ua 40429

USDA Forest Service
Northern Research Station
Landscape Change Research Group
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	sq. km	sq. mi	FIA Plots
Area of Region	10,171	3,927.0	99

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
Ash	2
Hickory	7
Maple	2
Oak	10
Pine	3
Other	27
	51

Abundance	
Abundant	1
Common	6
Rare	44
Absent	10
	61

Model
	Reliability	Adaptability
High	11	17
Medium	27	39
Low	25	7
FIA	0	
	63	63

Potential Change in Habitat Suitability
	Scenario RCP45	Scenario RCP85
Increase	13	13
No Change	19	24
Decrease	19	14
New	5	5
Unknown	7	7
	63	63

Capability to Cope or Persist
	Scenario RCP45	Scenario RCP85
Very Good	2	2
Good	7	7
Fair	12	14
Poor	15	16
Very Poor	13	10
FIA Only	0	0
Unknown	7	7
	56	56

Migration Potential
	SHIFT RCP45	SHIFT RCP85
Likely	2	2
Infill	30	33
Migrate	1	1
	33	36

Potential Changes in Climate Variables

Temperature (°F)

	Scenario	2009	2039	2069	2099	
Annual	CCSM45	69.2	70.8	72.1	72.3	
Average	CCSM85	69.2	71.1	73.3	75.4	
	GFDL45	69.2	73.8	73.2	74.5	
	GFDL85	69.2	71.7	74.7	77.8	
	HAD45	69.2	71.2	73.7	74.6	
	HAD85	69.2	71.5	74.7	77.8	
Growing	CCSM45	80.7	82.0	82.9	83.3	
Season	CCSM85	80.7	82.4	84.4	86.7	
May—Sep	GFDL45	80.7	86.3	85.1	87.1	
	GFDL85	80.7	83.7	86.9	90.7	
	HAD45	80.7	82.9	85.0	85.6	
	HAD85	80.7	83.2	86.5	89.2	
Coldest	CCSM45	51.1	53.4	54.2	54.3	
Month	CCSM85	51.1	53.6	54.7	56.0	
Average	GFDL45	51.1	54.5	54.6	54.7	
	GFDL85	51.1	52.3	53.5	54.0	
	HAD45	51.1	51.9	53.6	54.2	
	HAD85	51.1	53.8	55.1	56.9	
Warmest	CCSM45	84.2	85.1	85.6	85.8	
Month	CCSM85	84.2	85.6	86.3	87.4	
Average	GFDL45	84.2	87.6	88.0	89.2	
	GFDL85	84.2	87.7	89.2	91.5	
	HAD45	84.2	86.6	87.4	87.7	
	HAD85	84.2	86.9	88.6	89.5	

Precipitation (in)

	Scenario	2009	2039	2069	2099	
Annual	CCSM45	51.0	53.0	58.2	55.1	
Total	CCSM85	51.0	53.0	55.3	54.5	
	GFDL45	51.0	52.6	61.1	50.2	
	GFDL85	51.0	51.0	53.3	51.3	
	HAD45	51.0	52.6	49.6	53.6	
	HAD85	51.0	55.0	48.6	51.2	
Growing	CCSM45	23.4	25.9	27.6	25.1	
Season	CCSM85	23.4	24.3	24.8	22.8	
May—Sep	GFDL45	23.4	25.4	32.3	24.5	
	GFDL85	23.4	25.1	26.3	26.1	
	HAD45	23.4	23.3	22.5	25.1	
	HAD85	23.4	24.4	21.9	22.4	

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.

