD SPONSORED	2,385	70,624	63,083
HONEYWELL INTERNATIONAL INC	5,650	567,489	746,478
HONEYWELL INTERNATIONAL INC	3,158	457,363	417,235
HONG KONG EXCHANGES UNSPONSORED	1,778	49,460	50,949
HOOKER FURNITURE	548	26,096	14,434
HORMEL FOODS CORPORATION	1,948	69,599	83,141
HOST HOTELS & RESORTS, INC	5,349	89,776	89,168
HOYA CORPORATION SPONSORED	636	37,921	38,252
HP INC	12,073	159,455	247,014
HSBC HOLDINGS PLC SPONSORED	4,385	214,876	180,267
HUANENG PWR INTL INC SPONSORED	735	18,604	18,382
HUAZHU GROUP LTD SPONSORED	460	19,240	13,170
HUBSPOT INC	1,378	149,554	173,256
HUGO BOSS AG SPONSORED	1,108	17,993	13,523
HUMANA INC	1,045	191,731	299,372
HUMANA INC	2,404	588,995	688,698
HUNT JB TRANS SVCS	617	46,836	57,406
HUNTINGTON BANCSHARES INC	7,879	76,543	93,918
HUNTINGTON INGALLS INDUSTRIES	333	75,931	63,373
HURCO COMPANIES INC	238	10,634	8,497
HYPERA SA SPONSORED	1,584	17,249	12,331
IAC INTERACTIVECORP	2,200	446,614	402,688
IBERDROLA SA SPONSORED	1,270	40,587	40,748
IBERIABANK CORP	2,079	157,101	133,638
ICF INTERNATIONAL INC	724	23,410	46,901
ICHOR HOLDINGS LTD	668	22,625	10,888
ICICI BANK LTD SPONSORED	8,341	74,670	85,829
ICU MED INC	5,665	1,043,986	1,300,854
IDEXX LABS INC	631	73,171	117,379
IHS MARKIT LTD	2,626	122,414	125,969
ILLINOIS TOOL WKS INC	2,397	227,616	303,676
ILLUMINA INC	1,131	204,539	339,221
IMPERIAL BRANDS PLC SPONSORED	1,113	48,032	33,969
IMPERIAL OIL LTD	1,681	52,261	42,563
INCYTE CORPORATION	1,234	165,131	78,470
INDEPENDENT BANK GROUP INC	718	44,433	32,863
INDITEX UNSPONSORED	3,183	58,887	40,456
INDUST & COMM BANK CHINA UNSPONSORED	4,811	71,941	68,124
INDUSTRIAL LOGISTICS PROPERTIES	1,180	22,616	23,218
INFINEON TECHNOLOGIES AG SPONSORED	1,013	25,479	20,245
INFOSYS LTD SPONSORED	10,798	80,006	102,797
INFRAREIT INC	1,462	33,914	30,731
ING GROEP NV SPONSORED	3,711	67,717	39,559
INGENICO GROUP UNSPONSORED	1,188	22,864	13,175
INGERSOLL-RAND PLC	1,834	107,907	167,316

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INGLES MARKETS INC	537	24,021	14,617
INNOVATIVE INDUSTRIAL PROP CL A	261	11,779	11,847
INOGEN INC	690	44,819	85,677
INSIGHT ENTERPRISES INC	1,383	38,431	56,357
INSPERITY INC	1,455	49,477	135,839
INSTRUCTURE INC	1,080	39,554	40,511
INTEGER HOLDINGS CORPORATION	1,141	62,921	87,013
INTEL CORP	34,526	1,199,451	1,620,305
INTERCONTINENTAL EXCHANGE INC	4,254	217,290	320,454
INTERCONTINENTAL EXCHANGE INC	10,600	571,400	798,498
INTERCONTINENTAL HOTELS SPONSORED	547	27,539	29,861
INTERNATIONAL BANCSHARES CORP	2,156	58,664	74,166
INTERNATIONAL FLAVORS & FRAGRANCES	836	103,866	112,250
INTERNATIONAL PAPER CO	2,985	130,185	120,475
INTERPUBLIC GROUP COS INC	2,843	64,212	58,651
INTERSECT ENT INC	1,020	31,203	28,744
INTESA SANPAOLO SPONSORED	2,475	52,493	33,215
INTL BUSINESS MACHINES CORP	6,867	978,476	780,572
INTL CONSOLIDATED AIRLINES SPONSORED	1,140	19,126	17,761
INTREPID POTASH INC	3,568	13,510	9,277
INTUIT INC	1,966	214,717	387,007
INTUIT INC	7,578	965,260	1,491,729
INTUITIVE SURGICAL INC	856	165,481	409,956
INTUITIVE SURGICAL INC	4,105	804,110	1,965,967
INVACARE CORP	1,235	18,042	5,311
INVESCO LTD	2,941	100,069	49,232
INVESCO MORTGAGE	4,190	50,886	60,671
IPG PHOTONICS	332	80,161	37,612
IQVIA HOLDINGS INC	1,317	126,370	152,996
IRHYTHM TECHNOLOGIES INC	747	41,660	51,902
IRIDIUM COMMUNICATIONS INC	3,150	27,630	58,118
IRON MOUNTAIN INC	1,911	68,092	61,936
ISRAEL CHEMICALS LTD	3,716	16,857	21,033
ISTAR INC	2,708	32,673	24,832
ITAU UNIBANCO HOLDING SPONSORED	3,976	36,497	36,341
ITOCHU CORPORATION UNSPONSORED	728	26,499	24,832
J SAINSBURY PLC SPONSORED	2,951	42,110	39,809
JACK HENRY & ASSOC INC	614	86,770	77,683
JACOBS ENGINEERING GROUP INC	870	33,843	50,860
JAMES HARDIE INDS-SPONSORED	1,892	26,462	22,212
JAMES RIVER GROUP HOLDINGS LTD	20,208	801,428	738,400
JAPAN AIRLINES CO UNSPONSORED	1,016	16,855	17,963
JAPAN EXCHANGE GROUP INC UNSPONSORED	4,258	36,389	33,809
JAPAN TOBACCO INC UNSPONSORED	2,924	48,607	34,357
JARDINE MATHESON UNSPONSORED	1,117	73,073	77,129
JAZZ PHARMACEUTICALS PLC	3,552	563,793	440,306
JBS SA SPONSORED	1,947	10,489	11,536
JD COM INC SPONSORED	1,273	53,704	26,644
JEFFERIES FINANCIAL GROUP INC	2,289	55,945	39,737

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JERNIGAN CAPITAL INC	502	10,852	9,950
JGC CORP UNSPONSORED	825	25,837	23,121
JM SMUCKER CO	821	95,775	76,755
JOHNSON & JOHNSON	20,264	2,094,596	2,615,069
JOHNSON CONTROLS INTERNATIONAL PLC	6,740	321,145	199,841
JOHNSON OUTDOORS INC CL A	199	5,377	11,689
JP MORGAN CHASE & CO	25,262	417,001	2,466,076
JULIUS BAER GROUP LTD UNSPONSORED	4,942	57,850	34,891
JUNIPER NETWORKS INC	2,749	86,927	73,976
K12 INC	1,583	24,397	39,243
KADANT INC	419	17,300	34,132
KANSAS CITY SOUTHERN	762	63,424	72,733
KANSAS CITY SOUTHERN	4,115	439,025	392,777
KAO CORP UNSPONSORED	4,705	57,006	70,105
KASIKORNBANK PUBLIC COMPANY LTD	2,869	77,310	65,083
KB FINANCIAL GROUP INC SPONSORED	2,141	103,997	89,879
KB HOME COM	3,127	43,900	59,726
KBC GROUP NV UNSPONSORED	1,226	50,904	39,183
KDDI CORP UNSPONSORED	3,048	40,223	36,119
KELLOGG CO	1,796	127,199	102,390
KELLY SERVICES INC	1,305	26,379	26,726
KEMET CORPORATION	1,875	18,620	32,888
KEMPER CORPORATION	1,863	72,950	123,666
KERING SA UNSPONSORED	1,161	45,922	54,283
KEYCORP	7,861	100,659	116,186
KEYSIGHT TECHNOLOGIES INC	1,406	82,038	87,284
KFORCE INC	899	24,200	27,797
KIMBALL ELECTRONICS INC	1,025	13,233	15,877
KIMBALL INTL INC CL B	1,496	18,991	21,228
KIMBERLY CLARK CORP	2,554	309,091	291,003
KIMCO REALTY CORP	3,077	81,549	45,078
KINDER MORGAN INC	13,878	365,169	213,444
KINGFISHER PLC SPONSORED	2,547	21,741	13,295
KINROSS GOLD CORP	3,919	15,482	12,698
KINSALE CAPITAL GROUP INC	731	31,860	40,614
KIRIN HOLDINGS COMPANY SPONSORED	2,673	60,962	55,545
KLA-TENCOR CORP	1,134	75,011	101,482
KLX ENERGY SERVICES HOLDINGS INC	760	21,189	17,822
KOC HOLDING AS UNSPONSORED	1,870	37,005	24,684
KOHL'S CORP	1,219	56,030	80,868
KOMATSU LTD SPONSORED	1,556	44,296	33,516
KONE OYJ UNSPONSORED	1,383	38,514	33,026
KONINKLIJKE AHOLD DELHAIZE SPONSORED	1,758	32,079	44,354
KONINKLIJKE DSM NV SPONSORED	1,464	29,204	29,661
KONINKLIJKE PHILIPS NV	898	37,513	31,529
KONINKLIJKE VOPAK NV UNSPONSORED	245	12,191	11,159
KOREA ELECTRIC POWER CORP SPONSORED	6,522	112,256	96,200
KRAFT HEINZ CO	4,710	356,633	202,718
KRATON CORP	1,189	36,233	25,968

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CORPORATE STOCK

KROGER CO	6,486	244,758	178,365
KRONOS WORLDWIDE INC	1,038	26,753	11,958
KT CORP SPONSORED	5,632	79,837	80,087
KUBOTA SPONSORED	343	31,255	24,164
KULICKE & SOFFA INDS INC	2,674	35,748	54,202
KYOCERA CORP	1,219	75,888	60,749
L BRANDS, INC	1,804	172,725	46,309
L3 TECHNOLOGIES INC	565	74,882	98,118
LABORATORY CORP AMERICA HOLDINGS	736	90,381	93,001
LAFARGEHOLCIM LTD UNSPONSORED	2,770	33,951	22,603
L'AIR LIQUIDE UNSPONSORED	1,931	46,402	47,638
LAKELAND BANCORP INC	1,978	27,377	29,294
LAM RESEARCH CORP	1,174	111,544	159,864
LAMB WESTON HOLDINGS INC	1,250	95,886	91,950
LANTHEUS HOLDINGS INC	1,105	20,177	17,293
LAS VEGAS SANDS CORP	9,500	728,711	494,475
LAUDER ESTEE COS INC	1,618	133,532	210,502
LA-Z-BOY INC	1,811	47,907	50,183
LCI INDUSTRIES	132	12,615	8,818
LEGG MASON INC	3,352	130,259	85,510
LEGGETT & PLATT INC	956	43,030	34,263
LEMAITRE VASCULAR INC	661	11,609	15,626
LEND LEASE LTD SPONSORED	5,704	81,402	45,917
LENDINGTREE INC	305	55,287	66,969
LENNAR CORP-CL A	2,224	111,352	87,070
LENOVO GROUP LTD SPONSORED	2,511	26,759	33,647
LG DISPLAY CO LTD SPONSORED	9,215	114,255	75,471
LGI HOMES INC	671	25,233	30,343
LHC GROUP INC	1,027	48,367	96,415
LILLY ELI & CO	7,288	601,087	843,367
LILLY ELI & CO	7,900	886,376	914,188
LIMELIGHT NETWORKS INC	2,790	13,900	6,529
LINCOLN ELEC HLDGS INC	9,697	901,675	764,608
LINCOLN NATL CORP	1,601	85,353	82,147
LINDE PLC	4,213	689,600	657,397
LINE CORP SPONSORED	474	16,632	16,168
LITHIA MOTORS INC-CLASS A	7,815	887,456	596,519
LIVANOVA PLC	989	88,050	90,464
LIVEPERSON INC	2,035	29,619	38,380
LKQ CORP	2,233	70,183	52,989
LLOYDS BANKING GROUP PLC-SPONSORED	20,785	71,801	53,210
LOCALIZA RENT A CAR SPONSORED	3,871	25,116	29,226
LOCKHEED MARTIN CORP	1,887	422,220	494,092
LOEWS CORPORATION	1,995	76,897	90,812
LONDON STOCK EXCHANGE UNSPONSORED	4,604	60,616	60,312
LONZA GROUP AG UNSPONSORED	1,769	46,910	45,976
L'OREAL CO UNSPONSORED	1,529	66,742	69,814
LOWES COS INC	6,102	451,431	563,581
LUFTHANSA SPONSORED	822	22,193	18,865

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CORPORATE STOCK

LUKOIL PJSC SPONSORED	1,210	62,023	86,321
LUMENTUM HOLDINGS INC	2,403	86,183	100,950
LUXOTTICA GROUP SPA SPONSORED	373	21,326	22,037
LVMH MOET HENNESSY LOUIS UNSPONSORED	1,551	87,444	90,671
LYONDELLBASELL INDUSTRIES NV	2,346	216,710	195,093
M & T BANK CORP	1,098	135,935	157,157
M/I HOMES INC	1,054	25,234	22,155
MACERICH CO COM	787	67,141	34,061
MACQUARIE GROUP LTD SPONSORED	813	57,715	61,800
MACY'S INC	2,201	110,486	65,546
MAGELLAN HEALTH INC	951	63,920	54,102
MAGIC LEAP INC	4,645	106,988	125,415
MAGIC LEAP INC	1,126	30,402	30,402
MAGNA INTERNATIONAL INC CL A	593	30,939	26,952
MAKITA CORP-SPONSORED	1,111	45,783	39,079
MAMMOTH ENERGY SERVICES INC	389	13,102	6,994
MANTECH INTERNATIONAL CORP CL A	992	34,763	51,877
MANULIFE FINANCIAL CORP	2,799	55,455	39,718
MARATHON OIL CORP	6,144	94,278	88,105
MARATHON PETROLEUM CORPORATION	4,993	263,758	294,637
MARCUS & MILLICHAP INC	610	21,015	20,941
MARINE HARVEST ASA SPONSORED	1,376	26,484	29,157
MARKETAXESS	9,734	1,758,746	2,056,892
MARKS & SPENCER PLC SPONSORED	2,850	25,406	17,642
MARRIOT VACATIONS WORLDWIDE CORP	1,546	191,184	109,008
MARRIOTT INTERNATIONAL INC	2,261	160,173	245,454
MARSH & MCLENNAN COS INC	3,705	207,849	295,474
MARTIN MARIETTA MATLS INC	454	70,135	78,029
MASCO CORP	2,303	67,452	67,340
MASTEC INC	2,624	112,817	106,429
MASTERCARD INC CL A	6,896	695,618	1,300,930
MASTERCRAFT BOAT HOLDINGS INC	620	14,223	11,594
MATADOR RESOURCES CO	29,455	786,306	457,436
MATCH GROUP INC	2,482	112,124	106,155
MATERION CORP	684	29,248	30,773
MATTEL INC	2,477	57,997	24,745
MAURI GROUP CO., LTD UNSPONSORED	869	25,088	33,895
MAXIM INTEGRATED PRODS INC	2,297	128,465	116,802
MAXIM INTEGRATED PRODS INC	8,708	520,863	442,802
MAZDA MTR CORP UNSPONSORED	3,844	26,746	19,566
MCCORMICK & CO INC	860	72,358	119,746
MCDERMOTT INTERNATIONAL INC	3,683	61,137	24,087
MCDONALDS CORP	5,851	666,905	1,038,962
MCDONALDS CORP	3,110	516,151	552,243
MCGRATH RENTCORP	901	40,838	46,383
MCKESSON CORP	1,520	275,813	167,914
MDC HOLDINGS INC	1,682	39,556	47,281
MEDEQUITIES REALTY TRUST INC	1,192	13,852	8,153
MEDICAL PROPERTIES TRUST INC	13,896	185,178	223,448

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MEDIFAST INC	404	17,756	50,508
MEDIOBANCA SPA UNSPONSORED	2,064	22,097	17,523
MEDTRONIC PLC	10,275	772,587	934,614
MELCO RESORTS & ENTERTAINMENT	1,452	34,464	25,584
MERCK & CO INC	20,077	1,120,395	1,534,084
MERCK KGAA SPONSORED	488	10,333	10,128
MERIT MED SYSTEM INC	1,999	45,710	111,564
MERITAGE HOMES CORPORATION	1,558	75,189	57,210
METHANEX CORP	331	17,159	15,944
METLIFE INC	7,683	350,622	315,464
METTLER-TOLEDO INTERNATIONAL INC	186	74,690	105,198
MFA FINANCIAL INC	15,180	114,551	101,402
MGIC INVESTMENT CORPORATION	14,257	196,486	149,128
MGM RESORTS INTERNATIONAL	3,742	128,260	90,781
MGP INGREDIENTS INC	478	24,839	27,270
MICHAEL KORS HOLDINGS LTD	1,096	49,676	41,560
MICHAELS COS INC/THE	30,774	657,625	416,680
MICHELIN (CGDE) UNSPONSORED	1,509	43,708	29,576
MICRO FOCUS INTL PLC SPONSORED	593	10,223	10,206
MICROCHIP TECHNOLOGY INC	1,682	88,432	120,969
MICRON TECHNOLOGY INC	8,714	187,801	276,495
MICROSOFT CORP	58,635	3,292,524	5,955,557
MICROSOFT CORP	54,809	3,650,426	5,566,950
MID-AMER APARTMENT COMM	821	72,995	78,570
MID-AMER APARTMENT COMM	7,228	776,719	691,720
MIDDLEBY CORP	5,761	711,189	591,828
MIDSTATES PETROLEUM CO INC	952	13,187	7,150
MILLER HERMAN INC	2,245	65,364	67,911
MILLER INDUSTRIES INC/TENN	467	11,151	12,609
MINITAB CORP SPONSORED	772	36,276	42,309
MITSUBISHI ELECTRIC CORP UNSPONSORED	1,466	46,938	32,237
MITSUBISHI ESTATE	4,395	74,345	68,738
MITSUBISHI UFJ FINANCIAL-SPONSORED	12,320	78,418	59,998
MITSUI & CO LTD SPONSORED	102	30,944	31,671
MITSUI FUDOSAN CO LTD UNSPONSORED	1,371	86,384	90,116
MIZUHO FINANCIAL GROUP INC SPONSORED	13,315	46,946	39,945
MMC NORILSK NICKEL PJSC SPONSORED	1,976	33,193	37,228
MOBILE TELESYSTEMS SPONSORED	2,041	21,527	14,287
MODINE MFG CO	1,965	23,809	21,242
MOHAWK INDUSTRIES INC	457	89,645	53,451
MOLSON COORS BREWING CO-B	1,335	121,417	74,974
MOMO INC SPONSORED	228	7,996	5,415
MONARCH CASINO & RESORT INC	433	11,149	16,515
MONDELEZ INTERNATIONAL INC	10,898	497,182	436,247
MOODYS CORP	1,201	119,189	168,188
MORGAN STANLEY	10,222	340,687	405,302
MORGAN STANLEY	15,266	573,911	605,297
MOSAIC CO NEW	2,537	87,182	74,106
MOTOROLA SOLUTIONS, INC	1,176	82,636	135,287

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CORPORATE STOCK

MOVADO GROUP INC	655	16,943	20,711
MR COOPER GROUP INC	68	1,167	794
MR PRICE GROUP LTD SPONSORED	493	6,964	8,418
MS&AD INS GROUP HOLDINGS UNSPONSORED	2,552	39,368	35,894
MSCI INC	743	111,153	109,540
MTN GROUP LTD SPONSORED	2,168	19,918	13,225
MUENCHENER UNSPONSORED	2,245	46,779	49,053
MURATA MFG CO LTD UNSPONSORED	1,004	40,117	33,805
MURPHY OIL CORP	6,331	164,041	148,082
MYLAN NV	3,876	160,034	106,202
MYRIAD GENETICS INC	1,451	43,528	42,181
NASDAQ INC	844	58,288	68,845
NASPERS LTD SPONSORED	2,722	123,284	107,941
NATIONAL AUSTRALIA BK LTD SPONSORED	7,975	97,568	67,788
NATIONAL GRID PLC SPONSORED	503	32,524	24,134
NATIONAL-OILWELL INC	2,747	101,587	70,598
NATURGY ENERGY GROUP SA UNSPONSORED	5,975	27,460	30,413
NEDBANK GROUP LTD SPONSORED	1,969	30,928	38,041
NEKTAR THERAPEUTICS	1,307	134,633	42,961
NELNET INC-A	739	28,536	38,679
NESTLE SA SPONSORED	3,178	265,225	257,291
NETAPP INC	1,950	61,987	116,357
NETEASE INC SPONSORED	111	31,320	26,126
NETFLIX INC	3,286	366,058	879,531
NETFLIX INC	3,493	712,865	934,936
NETSCOUT SYSTEMS INC	3,361	104,665	79,420
NEUBERGER BERMAN HIGH INCOME BOND	1,456,535	12,427,152	11,695,972
NEUROCRINE BIOSCIENCES INC	9,551	896,077	682,037
NEW MEDIA INVESTMENT GROUP INC	2,233	30,320	25,836
NEW ORIENTAL EDUCATION SPONSORED	440	38,045	24,116
NEW RELIC INC	1,626	113,053	131,657
NEW YORK TIMES CO	4,940	96,716	110,113
NEWCREST MINING LTD SPONSORED	1,377	24,935	21,412
NEWELL BRANDS INC	3,543	162,848	65,864
NEWFIELD EXPLORATION CO	1,440	50,275	21,110
NEWMONT MNG CORP	3,854	91,989	133,541
NEWPARK RESOURCES INC	3,213	30,381	22,073
NEWS CORP/NEW CL A	2,482	37,255	28,171
NEWS CORP/NEW CL B	1,576	24,412	18,203
NEWSTAR FINANCIAL INC	1,190	-	-
NEXEO SOLUTIONS INC	2,243	16,826	19,267
NEXTERA ENERGY INC	3,643	407,638	633,226
NICE LTD SPONSORED	264	22,553	28,567
NIDEC CORPORATION SPONSORED	1,804	55,767	50,602
NIELSEN HLDGS PLC	2,428	116,836	56,645
NIKE INC-CLASS B	9,535	617,958	706,925
NIKE INC-CLASS B	10,700	704,067	793,298
NIKON CORP UNSPONSORED	2,257	39,104	33,562
NINTENDO LTD UNSPONSORED	897	42,687	29,691

