

Current and Potential Future Habitat, Capability, and Migration

	sq. km	sq. mi	FIA Plots
Area of Region	31,620	12,209	744

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	4			High	18	28	Increase	24	28	Very Good	9	11	Likely	0	0
Hickory	6			Medium	32	47	No Change	16	13	Good	14	15	Infill	20	23
Maple	5	Abundant	2	Low	36	15	Decrease	24	23	Fair	12	11	Migrate	9	10
Oak	14	Common	28	FIA	9		New	14	15	Poor	14	15		29	33
Pine	5	Rare	43				Unknown	17	16	Very Poor	15	12			
Other	39	Absent	19					95	95	FIA Only	4	4			
	73		92							Unknown	8	7			
											76	75			

Potential Changes in Climate Variables

Temperature (°F)

	Scenario	2009	2039	2069	2099	
Annual Average	CCSM45	49.7	51.1	52.9	53.2	
	CCSM85	49.7	51.6	53.7	56.2	
	GFDL45	49.7	52.5	54.1	54.8	
	GFDL85	49.7	52.1	54.9	58.2	
	HAD45	49.7	52.0	54.8	56.0	
	HAD85	49.7	52.3	56.1	59.8	
Growing Season (May—Sep)	CCSM45	63.5	65.0	66.5	67.2	
	CCSM85	63.5	65.5	67.6	70.7	
	GFDL45	63.5	66.7	68.7	69.9	
	GFDL85	63.5	66.5	69.9	73.7	
	HAD45	63.5	66.2	68.9	70.5	
	HAD85	63.5	66.5	71.6	75.3	
Coldest Month Average	CCSM45	27.7	28.9	30.3	30.7	
	CCSM85	27.7	30.1	30.9	32.3	
	GFDL45	27.7	31.2	31.5	31.9	
	GFDL85	27.7	30.1	31.0	31.6	
	HAD45	27.7	28.9	31.0	31.1	
	HAD85	27.7	30.0	31.9	33.6	
Warmest Month Average	CCSM45	68.1	69.5	70.6	71.1	
	CCSM85	68.1	70.3	71.8	73.3	
	GFDL45	68.1	70.8	72.2	73.0	
	GFDL85	68.1	71.3	73.3	75.6	
	HAD45	68.1	71.2	73.4	74.2	
	HAD85	68.1	72.7	76.1	78.3	

Precipitation (in)

	Scenario	2009	2039	2069	2099	
Annual Total	CCSM45	37.6	37.2	40.2	39.1	
	CCSM85	37.6	38.8	39.4	41.6	
	GFDL45	37.6	42.6	44.8	46.5	
	GFDL85	37.6	41.0	45.6	47.7	
	HAD45	37.6	39.1	40.8	40.2	
	HAD85	37.6	39.3	37.4	40.7	
Growing Season (May—Sep)	CCSM45	17.2	16.7	17.7	16.8	
	CCSM85	17.2	16.4	16.2	16.6	
	GFDL45	17.2	19.4	19.0	19.6	
	GFDL85	17.2	18.3	19.0	19.2	
	HAD45	17.2	17.2	15.9	16.2	
	HAD85	17.2	17.0	13.9	14.1	

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.

