

	sq. km	sq. mi	FIA Plots
Area of Region	8,033.6	3,101.8	251

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				
		Abundant	Common	High	Medium	Reliability	Adaptability	Scenario RCP45	Scenario RCP85	Scenario RCP45	Scenario RCP85	SHIFT RCP45	SHIFT RCP85	
Ash	3													
Hickory	4													
Maple	3	4		15	19	Increase	19	25	Very Good	9	10	Likely	1	1
Oak	16		19	34	46	No Change	12	13	Good	12	15	Infill	7	12
Pine	6			27	11	Decrease	29	22	Fair	7	10	Migrate	1	3
Other	30	13		2		New	7	8	Poor	11	8			
	62	75		78	76	Unknown	11	10	Very Poor	14	12			
							78	78	FIA Only	2	2			
									Unknown	9	8			
										64	65			

Potential Changes in Climate Variables

Temperature (°F)

Scenario	2009	2039	2069	2099	
Annual	62.5	64.0	65.8	65.9	
Average	62.5	64.3	66.4	68.9	
GFDL45	62.5	65.3	67.2	68.1	
GFDL85	62.5	65.2	68.3	71.7	
HAD45	62.5	64.2	66.8	68.0	
HAD85	62.5	64.6	67.5	71.1	
Growing Season	75.7	77.0	78.5	78.8	
May—Sep	75.7	77.1	79.3	82.2	
GFDL45	75.7	78.5	80.6	81.9	
GFDL85	75.7	78.6	81.9	85.7	
HAD45	75.7	77.8	79.9	81.3	
HAD85	75.7	77.8	81.4	85.0	
Coldest Month	42.7	45.0	45.8	46.0	
Average	42.7	45.0	45.9	47.2	
GFDL45	42.7	45.9	46.3	47.0	
GFDL85	42.7	44.6	45.6	46.7	
HAD45	42.7	43.0	44.8	45.2	
HAD85	42.7	43.5	44.6	46.2	
Warmest Month	80.3	81.7	82.4	82.4	
Average	80.3	81.8	83.2	84.4	
GFDL45	80.3	82.7	83.6	84.5	
GFDL85	80.3	83.2	84.9	87.0	
HAD45	80.3	82.6	83.8	84.4	
HAD85	80.3	82.9	85.0	87.0	

Precipitation (in)

Scenario	2009	2039	2069	2099	
Annual	53.6	58.8	60.1	60.2	
Total	53.6	59.5	60.4	66.4	
GFDL45	53.6	57.3	60.2	63.3	
GFDL85	53.6	56.5	61.7	61.1	
HAD45	53.6	55.9	55.9	54.9	
HAD85	53.6	58.6	54.2	51.7	
Growing Season	27.6	33.1	33.6	33.6	
May—Sep	27.6	31.4	33.0	36.0	
GFDL45	27.6	29.6	31.8	33.8	
GFDL85	27.6	28.8	33.2	33.6	
HAD45	27.6	28.4	28.0	26.2	
HAD85	27.6	29.9	26.1	22.7	