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CORPORATE STOCK

NIPPON TELEGRAPH & TELEPHN SPONSORED	810	37,090	32,918
NISOURCE INC	3,130	69,472	79,346
NISSAN MOTOR LTD SPONSORED	944	19,597	15,047
NITTO DENKO CORP-UNSPONSORED	673	29,975	16,859
NMI HOLDINGS INC	2,356	33,637	42,055
NN GROUP NV UNSPONSORED	905	20,022	17,729
NOAH HOLDINGS LTD SPONSORED	419	23,655	18,151
NOBLE ENERGY INC	3,517	115,302	65,979
NOKIA CORP SPONSORED	6,989	42,705	40,676
NOMURA HOLDINGS INC SPONSORED	5,590	31,951	20,795
NOODLES & CO	545	5,025	3,810
NORDEA BANK ABP SPONSORED	3,547	46,224	29,759
NORDSON CORP	7,483	874,885	893,096
NORDSTROM INC	841	54,387	39,199
NORFOLK SOUTHERN CORP	2,083	15,333	311,492
NORSK HYDRO ASA SPONSORED	1,405	10,479	6,379
NORTHERN TR CORP	1,788	133,473	149,459
NORTHRIM BANCORP INC	320	8,803	10,518
NORTHROP GRUMMAN CORPORATION	1,317	264,052	322,533
NORTHROP GRUMMAN CORPORATION	3,593	1,096,152	879,926
NORTHWEST PIPE CO	274	5,447	6,381
NORWEGIAN CRUISE LINE HOLDINGS	1,752	101,829	74,267
NOVANTA INC	1,206	54,405	75,978
NOVARTIS AG SPONSORED	2,179	186,215	186,980
NOVO NORDISK AS SPONSORED	2,197	106,332	101,216
NOVOZYMES A/S SPONSORED	372	19,183	16,647
NRG ENERGY INC	2,173	28,336	86,051
NSK LTD UNSPONSORED	447	10,140	7,621
NTT DOCOMO INC SPONSORED	1,388	34,108	30,883
NU SKIN ENTERPRISES INC	1,889	117,466	115,852
NUCOR CORP	2,309	98,282	119,629
NVIDIA CORP	4,522	268,424	603,687
NXP SEMICONDUCTORS	385	38,695	28,213
OCCIDENTAL PETE CORP	5,853	433,803	359,257
OCEANFIRST FINANCIAL CORPORATION	221	5,818	4,975
OFG BANCORP	1,830	17,091	30,122
OGE ENERGY CORP	22,594	816,459	885,459
OLD NATL BANCORP	5,087	71,762	78,340
OLD SECOND BANCORP INC	1,453	16,072	18,889
OLLIE'S BARGAIN OUTLET HOLDINGS INC	1,953	72,203	129,894
OLYMPIC STEEL INC	531	14,668	7,577
OLYMPUS CORP SPONSORED	806	27,783	24,930
OMNICOM GROUP	1,668	124,886	122,164
OMRON CORP SPONSORED	626	30,246	22,592
OMV AG SPONSORED	822	44,357	36,427
ONEMAIN HOLDINGS INC	2,738	84,427	66,506
ONEOK INC	3,249	169,850	175,284
OPEN TEXT CORP	569	17,965	18,549
OPPENHEIMER HOLDINGS INC	357	9,587	9,121

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OPUS BANK	657	18,789	12,871
ORACLE CORPORATION	20,396	812,823	920,879
ORASURE TECHNOLOGIES INC	2,232	45,192	26,070
O'REILLY AUTOMOTIVE INC	636	169,666	218,994
ORION GROUP HOLDINGS INC	1,713	11,559	7,349
ORIX CORP SPONSORED	520	42,446	37,206
ORKLA ASA SPONSORED	3,176	31,685	24,614
ORTHOFIX MEDICAL INC	698	27,136	36,638
OTSUKA HOLDINGS LIMITED	1,466	28,643	29,643
OVERSTOCK.COM INC	761	14,094	10,334
OXFORD INDS INC	696	46,054	49,444
PACCAR INC	2,540	135,781	145,136
PACIFIC PREMIER BANCORP	959	23,751	24,474
PACKAGING CORP OF AMERICA	682	74,058	56,920
PADDY POWER BETFAIR PLC UNSPONSORED	390	19,887	15,875
PANASONIC CORPORATION SPONSORED	3,191	47,822	28,687
PANDORA A/S SPONSORED	747	19,038	7,537
PARAMOUNT GROUP INC	7,779	123,857	97,704
PARKER HANNIFIN CORP	962	99,539	143,473
PARSLEY ENERGY INC	34,253	951,842	547,363
PATRICK INDS INC	912	33,177	27,004
PAYCHEX INC	2,312	120,398	150,627
PAYPAL HOLDINGS INC	8,911	364,944	749,326
PAYPAL HOLDINGS INC	13,705	638,137	1,152,453
PBF ENERGY INC	4,362	163,240	142,507
PC CONNECTION INC	427	9,781	12,695
PDL BIOPHARMA INC	5,756	23,436	16,692
PEABODY ENERGY CORP	4,003	144,727	122,011
PEARSON PLC SPONSORED	2,312	17,864	27,605
PEGASYSTEMS INC	1,399	38,782	66,914
PEMBINA PIPELINE CORP	1,125	38,442	33,379
PENNYMAC FINANCIAL SERVICES INC	797	16,543	16,944
PENNYMAC MORTGAGE INVT TRUST	2,483	36,326	46,233
PENTAIR PLC	1,194	43,714	45,109
PEOPLES BANC INC	815	22,374	24,532
PEOPLES UNITED FINANCIAL, INC	1,116	15,914	16,104
PEOPLES UNITED FINANCIAL, INC	2,489	42,487	35,916
PERFORMANCE FOOD GROUP CO	3,296	94,170	106,362
PERKINELMER INC	797	40,647	62,604
PERNOD RICARD SA UNSPONSORED	2,070	56,135	67,772
PERRIGO CO PLC	959	153,151	37,161
PETMED EXPRESS INC	780	13,127	18,143
PETROCHINA CO LTD SPONSORED	457	28,942	28,128
PETROLEO BRASILEIRO SA SPONSORED	2,427	25,120	31,575
PETROLEO BRASILEIRO SPONSORED	2,133	21,267	24,721
PEUGEOT SA UNSPONSORED	1,089	30,464	22,923
PFIZER INC	44,051	890,394	1,922,826
PG & E CORP	3,707	201,135	88,041
PGT INNOVATIONS INC	1,893	33,629	30,004

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CORPORATE STOCK

PHILIP MORRIS INTL INC	11,686	1,059,536	780,157
PHILIP MORRIS INTL INC	12,294	1,265,111	820,747
PHILLIPS 66	3,106	267,185	267,582
PHOTRONICS INC	2,982	28,168	28,866
PHYSICIANS REALTY TRUST	52,242	953,671	837,439
PICO HOLDINGS INC	869	11,581	7,943
PING AN INSURANCE SPONSORED	4,182	67,690	72,725
PINNACLE FINANCIAL PARTNERS INC	19,720	1,197,664	909,092
PINNACLE WEST CAP CORP	807	54,107	68,756
PIONEER NATURAL RESOURCES CO	1,230	171,271	161,770
PIPER JAFFRAY COS	613	34,841	40,360
PJSC GAZPROM SPONSORED	10,283	42,730	45,451
PLATFORM SPECIALTY PRODUCTS	8,269	92,105	85,419
PLDT INC SPONSORED	2,170	65,720	46,395
PNC FINL SVCS GROUP INC	3,464	319,537	404,976
POLARIS INDUSTRIES INC	8,946	964,609	685,979
POOL CORPORATION	4,878	525,798	725,115
POPULAR INC	3,965	155,975	187,227
PORSCHE AUTOMOBIL UNSPONSORED	4,171	26,386	24,275
PORTLAND GENERAL ELECTRIC CO	19,348	898,177	887,106
POSCO SPONSORED	1,550	110,160	85,157
POWER INTEGRATIONS INC	8,969	645,547	546,930
PPG INDUSTRIES INC	1,854	193,412	189,534
PPL CORPORATION	5,213	180,057	147,684
PREFERRED APARTMENT COMMUNITIES INC	1,467	15,437	20,626
PREMIER INC	27,891	893,392	1,041,729
PRICESMART INC	12,290	1,081,654	726,339
PRINCIPAL FINL GROUP INC	1,943	98,662	85,822
PROASSURANCE CORP	15,626	846,951	633,791
PROCTER & GAMBLE CO	18,927	1,478,553	1,739,770
PROGRESS SOFTWARE CORP	1,766	65,391	62,675
PROGRESSIVE CORP OHIO	4,533	163,021	273,476
PROLOGIS INC	4,644	226,248	272,696
PROSIEBENSAT 1 MEDIA AG UNSPONSORED	2,143	18,145	9,493
PROSPERITY BANCSHARES INC	2,678	161,764	166,839
PROVIDENT FINL SVCS INC	2,483	51,698	59,915
PRUDENTIAL FINL INC	3,087	258,056	251,745
PRUDENTIAL PLC	1,889	90,630	66,814
PT BANK MANDIRI UNSPONSORED	8,762	86,279	88,584
PTC THERAPEUTICS INC	715	22,859	24,539
PUBLIC SERVICE ENTERPRISE GROUP INC	3,657	151,306	190,347
PUBLIC STORAGE INC	1,082	247,814	219,008
PUBLICIS GROUPE SPONSORED	1,959	33,709	27,739
PULTE GROUP INC	2,006	36,971	52,136
PVH CORP	560	54,337	52,052
PYXUS INTERNATIONAL INC	313	6,514	3,712
QBE INS GROUP LTD SPONSORED	4,381	35,119	30,755
QIAGEN NV	1,108	35,391	38,171
QORVO INC	920	41,566	55,872

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CORPORATE STOCK

QUAD GRAPHICS INC	1,170	29,296	14,414
QUAKER CHEMICAL CORP	6,301	927,657	1,119,751
QUALCOMM INC	9,102	533,236	517,995
QUALYS INC	1,236	96,467	92,379
QUANTA SERVICES INCORPORATED	1,093	21,696	32,899
QUEST DIAGNOSTICS INC	986	65,863	82,104
QUIDEL CORP	1,169	50,093	57,071
QUINSTREET INC	1,372	14,926	22,268
R1 RCM INC	3,041	23,167	24,176
RAKUTEN INC SPONSORED	1,487	10,771	9,889
RALPH LAUREN CORP	400	44,976	41,384
RAPID7 INC	21,079	468,505	656,822
RAYMOND JAMES FINANCIAL INC	928	72,299	69,052
RAYONIER ADVANCED MATERIALS	1,971	42,549	20,991
RAYTHEON COMPANY	2,098	248,872	321,728
RBC BEARINGS INC	10,131	1,218,249	1,328,174
RCI HOSPITALITY HOLDINGS INC	335	9,417	7,481
RE/MAX HOLDINGS INC	704	33,301	21,648
READY CAPITAL CORP	669	10,101	9,252
REALTY INCOME CORP	2,156	110,263	135,914
RECKITT BENCKISER GROUP SPONSORED	4,008	74,694	60,641
RED ELECTRICA CORP UNSPONSORED	3,404	36,369	37,767
RED HAT INC	1,283	101,483	225,346
RED HAT INC	10,728	1,118,660	1,884,266
REGENCY CENTERS CORPORATION	1,250	84,470	73,350
REGENERON PHARMACEUTICALS INC	615	329,286	229,703
REGENXBIO INC	559	35,055	23,450
REGIONAL MANAGEM	507	12,567	12,193
REGIONS FINANCIAL CORP	8,638	82,715	115,576
REGIS CORP	1,335	20,411	22,628
RELX PLC SPONSORED	3,420	74,471	70,178
RENAULT SA UNSPONSORED	1,340	25,698	16,482
RENEWABLE ENERGY GROUP INC	1,277	12,660	32,819
REPSOL SA SPONSORED	1,795	32,988	28,774
REPUBLIC SERVICES INC	1,655	72,208	119,309
RESMED INC	1,028	79,863	117,058
RESOLUTE FOREST PRODUCTS INC	3,422	34,173	27,136
RESTAURANT BRANDS INTERNATIONAL INC	10,611	641,783	554,955
RESTAURANT BRANDS INTERNATIONAL INC	551	35,732	28,817
RH	723	61,036	86,630
RINGCENTRAL INC	2,509	67,280	206,842
RIO TINTO PLC SPONSORED	910	43,425	44,117
RITCHIE BROS AUCTIONEERS INC	27,749	857,033	907,947
RIVERVIEW BANCORP INC	801	7,481	5,831
RMR GROUP INC CL A	260	12,193	13,801
ROBERT HALF INTL INC	912	47,169	52,166
ROCHE HOLDING LTD SPONSORED	5,856	186,144	182,004
ROCKWELL AUTOMATION INC	928	101,016	139,645
ROGERS COMMUNICATIONS-CL B	390	20,440	19,991

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CORPORATE STOCK

ROGERS CORP	726	99,861	71,918
ROKU INC	874	29,767	26,779
ROLLINS INC	1,372	55,936	49,529
ROLLS-ROYCE HOLDINGS PLC SPONSORED	2,579	31,249	26,963
ROPER TECHNOLOGIES INC	813	165,939	216,681
ROSS STORES INC	2,813	141,839	234,042
ROSS STORES INC	11,800	822,950	981,760
ROYAL BANK OF CANADA	1,602	122,759	109,769
ROYAL BANK OF SCOTLAND SPONSORED	6,357	46,644	35,536
ROYAL CARIBBEAN CRUISES LTD	1,244	121,644	121,651
ROYAL DUTCH SHELL PLC SPONSORED	1,995	120,868	119,580
ROYAL DUTCH SHELL PLC SPONSORED	2,617	154,395	152,493
ROYAL KPN NEDERLAND NV SPONSORED	6,043	21,841	17,374
ROYAL MAIL PLC UNSPONSORED	2,508	26,652	17,205
RPM INTERNATIONAL INC	29,396	1,496,759	1,727,897
RUSH ENTERPRISES INC	1,288	35,970	44,410
RWE AKTIENGESELLSCHAFT SPONSORED	1,186	29,423	25,962
RYANAIR HOLDINGS PLC SPONSORED	314	33,550	22,401
RYOHIN KEIKAKU CO UNSPONSORED	472	27,591	22,710
S&P GLOBAL INC	1,858	173,971	315,749
SAFETY INCOME & GROWTH INC	622	11,211	11,700
SAFRAN SA UNSPONSORED	1,967	49,830	58,794
SAIA INC	955	59,695	53,308
SALESFORCE COM INC	5,695	498,399	780,044
SALESFORCE COM INC	8,780	669,027	1,202,597
SAMPO OYJ A SHARES UNSPONSORED	2,063	53,343	45,695
SANDERSON FARMS INC	751	54,274	74,567
SANDVIK AB SPONSORED	1,780	30,665	25,650
SANLAM LTD SPONSORED	4,362	45,260	48,135
SANOFI SPONSORED	2,327	114,725	101,015
SANTEN PHARMACEUTICAL CO UNSPONSORED	1,642	26,695	23,472
SAP SE SPONSORED	731	79,927	72,771
SASOL LTD SPONSORED	1,105	34,531	32,365
SBA COMMUNICATIONS CORP CL A	870	133,596	140,844
SBERBANK RUSSIA SPONSORED	4,170	56,649	45,703
SCANA CORP	1,033	60,399	49,357
SCANSOURCE INC	1,089	39,145	37,440
SCHLUMBERGER LTD	10,377	804,904	374,402
SCHNEIDER ELECTRIC UNSPONSORED	2,704	46,591	36,558
SCHNEIDER NATIONAL INC CL B	32,217	785,737	601,491
SCHNITZER STEEL INDS INC-A	1,049	22,743	22,606
SCHOLASTIC CORP	1,127	45,922	45,373
SCOR SPONSORED	13,240	54,033	58,388
SEAGATE TECHNOLOGY PLC	2,081	81,107	80,306
SEALED AIR CORP NEW	1,374	65,500	47,870
SECOM LTD UNSPONSORED	1,587	29,308	32,708
SEIKO EPSON UNSPONSORED	3,568	44,587	24,726
SELECT INCOME	2,349	60,007	17,289
SEMICONDUCTOR MANUF SPONSORED	2,087	13,913	8,932

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SEMPRA ENERGY	2,056	212,872	222,439
SEMPRA ENERGY	5,211	583,471	563,778
SENECA FOODS CORP CL-A	299	9,608	8,438
SERVICENOW INC	3,816	380,909	679,439
SEVEN & I HOLDINGS UNSPONSORED	3,549	70,836	76,925
SGS SA UNSPONSORED	1,691	40,384	38,022
SHARP CORPORATION UNSPONSORED	2,327	15,935	5,655
SHAW COMMUNICATIONS INC-CL B	1,495	34,191	27,045
SHERWIN WILLIAMS CO	645	180,124	253,782
SHIMANO INC UNSPONSORED ADR	2,075	27,716	29,486
SHIN ETSU CHEMICAL CO UNSPONSORED	2,126	48,063	40,819
SHINHAN FINANCIAL GROUP SPONSORED	2,344	104,787	83,189
SHIRE PLC SPONSORED	314	48,829	54,649
SHISEIDO LTD SPONSORED	823	32,681	51,857
SHOE CARNIVAL INC	419	10,039	14,041
SHOPRITE HLDGS SPONSORED	2,670	39,634	35,538
SHORE BANCSHARES INC	489	7,374	7,110
SHUTTERFLY INC	1,239	100,754	49,882
SIEMENS AG SPONSORED	1,413	97,791	79,241
SIERRA BANCORP	409	11,299	9,828
SIGNATURE BANK	9,408	1,116,770	967,236
SILICON LABORATORIES INC	9,060	722,270	714,019
SIMON PROPERTY GROUP INC	2,371	476,556	398,304
SIMULATIONS PLUS INC	415	7,169	8,259
SINA CORP	152	17,623	8,153
SINGAPORE EXCHANGE LTD UNSPONSORED	941	79,294	74,292
SINGAPORE TELECOM SPONSORED	893	23,336	19,200
SINOPEC SHANGHAI PETRO SPONSORED	501	30,271	21,623
SITEONE LANDSCAPE SUPPLY INC	1,562	98,278	86,332
SK TELECOM LTD SPONSORED	3,021	71,989	80,963
SKECHERS USA INC -CL A	5,325	155,538	121,889
SKF AB SPONSORED	794	16,808	12,009
SKYWEST INC	1,978	49,805	87,962
SKYWORKS SOLUTIONS INC	1,328	102,837	89,003
SL GREEN REALTY CORP	715	84,815	56,542
SLEEP NUMBER CORP	1,467	34,374	46,548
SMART GLOBAL HOLDINGS INC	213	8,309	6,326
SMC CORPORATION SPONSORED	2,216	40,347	32,952
SMITH & NEPHEW PLC SPONSORED	1,093	39,307	40,856
SMITH A O CORPORATION	1,058	58,209	45,177
SMITHS GROUP PLC SPONSORED	1,287	28,221	22,246
SNAP-ON INC	416	68,958	60,441
SOCIEDAD QUIMICA MINERA SPONSORED	208	11,820	7,966
SOCIETE GENERALE SPONSORED	4,369	50,155	27,481
SODEXO SA SPONSORED	1,166	28,467	23,716
SOFTBANK GROUP CORP UNSPONSORED	1,717	70,750	55,974
SOLAREEDGE TECHNOLOGIES INC	1,422	45,395	49,912
SONIC AUTOMOTIVE INC CL A	1,131	27,011	15,563
SONIC HEALTHCARE LTD SPONSORED	2,584	45,315	40,698

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CORPORATE STOCK

SONOVA HOLDING AG UNSPONSORED	1,432	49,200	46,941
SONY CORP SPONSORED	1,442	54,436	69,620
SORRENTO THERAPEUTICS INC	2,366	14,923	5,678
SOUTH STATE CORPORATION	257	15,586	15,407
SOUTH32 LTD SPONSORED	2,117	26,714	24,875
SOUTHERN COMPANY	7,710	160,937	338,623
SOUTHWEST AIRLINES CO	3,981	181,855	185,037
SP PLUS CORPORATION	846	23,762	24,991
SPARK NEW ZEALAND SPONSORED	1,459	20,131	20,244
SPARTAN MOTORS INC	1,243	5,186	8,987
SPECTRUM PHARMACEUTICALS INC	3,452	65,180	30,205
SPEEDWAY MOTORSPORTS INC	431	9,923	7,012
SPIRIT AEROSYSTEMS HLDGS INC	6,100	582,678	439,749
SPLUNK INC	6,800	708,270	712,980
SPOK HOLDINGS INC	749	14,263	9,932
SPROUTS FARMERS MARKETS LLC	4,733	89,956	111,273
SS&C TECHNOLOGIES HLDGS INC	22,519	864,633	1,015,832
SSE PLC SPONSORED	1,299	24,573	17,887
STAAR SURGICAL CO	117	5,010	3,733
STAMPS COM INC	613	136,117	95,407
STANDARD BANK GROUP SPONSORED	2,456	30,029	31,253
STANLEY BLACK & DECKER INC	1,107	118,275	132,552
STARBUCKS CORP	9,330	583,532	600,852
STATE STREET CORP	3,011	211,666	189,904
STERIS PLC	11,200	974,624	1,196,720
STERLING BANCORP	3,224	62,828	53,228
STMICROELECTRONICS NV-NY SHS	1,781	37,203	24,720
STONERIDGE INC	993	17,871	24,477
STORA ENSO CORPORATION SPONSORED	2,554	36,985	29,652
STRATEGIC EDUCATION INC	793	71,063	89,942
STRYKER CORPORATION	2,313	244,017	362,563
STRYKER CORPORATION	11,715	1,608,294	1,836,326
SUBARU CORP UNSPONSORED	1,792	32,072	19,515
SUEZ UNSPONSORED	4,540	39,152	29,374
SUMITOMO CHEM CO LTD UNSPONSORED	1,169	37,173	27,974
SUMITOMO MITSUI FINL GROUP SPONSORED	6,503	50,392	42,335
SUMITOMO MITSUI TRUST SPONSORED	5,527	21,953	19,566
SUMMIT HOTEL PROPERTIES	2,640	38,412	25,687
SUMMIT HOTEL PROPERTIES	75,462	1,141,275	734,245
SUN COMMUNITIES INC	11,283	991,449	1,147,594
SUN HUNG KAI PROP LTD SPONSORED	6,253	107,176	89,480
SUN LIFE FINANCIAL INC	1,113	43,225	36,940
SUNCOR ENERGY INC	2,479	86,904	69,338
SUNRUN INC	2,471	13,781	26,909
SUNTORY BVRGE & FOOD LTD UNSPONSORED	1,377	27,669	31,086
SUNTRUST BANKS INC	3,469	28,712	174,976
SUPERIOR ENERGY SERVICES INC	44,933	483,297	150,526
SUPERNUS PHARMACEUTICALS INC	1,949	46,341	64,746
SVB FINANCIAL GROUP	437	115,285	82,995

