S33 E90

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	10,306	3,979.1	98

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	2
Hickory	6
Maple	4
Oak	14
Pine	3
Other	38
	67

Abundance	
Abundant	0
Common	20
Rare	47
Absent	12
	79

	Model Reliability	Adaptability
High	14	22
Medium	31	48
Low	33	9
FIA	1	
	79	**79**

Potential Change in Habitat Suitability	Scenario RCP45	Scenario RCP85
Increase	27	31
No Change	25	23
Decrease	14	12
New	8	8
Unknown	5	5
	79	**79**

Capability to Cope or Persist	Scenario RCP45	Scenario RCP85
Very Good	6	7
Good	17	19
Fair	21	21
Poor	9	6
Very Poor	12	12
FIA Only	1	1
Unknown	4	4
	70	**70**

Migration Potential	SHIFT RCP45	SHIFT RCP85
Likely	0	0
Infill	44	45
Migrate	4	4
	48	**49**

Potential Changes in Climate Variables

Temperature (°F)

	Scenario	2009	2039	2069	2099
Annual Average	CCSM45	63.6	65.2	67.2	67.5
	CCSM85	63.6	65.7	68.1	70.7
	GFDL45	63.6	68.6	68.1	69.1
	GFDL85	63.6	66.3	69.3	72.8
	HAD45	63.6	66.1	69.0	70.2
	HAD85	63.6	66.4	70.8	74.5
Growing Season May—Sep	CCSM45	77.9	79.4	80.9	81.5
	CCSM85	77.9	80.0	82.3	85.7
	GFDL45	77.9	84.1	83.0	84.8
	GFDL85	77.9	81.2	84.6	88.8
	HAD45	77.9	81.4	84.1	85.1
	HAD85	77.9	81.5	87.8	91.1
Coldest Month Average	CCSM45	41.8	44.1	45.2	45.3
	CCSM85	41.8	44.5	45.8	47.2
	GFDL45	41.8	45.6	45.6	45.7
	GFDL85	41.8	43.2	44.3	44.9
	HAD45	41.8	42.5	44.4	45.0
	HAD85	41.8	43.7	45.2	46.9
Warmest Month Average	CCSM45	82.6	83.8	84.5	84.8
	CCSM85	82.6	84.6	85.6	87.3
	GFDL45	82.6	86.9	87.1	88.3
	GFDL85	82.6	86.1	87.7	90.3
	HAD45	82.6	87.2	89.1	89.2
	HAD85	82.6	87.8	91.8	92.8

Precipitation (in)

	Scenario	2009	2039	2069	2099
Annual Total	CCSM45	54.2	56.9	62.2	60.0
	CCSM85	54.2	57.4	59.1	62.9
	GFDL45	54.2	60.5	66.1	64.9
	GFDL85	54.2	59.6	62.8	65.4
	HAD45	54.2	52.1	56.6	59.8
	HAD85	54.2	56.0	49.6	55.1
Growing Season May—Sep	CCSM45	19.5	19.4	19.8	20.0
	CCSM85	19.5	18.3	17.8	18.4
	GFDL45	19.5	21.9	24.6	23.5
	GFDL85	19.5	22.9	24.4	25.0
	HAD45	19.5	17.6	18.8	17.9
	HAD85	19.5	19.5	14.9	15.1

