S34 E77

	sq. km	sq. mi	FIA Plots
Area of Region	5,874.7	2,268.2	183

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								Potential Change in Habitat Suitability			Capability to Cope or Persist			Migration Potential		
Ash	4									Scenario	Scenario			Scenario	Scenario		SHIFT	SHIFT
Hickory	3			Abundance			Model Reliability	Adaptability		RCP45	RCP85			RCP45	RCP85		RCP45	RCP85
Maple	3	Abundant	6	High	15	19	Increase	19	24	Very Good	9	10	Likely	3	5
Oak	15	Common	15	Medium	32	43	No Change	11	8	Good	12	15	Infill	9	11
Pine	6	Rare	37	Low	25	10	Decrease	25	23	Fair	5	4	Migrate	0	1
Other	27	Absent	15	FIA	3		New	6	7	Poor	11	9		**12**	**17**
	58		**73**		**75**	**72**	Unknown	14	13	Very Poor	13	12			
								75	**75**	FIA Only	2	2			
										Unknown	11	10			
											63	**62**			

Potential Changes in Climate Variables

Temperature (°F)

	Scenario	2009	2039	2069	2099	
Annual	CCSM45	62.4	63.8	65.6	65.7	
Average	CCSM85	62.4	64.1	66.2	68.7	
	GFDL45	62.4	65.1	67.0	67.9	
	GFDL85	62.4	65.0	68.1	71.5	
	HAD45	62.4	64.1	66.6	67.9	
	HAD85	62.4	64.4	67.4	71.1	
Growing	CCSM45	75.5	76.8	78.2	78.5	
Season	CCSM85	75.5	76.8	79.0	81.8	
May—Sep	GFDL45	75.5	78.3	80.4	81.6	
	GFDL85	75.5	78.4	81.7	85.4	
	HAD45	75.5	77.7	79.8	81.2	
	HAD85	75.5	77.7	81.3	85.0	
Coldest	CCSM45	42.6	45.0	45.8	45.8	
Month	CCSM85	42.6	45.0	45.8	47.0	
Average	GFDL45	42.6	45.8	46.1	46.8	
	GFDL85	42.6	44.5	45.5	46.4	
	HAD45	42.6	42.9	44.6	45.0	
	HAD85	42.6	43.4	44.4	46.0	
Warmest	CCSM45	80.1	81.5	82.2	82.2	
Month	CCSM85	80.1	81.7	83.0	84.2	
Average	GFDL45	80.1	82.5	83.4	84.3	
	GFDL85	80.1	82.9	84.6	86.7	
	HAD45	80.1	82.5	83.8	84.3	
	HAD85	80.1	82.9	85.0	87.0	

Precipitation (in)

	Scenario	2009	2039	2069	2099	
Annual	CCSM45	54.3	59.7	60.5	61.1	
Total	CCSM85	54.3	60.3	61.0	66.6	
	GFDL45	54.3	58.5	61.3	64.7	
	GFDL85	54.3	57.6	63.6	62.6	
	HAD45	54.3	56.1	57.2	56.1	
	HAD85	54.3	59.2	55.2	53.2	
Growing	CCSM45	28.6	34.2	34.4	34.4	
Season	CCSM85	28.6	32.3	33.7	36.3	
May—Sep	GFDL45	28.6	31.3	33.3	35.5	
	GFDL85	28.6	30.4	35.5	35.5	
	HAD45	28.6	28.7	29.0	27.4	
	HAD85	28.6	30.6	26.9	23.6	

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.

