ua 96697

USDA Forest Service
Northern Research Station
Landscape Change Research Group
Iverson, Peters, Prasad, Matthews

	sq. km	sq. mi	FIA Plots
Area of Region	8,100.0	3,127.4	92

Species Information

The columns below provide breif summaries of the species associated with the region and described in the table on the next pages. Definitions are provided in the Excel file for this region.

Genus	Species		Abundance		Model Reliability	Adaptability	Potential Change in Habitat Suitability	Scenario RCP45	Scenario RCP85	Capability to Cope or Persist	Scenario RCP45	Scenario RCP85	Migration Potential	SHIFT RCP45	SHIFT RCP85
Ash	4														
Hickory	1														
Maple	1		Abundant	2	High	9	8	Increase	13	14	Very Good	6	6	Likely	3	3
Oak	6		Common	11	Medium	21	28	No Change	6	5	Good	3	3	Infill	9	9
Pine	4		Rare	18	Low	13	7	Decrease	10	10	Fair	6	7	Migrate	1	3
Other	15		Absent	11	FIA	2		New	6	6	Poor	9	8		13	15
	31			42		45	43	Unknown	10	10	Very Poor	5	5			
									45	45	FIA Only	2	2			
											Unknown	8	8			
												39	39			

Potential Changes in Climate Variables

Temperature (°F)

	Scenario	2009	2039	2069	2099	
Annual	CCSM45	72.6	74.1	75.5	75.5	
Average	CCSM85	72.6	74.1	76.3	78.5	
	GFDL45	72.6	76.7	76.7	77.5	
	GFDL85	72.6	74.9	77.7	81.0	
	HAD45	72.6	74.1	76.2	77.3	
	HAD85	72.6	74.7	77.0	80.3	
Growing	CCSM45	80.6	81.9	83.1	83.2	
Season	CCSM85	80.6	81.9	84.1	86.5	
May—Sep	GFDL45	80.6	84.8	84.6	85.6	
	GFDL85	80.6	83.0	85.7	89.2	
	HAD45	80.6	82.7	84.4	85.6	
	HAD85	80.6	83.1	85.9	88.9	
Coldest	CCSM45	59.4	61.4	62.3	62.1	
Month	CCSM85	59.4	60.9	61.8	63.2	
Average	GFDL45	59.4	62.0	62.5	63.0	
	GFDL85	59.4	61.8	62.9	64.0	
	HAD45	59.4	59.3	60.5	61.1	
	HAD85	59.4	60.1	60.8	62.7	
Warmest	CCSM45	82.5	83.7	84.5	84.5	
Month	CCSM85	82.5	83.8	85.1	86.6	
Average	GFDL45	82.5	84.8	85.7	86.4	
	GFDL85	82.5	84.9	86.5	88.4	
	HAD45	82.5	84.7	85.4	86.0	
	HAD85	82.5	84.7	86.3	87.6	

Precipitation (in)

	Scenario	2009	2039	2069	2099	
Annual	CCSM45	49.1	52.2	52.2	54.8	
Total	CCSM85	49.1	51.5	51.8	50.3	
	GFDL45	49.1	57.5	59.1	61.2	
	GFDL85	49.1	53.4	62.7	58.0	
	HAD45	49.1	50.1	50.2	51.8	
	HAD85	49.1	46.9	48.6	47.1	
Growing	CCSM45	31.5	34.0	32.8	34.9	
Season	CCSM85	31.5	33.3	33.4	30.9	
May—Sep	GFDL45	31.5	36.2	36.7	36.6	
	GFDL85	31.5	34.5	38.9	35.5	
	HAD45	31.5	32.0	32.0	30.1	
	HAD85	31.5	29.5	27.5	26.6	

NOTE: For the six climate variables, four 30-year periods are used to indicate six potential future trajectories. The period ending in 2009 is based on modeled observations from the PRISM Climate Group and the three future periods were obtained from the NASA NEX-DCP30 dataset. Future climate projections from three models under two emission scenarios show estimates of each climate variable within the region. The three models are CCSM4, GFDL CM3, and HadGEM2-ES and the emission scenarios are the 4.5 and 8.5 RCP. The average value for the region is reported, even though locations within the region may vary substantially based on latitude, elevation, land-use, or other factors.

Cite as: Iverson, L.R.; Prasad, A.M.; Peters, M.P.; Matthews, S.N. 2019. Facilitating Adaptive Forest Management under Climate Change: A Spatially Specific Synthesis of 125 Species for Habitat Changes and Assisted Migration over the Eastern United States. Forests. 10(11): 989. https://doi.org/10.3390/f10110989.

ua 96697

U.S. Census Bureau Urban Areas
Climate Change Atlas Tree Species
Current and Potential Future Habitat, Capability, and Migration

USDA Forest Service
Northern Research Station
Landscape Change Research Group
Iverson, Peters, Prasad, Matthews