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
sweetgum	Liquidambar styraciflua	WDH	High	55.7	359.7	10.0	No change	No change	Medium	Common	Fair	Fair	Infill +	Infill +	1	1
sugarberry	Celtis laevigata	NDH	Medium	57.3	296.2	9.3	No change	No change	Medium	Common	Fair	Fair	Infill +	Infill +	1	2
loblolly pine	Pinus taeda	WDH	High	16.3	286.1	9.5	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good	Infill ++	Infill ++	1	3
water oak	Quercus nigra	WDH	High	47.1	147.1	5.3	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good	Infill ++	Infill ++	1	4
nuttall oak	Quercus texana	NSH	Medium	30.4	140.3	11.9	Lg. dec.	Lg. dec.	High	Common	Fair	Fair			0	5
green ash	Fraxinus pennsylvanica	WSH	Low	61.7	138.3	5.7	Sm. inc.	Sm. inc.	Medium	Common	Good	Good	Infill ++	Infill ++	1	6
southern red oak	Quercus falcata	WDL	Medium	10.4	129.3	8.0	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good	Infill ++	Infill ++	1	7
American elm	Ulmus americana	WDH	Medium	62.8	89.9	2.9	Sm. inc.	Sm. inc.	Medium	Common	Good	Good	Infill ++	Infill ++	1	8
boxelder	Acer negundo	WSH	Low	18.8	83.7	3.3	No change	No change	High	Common	Good	Good	Infill ++	Infill ++	1	9
eastern redcedar	Juniperus virginiana	WDH	Medium	12.2	77.3	4.9	No change	Sm. inc.	Medium	Common	Fair	Good	Infill +	Infill ++	1	10
pecan	Carya illinoinensis	NSH	Low	22.7	76.8	8.4	Sm. inc.	Lg. inc.	Low	Common	Fair	Good	Infill +	Infill ++	2	11
sycamore	Platanus occidentalis	NSL	Low	14	75.7	4.4	No change	No change	Medium	Common	Fair	Fair	Infill +	Infill +	1	12
winged elm	Ulmus alata	WDL	Medium	39.7	69.7	2.3	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good	Infill ++	Infill ++	1	13
red maple	Acer rubrum	WDH	High	30.9	68.7	3.3	No change	Sm. inc.	High	Common	Good	Very Good	Infill ++	Infill ++	1	14
black willow	Salix nigra	NSH	Low	19.2	67.5	5.3	Lg. inc.	Lg. inc.	Low	Common	Good	Good	Infill ++	Infill ++	1	15
overcup oak	Quercus lyrata	NSL	Medium	48.3	66.6	5.2	Sm. inc.	Sm. inc.	Low	Common	Fair	Fair	Infill +	Infill +	1	16
willow oak	Quercus phellos	NSL	Low	49.9	65.4	6.3	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good	Infill ++	Infill ++	1	17
water hickory	Carya aquatica	NSL	Medium	45.6	64.4	10.3	Sm. inc.	Sm. inc.	Medium	Common	Good	Good	Infill ++	Infill ++	1	18
eastern cottonwood	Populus deltoides	NSH	Low	9.7	63.5	5.9	No change	No change	Medium	Common	Fair	Fair	Infill +	Infill +	2	19
post oak	Quercus stellata	WDH	High	8.2	54.2	3.0	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good	Infill ++	Infill ++	2	20
shortleaf pine	Pinus echinata	WDH	High	7.5	44.5	2.4	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	21
white oak	Quercus alba	WDH	Medium	9.1	42.5	2.8	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	2	22
yellow-poplar	Liriodendron tulipifera	WDH	High	7.4	42.0	3.5	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	2	23
American hornbeam; muscle	Carpinus caroliniana	WSL	Low	10.6	40.9	4.0	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair	Infill +	Infill +	1	24
black cherry	Prunus serotina	WDL	Medium	10.2	40.0	2.3	No change	No change	Low	Rare	Very Poor	Very Poor			0	25
cherrybark oak; swamp red o	Quercus pagoda	NSL	Medium	27	39.6	3.5	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	26
slippery elm	Ulmus rubra	WSL	Low	45.3	39.0	1.4	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	27
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	8.3	38.2	3.7	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	1	28
pignut hickory	Carya glabra	WDL	Medium	10.5	36.6	2.3	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	29
water tupelo	Nyssa aquatica	NSH	Medium	9.5	36.0	15.4	No change	No change	Low	Rare	Very Poor	Very Poor			2	30
bald cypress	Taxodium distichum	NSH	Medium	18	35.0	5.1	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	2	31
American beech	Fagus grandifolia	WDH	High	6.4	33.1	4.5	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	32
swamp tupelo	Nyssa biflora	NDH	Medium	1	32.3	33.3	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor			0	33
black oak	Quercus velutina	WDH	High	4.7	30.2	4.4	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			2	34
water elm	Planera aquatica	NSL	Low	11.8	25.1	8.7	No change	Sm. inc.	Medium	Rare	Poor	Fair	Infill +	Infill +	1	35
common persimmon	Diospyros virginiana	NSL	Low	41.1	25.0	1.4	Sm. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	1	36
flowering dogwood	Cornus florida	WDL	Medium	8.7	19.3	1.4	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	1	37