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CORPORATE STOCK

SVENSKA HANDELSBANKEN AB UNSPONSOREI	3,464	24,996	19,225
SWATCH GROUP AG UNSPONSORED	1,415	27,905	20,631
SWEDBANK AB SPONSORED	798	21,711	17,867
SWIRE PAC LTD SPONSORED	4,594	51,156	48,490
SWISS RE LTD SPONSORED	1,742	38,077	39,909
SYKES ENTERPRISES INC	1,503	43,894	37,169
SYMANTEC CORPORATION	4,442	99,122	83,932
SYMRISE AG UNSPONSORED	3,002	60,956	55,612
SYNCHRONY FINANCIAL	5,404	165,308	126,778
SYNNEX CORP	1,145	119,964	92,562
SYNOPSIS INC	1,086	76,300	91,485
SYSCO CORP	3,510	145,621	219,937
SYSTEMEX CORP	963	30,546	22,842
SYSTEMAX INC	515	14,611	12,303
T ROWE PRICE GROUP INC	1,908	152,305	176,147
TABULA RASA HEALTHCARE INC	496	20,332	31,625
TACTILE SYSTEMS TECHNOLOGY INC	562	18,408	25,599
TAILORED BRANDS INC	1,876	58,245	25,589
TAIWAN SEMICONDUCTOR SPONSORED	7,472	280,282	275,792
TAKEDA PHARMACEUTICAL SPONSORED	1,880	51,488	31,622
TAKE-TWO INTERACTIVE SOFTWARE INC	956	102,579	98,411
TAL EDUCATION GROUP SPONSORED	883	29,905	23,558
TANDEM DIABETES CARE INC	2,527	80,882	95,950
TAPESTRY INC	2,043	64,480	68,951
TARGET CORP	3,948	302,032	260,923
TATA MOTORS LTD SPONSORED	3,829	103,768	46,637
TAYLOR MORRISON HOME CORP	2,949	61,625	46,889
TCF FINANCIAL CORP	6,514	163,344	126,958
TD AMERITRADE HOLDING CORP	12,942	387,420	633,640
TDK CORP SPONSORED	525	35,574	36,992
TE CONNECTIVITY LIMITED	2,554	162,397	193,159
TECH DATA CORP	1,303	105,896	106,598
TECHNIPFMC LTD	3,175	106,894	62,167
TECHTARGET INC	745	15,480	9,096
TECHTRONIC INDS LTD SPONSORED	1,758	46,967	46,148
TECK RESOURCES LIMITED	875	19,099	18,848
TEEKAY CORP	2,007	17,533	6,703
TELECOM ITALIA SPA SPONSORED	1,945	18,585	10,795
TELEFONICA SA SPONSORED	2,243	22,567	18,976
TELEKOMUNIKASI INDONESIA SPONSORED	2,363	77,743	61,934
TELENOR ASA SPONSORED	496	10,402	9,608
TELEPHONE AND DATA SYSTEMS INC	3,562	95,816	115,907
TELSTRA CORP SPONSORED	1,584	20,720	15,745
TEMPLETON GLOBAL BOND FUND	2,109,686	25,715,798	23,733,972
TENARIS SA SPONSORED	921	26,281	19,636
TENCENT HLDGS LTD UNSPONSORED	50,984	2,010,061	2,012,338
TENCENT HLDGS LTD UNSPONSORED	6,682	295,249	263,739
TERNA RETE ELETTRICA UNSPONSORED	3,536	63,110	60,289
TESCO PLC SPONSORED	5,235	39,939	38,320

ROBERT W. WOODRUFF FOUNDATION, INC. - #58-1695425

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CORPORATE STOCK

TESLA INC	3,571	1,044,087	1,188,429
TEVA PHARMACEUTICAL INDS SPONSORED	1,400	28,535	21,588
TEXAS CAPITAL BANCSHARES	14,356	1,126,738	733,448
TEXAS INSTRUMENTS INC	7,370	444,539	696,465
TEXAS ROADHOUSE INC CL A	16,425	1,058,589	980,573
TEXTAINER GROUP HOLDINGS LTD	917	18,212	9,133
TEXTRON INC	1,913	80,433	87,979
THE BUCKLE INC	1,305	30,579	25,239
THE HERSHEY COMPANY	1,021	90,233	109,431
THE TRADE DESK INC CL A	922	67,289	107,007
THERMO FISHER SCIENTIFIC INC	3,010	416,489	673,608
THIRD POINT REINSURANCE LTD	3,193	51,772	30,781
THOMSON REUTERS CORP	1,139	51,952	55,025
TIFFANY & CO	738	57,092	59,416
TIM PARTICIPACOE SA SPONSORED	1,442	27,607	22,120
TIMKENSTEEL CORPORATION	1,758	30,699	15,365
TITAN MACHINERY	690	8,638	9,074
TIVITY HEALTH INC	1,407	57,356	34,908
TIVO CORPORATION	4,576	85,078	43,060
TJX COS INC	9,624	358,723	430,578
TOKIO MARINE HOLDINGS SPONSORED	1,009	40,940	47,847
TOKYO ELECTRON LTD UNSPONSORED	559	21,424	15,741
TOPBUILD CORP	1,375	57,079	61,875
TORAY INDS	1,996	38,437	28,223
TORCHMARK CORP	782	45,700	58,282
TORO CO	21,904	1,371,659	1,223,996
TORONTO DOMINION BANK	1,986	110,134	98,744
TOSHIBA CORP UNSPONSORED	1,915	27,408	26,820
TOTAL S.A. SPONSORED	1,993	111,146	103,995
TOTAL SYSTEM SERVICES INC	1,212	65,851	98,523
TOYOTA MOTOR CORP SPONSORED	1,449	174,197	168,200
TPG RE FINANCE TRUST INC	517	9,942	9,451
TRACTOR SUPPLY CO	916	84,116	76,431
TRANSCANADA CORP	1,204	60,504	42,983
TRANSDIGM GROUP INC	349	84,793	118,681
TRAVELERS COMPANIES INC	1,995	227,215	238,901
TREASURY WINE ESTATES LTD	3,933	46,158	41,316
TREND MICRO INC SPONSORED	349	16,955	18,829
TREX COMPANY INC	2,342	72,962	139,021
TRIBUNE MEDIA COMPANY	2,840	115,717	128,879
TRINET GROUP INC	1,536	53,590	64,435
TRINITY INDUSTRIES INC	5,682	98,634	116,992
TRIPADVISOR INC	783	64,054	42,235
TRIPLE-S MANAGEMENT CORP	813	17,209	14,138
TRITON INTERNATIONAL LTD OF BERMUDA	1,898	34,709	58,971
TRIUMPH BANCORP INC	717	15,150	21,295
TRONOX LTD	2,546	67,054	19,808
TRUEBLUE INC	1,621	43,087	36,067
TRUPANION INC	758	16,992	19,299

ROBERT W. WOODRUFF FOUNDATION, INC. - #58-1695425

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CORPORATE STOCK

TRUSTMARK CORP	2,699	66,315	76,733
TURKCELL ILETISIM HIZM SPONSORED	1,478	8,701	8,306
TURKIYE GARANTI BANKASI SPONSORED	5,909	17,938	8,627
TURQUOISE HILL RESOURCES LTD	10,180	29,202	16,797
TUTOR PERINI CORP	1,467	26,846	23,428
TWENTY-FIRST CENTURY FOX INC CL A	8,072	253,571	388,425
TWENTY-FIRST CENTURY FOX INC CL B	3,712	112,876	177,359
TWITTER INC	5,779	225,401	166,088
TWO HARBORS INVESTMENT CORP	9,267	152,193	118,988
TYLER TECHNOLOGIES INC	5,468	927,412	1,016,064
TYSON FOODS INC CL A	2,091	93,688	111,659
UBER TECHNOLOGIES INC	2	66	98
UBER TECHNOLOGIES INC	2,724	132,856	132,856
UBER TECHNOLOGIES INC	13	429	634
UBER TECHNOLOGIES INC	3	99	146
UBER TECHNOLOGIES INC	13	429	634
UBER TECHNOLOGIES INC	5	165	244
UBER TECHNOLOGIES INC	8	390	390
UBER TECHNOLOGIES INC	4	132	195
UBER TECHNOLOGIES INC	3	99	146
UBER TECHNOLOGIES INC	34	1,121	1,658
UBISOFT ENTERTAINMENT SA UNSPONSORED	950	21,430	15,362
UBS GROUP AG	3,558	60,182	44,048
UDR INC	1,934	67,245	76,625
ULTA BEAUTY INC	422	86,118	103,322
ULTIMATE SOFTWARE GROUP INC	3,445	633,681	843,577
ULTRA CLEAN HOLDINGS	1,542	10,922	13,061
ULTRAPAR PARTICIPACOES SPONSORED	740	18,369	10,020
UMICORE SA UNSPONSORED	1,188	16,584	11,714
UMPQUA HLDGS CORP	8,806	161,172	140,015
UNDER ARMOUR INC CL C	1,271	19,572	20,552
UNDER ARMOUR INC-CL A	1,259	21,087	22,247
UNICHARM CORPORATION SPONSORED	7,095	41,545	46,827
UNICREDIT SPA UNSPONSORED	4,575	37,275	25,712
UNILEVER NV NY SHARES	1,768	105,553	95,118
UNILEVER PLC SPONSORED	1,570	91,662	82,033
UNION PAC CORP	5,550	505,249	767,177
UNIT CORP	1,986	36,438	28,360
UNITED CMNTY FINL CORP OHIO	2,413	20,256	21,355
UNITED CONTINENTAL HOLDINGS INC COM	1,869	104,097	156,491
UNITED MICROELECTRONICS SPONSORED	41,121	103,019	73,607
UNITED NAT FOODS INC	1,897	77,817	20,089
UNITED OVERSEAS BANK-SPONSORED	2,158	74,207	77,947
UNITED PARCEL SERVICE CL B	5,184	535,930	505,596
UNITED RENTALS INC	611	45,642	62,646
UNITED STATES CELLULAR CORP	549	20,949	28,532
UNITED STATES STEEL CORP	6,727	217,792	122,700
UNITED TECHNOLOGIES CORP	6,127	158,872	652,403
UNITED UTILITIES GROUP SPONSORED	1,127	27,184	21,058

ROBERT W. WOODRUFF FOUNDATION, INC. - #58-1695425

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CORPORATE STOCK

UNITEDHEALTH GROUP INC	7,279	929,953	1,813,344
UNITEDHEALTH GROUP INC	10,592	1,415,323	2,638,679
UNIVERSAL HEALTH SVCS INC	639	77,383	74,482
UNIVEST CORPORATION OF PENNSYLVANIA	648	14,723	13,977
UNUM GROUP	1,631	60,532	47,919
UPLAND SOFTWARE INC	389	8,706	10,573
UPM KYMMENE CORP SPONSORED	1,504	43,740	38,698
URBAN OUTFITTERS INC	3,053	124,583	101,360
US BANCORP NEW	11,487	499,661	524,956
USANA HEALTH SCIENCES INC	430	45,434	50,624
V.F. CORP	2,362	160,010	168,505
VALE S.A. SPONSORED	3,193	33,512	42,116
VALEO SA-SPONSORED	1,098	39,976	16,009
VALERO ENERGY CORP	3,193	204,742	239,379
VARIAN MEDICAL SYSTEMS INC	664	45,123	75,238
VARONIS SYSTEMS INC	734	32,600	38,829
VECTRUS INC	417	9,349	8,999
VEDANTA LTD SPONSORED	5,685	99,203	65,605
VENTAS INC	2,574	147,120	150,811
VEOLIA ENVIRONNEMENT SPONSORED	1,011	23,194	20,629
VERA BRADLEY INC	729	5,599	6,248
VERICEL CORPORATION	1,330	17,128	23,142
VERISIGN INC	801	77,234	118,780
VERISK ANALYTICS INC	1,278	99,089	139,353
VERITIV CORP	419	16,184	10,462
VERIZON COMMUNICATIONS INC	31,391	1,026,888	1,764,802
VERMILION ENERGY INC	699	26,192	14,728
VERSO CORP CL A	1,299	23,822	29,098
VERTEX PHARMACEUTICALS INC	1,962	241,165	325,123
VERTEX PHARMACEUTICALS INC	8,727	945,095	1,446,151
VESTAS WIND SYSTEMS UNSPONSORED	689	20,741	17,349
VIACOM INC-B	2,550	126,409	65,535
VICOR CORP	610	14,299	23,052
VILLAGE SUPER MKT INC CL A	414	11,749	11,070
VINCI SA UNSPONSORED	2,381	56,938	48,834
VIPSHOP HLDGS LTD SPONSORED	1,577	14,967	8,610
VIRTU FINANCIAL INC CL A	1,530	54,637	39,413
VISA INC CL A	13,415	1,067,734	1,769,975
VISA INC CL A	30,741	2,472,343	4,055,968
VISHAY PRECISION GROUP	585	9,768	17,685
VIVENDI SA UNSPONSORED	1,855	46,693	44,798
VMWARE INC	9,863	1,341,910	1,352,513
VODAFONE GROUP SPONSORED	1,781	49,061	34,338
VOLKSWAGEN AG SPONSORED	583	19,554	18,662
VOLKSWAGEN AG UNSPONSORED	1,570	25,636	24,674
VOLVO AB B SHS UNSPONSORED	1,819	33,992	23,702
VONAGE HOLDINGS CORP	8,254	55,211	72,057
VORNADO REALTY TRUST	1,246	101,187	77,289
VULCAN MATERIALS CO	956	91,081	94,453

ROBERT W. WOODRUFF FOUNDATION, INC. - #58-1695425

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CORPORATE STOCK

WABASH NATL CORP	2,216	28,822	28,985
WABTEC CORP	13,556	1,017,944	952,309
WAGeworks INC	12,895	769,629	350,228
WAL MART DE MEXICO SPONSORED	1,732	45,643	44,079
WALGREENS BOOTS ALLIANCE INC	6,095	502,453	416,471
WALKER & DUNLOP	1,084	34,253	46,883
WALMART INC	10,819	630,304	1,007,790
WARRIOR MET COAL INC	630	14,225	15,189
WASHINGTON FEDERAL INC	3,240	81,331	86,540
WASTE CONNECTIONS INC	9,100	539,230	675,675
WASTE MANAGEMENT INC	2,926	159,162	260,385
WATERS CORP	577	75,111	108,851
WATERSTONE FINANCIAL INC	967	12,890	16,207
WAYFAIR INC	1,596	79,307	143,768
WEBSTER FINL CORP WATERBURY CONN	16,522	823,019	814,369
WEC ENERGY GROUP INC	2,281	118,201	157,982
WEIBO CORP SPONSORED	165	16,555	9,641
WEIGHT WATCHERS INTL INC	1,111	52,811	42,829
WEIS MARKETS INC	621	31,522	29,671
WELLCARE HEALTH PLANS INC	411	123,884	97,033
WELLCARE HEALTH PLANS INC	1,977	530,922	466,750
WELLS FARGO & CO	32,122	1,760,061	1,480,182
WELLTOWER INC	2,946	196,220	204,482
WEST JAPAN RAILWAY CO UNSPONSORED	668	46,874	47,508
WEST PHARMACEUTICAL SVCS INC	14,445	1,364,891	1,416,043
WESTERN ALLIANCE BANCORPORATION	25,967	1,382,065	1,025,437
WESTERN ASSET MORTGAGE CAPITAL CORP	1,846	17,127	15,396
WESTERN DIGITAL CORP	2,131	133,348	78,783
WESTERN UNION CO	3,354	64,159	57,219
WESTPAC BKG CORP SPONSORED	5,126	126,595	89,551
WESTROCK CO	1,836	89,842	69,327
WEYERHAEUSER CO	5,443	148,867	118,984
WHEATON PRECIOUS METALS CORP	1,098	19,649	21,444
WHIRLPOOL CORPORATION	528	83,701	56,427
WILLIAM LYONS HOMES	975	18,525	10,423
WILLIAMS COS INC	8,975	304,217	197,899
WILLIS TOWERS WATSON PLC	971	116,510	147,456
WINNEBAGO INDS INC	1,080	51,580	26,147
WINTRUST FINANCIAL CORP	1,790	104,134	119,017
WIPRO LTD SPONSORED	14,379	80,455	73,764
WIRECARD AG UNSPONSORED	433	40,450	33,376
WM MORRISON SUPERMARKETS UNSPONSORE	2,102	33,520	28,335
WOLTERS KLUWER NV SPONSORED	510	22,936	29,927
WOODSIDE PETROLEUM SPONSORED	2,175	49,671	48,089
WOORI BANK SPONSORED	1,962	91,778	82,639
WORKDAY INC-CLASS A	4,879	526,163	779,079
WORKIVA INC CL A	466	10,367	16,725
WORLD ACCEPTANCE CORP	221	18,104	22,599
WORLD WRESTLING ENTERTAINMENT, INC	1,523	61,390	113,799

ROBERT W. WOODRUFF FOUNDATION, INC. - #58-1695425**Form 990-PF, Year 2018, Part II, Line 10b****CORPORATE STOCK**

WPP PLC SPONSORED	271	25,143	14,851
WPX ENERGY INC	15,547	169,104	176,458
WYNN RESORTS LTD	752	71,731	74,380
XCEL ENERGY INC	3,670	131,912	180,821
XENIA HOTELS & RESORTS INC	4,067	89,456	69,952
XEROX CORPORATION	1,543	40,659	30,490
XILINX INC	1,797	87,527	153,050
XYLEM INC	1,298	61,740	86,603
YAHOO JAPAN CORP UNSPONSORED	1,164	10,451	5,721
YANZHOU COAL SPONSORED	1,628	16,993	12,926
YARA INTERNATIONAL SPONSORED	774	17,898	14,919
YASKAWA ELECTRIC CORP UNSPONSORED	523	33,901	25,575
YELP INC	2,937	130,760	102,766
YUM CHINA HOLDINGS INC	994	39,993	33,329
YUM! BRANDS INC	2,492	132,936	229,065
YY INC SPONSORED	196	15,168	11,733
ZAGG INC	1,089	9,588	10,650
ZEBRA TECHNOLOGIES CORP	10,656	1,142,099	1,696,755
ZIMMER BIOMET HOLDINGS INC	1,462	158,444	151,639
ZIONS BANCORPORATION NA	1,461	48,828	59,521
ZOETIS INC	3,548	159,332	303,496
ZUMIEZ INC	693	16,396	13,285
ZURICH INSURANCE GROUP SPONSORED	2,206	65,798	65,750
		508,080,206	3,126,747,192

AGREEMENT RE: EXPENDITURE RESPONSIBILITY

This Agreement Re Expenditure Responsibility is made and entered into as of the 28th day of December, 2017, by and between the Robert W. Woodruff Foundation, Inc. ("Grantor") and Ichauway, Inc. ("Grantee").

WHEREAS, Grantor has agreed to make a grant of \$10,175,000 to Grantee contingent upon certain requirements and conditions; and

WHEREAS, Grantor and Grantee wish to set forth those requirements and conditions in writing;

NOW THEREFORE, Grantor and Grantee agree as follows:

1. Grantor shall make a grant of \$10,175,000 to Grantee for operating and capital expenses of the Joseph W. Jones Ecological Research Center in 2018. Grantee shall use the grant for operating and capital expenditures in accordance with the budget approved by its trustees. Grantee hereby agrees to repay any portion of the grant not used for such purposes.
2. Grantee hereby agrees to submit to Grantor full and complete annual reports on the manner in which the grant is spent and the progress made in accomplishing the purposes of the grant.
3. Grantee hereby agrees to maintain records of receipts and expenditures and to make its books and records available to Grantor at any reasonable time.
4. Grantee shall not use any of the grant
 - a) to carry on propaganda or otherwise to attempt to influence legislation (within the meaning of Section 4945 (d)(1) of the Internal Revenue Code),
 - b) to influence the outcome of any specific public election, or to carry on, directly or indirectly, any voter registration drive (within the meaning of Section 4945 (d)(2) of the Internal Revenue Code),
 - c) to make any grant which does not comply with the requirements of Section 4945 (d)(3) or (4) of the Internal Revenue Code, or
 - d) to undertake any activity for any purpose other than one specified in Section 170(c)(2)(B) of the Internal Revenue Code.

ROBERT W. WOODRUFF FOUNDATION, INC.

Name:

By:

Title:


P. Russell Hardin

President

ICHAUWAY, INC. d/b/a Joseph W. Jones Ecological Research Center

Name:

By:

Title:


Kier D. Klepzig

Director

2018 Annual Report to the Trustees of Ichauway, Inc.



Shown L-R: Denzell Cross, Lisa Giencke, Dan Knapp, J.T. Pynne. Photos by Richard T. Bryant.

Submitted by
Kier D. Klepzig, Ph.D.
Director
April 2, 2019

Introduction and Summary

The Jones Center at Ichauway, has moved from strategic planning to executing its mission, vision, goals and objectives. The Center is reorganizing and refocusing its research, completing a natural resources management plan to focus more clearly on efficiency and impact, and moving into new products and directions in its communications efforts.

All of this movement forward took place in a year capped by a devastating hurricane. Hurricane Michael struck Ichauway the evening of Oct. 10, 2018. Clean up efforts began immediately and continue to this day. As of this writing, 11 logging crews have salvaged over 95,000 tons – in 3,500 truckloads – of downed timber. Ichauway crews have followed behind, further removing wood that could interfere with equipment, hunting and prescribed fires that maintain the longleaf pine forest. The final month of 2018 brought us the retirement of Jimmy Atkinson as the Center's long-time Natural Resource Manager. In addition, Dr. Steve Jack, Conservation Ecologist, moved on to accept a new position in Texas. The Center is well served by the elevation of Scott Smith into the Natural Resource Manager position. The Center is currently advertising for a Forest Management Scientist to lead its silviculture, restoration and timber research.

Jones Center research continues to **Understand by increasing our role as a crossroads for researchers and practitioners.** Center scientists had a productive, impactful year, publishing 29 peer reviewed research articles (9 In press), and supervising and training 22 graduate students and 2 post-docs. New research on the identity and abundance of medicinal plants at Ichauway was conducted on site by a team from Emory University. Led by Dr. Cassy Quave, the crew spent 2 weeks at Ichauway, collecting nearly 200 species of plants and preparing them for assays of activity against cancer and infectious bacteria.

