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

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Iverson, Peters, Prasad, Matthews

	sq. km	sq. mi	FIA Plots
Area of Region	10,023	3,869.9	259

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
Ash	4
Hickory	4
Maple	3
Oak	17
Pine	6
Other	34
	68

Abundance	
Abundant	3
Common	24
Rare	41
Absent	11
	79

	Model Reliability	Adaptability
High	15	19
Medium	36	51
Low	28	9
FIA	3	
	82	**79**

Potential Change in Habitat Suitability	Scenario RCP45	Scenario RCP85
Increase	21	27
No Change	16	17
Decrease	28	21
New	4	5
Unknown	13	12
	82	**82**

Capability to Cope or Persist	Scenario RCP45	Scenario RCP85
Very Good	10	11
Good	9	17
Fair	12	10
Poor	17	15
Very Poor	11	5
FIA Only	2	2
Unknown	10	9
	71	**69**

Migration Potential	SHIFT RCP45	SHIFT RCP85
Likely	0	0
Infill	11	14
Migrate	1	2
	12	**16**

Potential Changes in Climate Variables

Temperature (°F)

	Scenario	2009	2039	2069	2099
Annual Average	CCSM45	61.4	63.1	65.1	65.2
	CCSM85	61.4	63.4	65.7	68.6
	GFDL45	61.4	64.0	66.2	67.1
	GFDL85	61.4	64.2	67.4	70.9
	HAD45	61.4	63.3	66.0	67.4
	HAD85	61.4	63.6	66.9	70.8
Growing Season May—Sep	CCSM45	75.2	76.8	78.5	79.0
	CCSM85	75.2	76.9	79.4	82.8
	GFDL45	75.2	77.9	80.4	81.7
	GFDL85	75.2	78.3	81.8	85.7
	HAD45	75.2	77.5	80.0	81.5
	HAD85	75.2	77.6	81.7	85.7
Coldest Month Average	CCSM45	40.6	42.9	43.7	43.8
	CCSM85	40.6	42.9	43.8	45.3
	GFDL45	40.6	43.9	44.3	45.0
	GFDL85	40.6	42.7	43.6	44.8
	HAD45	40.6	41.2	42.9	43.4
	HAD85	40.6	41.5	42.7	44.3
Warmest Month Average	CCSM45	80.2	82.0	82.9	82.9
	CCSM85	80.2	82.1	83.8	85.2
	GFDL45	80.2	82.7	83.7	84.7
	GFDL85	80.2	83.3	85.0	87.3
	HAD45	80.2	82.8	84.3	84.9
	HAD85	80.2	83.2	85.7	88.1

Precipitation (in)

	Scenario	2009	2039	2069	2099
Annual Total	CCSM45	48.5	54.5	56.0	56.9
	CCSM85	48.5	54.4	56.8	64.0
	GFDL45	48.5	52.1	56.0	58.9
	GFDL85	48.5	51.9	57.3	57.9
	HAD45	48.5	51.8	52.0	50.9
	HAD85	48.5	54.7	50.3	48.3
Growing Season May—Sep	CCSM45	24.6	30.3	31.2	32.0
	CCSM85	24.6	28.6	30.9	34.9
	GFDL45	24.6	26.9	29.6	31.4
	GFDL85	24.6	26.4	31.0	31.8
	HAD45	24.6	26.4	25.7	24.5
	HAD85	24.6	28.2	24.7	21.8

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.