Common Name	Scientific Name	Range	MR	%Cell	FIAsum	FIAiv	ChngCl45	ChngCl85	Adap	Abund	Capabil45	Capabil85	SHIFT45	SHIFT85	SSO	N
slash pine	Pinus elliottii	NDH	High	70.4	524.3	32.3	Sm. inc.	Sm. inc.	Medium	Abundant	Very Good	Very Good			1	1
pond cypress	Taxodium ascendens	NSH	Medium	38.3	505.0	33.0	Sm. inc.	Sm. inc.	Medium	Abundant	Very Good	Very Good			1	2
red maple	Acer rubrum	WDH	High	45.7	318.1	16.3	Sm. dec.	Sm. dec.	High	Common	Fair	Fair			1	3
longleaf pine	Pinus palustris	NSH	Medium	29.6	237.3	26.9	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	4
bald cypress	Taxodium distichum	NSH	Medium	18.5	228.4	21.3	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	5
live oak	Quercus virginiana	NDH	High	39.5	184.7	21.6	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	6
loblolly-bay	Gordonia lasianthus	NSH	Medium	23.5	137.8	12.1	No change	No change	Medium	Common	Fair	Fair			1	7
swamp tupelo	Nyssa biflora	NDH	Medium	42	126.0	8.1	Sm. inc.	Sm. inc.	Low	Common	Fair	Fair			1	8
laurel oak	Quercus laurifolia	NDH	Medium	53.1	89.6	7.1	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	9
cabbage palmetto	Sabal palmetto	NDH	Medium	33.3	80.8	9.3	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			0	10
redbay	Persea borbonia	NSL	Low	29.6	70.5	5.1	No change	No change	High	Common	Good	Good			1	11
sweetbay	Magnolia virginiana	NSL	Medium	30.9	68.8	8.2	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	12
water oak	Quercus nigra	WDH	High	21	51.9	9.1	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	13
pumpkin ash	Fraxinus profunda	NSH	FIA	3.7	39.1	10.0	Unknown	Unknown	NA	Rare	FIA Only	FIA Only			0	14
common persimmon	Diospyros virginiana	NSL	Low	7.4	18.9	5.6	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor			1	15
pond pine	Pinus serotina	NSH	Medium	11.1	18.6	13.2	Sm. inc.	Sm. inc.	Low	Rare	Poor	Poor	Infill +	Infill +	2	16
turkey oak	Quercus laevis	NSH	Medium	6.2	16.1	9.7	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	2	17
sweetgum	Liquidambar styraciflua	WDH	High	4.9	14.9	2.9	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	18
sugarberry	Celtis laevigata	NDH	Medium	7.4	13.9	7.2	No change	Sm. inc.	Medium	Rare	Poor	Fair	Infill +	Infill +	2	19
green ash	Fraxinus pennsylvanica	WSH	Low	2.5	13.8	5.3	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	20
American elm	Ulmus americana	WDH	Medium	14.8	11.0	4.5	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	21
sand pine	Pinus clausa	NDH	High	9.9	9.1	14.1	Sm. inc.	Sm. inc.	Low	Rare	Poor	Poor	Infill +	Infill +	2	22
black cherry	Prunus serotina	WDL	Medium	14.8	8.1	8.4	Lg. inc.	Lg. inc.	Low	Rare	Fair	Fair	Infill +	Infill +	1	23
Carolina ash	Fraxinus caroliniana	NSL	FIA	17.3	5.2	2.2	Unknown	Unknown	NA	Rare	FIA Only	FIA Only			0	24
water hickory	Carya aquatica	NSL	Medium	1.2	3.8	3.0	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	25
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	1.2	3.3	2.6	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			0	26
white ash	Fraxinus americana	WDL	Medium	1.2	2.0	1.6	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor			0	27
bluejack oak	Quercus incana	NSL	Low	4.9	1.1	3.8	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	28
black willow	Salix nigra	NSH	Low	4.9	1.1	3.5	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor			0	29
American hornbeam; muscle	Carpinus caroliniana	WSL	Low	1.2	0.9	0.7	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair	Infill +	Infill +	2	30
willow oak	Quercus phellos	NSL	Low	4.9	0.2	0.6	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	31
shortleaf pine	Pinus echinata	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	32
loblolly pine	Pinus taeda	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++	3	33
striped maple	Acer pensylvanicum	NSL	Medium	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	34
pignut hickory	Carya glabra	WDL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +	3	35
shagbark hickory	Carya ovata	WSL	Medium	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	36
American holly	Ilex opaca	NSL	Medium	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown			0	37
cucumbertree	Magnolia acuminata	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	38
southern magnolia	Magnolia grandiflora	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +	3	39
bigleaf magnolia	Magnolia macrophylla	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	40
blackgum	Nyssa sylvatica	WDL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Likely +	Likely +	3	41
cherrybark oak; swamp red o	Quercus pagoda	NSL	Medium	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown			0	42
Shumard oak	Quercus shumardii	NSL	Low	0	0	0	Unknown	Unknown	High	Modeled	Unknown	Unknown			0	43
post oak	Quercus stellata	WDH	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate +	3	44
American mountain-ash	Sorbus americana	NSL	Low	0	0	0	Unknown	Unknown	Low	Absent	Unknown	Unknown			0	45

USDA · FOREST SERVICE · NIACS Northern Institute of Applied Climate Science