One x One Degree

Climate Change Atlas Tree Species Current and Potential Future Habitat, Capability, and Migration

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

sq. km sq. mi FIA Plots Area of Region 10,188 3,933.4 307

Species Information

The columns below provide breif 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								in Habitat Suitability	Capability	Migration Potential				
Ash	2				Model			Scenario	Scenario		Scenario	Scenario		SHIFT	SHIFT
Hickory	8	Abu	ndance		Reliability	Adaptability		RCP45	RCP85		RCP45	RCP85		RCP45	RCP85
Maple	4	Abundant	5	High	14	23	Increase	27	29	Very Good	15	16	Likely	1	1
Oak	14	Common	21	Medium	30	45	No Change	17	16	Good	11	13	Infill	14	15
Pine	2	Rare	36	Low	33	10	Decrease	15	14	Fair	10	10	Migrate	9	9
Other	32	Absent	17	FIA	3		New	13	13	Poor	11	8	-	24	25
-	62		79	•	80	78	Unknown	8	8	Very Poor	12	12			
							•	80	80	FIA Only	1	1			
										Unknown	5	5			
Potential Changes in Climate Variables										•	65	65			

Potential Changes in Climate Variables

Temperature (°F)											
	Scenario	2009	2039	2069	2099						
Annual	CCSM45	61.8	63.4	65.2	65.6						
Average	CCSM85	61.8	64.1	66.4	69.1						
	GFDL45	61.8	64.9	66.4	67.7						
	GFDL85	61.8	64.7	67.5	71.2						
	HAD45	61.8	64.0	66.8	67.9						
	HAD85	61.8	64.3	68.6	72.0						
Growing	CCSM45	76.6	78.1	79.8	80.4						
Season	CCSM85	76.6	79.2	81.4	84.7						
May—Sep	GFDL45	76.6	80.4	82.1	84.5						
	GFDL85	76.6	80.5	83.7	88.4						
	HAD45	76.6	79.1	81.8	82.7						
	HAD85	76.6	79.6	84.9	87.8						
Coldest	CCSM45	39.3	41.8	42.8	43.1						
Month	CCSM85	39.3	41.9	42.9	44.4						
Average	GFDL45	39.3	43.0	43.3	43.4						
	GFDL85	39.3	40.3	41.9	42.4						
	HAD45	39.3	39.8	41.9	42.2						
	HAD85	39.3	41.8	43.6	45.3						
Warmest	CCSM45	82.6	84.0	84.8	85.0						
Month	CCSM85	82.6	85.3	86.0	87.7						
Average	GFDL45	82.6	87.6	88.3	90.0						
	GFDL85	82.6	87.3	88.9	92.6						
	HAD45	82.6	85.2	86.8	87.1						

Precipitation (in)												
	Scenario	2009	2039	2069	2099							
Annual	CCSM45	48.3	47.8	49.1	48.9 ◆◆◆							
Total	CCSM85	48.3	47.1	49.9	49.7							
	GFDL45	48.3	50.0	55.7	50.0							
	GFDL85	48.3	50.3	55.3	54.0							
	HAD45	48.3	49.1	50.7	52.3							
	HAD85	48.3	52.8	45.7	49.0							
Growing	CCSM45	21.1	20.9	19.9	20.8							
Season	CCSM85	21.1	20.4	19.1	19.6 ◆◆◆◆							
May—Sep	GFDL45	21.1	22.1	24.5	22.4							
	GFDL85	21.1	22.7	25.1	23.4							
	HAD45	21.1	21.1	21.0	21.4							
	HAD85	21.1	22.3	16.7	17.9							

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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HAD85