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-DGP30 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
loblolly pine	Pinus taeda	WDH	High	90.5	3883.7	38.2	No change	No change	Medium	Abundant	Good	Good			1	1
red maple	Acer rubrum	WDH	High	86.3	970.9	10.7	No change	No change	High	Abundant	Very Good	Very Good			1	2
sweetgum	Liquidambar styraciflua	WDH	High	86.2	949.1	10.1	No change	No change	Medium	Abundant	Good	Good			1	3
pond pine	Pinus serotina	NSH	Medium	44.8	760.1	16.6	Sm. dec.	Sm. dec.	Low	Abundant	Fair	Fair			0	4
swamp tupelo	Nyssa biflora	NDH	Medium	55.9	268.6	4.5	Lg. inc.	Lg. inc.	Low	Common	Good	Good			1	5
loblolly-bay	Gordonia lasianthus	NSH	Medium	30.2	264.5	7.8	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	6
green ash	Fraxinus pennsylvanica	WSH	Low	32.6	257.6	7.9	No change	No change	Medium	Common	Fair	Fair			1	7
water oak	Quercus nigra	WDH	High	56.5	235.7	3.6	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	8
yellow-poplar	Liriodendron tulipifera	WDH	High	41.9	219.7	4.5	Sm. dec.	Sm. dec.	High	Common	Fair	Fair			1	9
redbay	Persea borbonia	NSL	Low	59.8	198.7	2.9	No change	No change	High	Common	Good	Good			1	10
sweetbay	Magnolia virginiana	NSL	Medium	52.8	142.6	2.6	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	11
American holly	Ilex opaca	NSL	Medium	42.4	126.2	2.6	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	12
longleaf pine	Pinus palustris	NSH	Medium	20	118.3	5.8	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	13
American hornbeam; muscle	Carpinus caroliniana	WSL	Low	25.9	96.9	3.5	No change	Sm. inc.	Medium	Common	Fair	Good			1	14
white oak	Quercus alba	WDH	Medium	19.4	95.8	4.3	No change	No change	High	Common	Good	Good			1	15
laurel oak	Quercus laurifolia	NDH	Medium	23.7	91.0	3.8	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	16
pumpkin ash	Fraxinus profunda	NSH	FIA	8.8	83.6	8.6	Unknown	Unknown	NA	Common	FIA Only	FIA Only			0	17
slash pine	Pinus elliotii	NDH	High	2.5	82.0	32.8	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good	Infill ++	Infill ++	2	18
southern red oak	Quercus falcata	WDL	Medium	23.9	82.0	2.5	Sm. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	19
American elm	Ulmus americana	WDH	Medium	21.9	70.4	3.1	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good			1	20
sourwood	Oxydendrum arboreum	NDL	High	24.6	57.5	2.0	Lg. dec.	Lg. dec.	High	Common	Fair	Fair			1	21
bald cypress	Taxodium distichum	NSH	Medium	12.3	55.3	4.4	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good	Infill ++	Infill ++	1	22
blackgum	Nyssa sylvatica	WDL	Medium	22.3	50.8	2.1	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	23
willow oak	Quercus phellos	NSL	Low	19.5	48.9	2.6	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			1	24
swamp chestnut oak	Quercus michauxii	NSL	Low	20.3	42.3	1.9	No change	No change	Medium	Rare	Poor	Poor			1	25
mockernut hickory	Carya alba	WDL	Medium	11.9	40.0	2.4	Sm. inc.	Lg. inc.	High	Rare	Good	Good			1	26
black willow	Salix nigra	NSH	Low	4.8	39.5	7.9	No change	No change	Low	Rare	Very Poor	Very Poor			0	27
flowering dogwood	Cornus florida	WDL	Medium	17.7	32.4	1.5	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	28
Atlantic white-cedar	Chamaecyparis thyoides	NSH	Low	3.4	30.7	7.1	Sm. dec.	No change	Low	Rare	Very Poor	Very Poor			2	29
Carolina ash	Fraxinus caroliniana	NSL	FIA	5	28.2	5.7	Unknown	Unknown	NA	Rare	FIA Only	FIA Only			0	30
eastern redcedar	Juniperus virginiana	WDH	Medium	1.9	28.0	10.3	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	31
slippery elm	Ulmus rubra	WSL	Low	11.9	21.1	1.7	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	32
black cherry	Prunus serotina	WDL	Medium	19.6	20.2	1.0	Lg. inc.	Lg. inc.	Low	Rare	Fair	Fair			1	33
post oak	Quercus stellata	WDH	High	13.4	17.8	1.4	Lg. dec.	Lg. inc.	High	Rare	Poor	Good	Infill +	Infill ++	1	34
pond cypress	Taxodium ascendens	NSH	Medium	5.9	16.5	2.6	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	2	35
black oak	Quercus velutina	WDH	High	5.7	14.1	1.9	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	36
live oak	Quercus virginiana	NDH	High	1.2	13.8	3.3	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	37
river birch	Betula nigra	NSL	Low	3.7	13.3	3.5	Sm. dec.	No change	Medium	Rare	Very Poor	Poor		Infill +	1	38
