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Climate Change Atlas Tree Species
Current and Potential Future Habitat, Capability, and Migration

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	sq. km	sq. mi	FIA Plots
Area of Region	6,048.2	2,335.2	102

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	3
Maple	3
Oak	13
Pine	5
Other	28
	54

Abundance	
Abundant	6
Common	17
Rare	31
Absent	29
	83

	Model Reliability	Adaptability
High	19	23
Medium	32	49
Low	31	11
FIA	5	
	87	**83**

Potential Change in Habitat Suitability	Scenario RCP45	Scenario RCP85
Increase	16	22
No Change	11	5
Decrease	22	22
New	24	25
Unknown	14	13
	87	**87**

Capability to Cope or Persist	Scenario RCP45	Scenario RCP85
Very Good	4	7
Good	15	16
Fair	12	8
Poor	7	8
Very Poor	6	5
FIA Only	1	1
Unknown	9	8
	54	**53**

Migration Potential	SHIFT RCP45	SHIFT RCP85
Likely	2	1
Infill	11	13
Migrate	11	13
	24	**27**

Potential Changes in Climate Variables

Temperature (°F)

	Scenario	2009	2039	2069	2099
Annual Average	CCSM45	57.0	58.6	60.6	60.9
	CCSM85	57.0	59.0	61.4	64.2
	GFDL45	57.0	61.2	62.3	63.4
	GFDL85	57.0	60.1	63.5	67.4
	HAD45	57.0	59.3	62.5	63.9
	HAD85	57.0	59.6	63.3	67.5
Growing Season May—Sep	CCSM45	72.4	74.0	75.7	76.1
	CCSM85	72.4	74.2	76.7	80.1
	GFDL45	72.4	77.2	78.4	79.9
	GFDL85	72.4	76.2	79.9	84.2
	HAD45	72.4	75.0	78.0	79.6
	HAD85	72.4	74.9	79.2	83.8
Coldest Month Average	CCSM45	34.0	36.1	37.4	37.8
	CCSM85	34.0	36.6	37.7	39.2
	GFDL45	34.0	37.1	37.6	38.2
	GFDL85	34.0	36.6	37.7	39.1
	HAD45	34.0	35.4	37.4	37.7
	HAD85	34.0	36.0	37.5	39.4
Warmest Month Average	CCSM45	78.1	80.0	80.8	80.9
	CCSM85	78.1	80.1	81.8	83.1
	GFDL45	78.1	81.0	82.5	83.7
	GFDL85	78.1	82.3	84.3	86.8
	HAD45	78.1	81.1	82.9	83.7
	HAD85	78.1	81.2	83.8	86.8

Precipitation (in)

	Scenario	2009	2039	2069	2099
Annual Total	CCSM45	44.0	47.7	50.7	51.1
	CCSM85	44.0	48.9	49.8	56.9
	GFDL45	44.0	49.3	53.2	54.1
	GFDL85	44.0	46.4	53.0	54.1
	HAD45	44.0	46.8	47.9	46.3
	HAD85	44.0	51.1	45.8	48.7
Growing Season May—Sep	CCSM45	20.0	24.0	25.4	26.0
	CCSM85	20.0	24.0	24.1	27.8
	GFDL45	20.0	21.6	24.1	24.7
	GFDL85	20.0	20.3	23.7	24.1
	HAD45	20.0	22.1	20.8	18.9
	HAD85	20.0	22.7	19.0	19.5

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.

