

sq. km sq. mi FIA Plots
Area of Region 8,068.1 3,115.1 185

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				
						RCP45	RCP85	RCP45	RCP85	RCP45	RCP85				
Ash	3			High	17	19	Increase	12	17	Very Good	3	5	Likely	1	1
Hickory	5			Medium	34	48	No Change	15	11	Good	10	10	Infill	23	28
Maple	2	Abundant	3	Low	28	12	Decrease	22	21	Fair	8	8	Migrate	6	8
Oak	15	Common	14	FIA	3		New	22	21	Poor	14	14			
Pine	3	Rare	35				Unknown	11	12	Very Poor	12	8			
Other	24	Absent	26							FIA Only	1	1			
	52		78							Unknown	8	9			
					82	79		82	82		56	55		30	37

Potential Changes in Climate Variables

Temperature (°F)

Scenario	2009	2039	2069	2099	
Annual	57.3	58.7	60.5	60.7	
Average	57.3	59.0	61.2	63.7	
GFDL45	57.3	60.7	62.3	63.3	
GFDL85	57.3	60.2	63.4	67.2	
HAD45	57.3	59.2	62.1	63.3	
HAD85	57.3	59.4	62.6	66.3	
Growing Season	72.2	73.6	75.0	75.3	
May—Sep	72.2	73.7	75.9	78.8	
GFDL45	72.2	76.0	77.8	79.2	
GFDL85	72.2	75.6	79.2	83.2	
HAD45	72.2	74.3	76.7	78.0	
HAD85	72.2	74.1	77.6	81.2	
Coldest Month	35.1	37.2	38.4	38.9	
Average	35.1	37.7	38.8	40.2	
GFDL45	35.1	37.9	38.6	39.2	
GFDL85	35.1	37.4	38.6	40.0	
HAD45	35.1	36.0	37.9	38.2	
HAD85	35.1	36.8	38.2	40.0	
Warmest Month	78.1	79.5	80.3	80.3	
Average	78.1	79.5	81.0	82.2	
GFDL45	78.1	80.7	82.1	83.1	
GFDL85	78.1	81.7	83.6	85.9	
HAD45	78.1	80.4	81.7	82.2	
HAD85	78.1	80.4	82.1	84.2	

Precipitation (in)

Scenario	2009	2039	2069	2099	
Annual	44.0	47.6	49.5	49.4	
Total	44.0	49.4	49.3	55.1	
GFDL45	44.0	49.1	52.5	53.6	
GFDL85	44.0	47.3	52.6	53.7	
HAD45	44.0	47.4	48.0	46.3	
HAD85	44.0	51.8	46.4	47.3	
Growing Season	19.4	23.9	24.3	24.7	
May—Sep	19.4	23.9	23.5	26.0	
GFDL45	19.4	21.3	23.6	24.7	
GFDL85	19.4	20.8	23.6	24.3	
HAD45	19.4	21.8	20.8	18.1	
HAD85	19.4	22.8	19.2	17.8	

