S42 E79

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

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	sq. km	sq. mi	FIA Plots
Area of Region	3,714.3	1,434.1	89

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	3
Hickory	3
Maple	5
Oak	5
Pine	2
Other	24
	42

Abundance	
Abundant	6
Common	20
Rare	16
Absent	31
	73

	Model Reliability	Adaptability
High	18	23
Medium	27	38
Low	25	11
FIA	4	
	74	**72**

Potential Change in Habitat Suitability	Scenario RCP45	Scenario RCP85
Increase	17	17
No Change	7	6
Decrease	14	15
New	29	30
Unknown	7	6
	74	**74**

Capability to Cope or Persist	Scenario RCP45	Scenario RCP85
Very Good	5	7
Good	13	11
Fair	9	9
Poor	6	6
Very Poor	3	3
FIA Only	2	2
Unknown	3	2
	41	**40**

Migration Potential	SHIFT RCP45	SHIFT RCP85
Likely	1	1
Infill	9	10
Migrate	9	17
	19	**28**

Potential Changes in Climate Variables

Temperature (°F)

	Scenario	2009	2039	2069	2099
Annual Average	CCSM45	46.9	48.8	51.5	51.5
	CCSM85	46.9	49.3	52.0	55.2
	GFDL45	46.9	50.1	52.9	54.1
	GFDL85	46.9	50.3	54.1	58.6
	HAD45	46.9	50.1	53.5	55.3
	HAD85	46.9	50.1	54.5	59.9
Growing Season May—Sep	CCSM45	63.3	65.2	67.5	67.9
	CCSM85	63.3	65.5	68.1	72.1
	GFDL45	63.3	66.9	70.7	72.3
	GFDL85	63.3	67.8	72.1	77.1
	HAD45	63.3	66.9	69.7	72.2
	HAD85	63.3	66.4	71.6	77.4
Coldest Month Average	CCSM45	21.6	23.9	26.1	26.1
	CCSM85	21.6	24.7	26.1	28.2
	GFDL45	21.6	24.0	25.6	26.2
	GFDL85	21.6	24.8	26.3	28.4
	HAD45	21.6	23.3	26.6	26.6
	HAD85	21.6	24.6	27.1	30.4
Warmest Month Average	CCSM45	69.1	71.4	72.8	73.1
	CCSM85	69.1	71.9	73.5	75.7
	GFDL45	69.1	72.0	74.4	75.5
	GFDL85	69.1	73.6	76.0	78.9
	HAD45	69.1	73.2	74.9	76.7
	HAD85	69.1	73.4	76.8	81.2

Precipitation (in)

	Scenario	2009	2039	2069	2099
Annual Total	CCSM45	45.9	46.6	45.6	48.2
	CCSM85	45.9	47.6	47.6	48.6
	GFDL45	45.9	50.2	52.4	51.8
	GFDL85	45.9	47.7	51.9	53.2
	HAD45	45.9	46.0	47.4	46.9
	HAD85	45.9	47.6	45.3	49.2
Growing Season May—Sep	CCSM45	21.3	21.5	20.4	21.5
	CCSM85	21.3	20.8	20.8	20.4
	GFDL45	21.3	22.5	22.5	21.9
	GFDL85	21.3	21.2	21.7	21.3
	HAD45	21.3	20.9	19.4	20.1
	HAD85	21.3	20.9	17.8	18.7

