

Current and Potential Future Habitat, Capability, and Migration

	sq. km	sq. mi	FIA Plots
Area of Region	88,535	34,184	764

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	11	23	Increase	11	18	Very Good	0	0
Hickory	7			Medium	26	41	No Change	28	25	Good	8	14
Maple	4	Abundant	0	Low	33	10	Decrease	21	17	Fair	21	17
Oak	16	Common	10	FIA	8		New	1	1	Poor	13	16
Pine	3	Rare	58				Unknown	17	17	Very Poor	18	13
Other	34	Absent	7							FIA Only	5	5
	<b>68</b>		<b>75</b>		<b>78</b>	<b>74</b>		<b>78</b>	<b>78</b>	Unknown	9	9
											<b>74</b>	<b>74</b>
											<b>35</b>	<b>34</b>

Potential Changes in Climate Variables

Temperature (°F)

	Scenario	2009	2039	2069	2099	
Annual Average	CCSM45	60.4	62.2	63.9	64.5	
	CCSM85	60.4	62.8	64.8	67.6	
	GFDL45	60.4	66.3	65.2	66.5	
	GFDL85	60.4	63.3	66.3	70.2	
	HAD45	60.4	62.7	65.3	66.4	
	HAD85	60.4	62.9	67.4	70.6	
Growing Season (May—Sep)	CCSM45	76.3	78.3	79.9	80.6	
	CCSM85	76.3	79.1	81.1	84.5	
	GFDL45	76.3	84.3	82.2	84.7	
	GFDL85	76.3	80.3	83.8	88.8	
	HAD45	76.3	78.5	80.9	81.7	
	HAD85	76.3	79.1	84.1	86.8	
Coldest Month (Average)	CCSM45	36.3	38.6	39.5	40.2	
	CCSM85	36.3	38.7	39.5	41.1	
	GFDL45	36.3	39.9	40.1	40.2	
	GFDL85	36.3	37.4	38.8	39.4	
	HAD45	36.3	37.1	39.4	39.6	
	HAD85	36.3	39.2	41.2	42.9	
Warmest Month (Average)	CCSM45	82.7	84.5	85.7	86.1	
	CCSM85	82.7	85.5	86.4	88.2	
	GFDL45	82.7	87.7	88.5	90.4	
	GFDL85	82.7	87.5	89.3	93.5	
	HAD45	82.7	84.8	86.3	86.6	
	HAD85	82.7	86.0	88.5	89.6	

Precipitation (in)

	Scenario	2009	2039	2069	2099	
Annual Total	CCSM45	38.4	37.7	39.1	37.9	
	CCSM85	38.4	37.3	39.1	39.4	
	GFDL45	38.4	40.1	44.1	40.0	
	GFDL85	38.4	40.5	44.9	43.4	
	HAD45	38.4	39.6	39.7	41.4	
	HAD85	38.4	40.4	35.5	39.5	
Growing Season (May—Sep)	CCSM45	19.8	18.5	18.8	18.6	
	CCSM85	19.8	19.0	18.4	18.6	
	GFDL45	19.8	20.8	22.5	20.9	
	GFDL85	19.8	21.6	24.0	22.2	
	HAD45	19.8	20.2	20.3	20.7	
	HAD85	19.8	20.2	16.4	18.3	