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
loblolly pine	Pinus taeda	WDH	High	86.5	2768.4	32.2	No change	No change	Medium	Abundant	Good	Good	Infill ++	Infill ++	1	1
red maple	Acer rubrum	WDH	High	86.4	1519.0	18.8	Sm. dec.	Sm. dec.	High	Abundant	Good	Good	Infill ++	Infill ++	1	2
sweetgum	Liquidambar styraciflua	WDH	High	80.8	804.4	10.5	No change	No change	Medium	Abundant	Good	Good	Infill ++	Infill ++	1	3
American holly	Ilex opaca	NSL	Medium	76.5	494.7	6.9	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor	Infill +	Infill +	0	4
white oak	Quercus alba	WDH	Medium	47.7	309.2	6.8	Sm. dec.	Sm. dec.	High	Common	Fair	Fair	Infill +	Infill +	1	5
blackgum	Nyssa sylvatica	WDL	Medium	71.5	264.8	4.0	No change	No change	High	Common	Good	Good	Infill ++	Infill ++	1	6
black cherry	Prunus serotina	WDL	Medium	46.5	216.1	5.5	No change	No change	Low	Common	Poor	Poor	Infill +	Infill +	0	7
southern red oak	Quercus falcata	WDL	Medium	48.8	146.7	3.6	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good	Infill ++	Infill ++	1	8
yellow-poplar	Liriodendron tulipifera	WDH	High	29.9	125.2	4.1	Lg. inc.	Sm. inc.	High	Common	Very Good	Very Good	Infill ++	Infill ++	1	9
Virginia pine	Pinus virginiana	NDH	High	23.7	119.2	4.5	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor	Infill +		0	10
sassafras	Sassafras albidum	WSL	Low	31.7	92.6	2.8	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor	Infill +		0	11
water oak	Quercus nigra	WDH	High	43.3	83.9	2.3	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good	Infill ++	Infill ++	1	12
scarlet oak	Quercus coccinea	WDL	Medium	27.6	83.4	3.3	Sm. dec.	Lg. dec.	Medium	Common	Poor	Poor	Infill +	Infill +	0	13
willow oak	Quercus phellos	NSL	Low	29.7	74.1	2.6	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good	Infill ++	Infill ++	1	14
mockernut hickory	Carya alba	WDL	Medium	10.3	65.9	5.8	Sm. dec.	Sm. inc.	High	Common	Fair	Very Good	Infill +	Infill ++	1	15
black oak	Quercus velutina	WDH	High	19.9	64.5	3.8	Sm. inc.	Sm. dec.	Medium	Common	Good	Poor	Infill ++	Infill +	1	16
green ash	Fraxinus pennsylvanica	WSH	Low	9.9	56.5	5.7	No change	No change	Medium	Common	Fair	Fair	Infill +	Infill +	2	17
sweetbay	Magnolia virginiana	NSL	Medium	20.7	48.9	2.1	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	18
American beech	Fagus grandifolia	WDH	High	18	48.6	3.0	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	19
swamp chestnut oak	Quercus michauxii	NSL	Low	16.5	43.8	2.3	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	1	20
white ash	Fraxinus americana	WDL	Medium	6.2	21.8	3.5	Lg. dec.	Lg. dec.	Low	Rare	Very Poor	Very Poor			0	21
bald cypress	Taxodium distichum	NSH	Medium	3.5	21.5	5.5	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	22
cherrybark oak; swamp red o.	Quercus pagoda	NSL	Medium	9.9	20.5	2.1	No change	No change	Medium	Rare	Poor	Poor		Infill +	2	23
northern red oak	Quercus rubra	WDH	Medium	7.6	20.5	2.0	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor	Infill +	Infill +	2	24
flowering dogwood	Cornus florida	WDL	Medium	12.9	18.3	1.5	Lg. dec.	No change	Medium	Rare	Very Poor	Poor		Infill +	1	25
common persimmon	Diospyros virginiana	NSL	Low	5.9	16.9	3.2	No change	Sm. dec.	High	Rare	Fair	Poor			0	26
eastern redcedar	Juniperus virginiana	WDH	Medium	12.5	15.3	1.4	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	27
American hornbeam; musclev	Carpinus caroliniana	WSL	Low	8.7	13.3	1.5	No change	Sm. inc.	Medium	Rare	Poor	Fair	Infill +	Infill +	2	28
swamp tupelo	Nyssa biflora	NDH	Medium	6.6	13.2	4.6	Lg. inc.	Lg. inc.	Low	Rare	Fair	Fair	Infill +	Infill +	2	29
shortleaf pine	Pinus echinata	WDH	High	3.7	12.7	3.4	No change	Sm. inc.	Medium	Rare	Poor	Fair		Infill +	2	30
post oak	Quercus stellata	WDH	High	3.7	12.2	3.3	No change	Lg. inc.	High	Rare	Fair	Good			2	31
chestnut oak	Quercus prinus	NDH	High	1.2	11.2	9.1	Lg. dec.	Very Lg. dec.	High	Rare	Poor	Lost			0	32
sycamore	Platanus occidentalis	NSL	Low	1.2	10.5	8.5	No change	No change	Medium	Rare	Poor	Poor			2	33
Atlantic white-cedar	Chamaecyparis thyoides	NSH	Low	3.7	8.1	2.2	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor			0	34
pignut hickory	Carya glabra	WDL	Medium	6.3	7.8	1.2	Sm. dec.	No change	Medium	Rare	Very Poor	Poor		Infill +	2	35
black walnut	Juglans nigra	WDH	Low	2.5	6.1	2.5	Lg. dec.	Very Lg. dec.	Medium	Rare	Very Poor	Lost			0	36
river birch	Betula nigra	NSL	Low	2.3	5.2	1.9	No change	Lg. inc.	Medium	Rare	Poor	Good			2	37
black ash	Fraxinus nigra	WSH	Medium	1.2	4.9	4.0	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor			0	38
pecan	Carya illinoensis	NSH	Low	2.9	4.5	8.6	No change	Lg. inc.	Low	Rare	Very Poor	Fair		Infill +	2	39
sand hickory	Carya pallida	NSL	FIA	3.7	4.3	1.1	Unknown	Unknown	NA	Rare	FIA Only	FIA Only			0	40
overcup oak	Quercus lyrata	NSL	Medium	2.5	3.8	1.5	Lg. inc.	Lg. inc.	Low	Rare	Fair	Fair		Infill +	2	41
black willow	Salix nigra	NSH	Low	2.5	3.8	1.5	Lg. inc.	Lg. inc.	Low	Rare	Fair	Fair		Infill +	2	42
red mulberry	Morus rubra	NSL	Low	3.7	3.4	0.9	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	43
pin oak	Quercus palustris	NSH	Low	1.2	3.4	2.7	Lg. dec.	Lg. dec.	Low	Rare	Very Poor	Very Poor			0	44
black locust	Robinia pseudoacacia	NDH	Low	1.2	2.4	1.9	Very Lg. dec.	Very Lg. dec.	Medium	Rare	Lost	Lost			0	45
bitternut hickory	Carya cordiformis	WSL	Low	1.2	2.4	1.9	Very Lg. dec.	Very Lg. dec.	High	Rare	Lost	Lost			0	46
swamp white oak	Quercus bicolor	NSL	Low	1.2	1.8	1.5	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	47

