

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

sq. km sq. mi FIA Plots
 Area of Region 9,549.4 3,687.0 290

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	Scenario	Scenario	Scenario	SHIFT	SHIFT				
				High	24	RCP45	RCP85	RCP45	RCP85	RCP45	RCP85				
Ash	3			Medium	26	Increase	23	26	9	10	Likely	1	1		
Hickory	5			Low	30	No Change	13	12	12	14	Infill	15	17		
Maple	5	Abundant	2	FIA	7	Decrease	21	19	Fair	13	14	Migrate	7	11	
Oak	11	Common	27			New	13	14	Poor	12	9				
Pine	5	Rare	35			Unknown	9	8	Very Poor	9	7				
Other	35	Absent	15							FIA Only	3	3			
64		79		79		79		60		58		23		29	

Potential Changes in Climate Variables

Temperature (°F)

Scenario	2009	2039	2069	2099		
Annual	CCSM45	52.5	54.2	56.4	56.8	
Average	CCSM85	52.5	54.9	57.3	60.3	
	GFDL45	52.5	56.4	57.9	58.8	
	GFDL85	52.5	55.5	58.9	62.9	
	HAD45	52.5	55.2	58.7	60.3	
	HAD85	52.5	55.7	60.3	64.8	
Growing Season	CCSM45	69.5	71.3	73.2	74.0	
	CCSM85	69.5	72.0	74.5	78.2	
May—Sep	GFDL45	69.5	74.1	75.8	77.3	
	GFDL85	69.5	73.2	77.2	82.0	
	HAD45	69.5	72.7	76.0	78.0	
	HAD85	69.5	73.1	79.1	83.7	
Coldest Month	CCSM45	25.3	26.8	28.4	28.9	
	CCSM85	25.3	28.2	29.2	30.9	
Average	GFDL45	25.3	29.5	29.9	30.5	
	GFDL85	25.3	28.6	29.7	30.5	
	HAD45	25.3	26.8	29.5	29.5	
	HAD85	25.3	28.2	30.6	32.7	
Warmest Month	CCSM45	75.1	76.8	78.1	78.8	
	CCSM85	75.1	78.0	79.7	81.5	
Average	GFDL45	75.1	78.3	79.9	81.0	
	GFDL85	75.1	79.0	81.3	84.1	
	HAD45	75.1	78.8	81.4	82.3	
	HAD85	75.1	80.4	84.4	87.2	

Precipitation (in)

Scenario	2009	2039	2069	2099		
Annual	CCSM45	44.1	43.5	46.5	45.3	
Total	CCSM85	44.1	45.2	45.6	47.7	
	GFDL45	44.1	49.2	52.3	54.0	
	GFDL85	44.1	47.7	53.3	55.6	
	HAD45	44.1	45.9	47.8	47.2	
	HAD85	44.1	46.5	44.1	47.7	
Growing Season	CCSM45	20.9	20.5	21.2	20.0	
	CCSM85	20.9	19.6	19.6	19.6	
May—Sep	GFDL45	20.9	23.0	22.8	23.4	
	GFDL85	20.9	22.0	22.9	23.0	
	HAD45	20.9	20.9	19.3	19.8	
	HAD85	20.9	20.6	17.0	17.1	