Conservation makes a huge impact at Ichauway as we seek to **Demonstrate by ensuring that all who come in contact with the Jones Center become inspired advocates for our conservation and research philosophies.** Red-cockaded woodpecker populations continue to thrive with 38 active clusters, the fledging of 43 chicks, and currently total population of about 100 birds. The operational timber sale in 2018 netted \$197,000. The harvest was conducted to support a research project be large enough (717 acres) to generate a sufficiently remunerative sale to attract a buyer, and to accomplish other timber stand improvement objectives. The Center prescribed fire program saw 12,000 acres burned, with 4548 of those acres during the growing season. In cooperative work with Research, Conservation oversaw the synthesis and analysis of over 16 years of long term monitoring in which 854 plots were monitored. This work created over 1700 pages of graphs and tables, and resulted in a peer reviewed publication: The longleaf pine forest: Long-

term monitoring and restoration of a management dependent ecosystem. The study demonstrated that “through our management actions we have successfully made progress towards achieving our overall restoration goals”. As this monitoring progresses, future data will be used to assess progress and guide further restoration.

Our Outreach and Education program is leading the way in helping us **Promote by maximizing the impact of our knowledge and conservation ethic on natural resources management.** This was a productive and strategically impactful year for extending our science to those who might use it. We organized a very successful workshop for managers of conservation lands impacted by Hurricane Michael. We also provided leadership by serving on the Longleaf Partnership Council, as Chair of the Georgia Prescribed Fire Council, and Chair of the National Coalition of Fire Councils. In 2018, we educated over 600 professionals, students, and other visitors in the course of 30 educational programs for a total of over 1100 contact hours. We hosted the inaugural USFS Longleaf Summit. This workshop rolled out plans for the USFS “Million Acre Challenge”. We sponsored a team from the Emory Goizueta Business School’s program for MBA students to analyze market potential for longleaf pine, held a workshop to advance development of advanced growth and yield models for longleaf pine, and hosted the annual meeting of the Southern Company Environmental Affairs Department and the National Fish and Wildlife Foundation’s Southern Region staff at Ichauway. As part of our long time relationship with the Warnell School at UGA, we again taught the Prescribed Fire Maymester. We also established and regularly post to a Facebook page: www.facebook.com/thejonesctr/ to share Center updates and science news. We have recast our scientific articles in easily read Publication Briefs which are posted on our website. With reassignment of portions of some staff time to the outreach and education program, their capacity has increased as they work in 2019 to plan our next open house and create a communications plan for the Center.

Jones Center Advisory Committee (JCAC)

The Jones Center Advisory Committee has also changed strategically. As of last year’s report, the committee consisted of Dr. Jim Vose (USDA Forest Service, Water), Bob Larimore (Department of Defense, Fire), Dr. Nova Silvy (Texas A&M, Wildlife), and founding members Dr. Jerry Franklin (University of Washington, Forest Science) and Dr. Gene Likens (Cary Institute, Ecology). Since that time, Dr. Silvy has ended his term. In his place, we are happy to welcome Dr. Wes Burger (Mississippi State) a well-known and respected leader in quail and other wildlife research and management. Under the terms of our new JCAC charter, this committee will now meet biennially at Ichauway for an in-depth review and consultation with the Center’s officers and staff. These biennial meetings will focus on a higher-level consideration of Center programs within the context of current, cutting edge science, education and conservation. The JCAC will also receive updates on the Center’s progress in meeting goals and objectives set forth in its Strategic Plan. In alternate years,

JCAC members will meet at Ichauway for a research symposium, consisting of presentations, posters, and interactive discussions with Center staff, students, and external partners. The Director and the chair of the JCAC will meet in April of this year to plan for such a meeting in June, 2019. JCAC members will also make annual individual visits to provide informal advice and serve as a resource for Center staff and the Director.

In 2019, we anticipate adding two additional members: Dr. Jennifer Tank, a mid-career, well respected aquatic ecologist, at Notre Dame, and one more member, to be determined.

Research

General

The Jones Center's funded research has been reorganized into three programs: Woods, Water and Wildlife. Our approach going forward is to recognize and build upon our reliance on a programmatic approach to science. Programs, as we define them at the Center, are characterized by stability, core strength, critical mass, and the security to explore and take risks. This is in contrast to project based approaches that are driven by volatility, short term opportunistic studies and positions, and are more typical of universities. Each of these three programs will be led by a team of scientists who will establish projects of defined duration, budgets and deliverables. The programs will consist of studies aimed at enhancing knowledge applicable to natural resource management. Some research areas on the near horizon include, disturbance ecology of Ichauway post-Michael, restoration of longleaf pine ecosystems, including wildlife and understory plant communities, and applied groundcover restoration, including germplasm and fungal associates.

Research Projects

2018 was a transition year where we worked to realign our programs into the format defined by our updated strategic plan. However, reporting this year reflects some aspects of previous structure. The seven long-term research projects are complemented with additional but related externally funded projects that either expand our Ichauway projects, or extend our studies to be regional in scope with other valuable sites, cooperators and issues outside of Ichauway. In 2018 these were key project goals and achievements for each long-term project:

- 1) **Ecological Forestry in the Longleaf Pine Forest Type-Management to Sustain and Restore the Ecosystem and Reconnect the Landscape**
Investigators: Seth Bigelow, Steven Brantley, Mike Conner, Kevin McIntyre, and Lora Smith

Research Associates: Lisa Giencke, Jennifer Howze, Gail Morris, Stribling Stuber, Scott Taylor, and Andy Whelan

Collaborators: Joe O'Brien (USFS), Jean Brock, Brandon Rutledge, and Scott Smith

Graduate Students: Catherine Frock (Ph.D., UF, externally funded) and J.T. Pynne (Ph.D., UGA, externally funded)

The goal for this project is to meet the challenge of providing sound management information supported by a strong scientific understanding through coordinated research, outreach and demonstration efforts. This large and comprehensive project incorporates many applied research sub-projects focused on the longleaf pine forest. The two major focal areas are: 1) management of longleaf plantations to achieve a multi-aged condition sustained by natural regeneration and with a diverse plant community, and assessment of wildlife community use at different stages of stand development during the restoration process; and 2) assessing long-term effects of 3 uneven-aged harvest treatments on longleaf overstory and regeneration, the ground cover plant community, wildlife communities, and fuels distribution and fire behavior.

A battery of long-term monitoring studies was continued on longleaf pine regeneration, needle and seed fall, and wildlife activity. A major new field campaign was undertaken on prescribed fire intensity and hardwood mortality in silvicultural openings. Instruments included state-of-the-art dual-channel radiometers provided by Dr. Joe O'Brien of US Forest Service-Southern Research Station, and aerial vegetation assessment from a drone operated by Scott Taylor; images are being analyzed by Dr. Steven Brantley. In the Restoration project, monitoring of small mammal and bird use of plantations was measured to assess their use at different stages of stand development.

The plots of the Ecological Forestry experiment sustained considerable damage in Hurricane Michael, which will provide the basis for a study on effects of silvicultural treatments on resistance to windstorms. Key Achievements in 2018:

- 8 publications in print and 3 in press
- 2 external grants (both ended December 2018)
- 4 presentations at professional meetings

2) **Adaptive Silviculture for Climate Change (ASCC) in Southeastern USA**

Investigators: Seth Bigelow, Steven Brantley, Mike Conner, and Kier Klepzig

Research Associates: Lisa Giencke, Gail Morris, Tom Sheehan, Stribling Stuber, and Andy Whelan

Collaborators: Kevin McIntyre, Michael Stambaugh (University of Missouri), Linda Nagel, Courtney Peterson, Chris Looney (University of Colorado), Lisa Samuelson (AU), and Jason Vogel (UF).

Graduate Students: Anna Rolloson (M.S., UF) and Sean Reynolds (M.S., AU)

The project, part of a nation-wide study, is designed to test alternative silvicultural strategies for preparing stands in anticipation of impacts from a changing climate. Major goals of the project are to test strategies of resistance, resilience, and transition to future climates; our implementation of these strategies incorporates research questions regarding the role of oaks and other hardwoods in longleaf pine savannahs. After several years of preparation, the treatments were implemented in 2018. Logging crews felled pines in stands marked according to residual basal area targets. Felled trees were carefully removed with skidders. In treatments where mature hardwood trees are limited or eliminated, a chainsaw was used to girdle (make an incision around) the trunk then herbicide was applied to the cut: these trees will be left in place to provide habitat for snag-loving wildlife. Wildlife surveys via game camera and small-mammal trapping are ongoing and will provide a sensitive assessment of climate adaptation options on wildlife biodiversity. Highlights in 2018 include:

- One graduate student (University of Florida School of Forest Resources and Conservation) completed her field research on the influence of soil water-holding capacity on longleaf pine growth response to past climatic variation.
- Insect sampling was initiated by new collaborators in the Entomology/Microbiology lab.
- Post-treatment assessment of groundcover plant diversity was completed.
- A permanent belowground powerline was installed to provide electricity for studies on the effects of the adaptation treatments on forest water use.
- Woodruff Foundation Fellows toured the site.
- A graduate student was recruited with Dr. Lisa Samuelson of Auburn University to study how interactions with existing trees affects the performance of tree species translocated for climate change adaptation.
- A poster on how distribution of hardwood litter around trees affects prescribed fire intensity was presented by Research Associate Andy Whelan at the Ecological Society of America Annual Meeting.
- Bigelow participated in a national meeting of ASCC project researchers at Fort Collins, Colorado.

3) **Longleaf Pine Ecosystem Study**

Investigators: Steven Brantley, Seth Bigelow, and Mike Conner

Research Associates: Lisa Giencke, Gail Morris, Stribling Stuber, Scott Taylor, and Andy Whelan

Collaborators: Greg Starr and Christie Staudhammer (UA), Kamal Gandhi (UGA), and Jon Van Stan (GSU)

Graduate Students: Michael Belovitch (M.S., UGA), Haley Ritger (Ph.D., UGA), and Susie Weisner (Ph.D., UA)

The Longleaf Pine Ecosystem Study is a continuation of work started two decades ago to understand the effects of fire regime, soil texture, and resource additions (water and nitrogen) on productivity and species diversity, and guide ecosystem management and restoration efforts. That original project created numerous opportunities for outside collaboration and graduate student mentoring, and has resulted in a number of seminal publications and long-term data sets. The study has also evolved over time to adapt to emerging stakeholder needs. Three eddy-flux towers were added to the project in 2008, the resource amendment study ended in 2011, and a fire reintroduction study was initiated in 2015. Also in 2015, the ecohydrology lab began a series of forest water budget and forest health studies. The primary study objectives going into 2018 were: (1) quantify changes in the longleaf pine-wiregrass ecosystem function, resilience, and forest health among fire maintained stands, fire-suppressed stands, and stands where fire is being reintroduced after suppression; (2) determine fire and climate influences on carbon cycling and forest water use; and (3) quantify changes in plants, small mammals, and birds in response to fire suppression and reintroduction. In October, 2018 Hurricane Michael presented a new opportunity to study the resilience of longleaf pine ecosystem services after a severe disturbance. Key accomplishments in 2018 include:

- Published three journal articles, submitted seven additional publications (two are in press), and gave 14 professional presentations.
 - Supported three graduate students. Susie Weisner (Ph.D, Alabama) completed her dissertation on carbon and energy cycling in longleaf pine. Michael Belovitch (M.S., UGA), completed his thesis on hydraulic redistribution in longleaf pine sandhills. Doctoral candidate Haley Ritger (UGA) completed her field work and passed her oral and written exams.
 - Supported by a recently funded external grant. Brantley and Bigelow received an NSF RAPID grant with collaborator Greg Starr to measure the effects of Hurricane Michael on carbon, water, and energy budgets around the eddy-covariance towers.
 - The project was highlighted with 2 university class visits, 1 workshop field trip, and visits from 5 off-site research groups.
- 4) **Hydrologic Variation and Human Development in the Lower Flint River Basin: An Ongoing Landscape-Scale Experiment**
Investigators: Steve Golladay, Steven Brantley, and Jill Qi
Research Associates: Chelsea Smith and Stribling Stuber
Monitoring Technician: Brian Clayton
Collaborators: Carla Atkinson (UA), Krista Capps (UGA), Alan Covich (UGA), Mary Freeman (USGS), Mark Masters (Albany State), William Tolner (UGA), Matt Waters (AU) and Carol Wicks (LSU)

Graduate Students: Coleman Barrie (M.S., UGA), Christine Fallon (M.S., UGA), and Joseph Honings (Ph.D., LSU)

We are a recognized leader in southeastern aquatic ecosystem knowledge through detailed studies of the lower Flint River basin. By providing strong, policy-neutral leadership, we promote diversity of water management options that attempt to optimize benefits for all stakeholders. Since we do not have management responsibility for regional water resources, we view our role as advisors to the conservation and management communities. We believe that the path to sustainable water management requires stakeholder engagement and building adaptive capacity. Since the 1970's, the rapid expansion of irrigated agriculture and associated human population changes in southwestern Georgia have led to increased water demands from agriculture, industry, and municipalities. Watershed development has reduced hydrologic resilience, created potential pollution problems, and created periods of water scarcity. The region's water resources are showing signs of stress, particularly during droughts, which will likely have unintended negative consequences for aquatic biota, ecological services, and human health. Our water resources program addresses three fundamental questions associated with human activity in the region: (1) how does human land use and appropriation of water influence water availability and water quality in the lower FRB; (2) how does temporal variation in water availability affect aquatic ecosystems of the lower FRB; and (3) what management actions are necessary to provide for human demand while maintaining ecosystem services. Selected accomplishments include:

- The Soil Water Assessment Tool (SWAT) Model was parameterized and calibrated for Ichawaynochaway Creek. The model was used to evaluate irrigation efficiency scenarios and forest management alternatives for a collaborative project with the Georgia Chapter of the Nature Conservancy (TNC). Scenario analysis projected that investments in irrigation efficiency will mitigate extreme low flows. A report detailing modeling results was prepared for TNC and peer reviewed technical publications are being completed.
- We organized and hosted a meeting entitled 'Stakeholder Workshop on Water Conservation Strategies' with Georgia TNC. The 2-day workshop brought together stakeholders with widely varying perspectives on water use and focused on developing a path forward in implementing new water conservation strategies in the ACF basin. The workshop was held at Ichauway on Aug. 23-24, 2018.
- Studies of sediments, invasive bivalves, and nuisance aquatic vegetation revealed that a novel combination of invasive species in Lake Seminole is improving water quality in the Flint and Apalachicola Rivers and providing diverse productive habitat for game and non-game species. Results were

published in peer reviewed technical journals including Lake and Reservoir Management and Hydrobiologia.

- We participated in technical advisement for the NOAA Drought Early Warning System being implemented in the ACF River basin, Floridan Aquifer Sustainability Project (University of FL), Santee Forest Longleaf Restoration (US Forest Service), Freshwater Species Status Assessment (US Fish and Wildlife), Georgia Adopt a Stream (Georgia DNR), and Upper Flint River E-flows Working Group (American Rivers, Flint RiverKeeper, Municipal Water Authorities).
- 3 graduate students supported in collaborative research with UGA (1-Engineering, 1-Ecology) and LSU (1-Geology). Their research topics are diverse and include geological structure of Ichauway, modeling soil water flow paths, and fish responses to stream intermittence.
- 3 Journal articles, 1 article in press, 2 articles in review, 1 outreach publication, 1 proposal submitted, 13 technical meeting presentations, 2 public lectures.

5) **Geographically Isolated Wetlands in the Coastal Plain Landscape**

Investigators: Lora Smith, Steve Golladay, Steven Brantley, Mike Conner

Research Associates: Jennifer Howze, Chelsea Smith, Stribling Stuber, Lisa Giencke, Gail Morris

Collaborators: Carla Atkinson and Kevin Kocot (UA), Travis Glenn (UGA), and Carol Wicks (LSU)

Graduate Students: Dan Knapp (M.S., UA) and Joseph Honings (Ph.D., LSU)

This study is designed to enhance the understanding of wetland functions and services that could guide future policy relative to wetland management and conservation (nationally and at the state level). This study integrates research of the functional role of wetlands in the region, specifically with the goals to: 1) provide new information related to linkages of isolated wetlands to the regional watershed; 2) relate wetland ecosystem services to human health and well-being; and 3) use Ichauway's wetlands as a reference for evaluating functions and services of wetlands within intact and altered landscapes. Long term monitoring of wetland water levels, water quality, and biota (rare plants, invertebrates including mosquitoes, fish, amphibians, birds) at reference and altered wetlands is ongoing. Key activities in 2018 included:

- Supporting 2 graduate students on the project.
- Published 3 Papers (2 in press); 3 papers in review.
- Submitted 5 external proposals:

1. Golladay, S. W., S. T. Brantley, C. R. Smith, L. M. Giencke, B. Clayton, and J. Qi. 2018. RAPID Preproposal: Assessing Hurricane Michael effects on isolated wetlands in a mature longleaf pine landscape. Submitted to NSF Ecosystem Studies Cluster (preproposal submitted November 16, 2018, Full submission invited December 21, 2018).
 2. Conner, L. M., S. Castleberry, K. D. Kepzig, S. W. Golladay, and J. Hulcr. 2018. Sampling terrestrial eDNA: Letting the data come to you. Preproposal submitted to SERDP FY 2019 Statement of Need. (Declined March 1, 2018).
 3. O'Donnell, F. C., M. N. Waters, S. W. Golladay, and S. T. Brantley. 2018. Utilizing the wetland sediment record to understand legacy soil nutrient dynamics. Pre-Proposal NSF-Signals in the Soils (SitS). (Declined May 18, 2018) (Note: 360 preproposals submitted, 45 invited for full application).
 4. Tollner, E. B., T. Rasmussen, S. T. Brantley, S. W. Golladay, and C. M. Wicks. 2018. Evaluating Surface and subsurface hydrologic relations in a south Georgia Karstic Aquifer. Pre-Proposal USGS 104G Program. (Declined April 25, 2018) (Note: 161 proposals submitted, 30 invited to develop a full proposal).
 5. Glenn, T. C., L. L. Smith, C. L. Atkinson, K. M. Kocot, Hepinstall-Cymerman. 2018. New eDNA sequencing approaches to improve assessment of genetic diversity and landscape genetics in amphibian populations. Full proposal requested. Strategic Environmental Research and Development Program (SERDP). (Declined July 30, 2018).
- The project was highlighted with 5 university class visits and 10 natural resource professionals/groups.
 - Presentations at 3 professional meetings.
 - Recruited 1 Ph.D. student to study mammal populations in wetlands.
- 6) **The Ecological Role of Mesopredators, the Effects of Mesopredator Control, and Habitat Approaches for Managing Predation**
Investigators: Mike Conner, Lora Smith, Steven Brantley and Kier Klepzig
Research Associates: Gail Morris, Jennifer Howze, Stribling Stuber, and Tom Sheehan
Collaborators: Steven Castleberry (UGA) and Elizabeth Hunter (GSU)
Graduate Students: Daniel Crawford (Ph.D., VT), J.T. Johnson (Ph.D., UGA), Jessica Laskowski (Ph.D., UF), Michael Biggerstaff (M.S., UGA), Alex Potash (M.S., UF), and Chris Murphy (M.S., UGA)

Our research is based on the premise that wildlife populations need food, cover, and space (i.e., habitat) to persist. Food and cover generally occur in patches with some patches providing more cover than food, other patches more food than cover

and some providing little of either. The composition and distribution of patches vary in space and time, providing challenges for both individual animals and populations.

Animals that fail to incorporate predation risk into day-to-day behaviors are unlikely to survive and even more unlikely to reproduce. Therefore, predation risk is perhaps the strongest driver of animal behaviors such as diet, movements, and activity patterns, all of which influence space use and habitat selection. Competition also impacts animal behavior, and intraspecific competition has long been recognized as influencing habitat selection. Collectively, predation risk and competition affect animal habitat selection which can result in trophic cascades affecting entire ecosystems.

Our research is site-wide, but also capitalizes on existing infrastructure (predator exclosures, herbivore exclosures, and small animal exclosures) to better understand mechanisms behind animal behaviors (e.g., movement, foraging, habitat selection, etc.) and how those mechanisms affect animal populations, communities, and ecosystems. With this project we hope to advance our ability to manage wildlife populations, communities, and ecosystems in the face of changing environmental conditions. Therefore, we seek to understand how interspecific interactions, such as predation and competition, alter animal behaviors, such as foraging and habitat selection, to ultimately affect their distribution, abundance, and their ecosystem-level impacts. Key Achievements in 2018 include:

- Continued data collection (mammal, snake, and gopher tortoise abundance and demographics; antipredator behavior assessment, foraging under predation risk)
- 10 Publications in print, 1 in press, 2 in review
- Organized and hosted a USFWS Tortoise Population Target Workshop
- Provided 14 professional presentations or seminars
- Externally funded projects (2)
- Graduate students: 1 Ph.D., 1 M.S. student successfully defended
- Began data collection to evaluate the role of predation risk on plant defenses against herbivory

7) **The Entomology and Microbiology Lab: Ecological Roles of Insects and Fungi, Plant Preservation and Medicinal Uses**

Investigator: Kier Klepzig

Research Associates: Tom Sheehan and Lisa Giencke

Collaborators: Kamal Gandhi (UGA), Jess Hartshorn, (Clemson), Caterina Villari (UGA), Emily Coffey (Atlanta Botanical Garden), and Cassy Quave (Emory Univ.)

Graduate Students: Kelsea Young (M.S., Clemson), Ben Gochnauer (Ph.D., UGA), and Crystal Bishop (M.S., UGA)

Insects and microbes are the most understudied components of the ecosystems of Ichauway. Having a clear understanding of the composition, diversity and roles of these key taxa is critical to restoration, recovery, conservation and management of the longleaf pine forests and associated wetlands.

Our research objectives are based on cataloging the diversity of these organisms through hypothesis driven research. Our initial experimental work revolves around the response of insects and their associated fungi to disturbance. Early studies have examined the response of insects to silvicultural manipulations (adaptive silviculture for climate change), sampling ground beetles, pollinators and more. More recently, the lab has been preparing for studies on the impacts of wind disturbance and subsequent salvage, clean up and burning on two guilds of insects. After Hurricane Michael hit Ichauway as a Category 3 storm in October, 2018, thousands of tons of downed woody material covered the Ichauway landscape. Typically, such abundant logs, stumps, roots and more would be heavily colonized by bark beetles (attacking the aboveground portions of trees) and root weevils (attacking stumps and roots belowground). Both of these feeding guilds routinely vector blue stain fungi into their host material. Studies involving an MS student and a PhD student at Georgia, will look at the seasonal abundance of these insects in salvaged and non-salvaged stands, and identify the fungal associates present. An additional study will look at the role of insects as decomposers in the presence and absence of key mammal species. An MS student at Clemson will study dung beetles and carrion (carcass feeding) beetles in Ichauway's predator exclosures and herbivore exclosures.

