S31 E81

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	8,052.8	3,109.2	245

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		Abundance		Model Reliability	Adaptability		Potential Change in Habitat Suitability			Capability to Cope or Persist			Migration Potential	
								Scenario RCP45	Scenario RCP85			Scenario RCP45	Scenario RCP85		SHIFT RCP45	SHIFT RCP85
Ash	3														
Hickory	2														
Maple	2	Abundant	5	High	13	19	Increase	18	22	Very Good	5	9	Likely	1	1
Oak	14	Common	15	Medium	34	45	No Change	16	14	Good	14	11	Infill	13	18
Pine	5	Rare	37	Low	27	12	Decrease	20	18	Fair	7	10	Migrate	1	3
Other	31	Absent	18	FIA	3		New	7	9	Poor	14	12		**15**	**22**
	57		**75**		**77**	**76**	Unknown	16	14	Very Poor	8	7			
								77	**77**	FIA Only	3	3			
										Unknown	13	11			
											64	**63**			

Potential Changes in Climate Variables

Temperature (°F)

	Scenario	2009	2039	2069	2099	
Annual	CCSM45	67.0	68.5	70.3	70.2	
Average	CCSM85	67.0	68.7	70.9	73.2	
	GFDL45	67.0	69.9	71.5	72.3	
	GFDL85	67.0	69.6	72.5	76.0	
	HAD45	67.0	68.9	71.3	72.6	
	HAD85	67.0	69.3	72.3	75.8	
Growing	CCSM45	78.8	79.9	81.3	81.7	
Season	CCSM85	78.8	80.0	82.2	85.0	
May—Sep	GFDL45	78.8	81.6	83.0	84.2	
	GFDL85	78.8	81.4	84.3	88.1	
	HAD45	78.8	81.3	83.4	84.8	
	HAD85	78.8	81.4	85.5	88.7	
Coldest	CCSM45	49.2	51.5	52.3	52.1	
Month	CCSM85	49.2	51.2	52.2	53.5	
Average	GFDL45	49.2	51.9	52.3	52.9	
	GFDL85	49.2	51.4	52.5	53.3	
	HAD45	49.2	49.1	50.4	51.3	
	HAD85	49.2	50.0	51.0	52.6	
Warmest	CCSM45	82.6	83.8	84.7	84.9	
Month	CCSM85	82.6	83.9	85.3	86.9	
Average	GFDL45	82.6	84.5	85.2	86.0	
	GFDL85	82.6	84.7	86.2	88.3	
	HAD45	82.6	85.4	86.5	87.1	
	HAD85	82.6	85.6	88.0	89.4	

Precipitation (in)

	Scenario	2009	2039	2069	2099	
Annual	CCSM45	48.2	51.1	52.7	53.9	
Total	CCSM85	48.2	50.2	53.5	54.7	
	GFDL45	48.2	55.7	56.9	58.9	
	GFDL85	48.2	53.6	59.7	58.9	
	HAD45	48.2	45.7	45.0	48.8	
	HAD85	48.2	47.0	44.9	45.3	
Growing	CCSM45	25.0	27.7	27.9	28.2	
Season	CCSM85	25.0	26.1	29.0	28.8	
May—Sep	GFDL45	25.0	31.6	32.1	33.2	
	GFDL85	25.0	30.4	35.2	35.1	
	HAD45	25.0	24.1	22.9	23.4	
	HAD85	25.0	23.9	20.7	20.0	