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

Common Name	Scientific Name	Range	MR	%Cell	FIAsum	FIAiv	ChngCl45	ChngCl85	Adap	Abund	Capabil45	Capabil85	SHIFT45	SHIFT85	SSO	N
loblolly pine	Pinus taeda	WDH	High	63.4	1132.1	39.8	No change	No change	Medium	Abundant	Good	Good	Infill ++	Infill ++	1	1
sweetgum	Liquidambar styraciflua	WDH	High	35	298.3	12.5	No change	No change	Medium	Common	Fair	Fair	Infill +	Infill +	1	2
water oak	Quercus nigra	WDH	High	61.6	291.3	11.5	No change	No change	Medium	Common	Fair	Fair	Infill +	Infill +	1	3
sugarberry	Celtis laevigata	NDH	Medium	55.8	211.9	14.9	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor	Infill +	Infill +	0	4
post oak	Quercus stellata	WDH	High	14	64.3	7.3	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good	Infill ++	Infill ++	2	5
southern red oak	Quercus falcata	WDL	Medium	27.2	56.8	5.5	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good	Infill ++	Infill ++	1	6
green ash	Fraxinus pennsylvanica	WSH	Low	44.1	52.3	6.1	Sm. inc.	Sm. inc.	Medium	Common	Good	Good	Infill ++	Infill ++	1	7
willow oak	Quercus phellos	NSL	Low	30	49.1	7.8	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair	Infill +	Infill +	1	8
American hornbeam; muscle	Carpinus caroliniana	WSL	Low	8.8	45.2	6.8	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	9
cedar elm	Ulmus crassifolia	NDH	Medium	30.3	44.8	15.5	Lg. inc.	Lg. inc.	Low	Rare	Fair	Fair	Infill +	Infill +	1	10
winged elm	Ulmus alata	WDL	Medium	14.7	41.1	5.7	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	1	11
cherrybark oak; swamp red o	Quercus pagoda	NSL	Medium	23.2	36.5	4.7	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	12
American elm	Ulmus americana	WDH	Medium	40.3	31.4	4.6	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	13
black willow	Salix nigra	NSH	Low	13.8	26.3	6.3	Sm. inc.	Sm. inc.	Low	Rare	Poor	Poor	Infill +	Infill +	2	14
blackgum	Nyssa sylvatica	WDL	Medium	17.3	24.5	2.2	Sm. inc.	Sm. inc.	High	Rare	Good	Good	Infill ++	Infill ++	2	15
sycamore	Platanus occidentalis	NSL	Low	2.9	21.3	5.9	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	16
laurel oak	Quercus laurifolia	NDH	Medium	2.9	19.6	5.5	No change	No change	Medium	Rare	Poor	Poor	Infill +		2	17
river birch	Betula nigra	NSL	Low	1	17.6	14.7	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	18
redbay	Persea borbonia	NSL	Low	5.9	16.8	5.8	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	2	19
live oak	Quercus virginiana	NDH	High	15.7	14.4	12.1	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	2	20
shortleaf pine	Pinus echinata	WDH	High	5.9	14.3	2.0	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	21
slippery elm	Ulmus rubra	WSL	Low	18.7	14.3	3.4	Sm. dec.	No change	Medium	Rare	Very Poor	Poor		Infill +	2	22
American holly	Ilex opaca	NSL	Medium	11.8	12.0	1.9	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair	Infill +	Infill +	2	23
red maple	Acer rubrum	WDH	High	2.9	11.7	3.3	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	2	24
white ash	Fraxinus americana	WDL	Medium	7.9	11.6	3.7	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor			2	25
cittamwood/gum bumelia	Sideroxylon lanuginosum ssp.	NSL	Low	12.8	9.7	3.7	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	2	26
swamp chestnut oak	Quercus michauxii	NSL	Low	5.9	9.7	2.9	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			2	27
pignut hickory	Carya glabra	WDL	Medium	1	8.3	7.0	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	28
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	2	8.3	3.5	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	2	29
pecan	Carya illinoinensis	NSH	Low	12.8	7.5	4.7	Sm. inc.	Lg. inc.	Low	Rare	Poor	Fair	Infill +	Infill +	2	30
white oak	Quercus alba	WDH	Medium	2.9	6.5	1.8	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	2	31
hackberry	Celtis occidentalis	WDH	Medium	3.9	6.4	21.5	Sm. dec.	No change	High	Rare	Poor	Fair		Infill +	2	32
water elm	Planera aquatica	NSL	Low	1	5.7	4.8	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	33
black hickory	Carya texana	NDL	High	2.9	5.6	1.6	Sm. dec.	No change	Medium	Rare	Very Poor	Poor		Infill +	2	34
black cherry	Prunus serotina	WDL	Medium	9.8	5.3	1.5	Sm. dec.	No change	Low	Rare	Very Poor	Very Poor			2	35
mockernut hickory	Carya alba	WDL	Medium	7.9	4.5	7.5	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	2	36
bald cypress	Taxodium distichum	NSH	Medium	4.9	4.0	2.9	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	37
common persimmon	Diospyros virginiana	NSL	Low	8.8	2.9	1.6	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			0	38
bitternut hickory	Carya cordiformis	WSL	Low	1	2.4	2.0	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			0	39
boxelder	Acer negundo	WSH	Low	4.9	2.2	1.1	No change	No change	High	Rare	Fair	Fair		Infill +	2	40
eastern redcedar	Juniperus virginiana	WDH	Medium	7.1	1.9	2.8	Sm. dec.	No change	Medium	Rare	Very Poor	Poor			0	41
southern magnolia	Magnolia grandiflora	NSL	Low	1	1.4	1.2	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	42
longleaf pine	Pinus palustris	NSH	Medium	1	1.3	1.1	Very Lg. dec.	Very Lg. dec.	Medium	Rare	Lost	Lost			0	43
red mulberry	Morus rubra	NSL	Low	1	1.1	1.0	Very Lg. dec.	Very Lg. dec.	Medium	Rare	Lost	Lost			0	44
sweetbay	Magnolia virginiana	NSL	Medium	3.9	0.9	2.9	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	45
water hickory	Carya aquatica	NSL	Medium	3.9	0.8	2.8	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	46
shagbark hickory	Carya ovata	WSL	Medium	3.9	0.7	2.4	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	47

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Common Name	Scientific Name	Range	MR	%Cell	FIAsum	FIAiv	ChngCl45	ChngCl85	Adap	Abund	Capabil45	Capabil85	SHIFT45	SHIFT85	SSO	N
honeylocust	Gleditsia triacanthos	NSH	Low	2.6	0.7	1.4	No change	No change	High	Rare	Fair	Fair			0	48
pawpaw	Asimina triloba	NSL	Low	1	0.6	0.5	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	49
black oak	Quercus velutina	WDH	High	3.9	0.3	1.0	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	50
water tupelo	Nyssa aquatica	NSH	Medium	3.9	0.2	0.6	Lg. dec.	Lg. dec.	Low	Rare	Very Poor	Very Poor			0	51
slash pine	Pinus elliottii	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +		3	52
serviceberry	Amelanchier spp.	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	53
shellbark hickory	Carya laciniosa	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	54
Osage-orange	Maclura pomifera	NDH	Medium	0	0	0	Unknown	Unknown	High	Modeled	Unknown	Unknown			0	55
bigleaf magnolia	Magnolia macrophylla	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	56
sourwood	Oxydendrum arboreum	NDL	High	0	0	0	Unknown	Unknown	High	Modeled	Unknown	Unknown			0	57
pin cherry	Prunus pensylvanica	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	58
overcup oak	Quercus lyrata	NSL	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat	Likely +	Likely +	3	59
blackjack oak	Quercus marilandica	NSL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate ++	3	60
cabbage palmetto	Sabal palmetto	NDH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	61
sassafras	Sassafras albidum	WSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +	3	62
American basswood	Tilia americana	WSL	Medium	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	63