

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 8,686.5 3,353.9 350

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	Low	RCP45	RCP85	RCP45	RCP85	RCP45	RCP85			
Ash	3			15	22	Increase	15	15	Very Good	8	5	Likely	1	1
Hickory	1			21	34	No Change	12	9	Good	12	15	Infill	5	6
Maple	5	Abundant	8	25	9	Decrease	15	18	Fair	7	8	Migrate	5	7
Oak	5	Common	21	7		New	17	17	Poor	7	6			
Pine	4	Rare	20			Unknown	9	9	Very Poor	7	7			
Other	31	Absent	19						FIA Only	4	4			
	49		68	68	65		68	68	Unknown	2	2		11	14
										47	47			

Potential Changes in Climate Variables

Temperature (°F)

	Scenario	2009	2039	2069	2099	
Annual Average	CCSM45	43.3	45.1	48.2	48.5	
	CCSM85	43.3	46.0	49.2	52.8	
	GFDL45	43.3	46.3	49.0	50.4	
	GFDL85	43.3	46.6	50.1	55.2	
	HAD45	43.3	46.4	50.2	52.1	
	HAD85	43.3	47.0	51.4	57.0	
Growing Season (May—Sep)	CCSM45	63.8	65.7	68.4	68.8	
	CCSM85	63.8	66.7	69.7	73.9	
	GFDL45	63.8	67.2	70.5	72.6	
	GFDL85	63.8	67.9	71.7	77.5	
	HAD45	63.8	67.0	70.1	72.3	
	HAD85	63.8	67.2	71.7	77.3	
Coldest Month (Average)	CCSM45	10.2	11.8	14.3	14.7	
	CCSM85	10.2	12.1	14.4	16.9	
	GFDL45	10.2	13.8	15.5	16.0	
	GFDL85	10.2	14.1	15.9	19.1	
	HAD45	10.2	11.7	16.1	16.0	
	HAD85	10.2	15.6	18.9	22.5	
Warmest Month (Average)	CCSM45	70.3	72.5	74.0	74.5	
	CCSM85	70.3	73.7	75.7	78.3	
	GFDL45	70.3	73.7	75.2	76.8	
	GFDL85	70.3	74.6	76.6	80.1	
	HAD45	70.3	73.8	75.5	77.0	
	HAD85	70.3	74.7	77.0	80.9	

Precipitation (in)

	Scenario	2009	2039	2069	2099	
Annual Total	CCSM45	31.4	32.4	32.1	31.9	
	CCSM85	31.4	30.8	30.7	31.4	
	GFDL45	31.4	34.8	36.4	33.6	
	GFDL85	31.4	34.7	37.8	36.1	
	HAD45	31.4	33.5	32.8	33.5	
	HAD85	31.4	33.0	33.8	35.7	
Growing Season (May—Sep)	CCSM45	19.7	19.9	19.0	19.0	
	CCSM85	19.7	18.9	17.8	17.4	
	GFDL45	19.7	21.7	22.0	19.7	
	GFDL85	19.7	21.7	22.2	19.8	
	HAD45	19.7	19.9	18.4	18.7	
	HAD85	19.7	19.3	17.6	17.7	