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
loblolly pine	Pinus taeda	WDH	High	91.5	2764.2	26.2	No change	No change	Medium	Abundant	Good	Good			1	1
slash pine	Pinus elliottii	NDH	High	71.4	2369.9	25.6	No change	No change	Medium	Abundant	Good	Good			1	2
swamp tupelo	Nyssa biflora	NDH	Medium	68	730.4	8.2	No change	No change	Low	Abundant	Fair	Fair			0	3
red maple	Acer rubrum	WDH	High	79.7	628.3	6.4	No change	No change	High	Abundant	Very Good	Very Good			1	4
sweetgum	Liquidambar styraciflua	WDH	High	72.9	566.2	6.8	No change	Sm. inc.	Medium	Abundant	Good	Very Good			1	5
laurel oak	Quercus laurifolia	NDH	Medium	66.1	392.8	5.0	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	6
water oak	Quercus nigra	WDH	High	63.4	359.3	4.4	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	7
longleaf pine	Pinus palustris	NSH	Medium	22	290.4	9.2	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	8
live oak	Quercus virginiana	NDH	High	39.8	270.9	6.7	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	9
pond cypress	Taxodium ascendens	NSH	Medium	33.7	185.1	3.6	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good			1	10
redbay	Persea borbonia	NSL	Low	52.7	184.0	2.7	No change	No change	High	Common	Good	Good			1	11
loblolly-bay	Gordonia lasianthus	NSH	Medium	22.4	133.0	5.1	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	12
sweetbay	Magnolia virginiana	NSL	Medium	36.8	129.8	2.5	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good			1	13
green ash	Fraxinus pennsylvanica	WSH	Low	22.6	116.0	4.6	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	14
cabbage palmetto	Sabal palmetto	NDH	Medium	11	105.3	6.7	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			0	15
pond pine	Pinus serotina	NSH	Medium	13	74.9	3.8	Sm. inc.	Sm. inc.	Low	Common	Fair	Fair			1	16
bald cypress	Taxodium distichum	NSH	Medium	9.5	72.2	5.8	No change	No change	Medium	Common	Fair	Fair	Infill +	Infill +	1	17
water tupelo	Nyssa aquatica	NSH	Medium	10.5	69.3	3.2	Sm. dec.	Sm. dec.	Low	Common	Poor	Poor			0	18
eastern redcedar	Juniperus virginiana	WDH	Medium	12.8	68.0	7.9	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor	Infill +	Infill +	0	19
southern red oak	Quercus falcata	WDL	Medium	11.4	54.7	4.0	No change	Lg. inc.	High	Common	Good	Very Good	Infill ++	Infill ++	1	20
black willow	Salix nigra	NSH	Low	12.9	42.5	3.4	Sm. inc.	Lg. inc.	Low	Rare	Poor	Fair			1	21
yellow-poplar	Liriodendron tulipifera	WDH	High	7.9	40.2	3.4	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor	Infill +	Infill +	1	22
ogeechee tupelo	Nyssa ogeche	NSLX	FIA	8.1	36.1	2.6	Unknown	Unknown	Low	Rare	FIA Only	FIA Only			0	23
turkey oak	Quercus laevis	NSH	Medium	4.4	23.7	4.7	Sm. dec.	No change	High	Rare	Poor	Fair		Infill +	1	24
willow oak	Quercus phellos	NSL	Low	9.4	23.5	2.1	No change	Sm. inc.	Medium	Rare	Poor	Fair	Infill +	Infill +	1	25
southern magnolia	Magnolia grandiflora	NSL	Low	6.2	18.7	1.7	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	1	26
water hickory	Carya aquatica	NSL	Medium	5.8	18.1	2.9	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	27
American elm	Ulmus americana	WDH	Medium	7.8	18.1	1.7	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	2	28
American holly	Ilex opaca	NSL	Medium	9.7	15.8	1.1	Sm. inc.	Sm. inc.	Medium	Rare	Poor	Poor			1	29
winged elm	Ulmus alata	WDL	Medium	7.4	14.4	1.9	No change	Sm. inc.	Medium	Rare	Poor	Fair		Infill +	1	30
swamp chestnut oak	Quercus michauxii	NSL	Low	7.7	13.5	1.2	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	31
American hornbeam; musclev	Carpinus caroliniana	WSL	Low	5.8	12.4	2.0	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair	Infill +	Infill +	1	32
overcup oak	Quercus lyrata	NSL	Medium	5.8	12.3	1.9	No change	No change	Low	Rare	Very Poor	Very Poor			2	33
river birch	Betula nigra	NSL	Low	4.6	12.2	2.4	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	1	34
cherrybark oak; swamp red o	Quercus pagoda	NSL	Medium	2.5	12.0	4.8	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	35
sugarberry	Celtis laevigata	NDH	Medium	7.4	9.8	1.3	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	2	36
Shumard oak	Quercus shumardii	NSL	Low	1.2	9.2	7.4	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			0	37
common persimmon	Diospyros virginiana	NSL	Low	10.5	8.8	0.8	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor			1	38
post oak	Quercus stellata	WDH	High	6.4	8.6	0.9	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	2	39
blackgum	Nyssa sylvatica	WDL	Medium	11.3	7.8	0.9	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	1	40
black cherry	Prunus serotina	WDL	Medium	7.1	6.9	1.5	Lg. inc.	Lg. inc.	Low	Rare	Fair	Fair			1	41
white oak	Quercus alba	WDH	Medium	1.2	6.5	5.2	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor		Infill +	2	42
red mulberry	Morus rubra	NSL	Low	3.7	4.6	1.2	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	43
spruce pine	Pinus glabra	NSL	Low	0.9	3.9	2.2	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	44
flowering dogwood	Cornus florida	WDL	Medium	3.6	3.0	0.8	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	45
Carolina ash	Fraxinus caroliniana	NSL	FIA	1.2	3.0	2.4	Unknown	Unknown	NA	Rare	FIA Only	FIA Only			0	46
pignut hickory	Carya glabra	WDL	Medium	1.9	2.2	0.7	Very Lg. dec.	Lg. dec.	Medium	Rare	Lost	Very Poor			0	47