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
sugar maple	Acer saccharum	WDH	High	79	1074.4	12.5	Sm. dec.	Sm. dec.	High	Abundant	Good	Good			1	1
yellow-poplar	Liriodendron tulipifera	WDH	High	70.5	722.4	10.9	Lg. dec.	Lg. dec.	High	Abundant	Good	Good			1	2
red maple	Acer rubrum	WDH	High	62.3	433.6	7.0	Sm. dec.	Sm. dec.	High	Common	Fair	Fair			1	3
sassafras	Sassafras albidum	WSL	Low	56	413.6	6.2	Sm. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	4
black oak	Quercus velutina	WDH	High	36.8	413.3	9.1	No change	No change	Medium	Common	Fair	Fair			1	5
American beech	Fagus grandifolia	WDH	High	55.3	373.4	5.1	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	6
white oak	Quercus alba	WDH	Medium	53.3	348.8	5.8	Sm. inc.	No change	High	Common	Very Good	Good			1	7
white ash	Fraxinus americana	WDL	Medium	71.6	282.5	4.5	Sm. inc.	Sm. inc.	Low	Common	Fair	Fair			1	8
black cherry	Prunus serotina	WDL	Medium	74.5	248.7	4.2	Sm. inc.	No change	Low	Common	Fair	Poor			1	9
shagbark hickory	Carya ovata	WSL	Medium	54	225.3	3.5	No change	Sm. dec.	Medium	Common	Fair	Poor			1	10
sycamore	Platanus occidentalis	NSL	Low	48.1	214.0	4.9	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	11
black walnut	Juglans nigra	WDH	Low	50.2	197.7	4.2	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	12
American elm	Ulmus americana	WDH	Medium	69	190.9	2.7	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	13
northern red oak	Quercus rubra	WDH	Medium	50.4	189.9	4.1	No change	No change	High	Common	Good	Good			1	14
pignut hickory	Carya glabra	WDL	Medium	36.9	176.6	3.5	No change	No change	Medium	Common	Fair	Fair			1	15
bitternut hickory	Carya cordiformis	WSL	Low	54	150.6	3.7	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	16
chestnut oak	Quercus prinus	NDH	High	10.6	133.0	8.8	Sm. dec.	Sm. dec.	High	Common	Fair	Fair	Infill +	Infill +	2	17
honeylocust	Gleditsia triacanthos	NSH	Low	13.7	123.4	12.5	Lg. dec.	Sm. dec.	High	Common	Fair	Fair	Infill +	Infill +	1	18
silver maple	Acer saccharinum	NSH	Low	10.4	114.9	10.4	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good	Infill ++	Infill ++	1	19
black locust	Robinia pseudoacacia	NDH	Low	21.8	106.3	6.0	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good			1	20
hackberry	Celtis occidentalis	WDH	Medium	35.7	92.1	3.6	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	21
green ash	Fraxinus pennsylvanica	WSL	Low	30.4	92.0	4.7	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	22
slippery elm	Ulmus rubra	WSL	Low	42	87.3	2.1	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good			1	23
boxelder	Acer negundo	WSH	Low	21.4	85.0	4.5	Sm. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	24
Virginia pine	Pinus virginiana	NDH	High	6.6	81.5	5.8	No change	No change	Medium	Common	Fair	Fair	Infill +	Infill +	1	25
blackgum	Nyssa sylvatica	WDL	Medium	33.7	75.2	1.8	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	26
chinkapin oak	Quercus muehlenbergii	NSL	Medium	29.6	62.3	2.1	No change	No change	Medium	Common	Fair	Fair			1	27
eastern redcedar	Juniperus virginiana	WDH	Medium	21.4	59.0	2.9	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	28
black willow	Salix nigra	NSH	Low	9.7	56.9	10.4	Sm. dec.	No change	Low	Common	Poor	Poor		Infill +	0	29
American basswood	Tilia americana	WSL	Medium	26.8	47.4	2.9	Lg. dec.	Very Lg. dec.	Medium	Rare	Very Poor	Lost			0	30
American hornbeam; muscle	Carpinus caroliniana	WSL	Low	42.7	40.5	1.2	No change	Sm. inc.	Medium	Rare	Poor	Fair			1	31
pin oak	Quercus palustris	NSH	Low	18.4	40.3	5.0	Sm. inc.	Lg. inc.	Low	Rare	Poor	Fair	Infill +	Infill +	1	32
flowering dogwood	Cornus florida	WDL	Medium	30.1	40.0	1.2	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair			1	33
eastern white pine	Pinus strobus	WDH	High	15.5	38.4	5.2	Very Lg. dec.	Very Lg. dec.	Low	Rare	Lost	Lost			0	34
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	34.1	35.8	1.2	Sm. inc.	Lg. inc.	High	Rare	Good	Good			1	35
bigtooth aspen	Populus grandidentata	NSL	Medium	20.9	34.7	1.6	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	36
scarlet oak	Quercus coccinea	WDL	Medium	9.6	34.2	2.5	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	37
sweetgum	Liquidambar styraciflua	WDH	High	6.4	31.1	3.2	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	38
eastern cottonwood	Populus deltoides	NSH	Low	11.5	30.3	4.6	No change	Lg. inc.	Medium	Rare	Poor	Good	Infill +	Infill ++	1	39
Osage-orange	Maclura pomifera	NDH	Medium	11.9	29.3	8.4	Sm. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	1	40
red pine	Pinus resinosa	NSH	Medium	2.1	23.6	11.3	Lg. dec.	Lg. dec.	Low	Rare	Very Poor	Very Poor			0	41
shortleaf pine	Pinus echinata	WDH	High	3.3	22.3	4.0	No change	Sm. inc.	Medium	Rare	Poor	Fair	Infill +	Infill +	2	42
eastern redbud	Cercis canadensis	NSL	Low	21.5	20.4	1.4	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good			1	43
red mulberry	Morus rubra	NSL	Low	15.1	20.3	14.0	No change	Sm. inc.	Medium	Rare	Poor	Fair	Infill +	Infill +	2	44
Ohio buckeye	Aesculus glabra	NSL	Low	16.3	18.1	1.8	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	45
swamp white oak	Quercus bicolor	NSL	Low	2.9	13.7	4.2	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	46
black maple	Acer nigrum	NSH	Low	1.5	11.5	2.7	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor			0	47