Virginia pine	Pinus virginiana	NDH	High	2.2	11.8	4.2	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	39
cherrybark oak; swamp red o	Quercus pagoda	NSL	Medium	6.2	10.3	1.7	No change	Sm. inc.	Medium	Rare	Poor	Fair	Infill +	Infill +	2	40
boxelder	Acer negundo	WSH	Low	5	10.1	2.0	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor			0	41
water tupelo	Nyssa aquatica	NSH	Medium	1.2	8.6	6.9	Lg. inc.	Lg. inc.	Low	Rare	Fair	Fair	Infill +	Infill +	2	42
pecan	Carya illinoensis	NSH	Low	1.2	8.5	6.8	Sm. dec.	No change	Low	Rare	Very Poor	Very Poor			2	43
Shumard oak	Quercus shumardii	NSL	Low	4.6	8.4	1.5	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			0	44
pignut hickory	Carya glabra	WDL	Medium	4.8	7.0	1.4	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	45
common persimmon	Diospyros virginiana	NSL	Low	6.2	5.4	0.9	Very Lg. dec.	Very Lg. dec.	High	Rare	Lost	Lost			0	46
florida maple	Acer barbatum	NSL	Low	1.2	5.0	4.0	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor			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
shortleaf pine	Pinus echinata	WDH	High	1.2	4.9	3.9	No change	Lg. inc.	Medium	Rare	Poor	Good			2	48
blackjack oak	Quercus marilandica	NSL	Medium	3.4	4.8	1.3	Very Lg. dec.	Sm. dec.	High	Rare	Lost	Poor		Infill +	2	49
American beech	Fagus grandifolia	WDH	High	3.4	4.5	1.2	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			2	50
shagbark hickory	Carya ovata	WSL	Medium	1.2	3.5	2.8	Lg. dec.	Very Lg. dec.	Medium	Rare	Very Poor	Lost			0	51
turkey oak	Quercus laevis	NSH	Medium	2.4	3.1	1.2	Lg. inc.	Sm. inc.	High	Rare	Good	Good			2	52
scarlet oak	Quercus coccinea	WDL	Medium	3.2	3.0	0.7	Very Lg. dec.	Very Lg. dec.	Medium	Rare	Lost	Lost			0	53
overcup oak	Quercus lyrata	NSL	Medium	3.7	2.7	0.7	Sm. inc.	Lg. inc.	Low	Rare	Poor	Fair	Infill +	Infill +	2	54
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	1.2	1.9	1.6	Sm. dec.	No change	High	Rare	Poor	Fair		Infill +	2	55
sassafras	Sassafras albidum	WSL	Low	2.5	1.6	0.6	Very Lg. dec.	No change	Medium	Rare	Lost	Poor		Infill +	2	56
winged elm	Ulmus alata	WDL	Medium	1.2	1.2	1.0	No change	Lg. inc.	Medium	Rare	Poor	Good			2	57
northern red oak	Quercus rubra	WDH	Medium	1.2	1.2	1.0	Very Lg. dec.	Very Lg. dec.	High	Rare	Lost	Lost			0	58
sycamore	Platanus occidentalis	NSL	Low	1.2	1.1	0.9	Very Lg. dec.	Sm. inc.	Medium	Rare	Lost	Fair		Infill +	2	59
black walnut	Juglans nigra	WDH	Low	1.2	1.0	0.8	Very Lg. dec.	Very Lg. dec.	Medium	Rare	Lost	Lost			0	60
red mulberry	Morus rubra	NSL	Low	1.2	0.6	0.5	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	61
bigleaf magnolia	Magnolia macrophylla	NSL	Low	1	0.5	0.3	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	62
sand pine	Pinus clausa	NDH	High	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			3	63
serviceberry	Amelanchier spp.	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	64
pawpaw	Asimina triloba	NSL	Low	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown			0	65
water hickory	Carya aquatica	NSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +	3	66
shellbark hickory	Carya laciniosa	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	67
sugarberry	Celtis laevigata	NDH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate ++	3	68
white ash	Fraxinus americana	WDL	Medium	0	0	0	Unknown	Unknown	Low	Modeled	Unknown	Unknown			0	69
silverbell	Halesia spp.	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	70
Osage-orange	Maclura pomifera	NDH	Medium	0	0	0	Unknown	Unknown	High	Modeled	Unknown	Unknown			0	71
southern magnolia	Magnolia grandiflora	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	72
swamp white oak	Quercus bicolor	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	73
chestnut oak	Quercus prinus	NDH	High	0	0	0	Unknown	Unknown	High	Absent	Unknown	Unknown			0	74
bluejack oak	Quercus incana	NSL	Low	0	0	0	Unknown	New Habitat	Medium	Absent	Unknown	New Habitat		Migrate +	3	75
cabbage palmetto	Sabal palmetto	NDH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	76
American basswood	Tilia americana	WSL	Medium	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	77
cedar elm	Ulmus crassifolia	NDH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			0	78