The work of the Plant Lab is also included within our program of work. The Plant Lab Research Associate is leading efforts to identify and locate rare and threatened plants on Ichauway. These plants will be the first species incorporated into our germplasm preservation program. Seeds, plant material and samples for DNA extraction will be maintained in a new collection at the Jones Center. This work will also include isolation of endophytic fungi from collected plants. These fungi are crucial to plant survival and important in restoration efforts. Collaborators from the Atlanta Botanical Garden will also be involved in this work. The other major effort within the plant group involves collaboration with Emory University. In work led by Dr. Cassy Quave, plants collected at Ichauway are now being tested for activity against cancers and bacteria. Plans are to start a graduate student on this work in Fall, 2019. Key Achievements in 2018 include:

- Large scale field collections by Ichauway and Emory personnel.
- Publications: 2 in print, 2 in review.
- Graduate students, 1 in place, 3 more to start in 2019

Productivity

The Center research program continues to achieve a high level of publication productivity, both in numbers and quality.

Numerous presentations were given by staff and graduate students at international, national and regional professional meetings. A total of 22 graduate students from 7 universities were supported by the Center in 2018.

External Support and Collaboration

Our staff has secured external funding from six agencies for a total of six projects for research and outreach programs that are compatible with organizational objectives. These awards, spanning multiple years, totaled \$540,172. The total received in 2018 was \$104,092.

- University of Georgia (1)
- National Science Foundation (1)
- U.S. Fish and Wildlife Service (1)
- GA DNR (1)
- USDA NRCS (1)
- U.S. Army Corps of Engineers (SERDP) (1)

Education and Outreach

General

The Jones Center's education and outreach program had a very active year in 2018. The program includes a diverse portfolio of classes, field tours, workshops, and strategically targeted meetings for audiences of practicing natural resource professionals and university students enrolled in dedicated natural resource programs. These audiences represent the best opportunity for impact on natural resource management and conservation through application of Center science. We target high-leverage activities that make the most of the Center's resources, land base, and programmatic expertise. Over the last few years, education and outreach efforts have put greater emphasis on natural resource professionals, with this group comprising approximately two-thirds of the participants in 2018 Center programs. We continue to balance onsite educational activities, collaborative partnerships throughout the region, and digital and printed media for communication. Highlights of several of these topics are below with details listed in the Appendix.

Onsite Educational Activities

- 633 individuals participated in 29 Center educational events at Ichauway.
- The Center conducted a week-long UGA Maymester course on prescribed fire. We also hosted a visiting UGA Maymester on Ecological Issues in Georgia.
- The Center hosted a longleaf pine summit for USFS Region 8 leadership and National Forest supervisors. These individuals represent approximately 4 million acres of management oversight in the southeastern U.S.
- As part of efforts to advance economic understanding of longleaf pine, the Center collaborated with other NGOs to sponsor a project with the Emory University Goizueta School of Business to explore developing markets for longleaf pine.
- The Center hosted The Nature Conservancy in Georgia for a Stakeholder Workshop on Water Conservation Strategies. The workshop brought together stakeholders having varying perspectives on water use and focused on discussing a path forward in implementing new water conservation strategies in the ACF basin.
- The Center convened a group of institutional landowners, forest biometricians, and longleaf pine conservationists representing approximately 14 million acres of land management oversight in the southeastern U.S. The workshop explored development of an updated growth and yield model for longleaf pine, viewed as a critical step to more broadly engage large-acreage landowners in longleaf pine restoration.
- The Center hosted the annual meeting of the National Fish and Wildlife Foundation and the Southern Company environmental division, who make significant contributions to longleaf pine restoration through their collaboration on the Longleaf Stewardship Fund.
- In December, the Center convened a group of representatives of conservation lands in SW Georgia and the Florida Panhandle that were impacted by Hurricane Michael to share information and explore opportunities for response, recovery, and restoration of forests impacted by the storm.

Regional Collaborative Partnerships

- The Center continues to be active in the Longleaf Partnership Council (LPC). The LPC is a collaborative group working to implement the America's Longleaf Rangeland Conservation Plan for Longleaf Pine, which seeks to double the acreage of longleaf pine.

- Center staff serve as permanent Vice-Chair of the Georgia Prescribed Fire Council, Chair of the Coalition of Fire Councils, and as a member of the national Wildland Fire Leadership Council.
- Center scientists and staff served on committees and in leadership roles in various professional societies, as well as advisory committees for government agencies and NGO conservation groups.
- The Center helped lead offsite conferences such as the GA Prescribed Fire Council meeting, which set another record for attendance in 2018.

Printed and Digital Media

- The Center worked with Untamed Science to produce an internet video on gopher tortoise conservation.
- The Center has distilled information from individual research publications into shorter, “fact sheet” style publications intended to be more readable and accessible for a broader audience.
- The Center has established a social media presence through Facebook to share Center updates and science news.
- Center staff have presented webinars and on-line presentations in collaboration with the Southern Fire Exchange and the Wildland Fire Leadership Council. The Center consulted with a communications professional to review opportunities for greater utilization of digital communications media.

Conservation and Land Management

Stewardship of Ichauway

The Conservation staff at the Jones Center is charged with the long-term stewardship of the natural resources of Ichauway, and also to provide support for the Center's Research and Education programs. Resource management objectives for the Conservation program can broadly be characterized as ecological management and restoration of a functioning pine-grassland system in a landscape that includes embedded wetlands and streams and diverse animal and plant communities. An active prescribed fire program is required to meet these broad objectives. Other management activities include forest management at the stand scale, vegetative conversion and restoration activities, and management of endangered fauna and multiple game species.

Significant Activities in 2018

Some time was focused on developing a new natural resource management plan for Ichauway. The existing plan requires revision to better reflect changes in our management objectives and activities in the years since it was completed, and to provide direction for stewardship of the property as the Center implements the new strategic plan. Changes in personnel and time related impacts of Hurricane Michael delayed progress. However, initial drafts are being developed by conservation personnel and will be circulated to other staff for comment through mid-2019.

The Conservation Post-doctoral Associate (Angela Holland) continued progress in summarizing over 20 years' data from multiple monitoring efforts. A manuscript detailing the long-term forest monitoring program and how its results inform operational management was submitted to a journal for publication; following review the revised manuscript was resubmitted and has been accepted for publication early in 2019.

Damage from Hurricane Michael to our forest was highly variable, with some areas having only scattered trees down and other areas with almost complete tree loss. These impacts will affect forest and wildlife management activities over the next few months and likely over the next 3-4 years, with particular impacts on the prescribed fire and timber harvest programs and some hunting activities. Initially, we were able to contract with one logger to salvage downed and damaged timber. Through the end of 2018, a total of 11 logging crews had salvaged 35,000 tons of timber. Salvage logging will continue through the early part of 2019 and periodically in wet areas, as conditions permit. Some areas will not be salvaged for research purposes, in places that are too wet, and in some other places sensitive to soil disturbance. Efforts will be strategically focused to benefit ongoing resource management efforts, in particular prescribed fire.

Although many operational activities do not change a great deal from year to year, a list of ongoing management activities in 2018 is included below.

- A total of 12,000 acres were burned using prescribed fire to meet specific objectives, with 4548 acres (38%) burned during the growing season.
- The Red-cockaded woodpecker population continued to increase under our restoration and management program. In 2018 we had 38 active clusters with 34 potential breeding groups; 43 chicks fledged during the 2018 spring breeding season. Our current RCW population is approximately 100 birds. Hurricane Michael damaged 26% of the RCW cavity trees. Cavity replacement began immediately after the storm and cavities were replaced in active clusters within two weeks post-storm. The replacement of cavities will continue through spring of 2019.

- Conservation staff prepared and administered a timber sale on 717 acres across the property. This sale included Adaptive Silvicultural treatments in research plots and operational management for timber stand improvement. Net revenue from the sale was approximately \$197,000.
- Following the October 10 hurricane, conservation crews cleaned up downed/damaged trees and debris across the property. Initial efforts were focused on the Center headquarters and historic circle, then broadened to opening roads and firebreaks, clearing debris from fields and limited forested areas, and cleaning up logging ramps used by the salvage logger. These efforts will be ongoing for the next few years.

Budget Summary

The total budget for Ichauway, Inc. and the Joseph W. Jones Ecological Research Center for 2018 was \$10,734,600 of which \$10,175,000 was the board-approved internally funded budget and \$104,092 was funded from outside grants. The major source of funding for this budget was a grant from the Robert W. Woodruff Foundation.

All divisions of Ichauway operated within budget in 2018. Expenses for Research and support activities were \$3,404,810. Conservation and Land Management expenses were \$2,392,599. The expenses for Education and Outreach activities were \$598,054. Expenses for Administration, Maintenance and Operations were \$3,450,072, which also included overall Center operating expenses such as taxes, electric power and insurance costs.

APPENDIX

2018 ANNUAL REPORT to the TRUSTEES OF ICHAUWAY, INC.



Shown L-R: Eastern diamond-back rattlesnake (*Crotalus adamanteus*), Hairy lespedeza (*Lespedeza hirta*), Six-spined pine engraver (*Ips calligraphus*), Southeastern pocket gopher (*Geomys pinetis*)

Photo credits L-R: James T. Johnson, Sam Hart, Erich G. Vallery/USDA Forest Service/Bugwood.org, J.T. Pynne

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Publications, Presentations and Grants

“In Press” Publications

Crawford, D. A., M. J. Cherry, B. D. Kelly, E. P. Garrison, D. B. Shindle, L. M. Conner, R. B. Chandler, and K. V. Miller. Chronology of reproductive investment determines predation risk aversion in a felid-ungulate system. *Ecology and Evolution*. In press.

Moore, N. B., S. I. Duncan, E. I. Parsons, J. T. Pynne, J. D. Austin, L. M. Conner, S. B. Castleberry, R. A. Gitzen, and R. A. McCleery. A new live trap for southeastern pocket gophers. *Wildlife Society Bulletin*. doi: 10.1002/wsb.956. In press.

Holland, A. M., B. T. Rutledge, S. B. Jack, and J. M. Stober. The longleaf pine forest: long-term monitoring and restoration of a management dependent ecosystem. *Journal for Nature Conservation*, 47:38-50. In press.

Howze, J. M., and L. L. Smith. Detection of gopher tortoise burrows before and after a prescribed fire: implications for surveys. *Journal of Fish and Wildlife Management*. In press.

Howze, J. M., K. J. Sash, and L. L. Smith. Regional habitat selection and home range of the gray rat snake, *Pantherophis spiloides*, in pine-dominated forests. *Forest Ecology and Management*. In press.

Marzolf, N. S., C. R. Smith, and S. W. Golladay. Limpkin (*Aramus guaruana*) establishment following recent increase in non-native prey availability in Lake Seminole, Georgia. *Wilson Bulletin*. In press.

McIntyre, R. K., L. M. Conner, S. B. Jack, E. M. Schlimm, and L. L. Smith. Wildlife habitat condition in open pine woodlands: Field data to refine management targets. *Forest Ecology and Management*. In press.

Miniat C. F., J. F. Fraterrigo, S. T. Brantley, M. Callaham, S. Cordell, J. S. Dukes, C. P. Giardina, S. Jose, and G. Lovett. Chapter 3: Impacts of invasive species on forest and grassland ecosystem processes in the US. In: Patel-Weynand et al., editors. *State of Science for Non-Native Invasive Species in the United States*. Springer-Verlag. In press.

Norton, T. M., K. M. Andrews, and L. L. Smith. Techniques for working with wild reptiles. In D. R. Mader, and S. J. Driver (eds.). *Current therapy in reptile medicine and surgery*. Second edition. Saunders/Elsevier, St. Louis, Missouri. In Press.

Pynne, J. T., J. M. Owens, S. B. Castleberry, N. L. Castleberry, R. Brinkman. Movement and fate of translocated and in situ Southeastern pocket gophers. *Southeastern Naturalist*. In Press.

Sheehan, T. N., M. D. Ulyshen, S. Horn, and E. R. Hoebeke. Vertical and horizontal stratification of bark and wood boring beetles by feeding guild: Is there an optimal trap location for detection? *Journal of Pest Science* 92(1): 327-341. In press.

Smith, L. L., A. L. Subalusky, C. L. Atkinson, J. E. Earl, D. M. Mushet, D. E. Scott, S. L. Lance, S. A. Johnson. Biological connectivity of seasonally ponded wetlands across spatial and temporal scales. *Journal of The American Water Resources Association* 1–20. doi: 10.1111/1752-1688.12682. In press.

Published Refereed Journal Articles and Books

Aubrey, D. P., and R. O. Teskey. 2018. Stored root carbohydrates can maintain root respiration for extended periods. *New Phytologist* 218:142-152.

Bigelow, S. W., N. A. Jansen, S. B. Jack, and C. L. Staudhammer. 2018. Influence of selection method on skidder-trail soil compaction in longleaf pine forest. *Forest Science* 64:641-652.

Cherry, M. J., R. B. Chandler, E. P. Garrison, D. A. Crawford, B. D. Kelly, D. B. Shindle, K. G. Godsea, K. V. Miller, and L. M. Conner. 2018. Wildfire affects space use and movement of white-tailed deer in a tropical pyric landscape. *Forest Ecology and Management* 409:161-169.

Giencke, L. M., R. C. Denhof, L. K. Kirkman, O. S. Stuber, and S. T. Brantley. 2018. Seed sourcing for longleaf pine ground cover restoration: using plant performance to assess seed transfer zones and home-site advantage. *Restoration Ecology* 26:1127-1136.

Gonzalez-Benecke, C. A., D. Zhao, L. J. Samuelson, T. A. Martin, D. J. Leduc, and S. B. Jack. 2018. Local and general above-ground biomass functions for *Pinus palustris* trees. *Forests* 9:310; doi:10.3390/f9060310.

Gulsby, W. D., M. J. Cherry, J. T. Johnson, L. M. Conner, and K. V. Miller. 2018. Behavioral response of white-tailed deer to coyote predation risk. *Ecosphere* 9:e02141. 10.1002/ecs2.2141.

Gustafson, D. J., K. Harris-Shultz, P. E. Gustafson, L. M. Giencke, R. C. Denhof, and L. K. Kirkman. 2018. Seed sourcing for longleaf pine herbaceous understory restoration: Little bluestem (*Schizachyrium scoparium*) and Hairy lespedeza (*Lespedeza hirta*) restoration genetics. *Natural Areas Journal* 38:380-392.

- Holland, A. M., E. M. Schaubert, C. K. Nielson, and E. C. Hellgren. 2018. Stream community richness predicts apex predator occupancy dynamics in riparian systems. *Oikos* 127:1422-1436.
- Klopmeier, N. W., S. M. Pesi, G. Morris, and M. Conner. 2018. Sinkholes as a source of wildlife mortality. *Southeastern Naturalist* 17:N64-N67.
- Knapp, D., J. M. Howze, C. M. Murphy, and L. L. Smith. 2018. Prescribed fire affects diurnal vertebrate use of gopher tortoise (*Gopherus polyphemus*) burrows in a longleaf pine (*Pinus palustris*) forest. *Herpetological Conservation and Biology* 13:551-557.
- Lapham, M., C. F. Miniat, A. E. Mayfield III, R. M. Jetton, S. T. Brantley, D. R. Zietlow, C. Brown, and J. R. Rhea. 2018. Shade and hemlock woolly adelgid infestation increase eastern hemlock foliar nutrient concentration. *Forest Science* 6:577-582.
- Little, A. R., L. M. Conner, M. J. Chamberlain, N. P. Nibbelink, and R. J. Warren. 2018. Adult bobcat (*Lynx rufus*) habitat selection in a longleaf pine savanna. *Ecological Processes* 7, 1-12. doi: 10.1186/s13717-018-0129-5.
- Marzolf, N. S., S. W. Golladay, P. McCormick, A. P. Covich, and S. Wilde. 2018. Inter- and intra-annual apple snail egg mass dynamics in a large southeastern US reservoir. *Hydrobiologia* 811:155-171.
- Murphy, C. M., J. M. Howze, D. D. Knapp, L. L. Smith, and S. K. Hoss. 2018. *Crotalus horridus* (Timber rattlesnake). Hibernation behavior. *Herpetological Review* 49:127.
- Murphy, C. M., D. D. Knapp, J. M. Howze, M. C. Dziadzio, and L. L. Smith. 2018. An evaluation of the efficacy of box snake trap arrays for capturing snakes and a suggested new trap design. *Herpetological Review*. 49:461-465.
- Oishi, A. C., C. F. Miniat, K. A. Novick, S. T. Brantley, J. M. Vose, and J. T. Walker. 2018. Warmer temperatures reduce net carbon uptake, but do not affect water use, in a mature southern Appalachian forest. *Agricultural and Forest Meteorology* 252:269-282.
- Potash, A. D., L. M. Conner, and R. A. McCleery. 2018. Extreme movements of an individual male fox squirrel. *Southeastern Naturalist* 17:40-43.
- Prior, K. M., D. C. Adams, K. D. Klepzig, and J. Hulcr. 2018. When does invasive species removal lead to ecological recovery? Implications for management success. *Biological Invasions* 20:267-283.
- Qi, J., D. Markewitz, and D. Radcliffe. 2018. Modelling the effect of changing precipitation inputs on deep soil water utilization. *Hydrological Processes* 32:672-686.

- Qi, J., D. Markewitz, M. Foroughi, E. Jokela, B. Strahm, and J. Vogel. 2018. Drying-wetting cycles: effect on deep soil carbon. *Soil Systems* 2, 3; <https://doi.org/10.3390/soils2010003>.
- Shivers, S. D., S. W. Golladay, M. N. Waters, S. B. Wilde, P. D. Ashford, and A. P. Covich. 2018. Changes in submerged aquatic vegetation (SAV) coverage caused by extended drought and flood pulses. *Lake and Reservoir Management* 34:218-229.
- Shivers, S. D., S. W. Golladay, M. N. Waters, S. B. Wilde, and A. P. Covich. 2018. Rivers to reservoirs: hydrological drivers control reservoir function by affecting the abundance of submerged and floating macrophytes. *Hydrobiologia* 815:21-35.
- Tannenbaum, L. V., D. M. Bullis, N. R. Deuel, L. M. Conner, M. J. Chamberlain, and K. V. Miller. 2018. Demonstrated spatial irrelevance of gray fox at contaminated sites: are ecological risk assessments for mammals necessary? *Journal of Toxicology and Risk Assessment* 4:011. doi.org/10.23937/2572-4061.1510011.
- Whelan, A. W., S. W. Bigelow, M. F. Nieminen, and S. B. Jack. 2018. Fire season, overstory density and groundcover composition affect understory hardwood sprout demography in longleaf pine woodlands. *Forests* 2018, 9, 423; [doi:10.3390/f9070423](https://doi.org/10.3390/f9070423).
- Wiesner, S., C. L. Staudhammer, H. W. Loescher, A. Baron-Lopez, L. R. Boring, R. J. Mitchell, and G. Starr. 2018. Interactions among abiotic drivers, disturbance and gross ecosystem carbon exchange on soil respiration from subtropical pine savannas. *Ecosystems* 21:1639-1658.
- Wood, J. W., B. S. Cohen, T. J. Prebyl, L. M. Conner, B. A. Collier, and Michael J. Chamberlain. 2018. Time-since-fire and stand seral stage affect habitat selection of eastern wild turkeys in a managed longleaf pine ecosystem. *Forest Ecology and Management* 411:203-212.
- Wood J. D., B. S. Cohen, L. M. Conner, B. A. Collier, M. J. Chamberlain. 2018. Nest and brood sites of eastern wild turkeys. *Journal of Wildlife Management*. [doi:10.1002/jwmg.21562](https://doi.org/10.1002/jwmg.21562)

Proceedings, Outreach and Other Publications

- Brantley, S. T., J. Qi, and S. W. Golladay. 2018. Agricultural water conservation for streamflow in the lower Flint River. In cooperation with the Georgia Chapter of the Nature Conservancy. Report on file at the Jones Center.
- Brooks, J. R., and S. B. Jack. 2018. Longleaf pine: Restoration or reforestation? Pages 303-308 in J. E. Kirschman (comp.). *Proceedings of the 19th Biennial Southern Silvicultural Research Conference*. General Technical Report SRS-234. USDA, Forest Service, Southern Research Station, Asheville, North Carolina.

Howze, J. M. 2018. Florida Pine Snake: The Snake that Makes a Meal of Pocket Gophers. The Tortoise Burrow, Newsletter of the Gopher Tortoise Council: 38(2).

Loudermilk, E. L., S. A. Flanagan, S. Bhotika, C. Hawley, G. Starr, S. Wiesner, J. K. Hiers, J. J. O'Brien, S. Goodrick, M. A. Callaham, R. M. Scheller, K. D. Klepzig, and S. Taylor. 2018. Ecosystem process modeling of a southeastern U.S. frequently burned forest: Effects from varying fire frequency on landscape carbon projections. ESTCP/SERDP Symposium, Washington D.C. Abstract.

McIntyre, R. K., J. M. Guldin, T. Ettel, C. Ware, and K. Jones. 2018. Restoration of longleaf pine in the southern United States: A status report. Pages 297-302 in J. E. Kirschman (comp.). Proceedings of the 19th Biennial Southern Silvicultural Research Conference. General Technical Report SRS-234. USDA, Forest Service, Southern Research Station, Asheville, North Carolina.

Nieminen, M. F., and S. B. Jack. 2018. Long-term effects of prescribed fire site preparation on longleaf pine regeneration. Pages 309-314 in J. E. Kirschman (comp.). Proceedings of the 19th Biennial Southern Silvicultural Research Conference. General Technical Report SRS-234. USDA, Forest Service, Southern Research Station, Asheville, North Carolina.

O'Hanlon, B., and J. M. Howze. 2018. Florida Pine Snake: Upland Snake Species Profile. The Gopher Tortoise Council.

O'Hanlon, B., and J. M. Howze. 2018. Timber Rattlesnake: Upland Snake Species Profile. The Gopher Tortoise Council.

Meeting Presentations, Posters and Abstracts

Abernathy-Conners, H. N., D. A. Crawford, E. P. Garrison, R. B. Chandler, L. M. Conner, K. V. Miller, and M. J. Cherry. 2018. How do they weather the storm: White-tailed deer movement and habitat selection during Hurricane Irma. 41st Annual Conference of the Southeast Deer Study Group. Nashville, TN. Oral presentation.