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eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	3.7	2.0	0.5	Very Lg. dec.	Lg. dec.	High	Rare	Lost	Poor			0	48
sassafras	Sassafras albidum	WSL	Low	1.2	1.5	1.2	Sm. dec.	No change	Medium	Rare	Very Poor	Poor		Infill +	2	49
bluejack oak	Quercus incana	NSL	Low	1.2	1.4	1.1	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good			2	50
honeylocust	Gleditsia triacanthos	NSH	Low	1.2	1.3	1.0	No change	No change	High	Rare	Fair	Fair		Infill +	2	51
eastern redbud	Cercis canadensis	NSL	Low	1.1	1.2	0.8	Very Lg. dec.	Very Lg. dec.	Medium	Rare	Lost	Lost			0	52
boxelder	Acer negundo	WSH	Low	1.2	1.0	0.8	Very Lg. dec.	Very Lg. dec.	High	Rare	Lost	Lost			0	53
white ash	Fraxinus americana	WDL	Medium	1.6	0.8	0.2	Very Lg. dec.	Very Lg. dec.	Low	Rare	Lost	Lost			0	54
waterlocust	Gleditsia aquatica	NSLX	FIA	0.9	0.8	0.4	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	55
black oak	Quercus velutina	WDH	High	0.7	0.7	0.3	Lg. dec.	Very Lg. dec.	Medium	Rare	Very Poor	Lost			0	56
slippery elm	Ulmus rubra	WSL	Low	0.5	0.7	0.2	Very Lg. dec.	Very Lg. dec.	Medium	Rare	Lost	Lost			0	57
sand pine	Pinus clausa	NDH	High	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat	Likely +	Likely +	3	58
shortleaf pine	Pinus echinata	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	59
serviceberry	Amelanchier spp.	NSL	Low	0	0	0	Unknown	New Habitat	Medium	Absent	Unknown	New Habitat			3	60
cittamwood/gum bumelia	Sideroxylon lanuginosum ssp.	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			0	61
bitternut hickory	Carya cordiformis	WSL	Low	0	0	0	Unknown	Unknown	High	Modeled	Unknown	Unknown			0	62
shellbark hickory	Carya laciniosa	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	63
shagbark hickory	Carya ovata	WSL	Medium	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	64
black hickory	Carya texana	NDL	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	65
mockernut hickory	Carya alba	WDL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++	3	66
black ash	Fraxinus nigra	WSH	Medium	0	0	0	Unknown	Unknown	Low	Absent	Unknown	Unknown			0	67
cucumbertree	Magnolia acuminata	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	68
bigleaf magnolia	Magnolia macrophylla	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	69
sourwood	Oxydendrum arboreum	NDL	High	0	0	0	Unknown	Unknown	High	Absent	Unknown	Unknown			0	70
scarlet oak	Quercus coccinea	WDL	Medium	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	71
blackjack oak	Quercus marilandica	NSL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate +	3	72
chinkapin oak	Quercus muehlenbergii	NSL	Medium	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	73
nuttall oak	Quercus texana	NSH	Medium	0	0	0	Unknown	New Habitat	High	Absent	Unknown	New Habitat			0	74
black locust	Robinia pseudoacacia	NDH	Low	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown			0	75
American mountain-ash	Sorbus americana	NSL	Low	0	0	0	Unknown	Unknown	Low	Absent	Unknown	Unknown			0	76
cedar elm	Ulmus crassifolia	NDH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			0	77

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