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Common Name	Scientific Name	Range	MR	%Cell	FIAsum	FIAiv	ChngCl45	ChngCl85	Adap	Abund	Capabil45	Capabil85	SHIFT45	SHIFT85	SSO	N
yellow-poplar	Liriodendron tulipifera	WDH	High	73.3	1257.0	14.5	Lg. dec.	Lg. dec.	High	Abundant	Good	Good			1	1
sweetgum	Liquidambar styraciflua	WDH	High	88.3	1108.5	10.6	No change	No change	Medium	Abundant	Good	Good			1	2
loblolly pine	Pinus taeda	WDH	High	44.3	901.3	16.4	Lg. inc.	Lg. inc.	Medium	Abundant	Very Good	Very Good			1	3
red maple	Acer rubrum	WDH	High	83.9	878.0	9.0	No change	No change	High	Abundant	Very Good	Very Good			1	4
white oak	Quercus alba	WDH	Medium	62.2	644.4	9.0	Sm. dec.	Sm. dec.	High	Abundant	Good	Good			1	5
American beech	Fagus grandifolia	WDH	High	55	509.0	7.5	Lg. dec.	Lg. dec.	Medium	Abundant	Fair	Fair			0	6
Virginia pine	Pinus virginiana	NDH	High	41.2	443.9	7.5	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	7
blackgum	Nyssa sylvatica	WDL	Medium	65.4	245.4	3.6	No change	Sm. inc.	High	Common	Good	Very Good			1	8
American holly	Ilex opaca	NSL	Medium	57.7	216.1	2.8	No change	No change	Medium	Common	Fair	Fair			1	9
southern red oak	Quercus falcata	WDL	Medium	34.9	215.8	4.0	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	10
mockernut hickory	Carya alba	WDL	Medium	22.5	135.8	4.0	No change	Sm. inc.	High	Common	Good	Very Good			1	11
scarlet oak	Quercus coccinea	WDL	Medium	25.2	131.7	3.9	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	12
black locust	Robinia pseudoacacia	NDH	Low	23	119.3	4.5	Lg. dec.	Very Lg. dec.	Medium	Common	Poor	Lost			0	13
pignut hickory	Carya glabra	WDL	Medium	23.9	97.1	3.4	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	14
sassafras	Sassafras albidum	WSL	Low	26.3	88.3	4.0	Very Lg. dec.	Lg. dec.	Medium	Common	Lost	Poor			0	15
black cherry	Prunus serotina	WDL	Medium	32.6	87.5	2.6	Lg. inc.	Lg. inc.	Low	Common	Good	Good			1	16
chestnut oak	Quercus prinus	NDH	High	16.9	84.2	5.7	Lg. dec.	Lg. dec.	High	Common	Fair	Fair			1	17
cherrybark oak; swamp red o	Quercus pagoda	NSL	Medium	13.7	80.1	3.8	No change	Sm. inc.	Medium	Common	Fair	Good	Infill +	Infill ++	1	18
willow oak	Quercus phellos	NSL	Low	21.8	78.2	4.9	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	19
northern red oak	Quercus rubra	WDH	Medium	28.2	76.8	2.8	Sm. dec.	Lg. dec.	High	Common	Fair	Fair			1	20
American hornbeam; muscle	Carpinus caroliniana	WSL	Low	30.6	68.4	2.0	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good			1	21
swamp chestnut oak	Quercus michauxii	NSL	Low	17.8	62.7	4.0	No change	Sm. inc.	Medium	Common	Fair	Good	Infill +	Infill ++	1	22
sycamore	Platanus occidentalis	NSL	Low	17	60.3	5.5	Sm. inc.	Sm. inc.	Medium	Common	Good	Good	Infill ++	Infill ++	1	23
black oak	Quercus velutina	WDH	High	21.5	48.9	2.1	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			1	24
white ash	Fraxinus americana	WDL	Medium	12.7	43.5	8.1	Lg. dec.	Lg. dec.	Low	Rare	Very Poor	Very Poor			0	25
eastern redcedar	Juniperus virginiana	WDH	Medium	11.6	41.6	1.8	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair	Infill +	Infill +	1	26
bitternut hickory	Carya cordiformis	WSL	Low	4.1	21.3	3.8	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor		Infill +	2	27
flowering dogwood	Cornus florida	WDL	Medium	13.7	21.0	1.3	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good			1	28
ailanthus	Ailanthus altissima	NSL	FIA	8.4	18.1	2.4	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	29
sourwood	Oxydendrum arboreum	NDL	High	3.7	16.3	2.2	No change	No change	High	Rare	Fair	Fair	Infill +		2	30
American elm	Ulmus americana	WDH	Medium	13.9	15.2	2.5	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	31
river birch	Betula nigra	NSL	Low	4.7	14.8	2.9	No change	Sm. inc.	Medium	Rare	Poor	Fair	Infill +	Infill +	1	32
pawpaw	Asimina triloba	NSL	Low	10.9	12.4	1.2	Lg. dec.	Very Lg. dec.	Medium	Rare	Very Poor	Lost			0	33
slippery elm	Ulmus rubra	WSL	Low	5.3	11.9	1.6	Sm. dec.	No change	Medium	Rare	Very Poor	Poor		Infill +	1	34
shortleaf pine	Pinus echinata	WDH	High	4.6	11.0	2.2	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	2	35
white mulberry	Morus alba	NSL	FIA	1.4	10.9	5.7	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	36
black walnut	Juglans nigra	WDH	Low	3.3	7.8	2.4	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			2	37
pin oak	Quercus palustris	NSH	Low	6.5	7.4	1.3	Lg. dec.	Lg. dec.	Low	Rare	Very Poor	Very Poor			0	38
boxelder	Acer negundo	WSH	Low	7.9	6.8	1.0	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor			0	39
swamp tupelo	Nyssa biflora	NDH	Medium	2.7	6.5	1.6	Lg. inc.	Lg. inc.	Low	Rare	Fair	Fair	Infill +	Infill +	2	40
common persimmon	Diospyros virginiana	NSL	Low	9.5	6.2	0.7	No change	Sm. dec.	High	Rare	Fair	Poor		Infill +	1	41
post oak	Quercus stellata	WDH	High	1.1	4.4	1.8	Lg. inc.	Lg. inc.	High	Rare	Good	Good			2	42
serviceberry	Amelanchier spp.	NSL	Low	2.2	3.0	0.6	Very Lg. dec.	Lg. dec.	Medium	Rare	Lost	Very Poor			0	43
pitch pine	Pinus rigida	NSH	High	1.7	2.9	1.7	Very Lg. dec.	Very Lg. dec.	Medium	Rare	Lost	Lost			0	44
bigtooth aspen	Populus grandidentata	NSL	Medium	2.2	2.8	0.4	Very Lg. dec.	Very Lg. dec.	Medium	Rare	Lost	Lost			0	45
Norway maple	Acer platanoides	NSL	FIA	2.8	2.2	2.2	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	46
sweetbay	Magnolia virginiana	NSL	Medium	9.3	2.0	0.5	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	2	47