Belovitch, M. W., S. T. Brantley, and D. P. Aubrey. 2018. Hydraulic redistribution from roots to ecosystems. American Geophysical Union Fall Meeting, December 10–14. Washington, DC. Poster presentation.

Bigelow, S. W., R. S. Taylor, and S. T. Brantley. 2018. Exclusion of fire from longleaf pine forests alters nitrogen mineralization dynamics. Ecological Society of America annual meeting, August 5–10. New Orleans, LA. Poster presentation.

Biggerstaff, M. T., M. J. Cherry, L. M. Conner, C. H. Killmaster, J. T. Johnson, R. B. Chandler, and K. V. Miller. 2018. Use of passive camera grids to monitor activity patterns of white-tailed deer. Presented at the 9th International Deer Biology Congress. Denver, CO. Oral presentation.

Biggerstaff, M. T., M. J. Cherry, L. M. Conner, C. H. Killmaster, J. T. Johnson, R. B. Chandler, and K. V. Miller. 2018. Use of passive camera grids to monitor activity patterns of white-tailed deer. 41st Annual Conference of the Southeast Deer Study Group. Nashville, Tennessee. Oral presentation.

Bishop, C., T. N. Sheehan, K. J. K. Gandhi, and K. D. Klepzig. 2018. Adaptive silviculture for climate change: Insects as early indicators of disturbance. 59th annual Southern Forest Insect Work Conference, San Antonio, TX. Poster presentation.

Brantley, S. T., W. T. Flatley, P. J. Fornwalt, K. J. K. Gandhi, and S. W. Bigelow. 2018. Frequent-fire conifer forests of North America: Understanding trade-offs between water yield and carbon sequestration. 5th IUFRO Conference on Forests and Water in a Changing Environment. Valdivia, Chile. November 5–9. Oral presentation.

Brantley, S. T., M. W. Belovitch, and D. P. Aubrey. 2018. Interspecific variation in hydraulic redistribution and its importance to plant communities. 5th IUFRO Conference on Forests and Water in a Changing Environment. Valdivia, Chile. November 5–9. Poster presentation.

Buland, M., B. F. Barnes, K. D. Klepzig, K. J. K. Gandhi, and C. Villari. 2018. Dissecting the fungal community associated with root-feeding beetles in Georgia loblolly pine stands using a metabarcoding approach. American Phytopathological Society Meeting. Boston, MA. Oral presentation.

Buland, M., B. F. Barnes, K. D. Klepzig, K. J. K. Gandhi, and C. Villari. 2018. Elucidating the fungal community in loblolly pine stands of Georgia via metabarcoding. UGA Plant Center Symposium, Athens, GA. Oral presentation.

Buono, C. M., D. Adams, K. D. Klepzig, J. Hulcr, and K. M. Prior. 2018. Are ecological systems resilient to invasions? A systematic review of ecological response post invasive species management. Ecological Society of America Annual Meeting. New Orleans, LA. Poster presentation.

Conner, L. M. 2018. Responding to reviewer comments. Don't get rejected: Publishing in TWS journals. The Wildlife Society, Annual Meeting, Cleveland Ohio. October, 2018. Workshop oral presentation.

Davis, J. L., S. W. Golladay, and M. C. Freeman. 2018. The role of stream drying on fish metapopulations dynamics in the lower Ichawaynochaway Creek Basin. Southeastern Fisheries Council Annual Meeting, November 8-9. Hickory Knob State Park, McCormick, SC. Oral presentation.

Denham, S. O., A. C. Oishi, C. F. Miniati, S. T. Brantley, K. Yi, and K. A. Novick. 2018. Water use strategy of deciduous trees determines the relative importance of soil moisture and vapor pressure deficit in driving stomatal conductance. American Association of Geographers Annual Meeting. New Orleans, LA. April 10–14. Poster presentation.

Denham, S., A. C. Oishi, C. F. Miniati, S. T. Brantley, and K. A. Novick. 2018. Forest trees are not equally affected by hydrologic and atmospheric drought. American Geophysical Union Fall Meeting. Washington, DC. December 10–14. Poster presentation.

Engebretsen, K. N., M. J. Cherry, L. M. Conner, E. P. Garrison, K. V. Miller, and R. B. Chandler. 2018. Seeing spots: An SCR model to estimate spatial and temporal variation in fawn survival and recruitment. 9th International Deer Biology Congress. Estes Park, Colorado.

Engebretsen, K. N., M. J. Cherry, L. M. Conner, E. P. Garrison, K. V. Miller, and R. B. Chandler. 2018. Estimating ecological effects on fawn survival and recruitment in South Florida. 40th Annual Southeastern Deer Study Group Meeting. Nashville, Tennessee.

Frock, C. F., R. A. Mcleery, and L. M. Conner. 2018. Effects of GPS sampling frequency and timing on small mammal space use inferences. Ecological Society of America. New Orleans. August 2018. Oral presentation.

Gaya, H. E., B. L. Nuse, and C. T. Moore. 2018. A Bayesian hierarchical model to account for size bias in gopher tortoise distance surveys. 40th Annual Gopher Tortoise Council Meeting, October 11-14. Archbold Biological Station, Lake Placid, FL. Oral presentation.

Gaya, H. E., B. L. Nuse, and C. T. Moore. 2018. An interesting nuisance: A Bayesian hierarchical model for distance sampling when a detection covariate is also a demographic property of interest. The Wildlife Society 25th Annual Conference, October 7-11. Cleveland, OH. Oral presentation.

Gaya, H. E., L. L. Smith, and C. T. Moore. 2018. Where are all the tortoises? Annual SEPARC Meeting, February 22-25. Helen, GA. Oral presentation.

Gaya, H. E., L. L. Smith, and C. T. Moore. 2018. Where are all the tortoises? Warnell Graduate Student Symposium, January 31-February 2. University of Georgia, Athens GA. Oral presentation.

Giencke, L. M. 2018. (Re)Introduction to the Jones Center. Georgia Plant Conservation Alliance spring meeting. May 17. Oral presentation.

Giencke, L. M. 2018. The role of fire on plant community composition at Ichauway: A synthesis. Botanical Research Symposium at Emory. September 21. Poster presentation.

Giencke, L. M., L. K. Kirkman, R. S. Taylor. 2018. Plant community recovery following fire reintroduction: Impacts of spatial scale, forest structure, and site. Longleaf Alliance 12th Biennial Conference, October 23-26. Alexandria, LA. Poster presentation.

Giencke, L. M. 2018. Empirical seed zones based on a reciprocal transplant experiment. Eastern Seed Zone Forum Summit. May 10. Lexington, KY. Oral presentation.

Golladay, S. W., M. Waters, C. R. Smith, N. S. Marzolf, S. D. Shivers, B. Clayton, and A. P. Covich. 2018. Of limpkins and apple snails: Invasive species, novel ecosystems, and an uncertain future. Annual Meeting of the Society for Freshwater Science, May 20-24. Detroit MI. Oral presentation.

Gulsby, W. D., M. J. Cherry, J. T. Johnson, L. M. Conner, K. V. Miller. 2018. Behavioral Response of White-tailed Deer to Coyote Predation Risk Southeast Deer Study Group. Nashville, TN. Oral presentation.

Holland, A. M., B. T. Rutledge, and S. B. Jack. 2018. Application of long-term monitoring in the restoration of a longleaf pine system. 12th Biennial Longleaf Conference. October 23-26. Alexandria, LA. Poster presentation.

Howze, J. M., and L. L. Smith. 2018. The influence of prescribed fire on site selection in snakes in the longleaf pine ecosystem. The Georgia Wildlife Society, Sept. 6-7. Tifton, GA. Poster Presentation.

Howze, J. M., and L. L. Smith. 2018. The influence of prescribed fire on site selection in snakes in the longleaf pine ecosystem. Southeast Partners for Reptile and Amphibian Conservation, Feb. 23-24. Helen, GA. Oral Presentation.

Jack, S. B., B. T. Rutledge, and A. M. Holland. 2018. Long-term monitoring to inform adaptive management –The Ichauway experience. Society of American Foresters National Convention. October 3-7. Portland, OR. Oral presentation.

Johnson, J. T., M. J. Cherry, L. M. Conner, C. H. Killmaster, M. T. Biggerstaff, W. D. Gulsby, R. B. Chandler, and K. V. Miller. 2018. Preliminary development of an unbaited camera survey technique for estimating white-tailed deer densities. Presented at the 9th International Deer Biology Congress. Denver, CO. Oral presentation.

Johnson, J. T., M. J. Cherry, L. M. Conner, B. T. Rutledge, C. H. Killmaster, W. D. Gulsby, M. T. Biggerstaff, R. B. Chandler, and K. V. Miller. 2018. Preliminary development of an unbaited camera survey technique for estimating white-tailed deer densities. 41st Annual Meeting of the Southeast Deer Study Group. Nashville, TN. Oral presentation.

Klepzig, K. D. 2018. Invasive organisms and invasive fires: Reciprocal effects, management options. USDA Forum on Invasive Species. Georgia Association of Conservation Districts. Greensboro, GA. Oral presentation.

Klepzig, K. D. 2018. Invasive organisms and invasive fires: Reciprocal effects, management options. USDA Forum on Invasive Species. Annapolis, MD. Oral presentation.

Knapp, D. D., L. L. Smith, and C. L. Atkinson. 2018. Factors affecting ecological stoichiometry of larval anurans in geographically isolated wetlands. Southeast Partners in Amphibian and Reptile Conservation, February 22. Helen, GA. Poster Presentation.

Lapham, M., C. F. Miniati, A. E. Mayfield, III, R. M. Jetton, S. T. Brantley, D. R. Zietlow, C. Brown, and J. R. Rhea. 2018. Shade and hemlock woolly adelgid infestation affect eastern hemlock nutrient content. American Association of Geographers Annual Meeting. April 10–14. New Orleans, LA. Poster presentation.

McIntyre, R. K. 2018. Using wildlife habitat models to evaluate management endpoints for open pine woodland and savanna. National Conference on Ecosystem Restoration. New Orleans, LA. Oral presentation.

McIntyre, R. K. 2018. Using wildlife habitat models to evaluate management endpoints for open pine woodland and savanna. 12th Biennial Longleaf Alliance Conference. Alexandria LA. Oral presentation.

Miller, K. V., J. T. Johnson, and R. B. Chandler. 2018. Non-baited camera surveys for deer. 18th Annual Convention, Quality Deer Management Association. July 19-22. New Orleans, LA. Oral presentation.

Miniati, C. F., J. M. Fraterrigo, S. T. Brantley, M. Callahan, S. Cordell, J. S. Dukes, C. P. Giardina, S. Jose, and G. Lovett. 2018. Impacts of invasive species on forest and grassland ecosystem processes in the US. Entomological Society of America Annual Meeting. November 14. Vancouver, BC Canada. Invited oral presentation.

Oishi, A. C., C. F. Miniati, S. T. Brantley, K. A. Novick, P. V. Bolstad, J. M. Vose, P. V. Caldwell, and K. Duan. 2018. Effects of forest composition on components of evapotranspiration in a mature, southern Appalachian forest. 6th Interagency Conference on Research in Watersheds. Shepherdstown, WV. July 23–26. Oral presentation.

Potash, A., L. M. Conner, and R. A. McCleery. 2018. Interactions between multiple predators and environmental cover influence fox squirrel (*Sciurus niger*) fear. Gordon Research Conference on Predator-Prey Interactions. Ventura, CA. Poster presentation.

Pynne, J. T., E. Parsons, S. Duncan, S. Castleberry, M. Conner, J. Austin, R. Gitzen, and R. McCleery. 2018. Designing and implementing a distance sampling protocol for southeastern pocket gophers. The Wildlife Society. Cleveland, OH. October 2018. Poster presentation.

Pynne, J. T., S. Castleberry, M. Conner, E. Parsons, R. Gitzen, S. Duncan, R. McCleery, and J. Austin. 2018. Observations on the southeastern pocket gopher from a multi-state project. Georgia Chapter, The Wildlife Society. Athens, GA. September 2018. Oral presentation

Qi, J., S. T. Brantley, and S. W. Golladay. 2018. Longleaf pine restoration for streamflow in the lower Flint River. 5th IUFRO Conference on Forests and Water in a Changing Environment, November 5–9. Valdivia, Chile. Oral presentation.

Qi, J., D. Markewitz, and D. Radcliffe. 2018. Modeling the effects of changing precipitation inputs on deep soil water utilization. 5th IUFRO Conference on Forests and Water in a Changing Environment. November 5-9. Valdivia, Chile. Poster presentation.

Ritger, H. M., S. T. Brantley, J. J. O'Brien, K. D. Klepzig, C. T. Moore, L. R. Boring, and K. J. K. Gandhi. 2018. Effects of fire exclusion and fire reintroduction on bark beetles and tree defenses in longleaf pine. 59th Annual Southern Forest Insect Work Conference, July 17–20. San Antonio, TX. Oral presentation.

Sheehan, T. N., and K. D. Klepzig. 2018. Insects of Ichauway: Past, present, and future entomological research at the Jones Center. 59th annual Southern Forest Insect Work Conference. San Antonio, TX. Paper presentation.

Smith, C. R., and S. W. Golladay. 2018. Evidence for biological connectedness: Fish dispersal along intermittent flow paths among seasonal wetlands. Annual Meeting of the Society for Freshwater Science, May 20-24. Detroit MI. Oral presentation.

Smith, L. L. 2018. Georgia wetlands: Where fire and water meet. Georgia Prescribed Fire Council, September 27. Tifton, GA. Oral presentation.

Smith, L. L. 2018. Implementation of a candidate conservation agreement for the gopher tortoise: The Key Role of Stakeholders, Annual Conference of The Wildlife Society, October 7-11. Cleveland, OH. Oral presentation.

Starr, G., C. L. Staudhammer, S. Wiesner, and A. Whelan. 2018. The biogeochemical cycles of a subtropical savanna ecosystem. French National Institution of Agricultural Research (INRA). June 22. Lusignan, France. Oral presentation.

Starr, G., C. L. Staudhammer, S. Wiesner, and A. Whelan. 2018. Understanding the biogeochemical cycles of a subtropical savanna ecosystem. AgroParisTech. April 27. Grignon, France. Oral presentation.

Stuber, O. S., and S. T. Brantley. 2018. Water use during and after severe drought in a pine-dominated forest: comparing functional-group differences in evapotranspiration. 5th IUFRO Conference on Forests and Water in a Changing Environment. Valdivia, Chile. November 5–9. Oral presentation.

Stuber, O. S., and S. T. Brantley. 2018. Fire exclusion increases canopy interception loss in Longleaf Pine (*Pinus palustris*) forests. 5th IUFRO Conference on Forests and Water in a Changing Environment. Valdivia, Chile. November 5–9. Poster presentation.

Taylor, R. S. 2018. Introduction to the Jones Center and Longleaf Pine Ecosystem Project. USFS Experimental Forests and Ranges Workshop. May 30-April 3. Little Rock, AR. Oral presentation.

Taylor, R. S. 2018. Introduction to the Jones Center and Longleaf Pine Ecosystem Project. NEON Domain 3 Annual Meeting. October 30-November 1. Kissimmee, FL. Oral presentation.

Wagner, S., S. T. Brantley, O. S. Stuber, J. Van Stan, and A. Stubbins. 2018. A study of fire and rain: Dissolved black carbon in throughfall and stemflow. Goldschmidt Conference. Boston, MA. August 12–17. Oral presentation.

Walker, J. L., L. M. Giencke, R. C. Denhof, L. K. Kirkman, A. J. Savereno, S. L. Reid, G. Hernandez, O. S. Stuber, and S. T. Brantley. 2018. Which seed sources for longleaf pine restoration? Common garden studies to inform seed zone development. 12th Biennial Longleaf Alliance Conference. October 23–26. Alexandria, LA. Oral presentation.

Wiesner, S., P. C. Stoy, C. L. Staudhammer, and G. Starr. 2018. Maximum entropy production reveals differences in resilience to drought from variations in energy use efficiency across sites in a longleaf pine savanna. AGU Fall Meeting. Dec. 10-14. Washington, DC. Oral presentation.

Whelan, A. W., and S. W. Bigelow. 2018. Overstory density effects on fire residence time in longleaf pine forest. Annual Conference, Ecological Society of America. August 5-10. New Orleans, LA. Poster presentation.

Professional Seminars, Guest Lectures, and Special Presentations

Bigelow, S. W. 2018. Linking fire intensity and effects to longleaf pine silvicultural systems. USDA-FS SRS, March 22. Athens, GA. Invited seminar.

Conner, L. M. 2018. Predators, prey, and predation in the South's fire forest. Arkansas Tech University Lecture Series. November 5, 2018. Invited seminar.

Conner, L. M. 2018. Predation in the South's fire forest. Mississippi State University Conservation Lecture Series. Mississippi State, Mississippi. April 18. Invited Lecture.

Golladay, S. W. 2018. Overview of upper Flint River hydrologic change. Upper Flint River E-Flows Working Group, January 18. Newnan, GA. Invited oral presentation

Golladay, S. W. 2018. Overview of upper Flint River hydrologic change. Shoal Bass Anglers Annual Dinner, March 2. Macon, GA. Invited public lecture

Golladay, S. W. 2018. Hydrologic change and biological responses: Long term research in the lower Flint River. ACF Freshwater Mussel Workshop, August 6-9. Invited oral presentation

Klepzig, K. D. 2018. A living laboratory in a working forest: Privately funded research for the public good. Ecological Society of America Annual Meeting. New Orleans, LA. Invited symposium presentation.

Klepzig, K. D. 2018. If a tree falls in the forest: The impact of science, the science of impact. Southern Forest Insect Work Conference. San Antonio, TX. Invited keynote presentation.

Smith, L. L. 2018. Wildlife use of geographically isolated wetlands in forested versus agricultural landscapes. Southeastern Partners in Amphibian and Reptile Conservation. February 23-25. Unicoi State Park, GA. Invited speaker.

Externally Funded Projects

Conner, L. M., and K. Miller. Development and evaluation of an unbaited camera survey technique for estimating relative abundance and demographic parameters of white-tailed deer. U.S. Fish and Wildlife Service, subcontracted through University of Georgia. July 01, 2014 – September 30, 2018. \$145,140. Received in 2018, \$30,481.

Conner, L. M., and R. A. McCleery. Collaborative research: EAGER-NEON: NEON sites as a platform for transformative wildlife research. National Science Foundation. October 01, 2015 – September 30, 2018. \$167,148. Received in 2018, \$6,884.

Conner, L. M., and R. A. McCleery. Using an ecosystem engineer to restore functionality of natural pinelands in the southeastern United States. Georgia Department of Natural Resources. January 01, 2016 – September 30, 2018. \$187,153. Received in 2018, \$57,876.

Smith, L. L. Gopher tortoise conservation strategy workshop. U.S. Fish and Wildlife Service. August 01, 2017 - May 31, 2018. \$15,000. Received in 2018, \$6,236.

McIntyre, R. K. Natural Resource Conservation Service Prescribed Fire Training. USDA-NRCS. November 2015 – 2020. \$16,000. Received in 2018, \$2,615.

Smith, L. L. Gopher tortoise research. SERDP. U.S. Army Corps of Engineers. July 05, 2018 - July 4, 2020. \$9,731. Received in 2018, \$0.00.

Education and Outreach Program On-site Activities

University Classes

University of Georgia. A week-long Maymester short course in fire ecology. (12)

University of Florida. A two-day field experience focusing on longleaf pine silviculture, management and restoration. (29)

University of Georgia. A three-day field experience focusing on herpetofauna in longleaf pine ecosystems and isolated wetlands. (19)

University of Georgia. A one-day field experience focusing on environmental issues around Georgia. (22)

The University of the South. A three-day field experience focusing on longleaf pine management and restoration for the forest ecology course. (9)

Berry College. A three-day field experience focusing on longleaf pine, wildlife, and wetlands for a conservation biology class. (15)

Oregon State University. A one-day visit for and OSU professor to plan for a 2019 field visit. (1)

Natural Resource Professionals and Conservation Groups

Internal Prescribed Fire Course. A two-day course focusing on prescribed fire for Jones Center employees and graduate students, including execution of a prescribed burn. (5)

National Prescribed Fire Training Center I. A one-day field tour focusing on an introduction to longleaf pine ecosystems and prescribed fire in the southeastern U.S. (43)

National Prescribed Fire Training Center II. A one-day field tour focusing on an introduction to longleaf pine ecosystems and prescribed fire in the southeastern U.S. (19)

National Prescribed Fire Training Center III. A one-day field tour focusing on an introduction to longleaf pine ecosystems and prescribed fire in the southeastern U.S. (10)

Goizueta School of Business at Emory University. A two-day foundational overview of longleaf pine ecology, management, and restoration as part of an Impact 360 project in which graduate students explored how to grow markets for longleaf pine. (13)

Natural Resource Conservation Service (NRCS). A three-day training on prescribed fire for county and district-level NRCS agents to facilitate working with private landowners on prescribed fire on their properties. (18)

Institute for Georgia Environmental Leadership (IGEL). A one-day field tour focusing on longleaf pine ecology, prescribed fire and water resources issues for business, political, and environmental leaders from across the Georgia. (33)

U.S Forest Service Longleaf Leadership Summit. A three-day workshop of regional Forest Service leadership, National Forest supervisors, and district rangers to roll out the "Million Acre Challenge", a USFS program that commits to restoring one million acres of longleaf pine on National Forests located within the historic range of longleaf pine. (41)

Freshwater Mussel Workshop. A four-day training workshop focusing on field survey techniques and identification of freshwater mussels. (16)

Freshwater Mussel Species Status Assessment Workshop. A two-day workshop for U.S. Fish and Wildlife Service staff and regional mussel experts to evaluate the conservation status of freshwater mussels. (12)

Longleaf Pine Growth and Yield Workshop. A two-day workshop for institutional landowners (TIMOs, REITs), forest biometricians, and Longleaf Partnership Council representatives to explore opportunities for development of updated growth and yield models for longleaf pine. (20)

Georgia Prescribed Fire Council (GPFC). A two-day visit with speakers in conjunction with the Annual GPFC Meeting. (7)

Florida Natural Area Inventory (FNAI). A day visit by FNAI staff from Tallahassee to meet with Jones Center staff on regional longleaf pine mapping and inventory project. (2)

Adopt-A-Stream Board. A two-day meeting of the board of directors for the Georgia Adopt-A-Stream program, a citizen science network for monitoring water quality across the state. (12)

U.S. Forest Service Silviculture Certification Training. A day visit by the USFS regional silviculture continuing education program for Region 8 silviculturists to maintain certification. (9)

National Fish and Wildlife Foundation/Southern Company. A two-day workshop for national NFWF staff and regional environmental staff from the Southern Company to learn about longleaf pine ecology, management, and restoration and discuss their Longleaf Stewardship Fund grant program. (16)

Alabama Gopher Tortoise Survey Workshop. A two-day workshop for the American Forest Foundation to train land managers in Alabama on standard survey methodology for gopher tortoises. (14 people)

Stakeholder Workshop on Water Conservation Strategies. 2-day workshop brought together stakeholders having varying perspectives on water use and focused on discussing a path forward in implementing new water conservation strategies in the ACF basin. Organized by Steve Golladay, Steven Brantley, and Jill Qi with Georgia TNC. The conservation scenarios explored using the Ichauway SWAT Model were presented to stakeholders and their responses discussed. Participants were taken to locations at Ichauway where ecohydrology and forestry research are ongoing. The workshop was held at Ichauway on Aug. 23-24, 2018. (20)

Hurricane Michael Regional Stakeholders Meeting. A one-day meeting of representatives of storm-impacted conservation lands from across SW Georgia and the Florida panhandle to discuss hurricane response and restoration issues. (25)

Public Relations

Georgia Public Broadcasting/Georgia Forestry Association. Center staff collaborated with GPB and GFA on production of "Georgia Forests: Virtual Learning Journey", a virtual field trip for K-12 classrooms in Georgia. A four-person team spent 2 days at Ichauway filming and interviewing Center staff.