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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	83.6	4036.5	34.8	No change	No change	Medium	Abundant	Good	Good			1	1
sweetgum	Liquidambar styraciflua	WDH	High	90.6	1736.2	13.6	No change	No change	Medium	Abundant	Good	Good			1	2
red maple	Acer rubrum	WDH	High	88.2	1438.5	11.6	Sm. dec.	Sm. dec.	High	Abundant	Good	Good			1	3
water oak	Quercus nigra	WDH	High	63.7	467.0	5.2	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	4
yellow-poplar	Liriodendron tulipifera	WDH	High	40.8	383.2	5.9	Sm. dec.	Sm. dec.	High	Common	Fair	Fair			1	5
swamp tupelo	Nyssa biflora	NDH	Medium	51.3	363.4	5.2	Sm. inc.	Sm. inc.	Low	Common	Fair	Fair			1	6
American holly	Ilex opaca	NSL	Medium	52	223.9	3.2	No change	No change	Medium	Common	Fair	Fair			1	7
green ash	Fraxinus pennsylvanica	WSH	Low	30.1	218.9	4.9	No change	Sm. inc.	Medium	Common	Fair	Good			1	8
white oak	Quercus alba	WDH	Medium	34.6	210.3	4.9	No change	No change	High	Common	Good	Good			1	9
river birch	Betula nigra	NSL	Low	12.6	186.6	9.6	Lg. dec.	No change	Medium	Common	Poor	Fair			1	10
sweetbay	Magnolia virginiana	NSL	Medium	39.8	134.9	2.6	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	11
bald cypress	Taxodium distichum	NSH	Medium	18.1	130.6	5.4	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	12
American hornbeam; muscle	Carpinus caroliniana	WSL	Low	26.6	125.6	3.0	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	13
black cherry	Prunus serotina	WDL	Medium	26.3	113.8	3.0	Sm. inc.	Lg. inc.	Low	Common	Fair	Good			1	14
pond pine	Pinus serotina	NSH	Medium	9.6	109.7	5.5	No change	No change	Low	Common	Poor	Poor			0	15
willow oak	Quercus phellos	NSL	Low	21.7	107.4	4.3	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	16
water tupelo	Nyssa aquatica	NSH	Medium	8.4	99.5	8.0	No change	No change	Low	Common	Poor	Poor	Infill +	Infill +	0	17
laurel oak	Quercus laurifolia	NDH	Medium	18.5	98.1	3.6	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	18
southern red oak	Quercus falcata	WDL	Medium	27.2	92.7	3.1	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	19
American elm	Ulmus americana	WDH	Medium	19.8	92.6	3.2	No change	Lg. inc.	Medium	Common	Fair	Very Good			1	20
blackgum	Nyssa sylvatica	WDL	Medium	33.2	80.2	1.9	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	21
mockernut hickory	Carya alba	WDL	Medium	16.6	80.1	2.7	Sm. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	22
sourwood	Oxydendrum arboreum	NDL	High	22.1	77.0	2.6	Lg. dec.	Lg. dec.	High	Common	Fair	Fair			1	23
swamp chestnut oak	Quercus michauxii	NSL	Low	18	71.1	2.7	Sm. dec.	No change	Medium	Common	Poor	Fair			1	24
redbay	Persea borbonia	NSL	Low	31.3	65.0	1.4	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	25
longleaf pine	Pinus palustris	NSH	Medium	5.9	63.2	7.1	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good	Infill ++	Infill ++	1	26
black willow	Salix nigra	NSH	Low	11.6	57.3	3.8	Sm. inc.	Lg. inc.	Low	Common	Fair	Good			1	27
slippery elm	Ulmus rubra	WSL	Low	8.3	49.0	4.5	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	28
Virginia pine	Pinus virginiana	NDH	High	3.7	48.4	12.1	Very Lg. dec.	Very Lg. dec.	Medium	Rare	Lost	Lost			0	29
cherrybark oak; swamp red o	Quercus pagoda	NSL	Medium	9.4	44.2	3.0	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	1	30
loblolly-bay	Gordonia lasianthus	NSH	Medium	9.1	37.7	2.6	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	1	31
Carolina ash	Fraxinus caroliniana	NSL	FIA	3.7	28.2	4.2	Unknown	Unknown	NA	Rare	FIA Only	FIA Only			0	32
hackberry	Celtis occidentalis	WDH	Medium	4.4	28.1	4.7	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			0	33
pond cypress	Taxodium ascendens	NSH	Medium	1.4	26.1	11.4	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair	Infill +	Infill +	2	34
pumpkin ash	Fraxinus profunda	NSH	FIA	4	25.1	6.3	Unknown	Unknown	NA	Rare	FIA Only	FIA Only			0	35
post oak	Quercus stellata	WDH	High	10	24.1	1.1	Sm. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	2	36
flowering dogwood	Cornus florida	WDL	Medium	12.7	23.8	1.7	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good			1	37
American beech	Fagus grandifolia	WDH	High	6.3	23.7	2.4	No change	No change	Medium	Rare	Poor	Poor	Infill +		2	38
black oak	Quercus velutina	WDH	High	9	20.4	1.8	Lg. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	39
winged elm	Ulmus alata	WDL	Medium	5.6	13.5	1.5	No change	Lg. inc.	Medium	Rare	Poor	Good		Infill ++	1	40