**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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Section 255A

EcoMap 2007  
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
post oak	Quercus stellata	WDH	High	59.3	353.4	24.5	No change	No change	High	Common	Good	Good			1	1
blackjack oak	Quercus marilandica	NSL	Medium	52.4	123.7	11.6	No change	No change	High	Common	Good	Good			1	2
American elm	Ulmus americana	WDH	Medium	61.6	122.0	10.6	No change	No change	Medium	Common	Fair	Fair			1	3
eastern redcedar	Juniperus virginiana	WDH	Medium	52.5	117.8	11.7	No change	Sm. inc.	Medium	Common	Fair	Good	Infill +	Infill ++	1	4
winged elm	Ulmus alata	WDL	Medium	30.4	94.4	8.3	Sm. inc.	Sm. inc.	Medium	Common	Good	Good	Infill ++	Infill ++	1	5
Osage-orange	Maclura pomifera	NDH	Medium	24.3	73.1	9.8	No change	No change	High	Common	Good	Good	Infill ++	Infill ++	1	6
pecan	Carya illinoensis	NSH	Low	37.8	67.2	11.0	Sm. inc.	Sm. inc.	Low	Common	Fair	Fair	Infill +	Infill +	1	7
green ash	Fraxinus pennsylvanica	WSH	Low	32.4	65.1	6.5	No change	No change	Medium	Common	Fair	Fair	Infill +	Infill +	1	8
black oak	Quercus velutina	WDH	High	29.5	58.0	7.0	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor	Infill +	Infill +	0	9
black hickory	Carya texana	NDL	High	32	53.5	6.7	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor	Infill +	Infill +	0	10
hackberry	Celtis occidentalis	WDH	Medium	43.7	48.2	7.8	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	1	11
sugarberry	Celtis laevigata	NDH	Medium	34	42.7	5.0	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair	Infill +	Infill +	1	12
common persimmon	Diospyros virginiana	NSL	Low	22.3	37.2	5.0	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	1	13
honeylocust	Gleditsia triacanthos	NSH	Low	19.3	32.1	9.7	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	1	14
water oak	Quercus nigra	WDH	High	1.5	22.2	5.4	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	15
black willow	Salix nigra	NSH	Low	15.1	20.4	9.0	No change	Sm. inc.	Low	Rare	Very Poor	Poor		Infill +	1	16
sycamore	Platanus occidentalis	NSL	Low	9	19.1	3.8	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	17
red mulberry	Morus rubra	NSL	Low	20	18.6	3.8	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	18
southern red oak	Quercus falcata	WDL	Medium	2.7	16.7	4.8	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	2	19
white ash	Fraxinus americana	WDL	Medium	17.7	16.5	2.9	Sm. inc.	Lg. inc.	Low	Rare	Poor	Fair	Infill +	Infill +	1	20
cedar elm	Ulmus crassifolia	NDH	Medium	1.8	13.8	7.2	Lg. inc.	Lg. inc.	Low	Rare	Fair	Fair	Infill +	Infill +	2	21
boxelder	Acer negundo	WSH	Low	13.8	13.6	4.2	No change	Sm. inc.	High	Rare	Fair	Good	Infill +	Infill ++	1	22
Shumard oak	Quercus shumardii	NSL	Low	15	12.4	3.6	No change	Sm. inc.	High	Rare	Fair	Good	Infill +	Infill ++	1	23
black walnut	Juglans nigra	WDH	Low	19.2	11.8	4.2	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	1	24
eastern cottonwood	Populus deltoides	NSH	Low	10.3	10.6	8.4	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair	Infill +	Infill +	2	25
slippery elm	Ulmus rubra	WSL	Low	19.5	9.1	2.9	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good	Infill +	Infill ++	1	26
cittamwood/gum bumelia	Sideroxylon lanuginosum ssp.	NSL	Low	21.9	8.6	2.1	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	1	27
chinkapin oak	Quercus muehlenbergii	NSL	Medium	15.6	7.9	3.5	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	28
bitternut hickory	Carya cordiformis	NSL	Low	10.9	7.7	3.8	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	2	29
shortleaf pine	Pinus echinata	WDH	High	0.4	7.3	5.1	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	30
black locust	Robinia pseudoacacia	NDH	Low	5.2	6.9	14.8	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			2	31
river birch	Betula nigra	NSL	Low	1	6.6	2.2	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			2	32
pin oak	Quercus palustris	NSH	Low	6.1	6.5	5.3	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor			2	33
mockernut hickory	Carya alba	WDL	Medium	4.2	5.7	1.8	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	2	34
bur oak	Quercus macrocarpa	NDH	Medium	11.5	5.6	4.4	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor	Infill +	Infill +	2	35
eastern redbud	Cercis canadensis	NSL	Low	19.8	5.4	1.7	Sm. dec.	No change	Medium	Rare	Very Poor	Poor		Infill +	1	36
ashe juniper	Juniperus ashei	NDH	High	2	4.9	19.7	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			0	37
sweetgum	Liquidambar styraciflua	WDH	High	0.3	4.5	3.5	No change	Sm. inc.	Medium	Rare	Poor	Fair	Infill +	Infill +	2	38
northern red oak	Quercus rubra	WDH	Medium	12	4.2	3.3	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	2	39
loblolly pine	Pinus taeda	WDH	High	1.4	3.9	15.3	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	40
willow oak	Quercus phellos	NSL	Low	0.1	3.3	4.1	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			2	41
wild plum	Prunus americana	NSLX	FIA	7.5	3.3	2.0	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	42
Siberian elm	Ulmus pumila	NDH	FIA	3.9	2.9	7.2	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	43
black cherry	Prunus serotina	WDL	Medium	7.2	2.1	1.8	No change	No change	Low	Rare	Very Poor	Very Poor			2	44
white mulberry	Morus alba	NSL	FIA	2.5	2.1	2.2	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	45
sassafras	Sassafras albidum	WSL	Low	0.8	2.0	2.1	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	46
cherrybark oak; swamp red o	Quercus pagoda	NSL	Medium	0.2	1.8	4.3	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	47