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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	73.4	774.5	13.6	Sm. dec.	Sm. dec.	High	Abundant	Good	Good			1	1
yellow-poplar	Liriodendron tulipifera	WDH	High	55.9	547.0	11.1	Lg. dec.	Lg. dec.	High	Abundant	Good	Good			1	2
red maple	Acer rubrum	WDH	High	54.3	384.4	8.2	Sm. dec.	Sm. dec.	High	Common	Fair	Fair			1	3
sassafras	Sassafras albidum	WSL	Low	49.9	302.0	5.8	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	4
white oak	Quercus alba	WDH	Medium	44.7	276.9	7.1	Sm. inc.	No change	High	Common	Very Good	Good			1	5
white ash	Fraxinus americana	WDL	Medium	67.1	260.2	6.3	No change	No change	Low	Common	Poor	Poor			0	6
American beech	Fagus grandifolia	WDH	High	47.1	239.2	5.3	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor	Infill +	Infill +	0	7
black cherry	Prunus serotina	WDL	Medium	68.6	235.4	5.5	No change	No change	Low	Common	Poor	Poor			0	8
black oak	Quercus velutina	WDH	High	32.4	225.1	7.6	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	9
shagbark hickory	Carya ovata	WSL	Medium	49.4	173.9	4.2	No change	Sm. dec.	Medium	Common	Fair	Poor			1	10
American elm	Ulmus americana	WDH	Medium	70.6	163.9	3.4	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good			1	11
pignut hickory	Carya glabra	WDL	Medium	37.2	161.5	4.8	No change	Sm. dec.	Medium	Common	Fair	Poor			1	12
black walnut	Juglans nigra	WDH	Low	56.6	151.7	5.0	No change	No change	Medium	Common	Fair	Fair			1	13
sweetgum	Liquidambar styraciflua	WDH	High	19.2	146.2	8.4	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good	Infill ++	Infill ++	1	14
sycamore	Platanus occidentalis	NSL	Low	41.5	146.1	4.5	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	15
northern red oak	Quercus rubra	WDH	Medium	43	140.3	4.1	No change	Sm. dec.	High	Common	Good	Fair			1	16
green ash	Fraxinus pennsylvanica	WSH	Low	39.7	105.5	7.9	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	17
silver maple	Acer saccharinum	NSH	Low	17.3	93.7	10.2	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good	Infill ++	Infill ++	1	18
bitternut hickory	Carya cordiformis	WSL	Low	39.4	81.5	3.1	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	19
eastern redcedar	Juniperus virginiana	WDH	Medium	21.3	80.2	3.7	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good	Infill ++	Infill ++	1	20
blackgum	Nyssa sylvatica	WDL	Medium	30	79.6	2.3	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	21
pin oak	Quercus palustris	NSH	Low	18.4	74.5	5.3	No change	No change	Low	Common	Poor	Poor	Infill +	Infill +	0	22
slippery elm	Ulmus rubra	WSL	Low	37.2	69.7	2.3	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good			1	23
chestnut oak	Quercus prinus	NDH	High	5.8	69.1	10.1	Sm. dec.	Sm. dec.	High	Common	Fair	Fair	Infill +	Infill +	2	24
black locust	Robinia pseudoacacia	NDH	Low	14.3	67.1	4.6	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good			1	25
hackberry	Celtis occidentalis	WDH	Medium	41.6	63.5	3.7	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	26
black willow	Salix nigra	NSH	Low	12	62.6	15.0	Lg. dec.	Sm. inc.	Low	Common	Very Poor	Fair		Infill +	2	27
boxelder	Acer negundo	WSH	Low	32.4	62.3	4.1	Sm. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	28
Virginia pine	Pinus virginiana	NDH	High	9	62.0	7.0	No change	No change	Medium	Common	Fair	Fair	Infill +	Infill +	1	29
eastern white pine	Pinus strobus	WDH	High	9.9	53.5	5.4	Lg. dec.	Lg. dec.	Low	Common	Very Poor	Very Poor			0	30
honeylocust	Gleditsia triacanthos	NSH	Low	13.9	49.6	8.2	Lg. dec.	Sm. inc.	High	Rare	Poor	Good	Infill +	Infill ++	1	31
eastern cottonwood	Populus deltoides	NSH	Low	14.5	45.2	4.8	Sm. dec.	No change	Medium	Rare	Very Poor	Poor		Infill +	2	32
shingle oak	Quercus imbricaria	NDH	Medium	6.7	41.5	3.9	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	33
chinkapin oak	Quercus muehlenbergii	NSL	Medium	22.1	38.6	2.0	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	1	34
flowering dogwood	Cornus florida	WDL	Medium	27.9	37.2	1.2	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair			1	35
American hornbeam; musclev	Carpinus caroliniana	WSL	Low	23.5	26.2	1.4	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good			1	36
common persimmon	Diospyros virginiana	NSL	Low	13.3	24.7	1.6	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	1	37
red pine	Pinus resinosa	NSH	Medium	2.4	22.6	6.3	Lg. dec.	Lg. dec.	Low	Rare	Very Poor	Very Poor			2	38
American basswood	Tilia americana	WSL	Medium	16.3	20.5	2.1	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	39
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	15.1	18.2	1.1	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	1	40
scarlet oak	Quercus coccinea	WDL	Medium	7.1	17.4	2.0	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	41
eastern redbud	Cercis canadensis	NSL	Low	18.2	17.1	1.1	No change	Sm. inc.	Medium	Rare	Poor	Fair			1	42
Osage-orange	Maclura pomifera	NDH	Medium	13.1	16.1	6.8	Sm. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	2	43
bigtooth aspen	Populus grandidentata	NSL	Medium	11.2	16.1	1.8	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	44
river birch	Betula nigra	NSL	Low	5.7	15.2	2.8	Sm. dec.	No change	Medium	Rare	Very Poor	Poor		Infill +	2	45
pawpaw	Asimina triloba	NSL	Low	12.9	14.9	1.4	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	46
Ohio buckeye	Aesculus glabra	NSL	Low	12	13.4	2.6	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	47