One x One Degree
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	94.3	3901.4	31.1	No change	No change	Medium	Abundant	Good	Good			1	1
pond pine	Pinus serotina	NSH	Medium	53	1323.8	20.1	Sm. dec.	Sm. dec.	Low	Abundant	Fair	Fair			0	2
red maple	Acer rubrum	WDH	High	82.4	930.8	8.3	No change	No change	High	Abundant	Very Good	Very Good			1	3
sweetgum	Liquidambar styraciflua	WDH	High	76.1	702.5	6.3	Sm. inc.	Sm. inc.	Medium	Abundant	Very Good	Very Good			1	4
longleaf pine	Pinus palustris	NSH	Medium	39.4	660.0	12.3	Sm. inc.	Sm. inc.	Medium	Abundant	Very Good	Very Good			1	5
swamp tupelo	Nyssa biflora	NDH	Medium	58.9	525.6	6.1	Sm. inc.	Sm. inc.	Low	Abundant	Good	Good			1	6
loblolly-bay	Gordonia lasianthus	NSH	Medium	35.5	407.4	8.4	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	7
water oak	Quercus nigra	WDH	High	61.6	315.4	4.0	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	8
redbay	Persea borbonia	NSL	Low	65.4	266.8	2.9	No change	No change	High	Common	Good	Good			1	9
yellow-poplar	Liriodendron tulipifera	WDH	High	38.7	216.8	3.8	Sm. dec.	Sm. dec.	High	Common	Fair	Fair			1	10
sweetbay	Magnolia virginiana	NSL	Medium	59.8	172.9	2.4	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	11
pumpkin ash	Fraxinus profunda	NSH	FIA	7.4	127.1	12.5	Unknown	Unknown	NA	Common	FIA Only	FIA Only			0	12
American holly	Ilex opaca	NSL	Medium	43.3	125.1	2.1	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	13
green ash	Fraxinus pennsylvanica	WSH	Low	23.9	105.0	4.2	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good			1	14
pond cypress	Taxodium ascendens	NSH	Medium	8	99.9	6.4	Sm. inc.	Sm. inc.	Medium	Common	Good	Good	Infill ++	Infill ++	1	15
turkey oak	Quercus laevis	NSH	Medium	11.2	85.7	4.9	Sm. inc.	No change	High	Common	Very Good	Good	Infill ++	Infill ++	1	16
southern red oak	Quercus falcata	WDL	Medium	13.5	76.3	2.8	Sm. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	17
American hornbeam; muscle	Carpinus caroliniana	WSL	Low	20.9	72.0	2.7	No change	Sm. inc.	Medium	Common	Fair	Good			1	18
white oak	Quercus alba	WDH	Medium	13.8	61.8	1.5	No change	Sm. inc.	High	Common	Good	Very Good	Infill ++	Infill ++	1	19
laurel oak	Quercus laurifolia	NDH	Medium	23.5	59.2	2.0	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	20
slash pine	Pinus elliottii	NDH	High	1.9	53.5	8.1	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			2	21
swamp chestnut oak	Quercus michauxii	NSL	Low	13.4	49.5	2.7	Lg. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	22
sourwood	Oxydendrum arboreum	NDL	High	15	48.4	1.8	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor			1	23
mockernut hickory	Carya alba	WDL	Medium	14.7	46.0	2.3	Sm. inc.	Sm. inc.	High	Rare	Good	Good			1	24
Atlantic white-cedar	Chamaecyparis thyoides	NSH	Low	4.7	41.9	7.1	Sm. dec.	No change	Low	Rare	Very Poor	Very Poor			0	25
flowering dogwood	Cornus florida	WDL	Medium	13.4	36.1	1.6	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	26
bald cypress	Taxodium distichum	NSH	Medium	16	35.1	2.2	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	27
eastern redcedar	Juniperus virginiana	WDH	Medium	5.2	34.0	4.9	Sm. inc.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	28
blackgum	Nyssa sylvatica	WDL	Medium	8.9	26.6	1.6	Lg. inc.	Lg. inc.	High	Rare	Good	Good			1	29
American elm	Ulmus americana	WDH	Medium	8.9	25.4	2.0	No change	Sm. inc.	Medium	Rare	Poor	Fair	Infill +	Infill +	1	30
slippery elm	Ulmus rubra	WSL	Low	12.3	24.1	1.6	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	31
post oak	Quercus stellata	WDH	High	15.1	22.7	1.2	Lg. dec.	Lg. inc.	High	Rare	Poor	Good	Infill +	Infill ++	2	32
black cherry	Prunus serotina	WDL	Medium	20.8	19.1	1.0	Lg. inc.	Lg. inc.	Low	Rare	Fair	Fair			1	33
Virginia pine	Pinus virginiana	NDH	High	5.6	18.0	2.3	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	34
Carolina ash	Fraxinus caroliniana	NSL	FIA	3	13.3	3.2	Unknown	Unknown	NA	Rare	FIA Only	FIA Only			0	35
sassafras	Sassafras albidum	WSL	Low	2.8	13.3	2.5	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			2	36
willow oak	Quercus phellos	NSL	Low	7.6	9.4	1.0	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good	Infill +	Infill ++	2	37
white ash	Fraxinus americana	WDL	Medium	1.7	9.4	5.5	Lg. dec.	Lg. dec.	Low	Rare	Very Poor	Very Poor			0	38
live oak	Quercus virginiana	NDH	High	6	8.2	0.9	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	39
cherrybark oak; swamp red o	Quercus pagoda	NSL	Medium	8.7	7.9	1.3	No change	No change	Medium	Rare	Poor	Poor		Infill +	2	40
boxelder	Acer negundo	WSH	Low	2.8	7.8	1.7	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor			0	41
water hickory	Carya aquatica	NSL	Medium	1.7	6.6	3.9	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	42
blackjack oak	Quercus marilandica	NSL	Medium	3.5	4.6	0.8	Very Lg. dec.	Very Lg. dec.	High	Rare	Lost	Lost			2	43
eastern white pine	Pinus strobus	WDH	High	1.7	4.5	2.6	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor			0	44
overcup oak	Quercus lyrata	NSL	Medium	4.8	4.4	0.8	No change	Sm. inc.	Low	Rare	Very Poor	Poor		Infill +	2	45
black oak	Quercus velutina	WDH	High	1.1	4.1	1.5	Very Lg. dec.	Very Lg. dec.	Medium	Rare	Lost	Lost			0	46
pignut hickory	Carya glabra	WDL	Medium	3.4	3.5	1.0	Very Lg. dec.	Very Lg. dec.	Medium	Rare	Lost	Lost			0	47