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Common Name	Scientific Name	Range	MR	%Cell	FIAsum	FIAiv	ChngCl45	ChngCl85	Adap	Abund	Capabil45	Capabil85	SHIFT45	SHIFT85	SSO	N
Texas ash	Fraxinus texensis	NDH	FIA	1.3	1.7	3.4	Unknown	Unknown	NA	Rare	FIA Only	FIA Only			0	48
flowering dogwood	Cornus florida	WDL	Medium	2.3	1.6	0.6	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			2	49
overcup oak	Quercus lyrata	NSL	Medium	0.2	1.6	1.5	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor			0	50
Kentucky coffeetree	Gymnocladus dioicus	NSLX	FIA	3.6	1.5	3.4	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			2	51
northern catalpa	Catalpa speciosa	NSHX	FIA	1.1	1.5	10.1	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	52
silver maple	Acer saccharinum	NSH	Low	2.2	1.5	4.0	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor	Infill +		2	53
white oak	Quercus alba	WDH	Medium	2.4	1.0	2.3	Sm. inc.	Sm. inc.	High	Rare	Good	Good			2	54
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	0.5	0.7	2.2	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	2	55
blackgum	Nyssa sylvatica	WDL	Medium	0	0.4	0.2	No change	Sm. inc.	High	Rare	Fair	Good	Infill +		2	56
water hickory	Carya aquatica	NSL	Medium	0	0.4	0.2	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	57
sugar maple	Acer saccharum	WDH	High	0.4	0.2	0.5	No change	Sm. inc.	High	Rare	Fair	Good	Infill +		2	58
red maple	Acer rubrum	WDH	High	0	0.2	0.4	No change	No change	High	Rare	Fair	Fair			0	59
pignut hickory	Carya glabra	WDL	Medium	0	0.2	0.5	Sm. dec.	No change	Medium	Rare	Very Poor	Poor			0	60
shagbark hickory	Carya ovata	WSL	Medium	0.6	0.2	2.1	Sm. dec.	No change	Medium	Rare	Very Poor	Poor			0	61
American hornbeam; musclev	Carpinus caroliniana	WSL	Low	0.1	0.2	1.0	Sm. dec.	No change	Medium	Rare	Very Poor	Poor			0	62
Nuttall oak	Quercus texana	NSH	Medium	0.5	0.2	5.5	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			0	63
Scots pine	Pinus sylvestris	NSH	FIA	0.5	0.1	4.7	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	64
blue ash	Fraxinus quadrangulata	NSL	Low	0.3	0.1	1.3	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor			0	65
serviceberry	Amelanchier spp.	NSL	Low	0.9	0.0	0.7	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	66
American basswood	Tilia americana	WSL	Medium	0.1	0.0	0.2	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	67
durand oak	Quercus sinuata var. sinuata	NSL	FIA	0	0.0	0.0	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	68
Atlantic white-cedar	Chamaecyparis thyoides	NSH	Low	0	0	0	Unknown	Unknown	Low	Modeled	Unknown	Unknown			0	69
florida maple	Acer barbatum	NSL	Low	0	0	0	Unknown	Unknown	High	Modeled	Unknown	Unknown			0	70
mountain maple	Acer spicatum	NSL	Low	0	0	0	Unknown	Unknown	High	Absent	Unknown	Unknown			0	71
pawpaw	Asimina triloba	NSL	Low	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown			0	72
black ash	Fraxinus nigra	WSH	Medium	0	0	0	Unknown	Unknown	Low	Absent	Unknown	Unknown			0	73
cucumbertree	Magnolia acuminata	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	74
bigleaf magnolia	Magnolia macrophylla	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	75
pin cherry	Prunus pensylvanica	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	76
swamp chestnut oak	Quercus michauxii	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	77
live oak	Quercus virginiana	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++	3	78