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pawpaw	Asimina triloba	NSL	Low	8.1	10.3	1.2	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	48
ailanthus	Ailanthus altissima	NSL	FIA	1.8	9.7	4.6	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	49
common persimmon	Diospyros virginiana	NSL	Low	10.4	6.9	0.8	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	1	50
Siberian elm	Ulmus pumila	NDH	FIA	1	6.1	5.8	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	51
swamp chestnut oak	Quercus michauxii	NSL	Low	0.8	5.6	3.9	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	52
river birch	Betula nigra	NSL	Low	6.1	5.6	1.9	Sm. dec.	No change	Medium	Rare	Very Poor	Poor		Infill +	2	53
mockernut hickory	Carya alba	WDL	Medium	3.1	4.8	1.5	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	2	54
shellbark hickory	Carya laciniosa	NSL	Low	1	3.7	3.5	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	55
Kentucky coffeetree	Gymnocladus dioicus	NSLX	FIA	0.9	3.4	2.9	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	56
Shumard oak	Quercus shumardii	NSL	Low	1	2.9	2.8	No change	Lg. inc.	High	Rare	Fair	Good			2	57
bur oak	Quercus macrocarpa	NDH	Medium	1.3	2.6	0.8	Sm. dec.	No change	High	Rare	Poor	Fair	Infill +	Infill +	2	58
Norway spruce	Picea abies	NSH	FIA	1	2.6	2.5	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	59
blue ash	Fraxinus quadrangulata	NSL	Low	5.2	0.6	0.6	Very Lg. dec.	Very Lg. dec.	Low	Rare	Lost	Lost			0	60
serviceberry	Amelanchier spp.	NSL	Low	1.2	0.6	0.2	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	61
butternut	Juglans cinerea	NSLX	FIA	1	0.6	0.5	Unknown	Unknown	Low	Rare	FIA Only	FIA Only			0	62
northern catalpa	Catalpa speciosa	NSHX	FIA	0.3	0.4	0.1	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	63
Scots pine	Pinus sylvestris	NSH	FIA	1	0.4	0.3	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	64
red spruce	Picea rubens	NDH	High	0	0	0	Unknown	Unknown	Low	Absent	Unknown	Unknown			0	65
loblolly pine	Pinus taeda	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	66
striped maple	Acer pensylvanicum	NSL	Medium	0	0	0	Unknown	New Habitat	Medium	Absent	Unknown	New Habitat			3	67
mountain maple	Acer spicatum	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			3	68
pecan	Carya illinoensis	NSH	Low	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat		Migrate ++	3	69
black hickory	Carya texana	NDL	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	70
sugarberry	Celtis laevigata	NDH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate ++	3	71
sourwood	Oxydendrum arboreum	NDL	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	72
southern red oak	Quercus falcata	WDL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	73
cherrybark oak; swamp red o.	Quercus pagoda	NSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	74
shingle oak	Quercus imbricaria	NDH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +	3	75
blackjack oak	Quercus marilandica	NSL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	76
water oak	Quercus nigra	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate ++	3	77
post oak	Quercus stellata	WDH	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++	3	78
winged elm	Ulmus alata	WDL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++	3	79