

Section 251A

EcoMap 2007

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	35,976	13,890	74

Species Information

The columns below provide brief 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		Potential Change in Habitat Suitability		Capability to Cope or Persist		Migration Potential					
				Reliability	Adaptability	Scenario RCP45	Scenario RCP85	Scenario RCP45	Scenario RCP85	SHIFT RCP45	SHIFT RCP85				
Ash	2			High	12	17	Increase	3	2	Very Good	0	0	Likely	3	3
Hickory	0			Medium	20	27	No Change	10	12	Good	2	2	Infill	13	13
Maple	2	Abundant	0	Low	20	10	Decrease	12	11	Fair	7	7	Migrate	3	7
Oak	2	Common	5	FIA	3		New	22	22	Poor	6	6		19	23
Pine	3	Rare	23				Unknown	8	8	Very Poor	10	9			
Other	19	Absent	26					55	55	FIA Only	2	2			
	28		54		55	54				Unknown	5	5			
											32	31			

Potential Changes in Climate Variables

Temperature (°F)

Scenario	2009	2039	2069	2099		
Annual	CCSM45	41.1	42.7	45.6	46.2	
Average	CCSM85	41.1	43.5	47.0	50.7	
	GFDL45	41.1	47.6	46.0	47.6	
	GFDL85	41.1	44.0	47.4	52.4	
	HAD45	41.1	44.4	48.3	50.1	
	HAD85	41.1	44.9	49.6	55.3	
Growing Season	CCSM45	63.5	65.4	67.8	68.5	
	CCSM85	63.5	66.2	69.4	73.4	
May—Sep	GFDL45	63.5	71.3	69.4	71.4	
	GFDL85	63.5	66.8	70.5	76.2	
	HAD45	63.5	66.6	69.5	71.7	
	HAD85	63.5	66.5	70.5	76.2	
Coldest Month	CCSM45	5.1	6.9	9.2	9.4	
	CCSM85	5.1	6.4	9.1	11.6	
Average	GFDL45	5.1	8.7	10.0	10.6	
	GFDL85	5.1	9.2	10.8	13.9	
	HAD45	5.1	7.8	11.8	11.6	
	HAD85	5.1	10.8	15.0	18.5	
Warmest Month	CCSM45	70.2	72.7	74.3	74.8	
	CCSM85	70.2	73.8	76.0	78.4	
Average	GFDL45	70.2	73.8	75.3	76.7	
	GFDL85	70.2	74.0	76.1	79.5	
	HAD45	70.2	73.7	75.2	77.1	
	HAD85	70.2	73.8	76.2	79.9	

Precipitation (in)

Scenario	2009	2039	2069	2099		
Annual	CCSM45	22.2	22.5	22.7	21.9	
Total	CCSM85	22.2	22.2	22.0	22.2	
	GFDL45	22.2	24.9	26.8	25.4	
	GFDL85	22.2	25.7	27.5	27.1	
	HAD45	22.2	23.3	22.0	23.1	
	HAD85	22.2	23.3	22.6	24.5	
Growing Season	CCSM45	15.0	14.8	14.6	14.2	
	CCSM85	15.0	14.3	14.1	13.5	
May—Sep	GFDL45	15.0	17.2	18.2	16.9	
	GFDL85	15.0	17.3	18.3	17.4	
	HAD45	15.0	15.1	13.8	13.7	
	HAD85	15.0	14.8	13.2	13.0	

