

	sq. km	sq. mi	FIA Plots
Area of Region	106,533	41,133	212

Species Information

The columns below provide brief 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		Potential Change in Habitat Suitability		Capability to Cope or Persist		Migration Potential		
				Reliability	Adaptability	Scenario RCP45	Scenario RCP85	Scenario RCP45	Scenario RCP85	SHIFT RCP45	SHIFT RCP85	
Ash	2			High	12	17	Increase	5	7	Very Good	0	0
Hickory	2			Medium	23	37	No Change	16	13	Good	2	1
Maple	2	Abundant	0	Low	25	9	Decrease	9	10	Fair	10	12
Oak	5	Common	2	FIA	6		New	18	18	Poor	10	8
Pine	2	Rare	34				Unknown	18	18	Very Poor	8	9
Other	23	Absent	27					66	66	FIA Only	4	4
	36		63		66	63				Unknown	12	12
											46	46

Potential Changes in Climate Variables

Temperature (°F)

	Scenario	2009	2039	2069	2099	
Annual Average	CCSM45	49.9	51.7	53.7	54.6	
	CCSM85	49.9	52.2	54.6	57.7	
	GFDL45	49.9	55.9	54.5	55.9	
	GFDL85	49.9	52.6	55.7	60.1	
	HAD45	49.9	52.6	56.0	57.1	
	HAD85	49.9	53.1	58.0	61.6	
Growing Season (May—Sep)	CCSM45	68.7	70.8	73.2	74.0	
	CCSM85	68.7	71.5	74.0	77.7	
	GFDL45	68.7	76.7	74.6	76.7	
	GFDL85	68.7	72.3	75.8	81.3	
	HAD45	68.7	70.9	73.7	74.9	
	HAD85	68.7	71.6	76.3	79.6	
Coldest Month Average	CCSM45	21.3	23.5	24.6	25.7	
	CCSM85	21.3	23.7	24.7	26.6	
	GFDL45	21.3	24.6	25.0	25.3	
	GFDL85	21.3	23.7	25.2	26.7	
	HAD45	21.3	23.8	27.1	26.6	
	HAD85	21.3	26.7	30.3	32.3	
Warmest Month Average	CCSM45	75.5	77.9	79.8	80.5	
	CCSM85	75.5	79.4	81.0	83.5	
	GFDL45	75.5	79.1	80.5	81.9	
	GFDL85	75.5	79.9	81.4	85.1	
	HAD45	75.5	77.7	79.6	80.2	
	HAD85	75.5	79.3	81.8	83.9	

Precipitation (in)

	Scenario	2009	2039	2069	2099	
Annual Total	CCSM45	27.4	28.7	27.9	27.4	
	CCSM85	27.4	28.1	28.5	28.8	
	GFDL45	27.4	31.0	33.6	32.4	
	GFDL85	27.4	31.1	34.3	33.0	
	HAD45	27.4	31.2	30.3	31.1	
	HAD85	27.4	29.3	29.3	31.7	
Growing Season (May—Sep)	CCSM45	17.6	17.7	16.5	16.4	
	CCSM85	17.6	16.8	16.7	16.5	
	GFDL45	17.6	20.2	21.5	19.8	
	GFDL85	17.6	20.0	21.6	20.1	
	HAD45	17.6	19.0	18.6	18.8	
	HAD85	17.6	18.0	16.9	16.4	

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>.