eastern cottonwood	Populus deltoides	NSH	Low	3.2	12.3	2.4	Sm. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	41
sycamore	Platanus occidentalis	NSL	Low	3.5	12.2	2.7	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	42
boxelder	Acer negundo	WSH	Low	3	12.1	2.3	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor		Infill +	2	43
common persimmon	Diospyros virginiana	NSL	Low	9.5	11.3	0.9	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor			1	44
sugarberry	Celtis laevigata	NDH	Medium	0.9	10.9	9.5	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	45
overcup oak	Quercus lyrata	NSL	Medium	5	9.9	1.0	No change	Lg. inc.	Low	Rare	Very Poor	Fair		Infill +	2	46
water hickory	Carya aquatica	NSL	Medium	2.1	8.3	2.6	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
Shumard oak	Quercus shumardii	NSL	Low	3	8.2	2.7	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			0	48
slash pine	Pinus elliottii	NDH	High	1	8.2	8.2	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	49
sassafras	Sassafras albidum	WSL	Low	10.4	7.0	0.6	Lg. dec.	Lg. inc.	Medium	Rare	Very Poor	Good			1	50
turkey oak	Quercus laevis	NSH	Medium	2	6.1	3.1	No change	No change	High	Rare	Fair	Fair	Infill +		2	51
scarlet oak	Quercus coccinea	WDL	Medium	3	6.0	0.9	Lg. dec.	Very Lg. dec.	Medium	Rare	Very Poor	Lost			2	52
pignut hickory	Carya glabra	WDL	Medium	4.1	6.0	1.0	Sm. dec.	No change	Medium	Rare	Very Poor	Poor		Infill +	2	53
eastern redcedar	Juniperus virginiana	WDH	Medium	1.7	5.0	1.8	Sm. dec.	No change	Medium	Rare	Very Poor	Poor		Infill +	2	54
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	2	4.2	2.1	Sm. dec.	No change	High	Rare	Poor	Fair		Infill +	2	55
shagbark hickory	Carya ovata	WSL	Medium	1.6	4.1	1.8	Lg. dec.	Very Lg. dec.	Medium	Rare	Very Poor	Lost			0	56
florida maple	Acer barbatum	NSL	Low	1	4.0	4.0	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor			0	57
red mulberry	Morus rubra	NSL	Low	2.3	3.9	0.5	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	58
paulownia	Paulownia tomentosa	NSL	FIA	0.3	3.5	1.2	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	59
northern red oak	Quercus rubra	WDH	Medium	1.1	2.9	0.7	Very Lg. dec.	Very Lg. dec.	High	Rare	Lost	Lost			0	60
southern magnolia	Magnolia grandiflora	NSL	Low	1	2.9	2.9	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good	Infill +		2	61
shortleaf pine	Pinus echinata	WDH	High	0.9	2.4	0.5	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	62
blackjack oak	Quercus marilandica	NSL	Medium	2	2.2	1.1	Very Lg. dec.	Lg. inc.	High	Rare	Lost	Good			2	63
black walnut	Juglans nigra	WDH	Low	2	1.8	0.9	Very Lg. dec.	Very Lg. dec.	Medium	Rare	Lost	Lost			0	64
white ash	Fraxinus americana	WDL	Medium	1.8	1.8	0.8	Very Lg. dec.	Very Lg. dec.	Low	Rare	Lost	Lost			0	65
chestnut oak	Quercus prinus	NDH	High	1	1.6	1.6	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor			0	66
pawpaw	Asimina triloba	NSL	Low	0.9	0.5	0.5	Very Lg. dec.	Very Lg. dec.	Medium	Rare	Lost	Lost			0	67
chinkapin oak	Quercus muehlenbergii	NSL	Medium	1	0.4	0.4	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	68
striped maple	Acer pensylvanicum	NSL	Medium	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	69
serviceberry	Amelanchier spp.	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	70
shellbark hickory	Carya laciniosa	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	71
black hickory	Carya texana	NDL	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	72
eastern redbud	Cercis canadensis	NSL	Low	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown			0	73
black ash	Fraxinus nigra	WSH	Medium	0	0	0	Unknown	Unknown	Low	Absent	Unknown	Unknown			0	74
cucumbertree	Magnolia acuminata	NSL	Low	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown			0	75
bigleaf magnolia	Magnolia macrophylla	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	76
pin cherry	Prunus pensylvanica	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
bluejack oak	Quercus incana	NSL	Low	0	0	0	Unknown	New Habitat	Medium	Absent	Unknown	New Habitat		Migrate +	3	79
black locust	Robinia pseudoacacia	NDH	Low	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown			0	80
American basswood	Tilia americana	WSL	Medium	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	81
cedar elm	Ulmus crassifolia	NDH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			0	82