blackgum	Nyssa sylvatica	WDL	Medium	5.3	17.4	1.7	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	2	38
chinkapin oak	Quercus muehlenbergii	NSL	Medium	3.1	17.4	2.5	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			2	39
Shumard oak	Quercus shumardii	NSL	Low	6.6	16.9	3.5	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	2	40
mockernut hickory	Carya alba	WDL	Medium	9.7	16.9	1.3	No change	Sm. inc.	High	Rare	Fair	Good	Infill +	Infill ++	2	41
red mulberry	Morus rubra	NSL	Low	7.5	13.9	0.7	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	42
sassafras	Sassafras albidum	WSL	Low	13	13.6	1.3	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair	Infill +	Infill +	2	43
white ash	Fraxinus americana	WDL	Medium	12.7	10.7	1.7	Lg. inc.	Lg. inc.	Low	Rare	Fair	Fair	Infill +	Infill +	2	44
honeylocust	Gleditsia triacanthos	NSH	Low	19.3	8.7	1.2	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	2	45
Osage-orange	Maclura pomifera	NDH	Medium	1.5	7.4	1.2	Sm. dec.	No change	High	Rare	Poor	Fair	Infill +	Infill +	2	46
blackjack oak	Quercus marilandica	NSL	Medium	2.4	6.8	1.5	Sm. inc.	Lg. inc.	High	Rare	Good	Good			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
cittamwood/gum bumelia	Sideroxylon lanuginosum ssp.	NSL	Low	1	6.4	6.6	Lg. inc.	Lg. inc.	High	Rare	Good	Good			2	48
black locust	Robinia pseudoacacia	NDH	Low	5.6	6.0	1.1	No change	Sm. dec.	Medium	Rare	Poor	Very Poor			0	49
cedar elm	Ulmus crassifolia	NDH	Medium	9.7	5.5	2.7	Lg. inc.	Lg. inc.	Low	Rare	Fair	Fair	Infill +	Infill +	2	50
bitternut hickory	Carya cordiformis	WSL	Low	2.1	5.4	0.7	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	2	51
shagbark hickory	Carya ovata	WSL	Medium	12.6	5.3	1.9	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			2	52
eastern redbud	Cercis canadensis	NSL	Low	14.1	4.7	0.8	Lg. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			2	53
florida maple	Acer barbatum	NSL	Low	4	4.2	0.7	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	2	54
swamp chestnut oak	Quercus michauxii	NSL	Low	12.2	3.6	1.9	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	2	55
hackberry	Celtis occidentalis	WDH	Medium	1.3	3.5	4.8	Sm. dec.	No change	High	Rare	Poor	Fair		Infill +	2	56
slash pine	Pinus elliottii	NDH	High	0.7	2.9	2.0	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	57
sourwood	Oxydendrum arboreum	NDL	High	4.3	2.3	0.7	No change	No change	High	Rare	Fair	Fair			0	58
river birch	Betula nigra	NSL	Low	0.7	2.0	1.4	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	59
waterlocust	Gleditsia aquatica	NSLX	FIA	4.9	1.7	1.1	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	60
cucumbertree	Magnolia acuminata	NSL	Low	0.3	1.5	0.5	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	61
black walnut	Juglans nigra	WDH	Low	0.9	1.0	1.0	Sm. dec.	No change	Medium	Rare	Very Poor	Poor			0	62
silver maple	Acer saccharinum	NSH	Low	4	0.8	0.3	Very Lg. dec.	Very Lg. dec.	High	Rare	Lost	Lost			0	63
American basswood	Tilia americana	WSL	Medium	1.3	0.5	0.6	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	64
laurel oak	Quercus laurifolia	NDH	Medium	0.3	0.3	0.1	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	65
pawpaw	Asimina triloba	NSL	Low	3.9	0.2	0.8	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	66
American holly	Ilex opaca	NSL	Medium	0.3	0.1	0.0	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	67
ashe juniper	Juniperus ashei	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	68
longleaf pine	Pinus palustris	NSH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	69
striped maple	Acer pensylvanicum	NSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	70
serviceberry	Amelanchier spp.	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	71
black hickory	Carya texana	NDL	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	72
black ash	Fraxinus nigra	WSH	Medium	0	0	0	Unknown	Unknown	Low	Absent	Unknown	Unknown			0	73
silverbell	Halesia spp.	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	74
southern magnolia	Magnolia grandiflora	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	75
bigleaf magnolia	Magnolia macrophylla	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	76
redbay	Persea borbonia	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			3	77
pin cherry	Prunus pensylvanica	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	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