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
eastern redcedar	Juniperus virginiana	WDH	Medium	25	67.6	27.9	No change	No change	Medium	Common	Fair	Fair	Infill +	Infill +	2	1
bur oak	Quercus macrocarpa	NDH	Medium	16.2	52.7	27.3	Sm. dec.	Sm. dec.	High	Common	Fair	Fair	Infill +	Infill +	2	2
green ash	Fraxinus pennsylvanica	WSH	Low	24	44.9	18.6	No change	No change	Medium	Rare	Poor	Very Poor	Infill +		2	3
red mulberry	Morus rubra	NSL	Low	24	37.7	17.5	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			2	4
American elm	Ulmus americana	WDH	Medium	26.1	36.9	13.2	No change	Sm. inc.	Medium	Rare	Poor	Fair	Infill +	Infill +	2	5
eastern cottonwood	Populus deltoides	NSH	Low	14	35.1	26.5	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair	Infill +	Infill +	2	6
hackberry	Celtis occidentalis	WDH	Medium	19.9	33.9	12.0	Sm. inc.	No change	High	Rare	Good	Fair		Infill +	2	7
Siberian elm	Ulmus pumila	NDH	FIA	8.2	17.1	21.2	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	8
American basswood	Tilia americana	WSL	Medium	2.3	11.3	12.1	Sm. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			2	9
honeylocust	Gleditsia triacanthos	NSH	Low	8.4	10.5	15.0	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	2	10
boxelder	Acer negundo	WSH	Low	6.9	8.2	12.5	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	2	11
black willow	Salix nigra	NSH	Low	3.7	7.8	33.3	Sm. dec.	No change	Low	Rare	Very Poor	Very Poor			2	12
black walnut	Juglans nigra	WDH	Low	6	7.6	7.0	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	13
black locust	Robinia pseudoacacia	NDH	Low	1.2	4.4	41.8	No change	Sm. inc.	Medium	Rare	Poor	Fair	Infill +	Infill +	2	14
slippery elm	Ulmus rubra	WSL	Low	6.9	4.3	4.7	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	15
bitternut hickory	Carya cordiformis	WSL	Low	3.2	4.0	4.6	No change	Sm. dec.	High	Rare	Fair	Poor	Infill +	Infill +	2	16
peachleaf willow	Salix amygdaloides	NSLX	FIA	2.4	3.7	21.6	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	17
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	3.2	3.0	3.9	No change	Sm. dec.	High	Rare	Fair	Poor	Infill +	Infill +	2	18
Osage-orange	Maclura pomifera	NDH	Medium	3.2	2.4	8.7	Sm. inc.	Sm. inc.	High	Rare	Good	Good			2	19
silver maple	Acer saccharinum	NSH	Low	2.6	2.3	13.5	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	2	20
white mulberry	Morus alba	NSL	FIA	0.4	1.8	78.2	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	21
northern red oak	Quercus rubra	WDH	Medium	1.2	1.3	4.3	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	2	22
jack pine	Pinus banksiana	NSH	Medium	0.8	1.2	25.1	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			0	23
chinkapin oak	Quercus muehlenbergii	NSL	Medium	1.3	0.9	9.4	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	24
sycamore	Platanus occidentalis	NSL	Low	0.4	0.8	8.6	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	25
white ash	Fraxinus americana	WDL	Medium	0.3	0.8	4.7	No change	No change	Low	Rare	Very Poor	Very Poor			2	26
black oak	Quercus velutina	WDH	High	0.9	0.5	5.9	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	27
Kentucky coffeetree	Gymnocladus dioicus	NSLX	FIA	1.1	0.4	3.9	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	28
northern catalpa	Catalpa speciosa	NSHX	FIA	0.8	0.4	8.7	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	29
eastern redbud	Cercis canadensis	NSL	Low	0.2	0.2	4.6	No change	Sm. inc.	Medium	Rare	Poor	Fair			0	30
black cherry	Prunus serotina	WDL	Medium	0.6	0.1	2.5	Sm. inc.	Sm. inc.	Low	Rare	Poor	Poor	Infill +	Infill +	2	31
pawpaw	Asimina triloba	NSL	Low	0.3	0.1	3.4	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	32
red pine	Pinus resinosa	NSH	Medium	0.2	0.1	2.4	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor			0	33
wild plum	Prunus americana	NSLX	FIA	0.1	0.1	0.6	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	34
overcup oak	Quercus lyrata	NSL	Medium	0.4	0.1	3.3	Sm. dec.	No change	Low	Rare	Very Poor	Very Poor			0	35
shagbark hickory	Carya ovata	WSL	Medium	0.2	0.1	1.7	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair		Infill +	2	36
ashe juniper	Juniperus ashei	NDH	High	0	0	0	New Habitat	New Habitat	NA	Absent	New Habitat	New Habitat			0	37
shortleaf pine	Pinus echinata	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	38
longleaf pine	Pinus palustris	NSH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	39
eastern white pine	Pinus strobus	WDH	High	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			3	40
Virginia pine	Pinus virginiana	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	41
striped maple	Acer pensylvanicum	NSL	Medium	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	42
red maple	Acer rubrum	WDH	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			3	43
sugar maple	Acer saccharum	WDH	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate +	3	44
mountain maple	Acer spicatum	NSL	Low	0	0	0	Unknown	Unknown	High	Absent	Unknown	Unknown			0	45
serviceberry	Amelanchier spp.	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	46
yellow birch	Betula alleghaniensis	NDL	High	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown			0	47

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
cittamwood/gum bumelia	Sideroxylon lanuginosum ssp.	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate +	3	48
American hornbeam; musclev	Carpinus caroliniana	WSL	Low	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown				0 49
pecan	Carya illinoensis	NSH	Low	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	50
black hickory	Carya texana	NDL	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	51
sugarberry	Celtis laevigata	NDH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	52
flowering dogwood	Cornus florida	WDL	Medium	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown				0 53
sweetgum	Liquidambar styraciflua	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat				3 54
cucumbertree	Magnolia acuminata	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown				0 55
southern magnolia	Magnolia grandiflora	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown				0 56
bigleaf magnolia	Magnolia macrophylla	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown				0 57
balsam poplar	Populus balsamifera	NSH	Medium	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown				0 58
pin cherry	Prunus pensylvanica	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown				0 59
white oak	Quercus alba	WDH	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate +	3	60
scarlet oak	Quercus coccinea	WDL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat				3 61
blackjack oak	Quercus marilandica	NSL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate +	3	62
post oak	Quercus stellata	WDH	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	63
live oak	Quercus virginiana	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat				0 64
American mountain-ash	Sorbus americana	NSL	Low	0	0	0	Unknown	Unknown	Low	Absent	Unknown	Unknown				0 65
cedar elm	Ulmus crassifolia	NDH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat				2 66