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Common Name	Scientific Name	Range	MR	%Cell	FIAsum	FIAiv	ChngCl45	ChngCl85	Adap	Abund	Capabil45	Capabil85	SHIFT45	SHIFT85	SSO	N
green ash	Fraxinus pennsylvanica	WSH	Low	4.3	2.0	3.1	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	2	48
swamp white oak	Quercus bicolor	NSL	Low	1.3	1.3	0.7	Very Lg. dec.	Very Lg. dec.	Medium	Rare	Lost	Lost			0	49
eastern white pine	Pinus strobus	WDH	High	1.1	0.9	0.4	Lg. dec.	Lg. dec.	Low	Rare	Very Poor	Very Poor			0	50
American chestnut	Castanea dentata	NSLX	FIA	0.5	0.8	0.2	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	51
paulownia	Paulownia tomentosa	NSL	FIA	1.3	0.7	0.4	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	52
hackberry	Celtis occidentalis	WDH	Medium	4.3	0.6	0.9	No change	Sm. inc.	High	Rare	Fair	Good			2	53
water oak	Quercus nigra	WDH	High	4	0.5	0.8	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	54
ashe juniper	Juniperus ashei	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	55
slash pine	Pinus elliottii	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate ++	3	56
longleaf pine	Pinus palustris	NSH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++	3	57
pond pine	Pinus serotina	NSH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat	Migrate ++		3	58
bald cypress	Taxodium distichum	NSH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	59
striped maple	Acer pensylvanicum	NSL	Medium	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	60
silver maple	Acer saccharinum	NSH	Low	0	0	0	New Habitat	Unknown	High	Absent	New Habitat	Unknown	Likely +		3	61
mountain maple	Acer spicatum	NSL	Low	0	0	0	Unknown	Unknown	High	Absent	Unknown	Unknown			0	62
cittamwood/gum bumelia	Sideroxylon lanuginosum ssp.	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			0	63
water hickory	Carya aquatica	NSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	64
pecan	Carya illinoinensis	NSH	Low	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat		Migrate ++	3	65
shagbark hickory	Carya ovata	WSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	66
black hickory	Carya texana	NDL	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	67
sugarberry	Celtis laevigata	NDH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	68
eastern redbud	Cercis canadensis	NSL	Low	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown			0	69
honeylocust	Gleditsia triacanthos	NSH	Low	0	0	0	Unknown	New Habitat	High	Absent	Unknown	New Habitat			3	70
cucumbertree	Magnolia acuminata	NSL	Low	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown			0	71
red mulberry	Morus rubra	NSL	Low	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown			0	72
water tupelo	Nyssa aquatica	NSH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	73
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Likely +	Likely +	3	74
redbay	Persea borbonia	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	75
water elm	Planera aquatica	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	76
quaking aspen	Populus tremuloides	WDH	High	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	77
laurel oak	Quercus laurifolia	NDH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	78
overcup oak	Quercus lyrata	NSL	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	79
blackjack oak	Quercus marilandica	NSL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate +	3	80
nuttall oak	Quercus texana	NSH	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			0	81
Shumard oak	Quercus shumardii	NSL	Low	0	0	0	Unknown	Unknown	High	Modeled	Unknown	Unknown			0	82
live oak	Quercus virginiana	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	83
bluejack oak	Quercus incana	NSL	Low	0	0	0	Unknown	New Habitat	Medium	Absent	Unknown	New Habitat			3	84
black willow	Salix nigra	NSH	Low	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	85
winged elm	Ulmus alata	WDL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	86
cedar elm	Ulmus crassifolia	NDH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			0	87