Georgia River Network Fall Float on the Flint. A paddle event which included a stop at Ichauway, where Center staff gave overviews of the longleaf pine ecosystem and aquatic system. (175)

Education and Outreach Program Off-site Activities

Regional Partnerships and Advisement

Longleaf Partnership Council

The Center was a founding member of this regional partnership of federal, state, nongovernmental organization, and private groups working to implement the 2009 Rangewide Conservation Plan for Longleaf Pine, which seeks to double the acreage of longleaf from 4 to 8 million acres by 2025. Kevin McIntyre has worked with this effort as the Jones Center representative since it began in 2007 and served a three-year term on the leadership team from 2014-2016. He currently serves on several subcommittees of the Council.

Apalachicola Regional Stewardship Alliance (ARSA)

Kevin McIntyre is member of the ARSA, a regional partnership for longleaf restoration in a million-acre focus area centered around the Apalachicola National Forest and St. Marks National Wildlife Refuge. This group serves as a local implementation team for the Range-wide Conservation Plan for Longleaf Pine.

Chattahoochee Fall Line Conservation Partnership (CFLCP)

Steve Jack served as a member of the steering committee for the CFLCP, a regional partnership for longleaf restoration around the Ft. Benning/Fall Line Sandhills area of western Georgia. This group serves as a local implementation team for the Range-wide Conservation Plan for Longleaf Pine.

Coalition of Prescribed Fire Councils

Mark Melvin is currently serving on the board of this national organization, whose overarching goal is to create one voice to assist fire practitioners, policymakers, regulators, and citizens with issues surrounding prescribed fire use.

Georgia Prescribed Fire Council (GPFC)

The GPFC is a diverse group of stakeholders collaborating to protect the right, to encourage the use of, and to promote public understanding of prescribed fire in Georgia. Mark Melvin serves as permanent Vice-Chair for this group and coordinates the annual meeting. Mark served his second term as Chair in 2016.

Southern Fire Exchange (SFE)

The SFE is a regional program for fire science delivery in the Southeast, funded by the Joint Fire Science Program. The SFE consolidates southern fire information and provides new ways for the fire community to interact and learn from one another. Mark Melvin serves on the Advisory Board.

National Wildfire Coordination Group (NWCG)

The Fire Use Subcommittee reviews and updates NWCG prescribed fire training standards and policy. Mark Melvin serves as liaison on the Fire Use Subcommittee and also served on the Smoke Management Guide Review Team.

Wildland Fire Cohesive Strategy: Southeast Regional Committee

This group provides executive leadership, oversight, and guidance within their respective region for completing the tasks assigned by the Wildland Fire Executive Council during Phases II and III of the Cohesive Strategy. Mark Melvin serves as Southeast Regional Committee Member.

Southeast Regional Partnership for Planning and Sustainability (SERPPAS)

SERPPAS is a six-state partnership comprised of state and federal agencies that promotes collaboration in making resource use decisions supporting conservation of natural resources, working lands, and national defense. Mark Melvin serves on the Air Quality Subcommittee and Prescribed Fire Work Group, working to develop creative

solutions that address smoke management for prescribed fire and increase burning while complying with state air quality regulations.

Southeast Prescribed Fire and Smoke Management Workgroup

Mark Melvin served as a planning team member of the Southeast Prescribed Fire and Smoke Management Workgroup. This group is made up of representatives from eight southeastern state forestry and environmental air quality agencies and EPA Region 4 that work together to define and achieve mutual prescribed fire and air quality goals.

Georgia Adopt A Stream (AAS)

Steve Golladay served on the board of directors for Georgia AAS. A priority of the group was to refine the statewide online water quality database. Georgia AAS also started a program of data collection for Paddle Georgia and other river education efforts.

Georgia Water Resources Conference 2019

Steve Golladay serves as a member of the Steering Committee, and the Jones Center at Ichauway is a sponsor. The committee designs the program, invites plenary speakers, and recruits sponsors. Steve is organizing a session, working with Ben Emmanuel (American Rivers) and Gordon Rogers (Flint Riverkeeper), to develop a special track on science-based water management strategies in the Flint River.

Upper Flint River Eflows Working Group (UFREWG)

The UFREWG is composed of municipal water authorities, the Flint RiverKeeper, American Rivers, and interested stakeholders committed to developing science-based water management in the Flint River. Steve Golladay provides technical advisement, that includes detailed analysis of long term climate and stream flow trends in the upper Flint River.

Floridan Aquifer Collaborative Engagement for Sustainability (FACETS) Project

FACETS is funded by US Department of Agriculture to study conservation practices in the lower Flint and Suwannee River Basins. Steve Golladay serves as a member of the Participatory Modeling Process (PMP) whose goal is to create a venue for scientists and stakeholders to come together and share perspectives, identify knowledge gaps, and co-create holistic, legitimate visions for the future. This is a 5 year commitment that began in 2018.

Flint River Policy Center at Albany State and Flint RiverQuarium

The RiverQuarium in Albany Georgia is engaging in a strategic planning process to update its exhibits and education program. Steve Golladay was invited to advise in the development of a research and conservation program that is relevant to the lower Flint River and Apalachicola-Chattahoochee-Flint River Basins. The Water Policy Center at Albany State University is a partner in this effort.

Staff

Scientists

Seth W. Bigelow – Assistant Scientist, Forest Ecology
Adjunct Assistant Professor, University of Florida
Adjunct Assistant Professor, Auburn University

Steven T. Brantley - Assistant Scientist, Ecohydrology
Adjunct Assistant Professor - University of Georgia
Courtesy Assistant Professor - Louisiana State University

L. Michael Conner - Scientist, Wildlife Ecology
Courtesy Assistant Professor - University of Florida
Affiliate Assistant Professor - Auburn University
Adjunct Assistant Professor - University of Georgia
Adjunct Assistant Professor - Mississippi State University
Adjunct Assistant Professor - University of Tennessee
Adjunct Assistant Professor - Virginia Tech

Stephen W. Golladay - Associate Scientist, Aquatic Ecology
Adjunct Associate Professor - University of Georgia

Kier D. Klepzig – Director, Scientist, Entomology

Lora L. Smith - Scientist, Wildlife Ecology
Adjunct Professor - University of Alabama
Affiliate Professor - Auburn University
Adjunct Professor - University of Georgia
Courtesy Professor - University of Florida

Angela M. Holland – Conservation Postdoctoral Associate

Ji “Jill” Qi – Hydrology Postdoctoral Associate

*Steven B. Jack - Conservation Ecologist, Applied Forest Scientist
Courtesy Associate Professor - University of Florida
Affiliate Assistant Professor - Auburn University

Research Associates and Technicians

Brian A. Clayton - Monitoring Technician II, Groundwater Hydrology

Brian M. Cloninger - Central Analytical Lab Technician

Lisa M. Giencke – Senior Research Associate I, Plant Ecology

Jennifer L. Howze – Senior Research Associate I, Herpetology

Gail Morris – Senior Research Associate I, Wildlife Ecology

Thomas N. Sheehan –Research Associate I, Forest Entomology

Chelsea R. Smith - Research Associate II, Aquatic Ecology

O. Stribling Stuber – Research Associate II, Ecohydrology

R. Scott Taylor – Research Coordinator, Forest Ecology

Andy W. Whelan –Research Associate I, Forest Ecology

*Mary Frances Nieminen – Research Associate II, Forest Ecology III

Research Support

Chandler “Lain” Alexander - IT and Network Support Technician

Jean C. Brock - Information Technology Manager / Geographic Information Systems

Micheal G. Simmons – Database / Data Analyst

*Elizabeth P. Cox - Science Librarian

Education

R. Kevin McIntyre - Education Coordinator

Jessica D. McCorvey - Education Program Assistant

Mark A. Melvin - Education Technician / Conservation Management

Conservation

Bobby E. Bass - Conservation Technician II

T. Scott Smith - Assistant Natural Resource Manager

Mark A. Melvin - Conservation Management / Education Technician

Joel L. Rackley - Agricultural Specialist

Brandon T. Rutledge - Conservation Biologist

David C. Varnadoe - Conservation Horticulturist

*James B. Atkinson, Jr. - Natural Resource Manager

*Steven B. Jack - Conservation Ecologist

Maintenance and Operations

H. Kip Davis – Operations Manager

Bronwyn S. Hinton – Guest Services Manager

*Scott T. Cumbie – Safety Manager

*Dennis J. Williams - Maintenance Manager

Administration

Kier D. Klepzig – Director

Regina E. Carter – Senior Accountant

Cindy C. Craft – Administrative and Human Resource Assistant

Amanda “Mandy” S. Dukes - Accounts Payable/Procurement Specialist

Becky H. Gay – Business Administrator

Deborah R. Roberts – Receptionist

Denise R. Rovig - Assistant to the Director

* has left the Center

Graduate Students

Graduated 2018

Interspecific variation in hydraulic redistribution and its importance to ecosystem processes in a xeric longleaf pine savanna.
(University of Georgia, M.S., **S. T. Brantley**)

Michael Belovitch

Environmental and seasonal influences on white-tailed deer activity.
(University of Georgia, M.S., **L. M. Conner**)

Michael Biggerstaff

Wading bird use of geographically isolated wetlands in the southeastern U.S. coastal plain.
(Florida Atlantic University, M.S., **L. L. Smith**)

Camille Herteux

Predator community composition and fox squirrel response to predation risk.
(University of Florida, M.S., **L. M. Conner**)

Alex Potash

Maximum entropy and its role in the carbon and energy cycling of subtropical longleaf pine savannas.
(University of Alabama, Ph.D., **L. R. Boring**)

Susanne Wiesner

Current 2018 Projects

Using a small unmanned aerial system (sUAS) to map macrophyte assemblages in Lake Seminole, Georgia.
(University of Georgia, M.S., **S. W. Golladay**)
On a family leave of absence.

Philip Ashford

Improving rainfall-runoff models in the Ichawaynochaway Creek using Web Soil Survey data.
(University of Georgia, M.S., **S. T. Brantley**)

Coleman Barrie

Fear, forage, and fire: White-tailed deer in a pyric landscape.
(Virginia Tech, Ph.D., **L. M. Conner**)

Daniel Crawford

Effects of water scarcity on freshwater fish foodwebs.
(University of Georgia, M.S., **S. W. Golladay**)

Christine Fallon

-
- An integrative study in the behavioral landscape ecology of Sherman's fox squirrels: Implications for animal conservation in a changing world.
(University of Florida, Ph.D., **L. M. Conner**) **Catherine Frock**
- Sampling design enhancement for gopher tortoises.
(University of Georgia, M. S., **L. L. Smith**) **Heather Gaya**
- Interactions between Ips beetles, associated fungi and mites, and longleaf pines under a frequent fire regime.
(University of Georgia, Ph.D., **K. D. Klepzig**) **Ben Gochnour**
- Using seismic surveys and ground penetrating radar to map below-ground structures on Ichauway, specifically focusing on the interface between soils and bedrock around wetlands.
(Louisiana State University, Ph.D., **S. T. Brantley**) **Joseph Honings**
- Development and evaluation of a camera survey technique for estimating population parameters of white-tailed deer (*Odocoileus virginianus*).
(University of Georgia, Ph.D., **L. M. Conner**) **James Johnson**
- Factors affecting ecological stoichiometry of larval anurans and nutrient availability in geographically isolated wetlands.
(University of Alabama, M.S., **L. L. Smith**) **Dan Knapp**
- Food and fear: Using terrestrial mammals to decouple the drivers of habitat selection.
(University of Florida, Ph.D., **L. M. Conner**) **Jessica Laskowski**
- Quantifying the value of underground vertebrate refugia in the longleaf pine ecosystem.
(University of Georgia, M.S., **L. L. Smith**) **Chris Murphy**
- Evaluation of post-release movement and habitat selection behavior in reintroduced populations of the eastern indigo snake.
(Auburn University, M.S., **L. L. Smith**) **Sara Piccolomini**
- Using an ecosystem engineer to restore functionality of natural pinelands in the southeastern United States.
(University of Georgia, Ph.D., **L. M. Conner**) **J.T. Pynne**
- Facilitation and competition effects on translocation of tree species for climate change adaptation.
(Auburn University, M.S., **S. W. Bigelow**) **Sean Reynolds**

Effects of fire regime on subcortical Insects, tree physiology, and their Interactions in longleaf pine (*Pinus palustris*) (University of Georgia, Ph.D., **S. T. Brantley**)

Haley Ritger

Neighborhood influences on longleaf pine response to drought. (University of Florida, M.S., **S. W. Bigelow**)

Anna Rollosson

Incoming 2019 Students

Restoration of ecosystem function in Longleaf pine plantations. (University of Florida, M.S., **S. W. Bigelow**)

Benju Baniya

Effects of wind disturbance on root infesting beetles and fungi in longleaf pine. (University of Georgia, M.S., **K. D. Klepzig**)

Crystal Bishop

Mammal use of isolated wetlands. (University of Georgia, Ph.D., **L. M. Conner**)

Elizabeth Parsons

Community re-organization of longleaf pine forest after a hurricane. (University of Florida, **S. W. Bigelow**)

Cody Pope

Decomposer beetles in the presence and absence of predators. Clemson University, M.S., **K. D. Klepzig**)

Kelsea Young

Jones Center Advisory Committee

Dr. Jim Vose (2013-present) Chair (2015-present)
Research Ecologist and Project Leader
U.S. Forest Service, Southern Research Station
Center for Integrated Forest Science

Dr. Jerry F. Franklin (1988-present), Founding Member
Professor of Ecosystem Management
College of Forest Resources
University of Washington

Mr. Robert Larimore (2010-present)
Chief, Environmental Division
U.S. Army Garrison (USAG), Italy

Dr. Gene E. Likens (1988-present), Founding Member
Distinguished Senior Scientist, Ecologist
Founding Director and President Emeritus
Cary Institute of Ecosystem Studies

*Dr. Bernard "Bern" W. Sweeney (2016-2018)
Director, President, Senior Research Scientist
Stroud Water Research Center
Avondale, Pennsylvania

*has rotated off the Committee

Guest Seminars

Michael Belovitch, Jones Center supported M.S. student, Warnell School of Forestry and Natural Resources, University of Georgia. Hydraulic redistribution in savanna forests – Interspecific variation and consequences for ecosystem processes. Hosted by Dr. Steven Brantley.

Dr. Wes Burger, Dale H. Arner Professor of Wildlife Ecology and Management, Mississippi Agricultural and Forestry Experiment Station, Mississippi State University. Wildlife conservation in working landscapes. Hosted by Dr. Kier Klepzig and Dr. Mike Conner.

Dr. Raelene Crandall, Assistant Professor of Fire Ecology, School of Forest Resources and Conservation, University of Florida. Biodiversity, invasions, and restoration in dynamic, fire-maintained landscapes. Hosted by Dr. Seth Bigelow.

Dr. Wendell Cropper, Professor, Biological Process Modeling, School of Forest Resources and Conservation, University of Florida. The Longleaf Paradigm. Hosted by Dr. Seth Bigelow.

Dr. Gino D'Angelo, Assistant Professor, Deer Ecology and Management, Warnell School of Forestry and Natural Resources, University of Georgia. Bridging the gap: Problem solving in deer management. Hosted by Dr. Mike Conner.

Nicholas "Nick" Deuel, East Panhandle Area Bear Biologist, Black Bear Management Program, Florida Fish and Wildlife Conservation Program, Eastpoint, Florida, and former Jones Center supported M.S. student. Space use, interactions, extra-territorial forays and habitat selection of gray foxes (*Urocyon cinereoargenteus*) in southwestern Georgia. Hosted by Dr. Mike Conner.

Dr. Travis Glenn, Associate Director, Institute of Bioinformatics, Associate Professor, Environmental Health Science, University of Georgia. How some genetic data can change your view of crocodilians and tropical forests. Hosted by Dr. Lora Smith.

Dr. Johnny Grace, Courtesy Graduate Faculty, College of Agriculture and Food Sciences, Florida Agricultural and Mechanical University, Tallahassee, Florida. Exploring the influence of management and changing systems in coastal plain watersheds. Hosted by Dr. Steven Brantley.

Camille Herteux, Jones Center supported M.S. Student, Environmental Science, Florida Atlantic University. Wading bird use of geographically isolated wetlands in the southeastern U.S. coastal plain. Hosted by Dr. Lora Smith.

Dr. Marcus Lashley, Assistant Professor, College of Forest Resources, Mississippi State University. What happens if everything dies? Hosted by Dr. Mike Conner.

Dr. Rima D. Lucardi, Research Ecologist, Insects, Diseases, and Invasive Plants, USDA Forest Service. Always the beautiful answer who asks a more beautiful question: The power of basic and applied sciences in invasion and conservation biology. Hosted by Dr. Kier Klepzig.

Dr. Andrew Sanchez Meador, Program Director of Biometrics and Forest Management, School of Forestry, Northern Arizona University. Resiliency and heterogeneity in southwestern frequent-fire forests: Tree-, stand- and landscape-level patterns. Hosted by Dr. Steve Jack.

Dr. Wayne Morse, Associate Professor, Human Dimensions of Natural Resources, School of Forestry and Wildlife Sciences, Auburn University. The benefits of nature: Ecosystem services in the South. Hosted by Dr. Kier Klepzig.

Rob Nelson, CEO, Untamed Science, Biologist, Montana State University-Bozeman. Why science needs video. Hosted by Dr. Kier Klepzig.

Dr. Frances O'Donnell, Assistant Professor, Department of Civil Engineering, Auburn University. The interacting effects of climate, fire, and management on semi-arid forested watersheds. Hosted by Dr. Steven Brantley.

Dr. Bridget J. Piculell, Postdoctoral Fellow, Department of Biology, College of Charleston, Charleston, South Carolina. Know your roots: Investigating the genetic basis of mycorrhizal traits in loblolly pine. Hosted by Dr. Steven Brantley.

Alex Potash, Jones Center supported M.S. Student, Department of Wildlife Ecology and Conservation, University of Florida. Hosted by Dr. Mike Conner.

Dr. Cassandra Quave, Herbarium Curator, Assistant Professor of Dermatology and Human Health, Emory University. Ethnobotany and the discovery of new drugs from nature. Hosted by Dr. Kier Klepzig.

Dr. Lindsey Sargent Reisinger, Research Assistant Professor, School of Forest Resources and Conservation, Fisheries and Aquatic Sciences Program, University of Florida. Contemporary evolution and parasitism alter the ecological impacts of an invasive crayfish. Hosted by Dr. Steve Golladay.

Dr. Ajay Sharma, Assistant Professor, Applied Forest Ecology, West Florida Research and Education Center, University of Florida IFAS. Can slash pine be sustainably managed using uneven-aged Silviculture? Hosted by Dr. Steve Jack.

- Dr. Michael Stambaugh, Associate Professor, School of Natural Resources, University of Missouri. Update on results of Ichauway tree ring research. Hosted by Dr. Steve Jack.
- Dr. Bill Tollner, Professor, College of Engineering, School of Environmental, Mechanical and Agricultural, and Civil Engineering, University of Georgia. Water management and habitat suitability study along rivers in Georgia. Hosted by Dr. Steven Brantley.
- Dr. J. T. Vogt, Project Leader, Supervisory Biological Scientist, Southern Research Station, USDA Forest Service, Athens, Georgia. An entomologist's journey, from fire ants to forest pests. Hosted by Dr. Kier Klepzig.
- Dr. Liana Zanette, Professor and Faculty Scholar, Wildlife Population, Conservation, and Behavioural Ecology, Western University, London, Ontario, Canada. The dimensions of fear: From brains to ecosystems to human mental health and human impacts. Hosted by Dr. Mike Conner.