Assateague Island

National Park Climate Change Atlas Tree Species

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

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
sourwood	Oxydendrum arboreum	NDL	High	1.2	1.4	1.1	Sm. inc.	Sm. inc.	High	Rare	Good	Good			2	48
Siberian elm	Ulmus pumila	NDH	FIA	1.1	1.1	0.8	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	49
Norway maple	Acer platanoides	NSL	FIA	1.2	0.9	0.8	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	50
bigtooth aspen	Populus grandidentata	NSL	Medium	3.1	0.8	1.7	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	51
turkey oak	Quercus laevis	NSH	Medium	1.6	0.7	0.8	Lg. inc.	Lg. inc.	High	Rare	Good	Good			2	52
slash pine	Pinus elliottii	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate ++	3	53
longleaf pine	Pinus palustris	NSH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	54
pitch pine	Pinus rigida	NSH	High	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown			0	55
pond pine	Pinus serotina	NSH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	56
pond cypress	Taxodium ascendens	NSH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	57
silver maple	Acer saccharinum	NSH	Low	0	0	0	New Habitat	Unknown	High	Absent	New Habitat	Unknown			3	58
serviceberry	Amelanchier spp.	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	59
pawpaw	Asimina triloba	NSL	Low	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown			0	60
gray birch	Betula populifolia	NSL	Low	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown			0	61
cittamwood/gum bumelia	Sideroxylon lanuginosum ssp.	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			0	62
water hickory	Carya aquatica	NSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	63
shagbark hickory	Carya ovata	WSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	64
black hickory	Carya texana	NDL	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	65
sugarberry	Celtis laevigata	NDH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	66
hackberry	Celtis occidentalis	WDH	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			3	67
loblolly-bay	Gordonia lasianthus	NSH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	68
cucumbertree	Magnolia acuminata	NSL	Low	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown			0	69
bigleaf magnolia	Magnolia macrophylla	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	70
water tupelo	Nyssa aquatica	NSH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	71
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	0	0	0	Unknown	Unknown	High	Absent	Unknown	Unknown			0	72
redbay	Persea borbonia	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	73
water elm	Planera aquatica	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	74
quaking aspen	Populus tremuloides	WDH	High	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	75
laurel oak	Quercus laurifolia	NDH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	76
Nuttall oak	Quercus texana	NSH	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			0	77
live oak	Quercus virginiana	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	78
winged elm	Ulmus alata	WDL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	79
American elm	Ulmus americana	WDH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +	3	80
cedar elm	Ulmus crassifolia	NDH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			0	81
slippery elm	Ulmus rubra	WSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	82