82.6

86.3

89.0

90.0

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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	90.4	2645.4	23.1 No change	No change	High	Abundant	Very Good	Very Good			1 1
shortleaf pine	Pinus echinata	WDH	High	67.9	1783.6	21.8 No change	No change	Medium	Abundant	Good	Good			1 2
loblolly pine	Pinus taeda	WDH	High	39.2	1273.0	27.0 Sm. inc.	Sm. inc.	Medium	Abundant	Very Good	Very Good			1 3
winged elm	Ulmus alata	WDL	Medium	86.4	693.0	6.0 Sm. inc.	Sm. inc.	Medium	Abundant	Very Good	Very Good			1 4
eastern redcedar	Juniperus virginiana	WDH	Medium	66	515.8	6.2 Sm. inc.	Sm. inc.	Medium	Abundant	Very Good	Very Good			1 5
blackjack oak	Quercus marilandica	NSL	Medium	64.4	463.1	5.6 Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1 6
black hickory	Carya texana	NDL	High	57	358.4	4.5 No change	No change	Medium	Common	Fair	Fair			1 7
mockernut hickory	Carya alba	WDL	Medium	67.3	320.1	4.2 Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1 8
water oak	Quercus nigra	WDH	High	34.2	270.7	5.3 Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1 9
southern red oak	Quercus falcata	WDL	Medium	26.7	235.3	6.0 Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1 10
sweetgum	Liquidambar styraciflua	WDH	High	14.9	231.6	9.9 Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good	Infill ++	Infill ++	1 11
green ash	Fraxinus pennsylvanica	WSH	Low	34.5	227.1	5.6 Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1 12
Osage-orange	Maclura pomifera	NDH	Medium	18.3	187.9	5.8 No change	No change	High	Common	Good	Good			1 13
black oak	Quercus velutina	WDH	High	37.4	146.9	3.0 Sm. inc.	No change	Medium	Common	Good	Fair			1 14
American elm	Ulmus americana	WDH	Medium	26.8	135.9	3.7 Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1 15
white ash	Fraxinus americana	WDL	Medium	31.8	126.6	3.4 Sm. inc.	Sm. inc.	Low	Common	Fair	Fair			1 16
honeylocust	Gleditsia triacanthos	NSH	Low	13.9	123.3	6.4 No change	Sm. inc.	High	Common	Good	Very Good			1 17
white oak	Quercus alba	WDH	Medium	20.2	120.5	4.2 Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1 18
sugarberry	Celtis laevigata	NDH	Medium	23.4	83.8	2.5 Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1 19
northern red oak	Quercus rubra	WDH	Medium	22	81.3	3.1 Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good	Infill ++	Infill ++	1 20
blackgum	Nyssa sylvatica	WDL	Medium	21	79.5	2.9 Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1 21
cedar elm	Ulmus crassifolia	NDH	Medium	8.5	78.3	6.4 Sm. inc.	Lg. inc.	Low	Common	Fair	Good	Infill +	Infill ++	2 22
slippery elm	Ulmus rubra	WSL	Low	11.2	76.6	5.6 Sm. dec.	Sm. inc.	Medium	Common	Poor	Good			1 23
red maple	Acer rubrum	WDH	High	18	66.3	2.9 Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good	Infill ++	Infill ++	1 24
Shumard oak	Quercus shumardii	NSL	Low	7.6	62.8	5.6 No change	No change	High	Common	Good	Good			1 25
bitternut hickory	Carya cordiformis	WSL	Low	9.8	52.1	2.9 Sm. dec.	Sm. dec.	High	Common	Fair	Fair			1 26
common persimmon	Diospyros virginiana	NSL	Low	14.2	45.8	3.3 Sm. inc.	Lg. inc.	High	Rare	Good	Good			1 27
sycamore	Platanus occidentalis	NSL	Low	5.3	43.6	2.6 No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	1 28
boxelder	Acer negundo	WSH	Low	4.2	42.9	2.4 No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	1 29
cherrybark oak; swamp red o	Quercus pagoda	NSL	Medium	3.1	40.5	9.0 No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	1 30
black willow	Salix nigra	NSH	Low	5.6	40.5	4.1 No change	No change	Low	Rare	Very Poor	Very Poor			0 31
black cherry	Prunus serotina	WDL	Medium	19.2	40.4	1.3 Lg. inc.	Lg. inc.	Low	Rare	Fair	Fair			1 32
river birch	Betula nigra	NSL	Low	10.2	40.1	3.8 Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good			1 33
willow oak	Quercus phellos	NSL	Low	3.7	39.6	4.5 No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2 34
cittamwood/gum bumelia	Sideroxylon lanuginosum ssp.	. NSL	Low	14.3	36.2	2.3 Lg. inc.	Lg. inc.	High	Rare	Good	Good			1 35
American hornbeam; muscle	e Carpinus caroliniana	WSL	Low	7.5	25.5	2.8 No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	1 36
eastern hophornbeam; irony	v Ostrya virginiana	WSL	Low	13	19.1	1.2 Lg. inc.	Lg. inc.	High	Rare	Good	Good			1 37
chinkapin oak	Quercus muehlenbergii	NSL	Medium	5.3	17.1	2.2 Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0 38
pecan	Carya illinoinensis	NSH	Low	5.2	16.7	2.7 Sm. inc.	Lg. inc.	Low	Rare	Poor	Fair	Infill +	Infill +	1 39
silver maple	Acer saccharinum	NSH	Low	0.1	16.4	1.5 Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			0 40
hackberry	Celtis occidentalis	WDH	Medium	6.5	14.4	2.7 No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	1 41
eastern redbud	Cercis canadensis	NSL	Low	8.2	13.7	1.1 No change	No change	Medium	Rare	Poor	Poor			1 42
sassafras	Sassafras albidum	WSL	Low	2.9	10.5	3.6 Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1 43
shagbark hickory	Carya ovata	WSL	Medium	1.4	10.4	2.4 Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0 44
overcup oak	Quercus lyrata	NSL	Medium	1.9	10.1	2.6 Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor			2 45
ailanthus	Ailanthus altissima	NSL	FIA	1	10.1	10.3 Unknown	Unknown	NA	Rare	NNIS	NNIS			0 46
red mulberry	Morus rubra	NSL	Low	7.8	9.7	1.2 No change	Sm. inc.	Medium	Rare	Poor	Fair			1 47