Collaborating Organizations

Albany State University
America's Longleaf Restoration Initiative
Auburn University
Clemson University
Conservancy of SW Florida
Emory University
Emory University Goizueta School of Business
Flint RiverKeeper
Flint RiverQuarium
Flint River Soil and Water Conservation District
Florida Atlantic University
Florida Fish and Wildlife Conservation Commission
Georgia Dept. of Natural Resources
Georgia Forestry Commission
Georgia Southern University
Larson & McGowin Forestry Consultants
Lolly Creek Consultants
Louisiana State University
National Park Service
Murray State University
National Coalition of Prescribed Fire Councils
National Ecological Observatory Network
National Fish and Wildlife Foundation
National Prescribed Fire Training Center
Natural Resource Conservation Service
Northeastern University

Resource Management Services

Southern Fire Exchange

Texas A&M University

The Citadel

The Conservation Fund

The Longleaf Alliance

The Nature Conservancy in Georgia

U.S. Environmental Protection Agency

U.S. Fish & Wildlife Service

U.S. Forest Service

U.S. Geological Survey

University of Alabama

University of Central Arkansas

University of Colorado

University of Florida

University of Georgia

University of Jena ,Germany

University of Missouri

University of Tennessee

Virginia Tech

Western University, London, Ontario Canada

Wildland Fire Leadership Council

ROBERT W. WOODRUFF FOUNDATION, INC. - #58-1695425
Form 990-PF, Year 2018, Page 6, Part VIII
COMPENSATION OF TRUSTEES AND OFFICERS

(a) Name and Address	(b)		(c)	(d) Contributions to Benefit Plans				(e)
	Title	Hours Per Week		Comp	403b	457b**	Insurance Benefits*	
TRUSTEES:								
James B. Williams 191 Peachtree Street, Suite 3540 Atlanta, Georgia 30303	Trustee Chairman Emeritus	4	35,000			1,447		
Jenner Wood 191 Peachtree Street, Suite 3540 Atlanta, Georgia 30303	Trustee Chairman	4	25,000			1,447		
Wilton Looney 191 Peachtree Street, Suite 3540 Atlanta, Georgia 30303	Trustee Deceased 6/1/2018	1	20,000			603		
Lawrence Gellerstedt 191 Peachtree Street, Suite 3540 Atlanta, Georgia 30303	Trustee Vice- Chairman	1	25,000			1,447		
Thomas Lawley 191 Peachtree Street, Suite 3540 Atlanta, Georgia 30303	Trustee	1	25,000			1,447		
David P. Stockert 191 Peachtree Street, Suite 3540 Atlanta, Georgia 30303	Trustee Elected 11/7/2018	1	5,833			241		
TOTAL TRUSTEES		12	135,833			6,632		
OFFICERS:								
P. Russell Hardin 191 Peachtree Street, Suite 3540 Atlanta, Georgia 30303	President	17	215,338	8,263	6,673	18,736	17,365	959
Erik S. Johnson 191 Peachtree Street, Suite 3540 Atlanta, Georgia 30303	Secretary Treasurer	17	104,964	8,263	6,673	10,667	809	621
TOTAL OFFICERS		34	320,302	16,526	13,346	29,403	18,174	1,579
TOTAL - TRUSTEES & OFFICERS			456,135	84,082				1,579

* Insurance: Trustees - Directors & Officers Liability only

Officers - Directors & Officers Liability, Medical, Life, Disability, Dental, Workers Compensation and Travel Accident

**457b and 457f not expensed and not included in Part I, Line 15

457f - unvested and contingent upon the employee working to a specified age.

ROBERT W. WOODRUFF FOUNDATION, INC. - #58-1695425
990-PF, Year 2018, Page 8, Part X, Line 1e

As of December 31, 2018, the Foundation owned 55,875,147 shares of The Coca-Cola Company common stock. These represent approximately 1.31% of the total average of 4,268 million shares outstanding which is an insignificant decrease from the January 1, 2018 amount evaluated in the attached opinion letter.

The average monthly fair market value of the Foundation's Coca-Cola stock before applying the blockage discount was \$2,645,076,029. Based upon the attached opinion letter from Shearwater Valuation Associates, the Foundation applied a blockage discount factor of 3.10%.

$$\$2,645,076,029 @ 3.10\% = \$81,997,357$$



May 11, 2018

Mr. Erik S. Johnson
General Counsel and Secretary
The Robert W. Woodruff Foundation, Inc.
191 Peachtree Street, N.E.
Suite 3450
Atlanta, Georgia 30303

Dear Mr. Johnson:

At your request, Shearwater Valuation Associates, LLC ("SVA") was retained to perform a Valuation Engagement, express Conclusions of Value and prepare this detailed report to assist in the determination of blockage discounts for 59,134,600 shares, 30,656,566 shares, and 26,248,560 shares of the common stock ("Subject Property") of The Coca-Cola Company ("TCCC" or "The Company"). This Valuation Engagement was performed for the sole purpose of preparing 990-PF tax returns ("Specified Purpose"). The valuation date is January 1, 2018.

SVA performed a Valuation Engagement and presents this detailed report in conformity with the "Statement on Standards for Valuation Services No. 1" (SSVS) of the American Institute of Certified Public Accountants. SSVS defines a Valuation Engagement as "an engagement to estimate value in which a valuation analyst determines an estimate of the value of a subject interest by performing appropriate procedures, as outlined in the AICPA Statement on Standards for Valuation Services, and is free to apply the valuation approaches and methods he or she deems appropriate in the circumstances. The valuation analyst expresses the results of the valuation engagement as a conclusion of value, which may be either a single amount or a range." SSVS defines a Conclusion of Value as "an estimate of the value of a business, business ownership interest, security, or intangible asset, arrived at by applying the valuation procedures appropriate for a valuation engagement and using professional judgment as to the value or range of values based on those procedures." SSVS addresses a detailed report as follows: "The *detailed report* is structured to provide sufficient information to permit intended users to understand the data, reasoning, and analyses underlying the valuation analyst's conclusion of value."

Mr. Erik S. Johnson
May 11, 2018
Page Two

The standard of value is fair market value, defined in Revenue Ruling 59-60 as “the price at which the property would change hands between a willing buyer and a willing seller when the former is not under any compulsion to buy and the latter is not under any compulsion to sell, both parties having reasonable knowledge of relevant facts.” Revenue Ruling 59-60 also defines the hypothetical willing buyer and seller as follows: “Court decisions frequently state in addition that the hypothetical buyer and seller are assumed to be able, as well as willing, to trade and to be well informed about the property and concerning the market for such property.” Furthermore, fair market value assumes that the price is transacted in cash or cash equivalents. All the relevant factors described in Revenue Ruling 59-60¹ were considered, including:

- The nature and history of the business;
- The general economic outlook;
- The general industry outlook;
- The book value of the stock and the financial condition of the business;
- The earnings and distribution paying capacity of the business;
- The intangible assets of the business;
- Sales of the business interest and the size of the subject property; and
- Stock prices of similar publicly traded companies.

The premise of value is liquidation. The type of liquidation is orderly, which assumes assets are sold over a reasonable period to maximize the proceeds received.

There were no restrictions or limitations in the scope of work or data available for analysis. SVA believes the analyses, opinions, and conclusions of this report conform to the relevant provisions of American Institute of Certified Public Accountants Statement on Standards for Valuation Services No. 1, and the standards of the National Association of Certified Valuators and Analysts for conducting and reporting on business valuations. In performing the Valuation Engagement, SVA performed various economic, industry and market research. The Conclusions of Value are based on the economic, market and business conditions as they existed on January 1, 2018, based on information available at that time. SVA evaluated the most advantageous method of disposing the Subject Property and concluded a gradual open-market liquidation of the shares appears to provide the greatest present value of net proceeds relative to the time and transaction costs (including professional fees) associated with other disposal methods. SVA estimated the amount of time required to gradually liquidate the shares of each block in an orderly fashion in the open market and calculated the present value of future proceeds based on the January 1, 2018 freely-traded share price. SVA then calculated the costs of a hypothetical put option required to protect the January 1, 2018 share price.

¹ Revenue Ruling 59-60 has been modified by Revenue Ruling 65-193 and further amplified by Revenue Rulings 77-287 and 83-120.

Mr. Erik S. Johnson
May 11, 2018
Page Three

The Conclusions of Value are subject to the representations in Section IV. of this report, and to the Statement of Assumptions and Limiting Conditions in Appendix C. The Conclusions of Value and detailed report are to be used only as of January 1, 2018, and are not valid as of any other date. Based on the analyses, procedures, assumptions and limiting conditions described herein, the Conclusions of Value regarding the blockage discounts for the Subject Property are as follows:

The Coca-Cola Company
Summary of Estimated Blockage Discounts
January 1, 2018

Block	Discount Due to Absorption Period	+	Cost of Price Protection	=	Blockage Discount
59,134,600	0.15% Exhibit II.A.		2.95%		3.10%
30,656,566	0.07% Exhibit II.B.		1.88%		1.95%
26,248,560	0.07% Exhibit II.C.		1.80%		1.87%

Thank you for the opportunity to be of service in this matter.

Sincerely,

BY: *Robert A. Ethridge*
Robert A. Ethridge, CFA, CPA, CVA
Shearwater Valuation Associates, LLC
Promenade Two
1230 Peachtree Street, N.E., Suite 1900
Atlanta, Georgia 30309

ROBERT W. WOODRUFF FOUNDATION, INC. - # 58-1695425
Form 990-PF, Year 2018, Page 10, Part XV, Line 2
INFORMATION REGARDING GRANT PROGRAMS

- (a) P. Russell Hardin, President
Robert W. Woodruff Foundation, Inc.
191 Peachtree Street, NE
Suite 3540
Atlanta, Georgia 30303
- Telephone: (404) 522-6755
- (b) Application form not required. Proposals should be made in letter form and include the following information:
- A description of the organization, its purposes, programs, staffing and governing board
 - The organization's latest financial statements including the most recent audit report
 - A description of the proposed project and full justification for its funding
 - An itemized project budget, including other sources of support in hand or anticipated
 - Evidence from the IRS of the organization's tax-exempt status and that the applying organization itself is not a private foundation
- (c) Grant applications are considered semi-annually in April and November for requests received by the first of February and September.
- (d) Grants generally are limited to tax-exempt charities and selected governmental agencies located and operating in Georgia, with primary interest to the metropolitan Atlanta area. Grants to qualified public charities headquartered outside Georgia occasionally are considered when it is demonstrated that the proposed project will have particular impact in Georgia and fits within the program interests of the Foundation. These interests are focused on the following program areas:
- Elementary, secondary and higher education
 - Health care and education
 - Human services, particularly for children and youth
 - Economic development and civic affairs
 - Art and cultural activities
 - Conservation of natural resources and environmental education

Grants for regular operating expenses are avoided.

No grants are made to individuals.

ROBERT W. WOODRUFF FOUNDATION, INC. - #58-1695425

Form 990-PF, Year 2018, Page 11, Part XV, Line 3b

GRANTS APPROVED FOR FUTURE PAYMENT

Recipient	Foundation Status	Purpose of Grant	Amount
<u>COMMUNITY DEVELOPMENT</u>			
Atlanta Police Foundation 191 Peachtree Street, NE, Suite 191 Atlanta, GA 30303	PC	\$35 million campaign to support a comprehensive public safety strategy to reduce crime in Atlanta.	2,000,000
<u>ENVIRONMENT</u>			
Chattahoochee Nature Center P.O. Box 769769 Roswell, GA 30076	PC	\$8.3 million campaign to support first phase of capital improvements prioritized in master plan.	1,750,000
Ichauway, Incorporated 3988 Jones Center Drive Newton, GA 39870	POF	2019 capital and operating needs.	10,500,000
		TOTAL ENVIRONMENT	12,250,000
		TOTAL GRANTS	14,250,000
Foundation status of recipient:	PC	Public charity described in 509(a)(1) or (2)	
	POF	Private operating foundation (section 4942(j)(3)) other than an EOF	

Form **990-T**

Exempt Organization Business Income Tax Return
(and proxy tax under section 6033(e))

OMB No. 1545-0687

2018

Department of the Treasury
Internal Revenue Service

For calendar year 2018 or other tax year beginning _____, and ending _____

▶ Go to www.irs.gov/Form990T for instructions and the latest information.

▶ Do not enter SSN numbers on this form as it may be made public if your organization is a 501(c)(3).

Open to Public Inspection for 501(c)(3) Organizations Only

A <input type="checkbox"/> Check box if address changed B Exempt under section <input checked="" type="checkbox"/> 501(c)(3)) <input type="checkbox"/> 408(e) <input type="checkbox"/> 220(e) <input type="checkbox"/> 408A <input type="checkbox"/> 530(a) <input type="checkbox"/> 529(a)	Print or Type	Name of organization (<input type="checkbox"/> Check box if name changed and see instructions.) Robert W. Woodruff Foundation, Inc.	D Employer identification number (Employees' trust, see instructions.) 58-1695425
		Number, street, and room or suite no. If a P.O. box, see instructions. 191 Peachtree Street, NE, No. 3540	E Unrelated business activity code (See instructions.)
		City or town, state or province, country, and ZIP or foreign postal code Atlanta, GA 30303-1799	

C Book value of all assets at end of year 653,534,918.	F Group exemption number (See instructions.) ▶
G Check organization type ▶ <input checked="" type="checkbox"/> 501(c) corporation <input type="checkbox"/> 501(c) trust <input type="checkbox"/> 401(a) trust <input type="checkbox"/> Other trust	

H Enter the number of the organization's unrelated trades or businesses. ▶ **1** Describe the only (or first) unrelated trade or business here ▶ _____ . If only one, complete Parts I-V. If more than one, describe the first in the blank space at the end of the previous sentence, complete Parts I and II, complete a Schedule M for each additional trade or business, then complete Parts III-V.

I During the tax year, was the corporation a subsidiary in an affiliated group or a parent-subsidiary controlled group? ▶ Yes No
If "Yes," enter the name and identifying number of the parent corporation. ▶ _____

J The books are in care of ▶ **Erik S. Johnson, Secretary** Telephone number ▶ **404-522-6755**

Part I Unrelated Trade or Business Income		(A) Income	(B) Expenses	(C) Net
1 a Gross receipts or sales				
b Less returns and allowances	c Balance ▶	1c		
2 Cost of goods sold (Schedule A, line 7)		2		
3 Gross profit. Subtract line 2 from line 1c		3		
4 a Capital gain net income (attach Schedule D)		4a		
b Net gain (loss) (Form 4797, Part II, line 17) (attach Form 4797)		4b		
c Capital loss deduction for trusts		4c		
5 Income (loss) from a partnership or an S corporation (attach statement)		5		
6 Rent income (Schedule C)		6		
7 Unrelated debt-financed income (Schedule E)		7		
8 Interest, annuities, royalties, and rents from a controlled organization (Schedule F)		8		
9 Investment income of a section 501(c)(7), (9), or (17) organization (Schedule G)		9		
10 Exploited exempt activity income (Schedule I)		10		
11 Advertising income (Schedule J)		11		
12 Other income (See instructions; attach schedule)		12		
13 Total. Combine lines 3 through 12		13	0.	

Part II Deductions Not Taken Elsewhere (See instructions for limitations on deductions.)
(Except for contributions, deductions must be directly connected with the unrelated business income.)

14 Compensation of officers, directors, and trustees (Schedule K)		14		
15 Salaries and wages		15		
16 Repairs and maintenance		16		
17 Bad debts		17		
18 Interest (attach schedule) (see instructions)		18		
19 Taxes and licenses		19		
20 Charitable contributions (See instructions for limitation rules)		20		
21 Depreciation (attach Form 4562)	21			
22 Less depreciation claimed on Schedule A and elsewhere on return	22a		22b	
23 Depletion		23		
24 Contributions to deferred compensation plans		24		
25 Employee benefit programs		25		
26 Excess exempt expenses (Schedule I)		26		
27 Excess readership costs (Schedule J)		27		
28 Other deductions (attach schedule)		28		
29 Total deductions. Add lines 14 through 28		29	0.	
30 Unrelated business taxable income before net operating loss deduction. Subtract line 29 from line 13		30	0.	
31 Deduction for net operating loss arising in tax years beginning on or after January 1, 2018 (see instructions)		31		
32 Unrelated business taxable income. Subtract line 31 from line 30		32	0.	

Part III Total Unrelated Business Taxable Income

Table with 2 columns: Description and Amount. Rows include: 33 Total of unrelated business taxable income... 0.; 34 Amounts paid for disallowed fringes... 20,180.; 35 Deduction for net operating loss...; 36 Total of unrelated business taxable income before specific deduction... 20,180.; 37 Specific deduction... 1,000.; 38 Unrelated business taxable income... 19,180.

Part IV Tax Computation

Table with 2 columns: Description and Amount. Rows include: 39 Organizations Taxable as Corporations... 4,028.; 40 Trusts Taxable at Trust Rates...; 41 Proxy tax...; 42 Alternative minimum tax...; 43 Tax on Noncompliant Facility Income...; 44 Total. Add lines 41, 42, and 43 to line 39 or 40... 4,028.

Part V Tax and Payments

Table with 2 columns: Description and Amount. Rows include: 45a Foreign tax credit...; 45b Other credits...; 45c General business credit...; 45d Credit for prior year minimum tax...; 45e Total credits...; 46 Subtract line 45e from line 44... 4,028.; 47 Other taxes...; 48 Total tax... 4,028.; 49 2018 net 965 tax liability... 0.; 50a Payments...; 50b 2018 estimated tax payments...; 50c Tax deposited with Form 8868...; 50d Foreign organizations...; 50e Backup withholding...; 50f Credit for small employer health insurance...; 50g Other credits, adjustments, and payments...; 51 Total payments...; 52 Estimated tax penalty...; 53 Tax due... 4,028.; 54 Overpayment...; 55 Enter the amount of line 54 you want: Credited to 2019 estimated tax; Refunded.

Part VI Statements Regarding Certain Activities and Other Information (see instructions)

Table with 2 columns: Question and Yes/No. Rows include: 56 At any time during the 2018 calendar year, did the organization have an interest in or a signature or other authority over a financial account...; 57 During the tax year, did the organization receive a distribution from, or was it the grantor of, or transferor to, a foreign trust?; 58 Enter the amount of tax-exempt interest received or accrued during the tax year.

Signature block and preparer information. Includes: Sign Here, Signature of officer (Handwritten: Russell N. C.), Date (5/8/19), Title (President), Preparer's name, Preparer's signature, Date, Check self-employed, PTIN, Firm's name, Firm's EIN, Firm's address, Phone no.

Schedule A - Cost of Goods Sold. Enter method of inventory valuation ► **N/A**

1	Inventory at beginning of year	1		6	Inventory at end of year	6	
2	Purchases	2		7	Cost of goods sold. Subtract line 6 from line 5. Enter here and in Part I, line 2	7	
3	Cost of labor	3		8	Do the rules of section 263A (with respect to property produced or acquired for resale) apply to the organization?		Yes No
4a	Additional section 263A costs (attach schedule)	4a					
b	Other costs (attach schedule)	4b					
5	Total. Add lines 1 through 4b	5					

Schedule C - Rent Income (From Real Property and Personal Property Leased With Real Property)

(see instructions)

1. Description of property

(1)	
(2)	
(3)	
(4)	

2. Rent received or accrued

(a) From personal property (if the percentage of rent for personal property is more than 10% but not more than 50%)	(b) From real and personal property (if the percentage of rent for personal property exceeds 50% or if the rent is based on profit or income)	3(a) Deductions directly connected with the income in columns 2(a) and 2(b) (attach schedule)
(1)		
(2)		
(3)		
(4)		
Total	0.	Total 0.

(c) **Total income.** Add totals of columns 2(a) and 2(b). Enter here and on page 1, Part I, line 6, column (A) 0. (b) **Total deductions.** Enter here and on page 1, Part I, line 6, column (B) 0.

Schedule E - Unrelated Debt-Financed Income (see instructions)

1. Description of debt-financed property	2. Gross income from or allocable to debt-financed property	3. Deductions directly connected with or allocable to debt-financed property		
		(a) Straight line depreciation (attach schedule)	(b) Other deductions (attach schedule)	
(1)				
(2)				
(3)				
(4)				
4. Amount of average acquisition debt on or allocable to debt-financed property (attach schedule)	5. Average adjusted basis of or allocable to debt-financed property (attach schedule)	6. Column 4 divided by column 5	7. Gross income reportable (column 2 x column 6)	8. Allocable deductions (column 6 x total of columns 3(a) and 3(b))
(1)		%		
(2)		%		
(3)		%		
(4)		%		
Totals		Enter here and on page 1, Part I, line 7, column (A). 0.		Enter here and on page 1, Part I, line 7, column (B). 0.
Total dividends-received deductions included in column 8				0.

Schedule F - Interest, Annuities, Royalties, and Rents From Controlled Organizations (see instructions)

1. Name of controlled organization	2. Employer identification number	Exempt Controlled Organizations			
		3. Net unrelated income (loss) (see instructions)	4. Total of specified payments made	5. Part of column 4 that is included in the controlling organization's gross income	6. Deductions directly connected with income in column 5
(1)					
(2)					
(3)					
(4)					

Nonexempt Controlled Organizations

7. Taxable income	8. Net unrelated income (loss) (see instructions)	9. Total of specified payments made	10. Part of column 9 that is included in the controlling organization's gross income	11. Deductions directly connected with income in column 10
(1)				
(2)				
(3)				
(4)				
Totals			Add columns 5 and 10. Enter here and on page 1, Part I, line 8, column (A). 0.	Add columns 6 and 11. Enter here and on page 1, Part I, line 8, column (B). 0.

Schedule G - Investment Income of a Section 501(c)(7), (9), or (17) Organization (see instructions)

1. Description of income	2. Amount of income	3. Deductions directly connected (attach schedule)	4. Set-asides (attach schedule)	5. Total deductions and set-asides (col. 3 plus col. 4)
(1)				
(2)				
(3)				
(4)				
Totals		Enter here and on page 1, Part I, line 9, column (A). 0.		Enter here and on page 1, Part I, line 9, column (B). 0.

Schedule I - Exploited Exempt Activity Income, Other Than Advertising Income (see instructions)

1. Description of exploited activity	2. Gross unrelated business income from trade or business	3. Expenses directly connected with production of unrelated business income	4. Net income (loss) from unrelated trade or business (column 2 minus column 3). If a gain, compute cols. 5 through 7.	5. Gross income from activity that is not unrelated business income	6. Expenses attributable to column 5	7. Excess exempt expenses (column 6 minus column 5, but not more than column 4).
(1)						
(2)						
(3)						
(4)						
Totals		Enter here and on page 1, Part I, line 10, col. (A). 0.	Enter here and on page 1, Part I, line 10, col. (B). 0.			Enter here and on page 1, Part II, line 26. 0.

Schedule J - Advertising Income (see instructions)

Part I Income From Periodicals Reported on a Consolidated Basis

1. Name of periodical	2. Gross advertising income	3. Direct advertising costs	4. Advertising gain or (loss) (col. 2 minus col. 3). If a gain, compute cols. 5 through 7.	5. Circulation income	6. Readership costs	7. Excess readership costs (column 6 minus column 5, but not more than column 4).
(1)						
(2)						
(3)						
(4)						
Totals (carry to Part II, line (5))		0.	0.			0.

Part II **Income From Periodicals Reported on a Separate Basis** (For each periodical listed in Part II, fill in columns 2 through 7 on a line-by-line basis.)

1. Name of periodical	2. Gross advertising income	3. Direct advertising costs	4. Advertising gain or (loss) (col. 2 minus col. 3). If a gain, compute cols. 5 through 7.	5. Circulation income	6. Readership costs	7. Excess readership costs (column 6 minus column 5, but not more than column 4).
(1)						
(2)						
(3)						
(4)						
Totals from Part I	0.	0.				0.
Totals, Part II (lines 1-5)	Enter here and on page 1, Part I, line 11, col. (A). 0.	Enter here and on page 1, Part I, line 11, col. (B). 0.				Enter here and on page 1, Part II, line 27. 0.

Schedule K - Compensation of Officers, Directors, and Trustees (see instructions)

1. Name	2. Title	3. Percent of time devoted to business	4. Compensation attributable to unrelated business
(1)		%	
(2)		%	
(3)		%	
(4)		%	
Total. Enter here and on page 1, Part II, line 14			0.