Sep 2022

S34 E77

One x One Degree
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
river birch	Betula nigra	NSL	Low	1.7	3.4	2.0	No change	Lg. inc.	Medium	Rare	Poor	Good		Infill ++	2	48
ailanthus	Ailanthus altissima	NSL	FIA	1.1	3.2	1.2	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	49
Shumard oak	Quercus shumardii	NSL	Low	1.7	1.8	1.0	Sm. dec.	Lg. dec.	High	Rare	Poor	Poor			0	50
florida maple	Acer barbatum	NSL	Low	1	1.7	0.6	Very Lg. dec.	Very Lg. dec.	High	Rare	Lost	Lost			0	51
American beech	Fagus grandifolia	WDH	High	1.5	1.6	0.8	No change	No change	Medium	Rare	Poor	Poor	Infill +		2	52
common persimmon	Diospyros virginiana	NSL	Low	5.5	1.6	0.5	Very Lg. dec.	Very Lg. dec.	High	Rare	Lost	Lost			0	53
southern magnolia	Magnolia grandiflora	NSL	Low	1.7	1.2	0.7	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	54
red mulberry	Morus rubra	NSL	Low	1.3	0.8	0.4	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	55
scarlet oak	Quercus coccinea	WDL	Medium	1.7	0.7	0.4	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	56
cucumbertree	Magnolia acuminata	NSL	Low	1.7	0.7	0.4	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	57
Osage-orange	Maclura pomifera	NDH	Medium	3.8	0.4	0.5	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor			0	58
sand pine	Pinus clausa	NDH	High	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			3	59
serviceberry	Amelanchier spp.	NSL	Low	0	0	0	New Habitat	Unknown	Medium	Absent	New Habitat	Unknown			3	60
pawpaw	Asimina triloba	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	61
sugarberry	Celtis laevigata	NDH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate ++	3	62
silverbell	Halesia spp.	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	63
black walnut	Juglans nigra	WDH	Low	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown			0	64
bigleaf magnolia	Magnolia macrophylla	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	65
water tupelo	Nyssa aquatica	NSH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat	Likely +	Likely +	3	66
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	0	0	0	Unknown	New Habitat	High	Absent	Unknown	New Habitat		Likely +	3	67
sycamore	Platanus occidentalis	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +	3	68
swamp white oak	Quercus bicolor	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	69
chinkapin oak	Quercus muehlenbergii	NSL	Medium	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	70
chestnut oak	Quercus prinus	NDH	High	0	0	0	Unknown	Unknown	High	Absent	Unknown	Unknown			0	71
northern red oak	Quercus rubra	WDH	Medium	0	0	0	Unknown	Unknown	High	Modeled	Unknown	Unknown			0	72
black willow	Salix nigra	NSH	Low	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat	Likely +	Likely +	3	73
American basswood	Tilia americana	WSL	Medium	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	74
winged elm	Ulmus alata	WDL	Medium	0	0	0	Unknown	New Habitat	Medium	Absent	Unknown	New Habitat		Likely +	3	75

Sep 2022