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
red maple	Acer rubrum	WDH	High	83.5	2109.9	14.8	Sm. dec.	Sm. dec.	High	Abundant	Good	Good			1	1
sugar maple	Acer saccharum	WDH	High	81.4	1673.1	13.8	Sm. dec.	Sm. dec.	High	Abundant	Good	Good			1	2
white ash	Fraxinus americana	WDL	Medium	73.3	1166.5	10.1	No change	Sm. dec.	Low	Abundant	Fair	Fair			0	3
black cherry	Prunus serotina	WDL	Medium	74.5	1118.8	8.1	No change	Sm. dec.	Low	Abundant	Fair	Fair			0	4
quaking aspen	Populus tremuloides	WDH	High	51.9	790.2	8.3	Lg. dec.	Lg. dec.	Medium	Abundant	Fair	Fair			0	5
eastern hemlock	Tsuga canadensis	NSH	High	54.8	748.7	8.8	Lg. dec.	Lg. dec.	Low	Abundant	Poor	Poor			0	6
American beech	Fagus grandifolia	WDH	High	60.2	363.2	4.4	Sm. inc.	No change	Medium	Common	Good	Fair			1	7
American elm	Ulmus americana	WDH	Medium	52.9	250.5	2.9	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good			1	8
Scots pine	Pinus sylvestris	NSH	FIA	14.6	209.9	11.1	Unknown	Unknown	NA	Common	NNIS	NNIS			0	9
green ash	Fraxinus pennsylvanica	WSH	Low	26.1	196.5	7.1	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	10
yellow birch	Betula alleghaniensis	NDL	High	39.1	154.7	3.2	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	11
black willow	Salix nigra	NSH	Low	12	154.5	7.0	Lg. dec.	Lg. dec.	Low	Common	Very Poor	Very Poor			0	12
silver maple	Acer saccharinum	NSH	Low	6.7	140.5	16.8	Sm. dec.	No change	High	Common	Fair	Good	Infill +	Infill ++	1	13
shagbark hickory	Carya ovata	WSL	Medium	5.8	114.3	9.1	No change	No change	Medium	Common	Fair	Fair			1	14
black locust	Robinia pseudoacacia	NDH	Low	13.1	114.3	5.4	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	15
bitternut hickory	Carya cordiformis	WSL	Low	14.7	105.6	5.9	No change	Sm. inc.	High	Common	Good	Very Good			1	16
black ash	Fraxinus nigra	WSH	Medium	5.3	105.6	19.1	Lg. dec.	Lg. dec.	Low	Common	Very Poor	Very Poor			0	17
northern red oak	Quercus rubra	WDH	Medium	23.4	95.9	2.1	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	18
Norway spruce	Picea abies	NSH	FIA	8.9	95.4	7.7	Unknown	Unknown	NA	Common	NNIS	NNIS			0	19
eastern cottonwood	Populus deltoides	NSH	Low	5.3	80.3	14.4	Sm. dec.	No change	Medium	Common	Poor	Fair		Infill +	1	20
American basswood	Tilia americana	WSL	Medium	22.3	76.1	3.0	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	21
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	32.2	69.9	1.7	Sm. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	22
American hornbeam; muscle	Carpinus caroliniana	WSL	Low	29.7	67.3	1.7	No change	Sm. inc.	Medium	Common	Fair	Good			1	23
cucumbertree	Magnolia acuminata	NSL	Low	26.5	60.5	1.3	Sm. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	24
yellow-poplar	Liriodendron tulipifera	WDH	High	3.5	53.0	2.5	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good	Infill ++	Infill ++	1	25
bigtooth aspen	Populus grandidentata	NSL	Medium	13.1	51.8	3.5	Sm. inc.	Sm. dec.	Medium	Common	Good	Poor			1	26
boxelder	Acer negundo	WSH	Low	3	44.8	1.4	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	2	27
black oak	Quercus velutina	WDH	High	0.4	28.1	1.4	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	28
pignut hickory	Carya glabra	WDL	Medium	3.9	25.3	1.8	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	29
white spruce	Picea glauca	NSL	Medium	2.7	24.4	9.1	Very Lg. dec.	Very Lg. dec.	Medium	Rare	Lost	Lost			0	30
chokecherry	Prunus virginiana	NSLX	FIA	2.7	22.1	8.2	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	31
blackgum	Nyssa sylvatica	WDL	Medium	9.5	19.7	3.6	Sm. inc.	Lg. inc.	High	Rare	Good	Good			1	32
bur oak	Quercus macrocarpa	NDH	Medium	5.4	19.5	3.6	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			0	33
pin cherry	Prunus pensylvanica	NSL	Low	4.9	14.0	0.8	Very Lg. dec.	Very Lg. dec.	Medium	Rare	Lost	Lost			0	34
white oak	Quercus alba	WDH	Medium	3.1	12.1	0.7	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	2	35
serviceberry	Amelanchier spp.	NSL	Low	9.2	11.6	0.5	No change	No change	Medium	Rare	Poor	Poor			1	36
peachleaf willow	Salix amygdaloides	NSLX	FIA	2.7	10.3	3.8	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	37
chestnut oak	Quercus prinus	NDH	High	3.3	9.0	0.8	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	2	38
eastern white pine	Pinus strobus	WDH	High	3.8	8.0	1.2	Lg. inc.	Lg. inc.	Low	Rare	Fair	Fair	Infill +	Infill +	2	39
sweet birch	Betula lenta	NDH	High	1.1	7.4	0.3	Lg. inc.	Lg. inc.	Low	Rare	Fair	Fair	Infill +	Infill +	2	40
black walnut	Juglans nigra	WDH	Low	2.7	2.3	0.9	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	41
striped maple	Acer pensylvanicum	NSL	Medium	2.7	0.9	0.3	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	42
balsam fir	Abies balsamea	NDH	High	0	0	0	Unknown	Unknown	Low	Modeled	Unknown	Unknown			0	43
eastern redcedar	Juniperus virginiana	WDH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++	3	44
shortleaf pine	Pinus echinata	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate ++	3	45
florida maple	Acer barbatum	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			0	46
cittamwood/gum bumelia	Sideroxylon lanuginosum ssp.	NSL	Low	0	0	0	Unknown	New Habitat	High	Absent	Unknown	New Habitat			0	47

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black hickory	Carya texana	NDL	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	48
mockernut hickory	Carya alba	WDL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	49
sugarberry	Celtis laevigata	NDH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	50
hackberry	Celtis occidentalis	WDH	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	51
eastern redbud	Cercis canadensis	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	52
flowering dogwood	Cornus florida	WDL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	53
common persimmon	Diospyros virginiana	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate +	3	54
honeylocust	Gleditsia triacanthos	NSH	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			3	55
sweetgum	Liquidambar styraciflua	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate ++	3	56
Osage-orange	Maclura pomifera	NDH	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate +	3	57
mountain or Fraser magnolia	Magnolia fraseri	NSL	Low	0	0	0	Unknown	Unknown	Low	Absent	Unknown	Unknown			0	58
red mulberry	Morus rubra	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	59
sourwood	Oxydendrum arboreum	NDL	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate +	3	60
sycamore	Platanus occidentalis	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	61
swamp white oak	Quercus bicolor	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	62
scarlet oak	Quercus coccinea	WDL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate ++	Migrate +	3	63
southern red oak	Quercus falcata	WDL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate +	3	64
shingle oak	Quercus imbricaria	NDH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	65
blackjack oak	Quercus marilandica	NSL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			3	66
chinkapin oak	Quercus muehlenbergii	NSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	67
pin oak	Quercus palustris	NSH	Low	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	68
post oak	Quercus stellata	WDH	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			3	69
live oak	Quercus virginiana	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	70
sassafras	Sassafras albidum	WSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++	3	71
winged elm	Ulmus alata	WDL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	72
cedar elm	Ulmus crassifolia	NDH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			0	73
slippery elm	Ulmus rubra	WSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +	3	74