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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	3.5	13.3	3.8	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good	Infill +	Infill ++	2	48
red mulberry	Morus rubra	NSL	Low	16.8	12.0	5.0	No change	Sm. inc.	Medium	Rare	Poor	Fair	Infill +	Infill +	2	49
swamp white oak	Quercus bicolor	NSL	Low	3.4	8.6	3.4	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	50
swamp chestnut oak	Quercus michauxii	NSL	Low	1.1	8.2	6.1	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	51
mockernut hickory	Carya alba	WDL	Medium	4.8	7.9	2.2	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	2	52
shellbark hickory	Carya laciniosa	NSL	Low	1.3	7.6	3.4	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	53
northern catalpa	Catalpa speciosa	NSHX	FIA	4	6.1	3.7	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	54
Siberian elm	Ulmus pumila	NDH	FIA	2.8	5.9	4.2	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	55
ailanthus	Ailanthus altissima	NSL	FIA	2.4	4.9	2.6	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	56
black maple	Acer nigrum	NSH	Low	0.7	3.6	2.5	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor			0	57
northern pin oak	Quercus ellipsoidalis	NSH	Medium	1.6	3.3	5.5	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			0	58
winged elm	Ulmus alata	WDL	Medium	1.6	2.9	1.8	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	59
Scots pine	Pinus sylvestris	NSH	FIA	1.9	2.4	8.7	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	60
blue ash	Fraxinus quadrangulata	NSL	Low	3.5	2.3	1.6	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor			0	61
Shumard oak	Quercus shumardii	NSL	Low	0.6	2.2	3.5	No change	Lg. inc.	High	Rare	Fair	Good			2	62
Kentucky coffeetree	Gymnocladus dioicus	NSLX	FIA	2.2	2.0	1.6	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	63
rock elm	Ulmus thomasii	NSLX	FIA	4.1	1.2	3.5	Unknown	Unknown	Low	Rare	FIA Only	FIA Only			0	64
bur oak	Quercus macrocarpa	NDH	Medium	3.6	1.2	2.4	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	2	65
post oak	Quercus stellata	WDH	High	0.1	0.8	0.8	Lg. inc.	Lg. inc.	High	Rare	Good	Good			2	66
pecan	Carya illinoensis	NSH	Low	0.2	0.8	1.4	Lg. inc.	Lg. inc.	Low	Rare	Fair	Fair	Infill +	Infill +	2	67
Norway spruce	Picea abies	NSH	FIA	0.3	0.8	2.5	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	68
serviceberry	Amelanchier spp.	NSL	Low	0.7	0.6	0.3	Sm. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	69
butternut	Juglans cinerea	NSLX	FIA	0.3	0.2	0.3	Unknown	Unknown	Low	Rare	FIA Only	FIA Only			0	70
black ash	Fraxinus nigra	WSH	Medium	0.8	0.2	1.6	Lg. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor			0	71
bald cypress	Taxodium distichum	NSH	Medium	1.3	0.1	1.1	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	72
white mulberry	Morus alba	NSL	FIA	0.6	0.0	0.2	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	73
red spruce	Picea rubens	NDH	High	0	0	0	Unknown	Unknown	Low	Absent	Unknown	Unknown			0	74
jack pine	Pinus banksiana	NSH	Medium	0	0	0	Unknown	Unknown	High	Modeled	Unknown	Unknown			0	75
loblolly pine	Pinus taeda	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++	3	76
striped maple	Acer pensylvanicum	NSL	Medium	0	0	0	Unknown	New Habitat	Medium	Absent	Unknown	New Habitat			3	77
mountain maple	Acer spicatum	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			3	78
yellow buckeye	Aesculus flava	NSL	Low	0	0	0	Unknown	Unknown	Low	Modeled	Unknown	Unknown			0	79
yellow birch	Betula alleghaniensis	NDL	High	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown			0	80
cittamwood/gum bumelia	Sideroxylon lanuginosum ssp.	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			3	81
black hickory	Carya texana	NDL	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	82
sugarberry	Celtis laevigata	NDH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	83
sourwood	Oxydendrum arboreum	NDL	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	84
redbay	Persea borbonia	NSL	Low	0	0	0	Unknown	Unknown	High	Absent	Unknown	Unknown			0	85
pin cherry	Prunus pensylvanica	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	86
southern red oak	Quercus falcata	WDL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	87
cherrybark oak; swamp red o.	Quercus pagoda	NSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++	3	88
overcup oak	Quercus lyrata	NSL	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat		Migrate +	3	89
blackjack oak	Quercus marilandica	NSL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	90
water oak	Quercus nigra	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	91
willow oak	Quercus phellos	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	92
live oak	Quercus virginiana	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	93
bluejack oak	Quercus incana	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	94

Climate Change Atlas Tree Species

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Common Name	Scientific Name	Range	MR	%Cell	FIAsum	FIAiv	ChngCl45	ChngCl85	Adap	Abund	Capabil45	Capabil85	SHIFT45	SHIFT85	SSO	N
cedar elm	Ulmus crassifolia	NDH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			3	95