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
quaking aspen	Populus tremuloides	WDH	High	81.9	1370.8	11.0	Sm. dec.	Sm. dec.	Medium	Abundant	Fair	Fair			0	1
red maple	Acer rubrum	WDH	High	85.8	1072.3	9.3	No change	Sm. dec.	High	Abundant	Very Good	Good			1	2
northern pin oak	Quercus ellipsoidalis	NSH	Medium	55.6	976.4	12.6	Sm. dec.	Sm. dec.	High	Abundant	Good	Good			1	3
northern red oak	Quercus rubra	WDH	Medium	68.9	780.4	8.1	No change	Sm. dec.	High	Abundant	Very Good	Good			1	4
bur oak	Quercus macrocarpa	NDH	Medium	66.3	694.3	7.5	No change	No change	High	Abundant	Very Good	Very Good			1	5
red pine	Pinus resinosa	NSH	Medium	29.3	644.7	12.5	No change	No change	Low	Abundant	Fair	Fair			0	6
paper birch	Betula papyrifera	WDH	High	69.7	620.3	6.3	Sm. dec.	Sm. dec.	Medium	Abundant	Fair	Fair			0	7
sugar maple	Acer saccharum	WDH	High	50.4	510.6	8.0	No change	No change	High	Abundant	Very Good	Very Good			1	8
white oak	Quercus alba	WDH	Medium	55.9	447.7	6.0	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	9
American elm	Ulmus americana	WDH	Medium	66.4	429.2	4.8	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	10
American basswood	Tilia americana	WSL	Medium	54.7	428.6	5.3	No change	No change	Medium	Common	Fair	Fair			1	11
eastern white pine	Pinus strobus	WDH	High	41	405.2	7.0	No change	Sm. dec.	Low	Common	Poor	Poor			0	12
black ash	Fraxinus nigra	WSH	Medium	48.4	403.4	6.2	No change	No change	Low	Common	Poor	Poor			0	13
green ash	Fraxinus pennsylvanica	WSH	Low	59.6	373.2	4.6	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	14
bigtooth aspen	Populus grandidentata	NSL	Medium	41.6	357.5	5.2	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	15
jack pine	Pinus banksiana	NSH	Medium	20.1	310.6	10.6	Sm. dec.	Sm. dec.	High	Common	Fair	Fair			1	16
boxelder	Acer negundo	WSH	Low	31	308.6	7.5	Sm. inc.	No change	High	Common	Very Good	Good			1	17
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	54.7	266.7	3.8	No change	No change	High	Common	Good	Good			1	18
black cherry	Prunus serotina	WDL	Medium	58.9	224.4	3.0	Lg. inc.	Lg. inc.	Low	Common	Good	Good			1	19
tamarack (native)	Larix laricina	NSH	High	15.1	165.3	7.3	Sm. inc.	Sm. inc.	Low	Common	Fair	Fair			1	20
white ash	Fraxinus americana	WDL	Medium	34.3	149.2	3.6	Lg. inc.	Lg. inc.	Low	Common	Good	Good			1	21
eastern cottonwood	Populus deltoides	NSH	Low	7.9	72.1	4.7	No change	No change	Medium	Common	Fair	Fair	Infill +	Infill +	2	22
white spruce	Picea glauca	NSL	Medium	6.6	71.9	5.9	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	23
balsam fir	Abies balsamea	NDH	High	4.4	70.0	2.9	No change	No change	Low	Common	Poor	Poor	Infill +	Infill +	2	24
Siberian elm	Ulmus pumila	NDH	FIA	1.2	65.3	56.7	Unknown	Unknown	NA	Common	NNIS	NNIS			0	25
silver maple	Acer saccharinum	NSH	Low	6.8	59.7	5.9	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good	Infill ++	Infill ++	1	26
butternut	Juglans cinerea	NSLX	FIA	19.8	57.6	2.3	Unknown	Unknown	Low	Common	FIA Only	FIA Only			0	27
slippery elm	Ulmus rubra	WSL	Low	17.7	53.8	2.4	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	28
bitternut hickory	Carya cordiformis	WSL	Low	29.1	52.7	1.5	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	29
black spruce	Picea mariana	NSH	High	4.4	39.9	2.6	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	30
eastern redcedar	Juniperus virginiana	WDH	Medium	4.2	39.9	4.3	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	2	31
balsam poplar	Populus balsamifera	NSH	Medium	1.4	37.5	7.5	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	32
Scots pine	Pinus sylvestris	NSH	FIA	4.8	34.0	4.6	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	33
yellow birch	Betula alleghaniensis	NDL	High	14.9	31.9	1.9	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	34
black locust	Robinia pseudoacacia	NDH	Low	0.6	27.4	3.3	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	35
black oak	Quercus velutina	WDH	High	1.9	25.1	2.4	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	2	36
American hornbeam; muscle	Carpinus caroliniana	WSL	Low	18	15.1	0.8	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	37
Ohio buckeye	Aesculus glabra	NSL	Low	1	12.0	8.9	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	38
serviceberry	Amelanchier spp.	NSL	Low	5.1	11.0	1.3	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	39
pin cherry	Prunus pensylvanica	NSL	Low	2.1	8.5	3.3	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	40
chokecherry	Prunus virginiana	NSLX	FIA	10.2	7.5	0.6	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	41
hackberry	Celtis occidentalis	WDH	Medium	3.7	7.3	1.5	Sm. inc.	Lg. inc.	High	Rare	Good	Good			2	42
northern white-cedar	Thuja occidentalis	WSH	High	3.5	6.2	1.8	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	43
black maple	Acer nigrum	NSH	Low	1.2	4.8	4.2	Sm. dec.	Lg. dec.	High	Rare	Poor	Poor			0	44
wild plum	Prunus americana	NSLX	FIA	0.9	1.6	1.1	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	45
Norway spruce	Picea abies	NSH	FIA	0.4	1.2	0.3	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	46
peachleaf willow	Salix amygdaloides	NSLX	FIA	0.2	1.2	0.2	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	47

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USDA Forest Service
Northern Research Station
Landscape Change Research Group
Iverson, Peters, Prasad, Matthews

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Common Name	Scientific Name	Range	MR	%Cell	FIAsum	FIAiv	ChngCI45	ChngCI85	Adap	Abund	Capabil45	Capabil85	SHIFT45	SHIFT85	SSO	N	
river birch	Betula nigra	NSL	Low	1.2	1.1	0.9	Very Lg. dec.	Very Lg. dec.	Medium	Rare	Lost	Lost				0	48
red mulberry	Morus rubra	NSL	Low	0.2	0.4	0.1	No change	Sm. inc.	Medium	Rare	Poor	Fair		Infill +		2	49
striped maple	Acer pensylvanicum	NSL	Medium	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown				0	50
mountain maple	Acer spicatum	NSL	Low	0	0	0	New Habitat	Unknown	High	Absent	New Habitat	Unknown				3	51
cittamwood/gum bumelia	Sideroxylon lanuginosum ssp.	NSL	Low	0	0	0	Unknown	New Habitat	High	Absent	Unknown	New Habitat				0	52
shagbark hickory	Carya ovata	WSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +		3	53
black hickory	Carya texana	NDL	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat				0	54
mockernut hickory	Carya alba	WDL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat				3	55
eastern redbud	Cercis canadensis	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat				3	56
American beech	Fagus grandifolia	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +		3	57
honeylocust	Gleditsia triacanthos	NSH	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate +		3	58
black walnut	Juglans nigra	WDH	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +		3	59
yellow-poplar	Liriodendron tulipifera	WDH	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat				3	60
Osage-orange	Maclura pomifera	NDH	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate +		3	61
sycamore	Platanus occidentalis	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat				3	62
swamp white oak	Quercus bicolor	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +		3	63
blackjack oak	Quercus marilandica	NSL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat				3	64
Shumard oak	Quercus shumardii	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat				0	65
post oak	Quercus stellata	WDH	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat				0	66
black willow	Salix nigra	NSH	Low	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat	Migrate +	Migrate ++		3	67
sassafras	Sassafras albidum	WSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +		3	68