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pin oak	Quercus palustris	NSH	Low	2.9	9.2	3.1 Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor			0 48
florida maple	Acer barbatum	NSL	Low	1.8	8.5	4.1 No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	2 49
water hickory	Carya aquatica	NSL	Medium	2.8	7.8	2.5 Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0 50
black walnut	Juglans nigra	WDH	Low	1.3	7.7	3.4 Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0 51
water elm	Planera aquatica	NSL	Low	1	7.1	7.2 Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0 52
flowering dogwood	Cornus florida	WDL	Medium	8.5	5.5	0.6 Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good	Infill +	Infill ++	1 53
wild plum	Prunus americana	NSLX	FIA	4.4	3.4	0.6 Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0 54
American holly	Ilex opaca	NSL	Medium	1.4	3.2	1.2 No change	No change	Medium	Rare	Poor	Poor		Infill +	2 55
black locust	Robinia pseudoacacia	NDH	Low	1.1	2.6	0.5 Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0 56
pignut hickory	Carya glabra	WDL	Medium	2	2.3	1.2 Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2 57
serviceberry	Amelanchier spp.	NSL	Low	1	0.6	0.6 Lg. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0 58
white mulberry	Morus alba	NSL	FIA	1	0.6	0.6 Unknown	Unknown	NA	Rare	NNIS	NNIS			0 59
nuttall oak	Quercus texana	NSH	Medium	1	0.5	0.5 Lg. dec.	Lg. dec.	High	Rare	Poor	Poor			0 60
shellbark hickory	Carya laciniosa	NSL	Low	0.8	0.5	0.4 Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0 61
pawpaw	Asimina triloba	NSL	Low	0.5	0.4	0.2 Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0 62
ashe juniper	Juniperus ashei	NDH	High	0	0	0 New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0 63
slash pine	Pinus elliottii	NDH	High	0	0	0 New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3 64
longleaf pine	Pinus palustris	NSH	Medium	0	0	0 New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3 65
American beech	Fagus grandifolia	WDH	High	0	0	0 New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3 66
black ash	Fraxinus nigra	WSH	Medium	0	0	0 New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			3 67
silverbell	Halesia spp.	NSL	Low	0	0	0 Unknown	Unknown	Medium	Absent	Unknown	Unknown			0 68
yellow-poplar	Liriodendron tulipifera	WDH	High	0	0	0 New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3 69
southern magnolia	Magnolia grandiflora	NSL	Low	0	0	0 New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3 70
sweetbay	Magnolia virginiana	NSL	Medium	0	0	0 New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3 71
mountain or Fraser magnol	ia Magnolia fraseri	NSL	Low	0	0	0 Unknown	Unknown	Low	Absent	Unknown	Unknown			0 72
water tupelo	Nyssa aquatica	NSH	Medium	0	0	0 Unknown	Unknown	Low	Absent	Unknown	Unknown			0 73
sourwood	Oxydendrum arboreum	NDL	High	0	0	0 New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3 74
eastern cottonwood	Populus deltoides	NSH	Low	0	0	0 New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +	3 75
pin cherry	Prunus pensylvanica	NSL	Low	0	0	0 Unknown	Unknown	Medium	Absent	Unknown	Unknown			0 76
laurel oak	Quercus laurifolia	NDH	Medium	0	0	0 New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3 77
bur oak	Quercus macrocarpa	NDH	Medium	0	0	0 Unknown	Unknown	High	Modeled	Unknown	Unknown			0 78
live oak	Quercus virginiana	NDH	High	0	0	0 New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++	3 79
bluejack oak	Quercus incana	NSL	Low	0	0	0 New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3 80