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
bur oak	Quercus macrocarpa	NDH	Medium	28.2	127.5	23.3	Sm. dec.	Sm. dec.	High	Common	Fair	Fair	Infill +	Infill +	2	1
boxelder	Acer negundo	WSH	Low	36.5	102.3	18.9	Sm. dec.	Sm. dec.	High	Common	Fair	Fair	Infill +	Infill +	2	2
green ash	Fraxinus pennsylvanica	WSH	Low	35.4	83.0	16.9	No change	No change	Medium	Common	Fair	Fair	Infill +	Infill +	2	3
quaking aspen	Populus tremuloides	WDH	High	11.6	70.6	21.6	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor	Infill +	Infill +	2	4
American elm	Ulmus americana	WDH	Medium	29.7	56.8	15.2	Sm. dec.	No change	Medium	Common	Poor	Fair	Infill +	Infill +	2	5
American basswood	Tilia americana	WSL	Medium	14.9	31.3	9.5	Sm. inc.	No change	Medium	Rare	Fair	Poor	Infill +	Infill +	2	6
balsam poplar	Populus balsamifera	NSH	Medium	4.5	20.2	9.5	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	7
eastern cottonwood	Populus deltoides	NSH	Low	7.6	19.1	31.5	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	8
sugar maple	Acer saccharum	WDH	High	1.2	14.3	2.8	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	2	9
jack pine	Pinus banksiana	NSH	Medium	0.2	13.9	29.9	Sm. dec.	Lg. dec.	High	Rare	Poor	Poor	Infill +	Infill +	2	10
Siberian elm	Ulmus pumila	NDH	FIA	4	11.2	22.9	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	11
northern red oak	Quercus rubra	WDH	Medium	2	8.9	5.9	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	2	12
black ash	Fraxinus nigra	WSH	Medium	5.4	7.6	6.7	No change	No change	Low	Rare	Very Poor	Very Poor			2	13
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	4.7	7.2	2.3	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	2	14
peachleaf willow	Salix amygdaloides	NSLX	FIA	1.5	6.2	15.2	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	15
white spruce	Picea glauca	NSL	Medium	2	4.5	9.4	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			2	16
paper birch	Betula papyrifera	WDH	High	1.8	3.9	2.0	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	17
chokecherry	Prunus virginiana	NSLX	FIA	15.8	3.7	2.8	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	18
red pine	Pinus resinosa	NSH	Medium	0.8	3.7	37.1	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor			2	19
black cherry	Prunus serotina	WDL	Medium	1.9	2.9	1.1	Sm. dec.	No change	Low	Rare	Very Poor	Very Poor			2	20
slippery elm	Ulmus rubra	WSL	Low	3.2	1.4	6.6	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	21
eastern white pine	Pinus strobus	WDH	High	0.8	1.0	9.8	No change	Sm. dec.	Low	Rare	Very Poor	Very Poor			2	22
serviceberry	Amelanchier spp.	NSL	Low	1.9	0.7	0.9	Lg. dec.	Very Lg. dec.	Medium	Rare	Very Poor	Lost			0	23
black willow	Salix nigra	NSH	Low	0.2	0.5	1.4	No change	No change	Low	Rare	Very Poor	Very Poor			2	24
hackberry	Celtis occidentalis	WDH	Medium	1.2	0.4	1.2	Lg. inc.	Lg. inc.	High	Rare	Good	Good			2	25
eastern redcedar	Juniperus virginiana	WDH	Medium	0.4	0.3	1.5	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	26
balsam fir	Abies balsamea	NDH	High	0.2	0.1	0.1	Lg. dec.	Lg. dec.	Low	Rare	Very Poor	Very Poor			2	27
pin cherry	Prunus pensylvanica	NSL	Low	0.5	0.0	0.1	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	28
ashe juniper	Juniperus ashei	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	29
tamarack (native)	Larix laricina	NSH	High	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat	Likely +	Likely +	3	30
northern white-cedar	Thuja occidentalis	WSH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	31
striped maple	Acer pensylvanicum	NSL	Medium	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	32
red maple	Acer rubrum	WDH	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++	3	33
silver maple	Acer saccharinum	NSH	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	34
mountain maple	Acer spicatum	NSL	Low	0	0	0	Unknown	Unknown	High	Absent	Unknown	Unknown			0	35
cittamwood/gum bumelia	Sideroxylon lanuginosum ssp.	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			0	36
bitternut hickory	Carya cordiformis	WSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate +	3	37
shagbark hickory	Carya ovata	WSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	38
flowering dogwood	Cornus florida	WDL	Medium	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown			0	39
honeylocust	Gleditsia triacanthos	NSH	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			3	40
black walnut	Juglans nigra	WDH	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +	3	41
bigleaf magnolia	Magnolia macrophylla	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	42
red mulberry	Morus rubra	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	43
white oak	Quercus alba	WDH	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate +	3	44
swamp white oak	Quercus bicolor	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	45
northern pin oak	Quercus ellipsoidalis	NSH	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Likely +	Likely +	3	46
Nuttall oak	Quercus texana	NSH	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			0	47



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pin oak	Quercus palustris	NSH	Low	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			0	48
post oak	Quercus stellata	WDH	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			0	49
black oak	Quercus velutina	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	50
live oak	Quercus virginiana	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	51
black locust	Robinia pseudoacacia	NDH	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	52
American mountain-ash	Sorbus americana	NSL	Low	0	0	0	Unknown	Unknown	Low	Absent	Unknown	Unknown			0	53
winged elm	Ulmus alata	WDL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	54
cedar elm	Ulmus crassifolia	NDH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			0	55