

	sq. km	sq. mi	FIA Plots
Area of Region	8,340.2	3,220.2	593

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		
		High	Common	Reliability	Adaptability	Scenario	Scenario	Scenario	Scenario	SHIFT	SHIFT	
						RCP45	RCP85	RCP45	RCP85	RCP45	RCP85	
Ash	3					Increase	15	15	Very Good	5	5	
Hickory	0					No Change	7	7	Good	12	12	
Maple	5	Abundant	8	High	19	18	Decrease	10	10	Fair	7	8
Oak	2	Common	14	Medium	24	34	New	26	29	Poor	5	4
Pine	3	Rare	13	Low	20	13	Unknown	8	5	Very Poor	3	2
Other	22	Absent	30	FIA	3					FIA Only	2	2
	35		65		66	65		66	66		39	35
											11	13
											18	20

Potential Changes in Climate Variables

Temperature (°F)

Scenario	2009	2039	2069	2099		
Annual	CCSM45	40.2	41.8	44.9	44.9	
Average	CCSM85	40.2	42.6	45.8	49.4	
	GFDL45	40.2	43.3	46.4	47.9	
	GFDL85	40.2	43.8	47.5	53.0	
	HAD45	40.2	43.6	46.9	48.9	
	HAD85	40.2	43.9	48.0	54.0	
Growing Season	CCSM45	59.7	61.3	64.0	64.1	
	CCSM85	59.7	62.1	64.9	68.9	
May—Sep	GFDL45	59.7	63.8	67.7	70.0	
	GFDL85	59.7	64.5	69.0	75.3	
	HAD45	59.7	63.1	65.5	68.0	
	HAD85	59.7	62.9	67.0	73.0	
Coldest Month	CCSM45	9.9	11.0	13.6	13.4	
	CCSM85	9.9	11.3	13.6	16.2	
Average	GFDL45	9.9	12.7	14.7	15.3	
	GFDL85	9.9	13.6	15.4	18.5	
	HAD45	9.9	11.9	16.1	16.0	
	HAD85	9.9	15.2	18.0	22.3	
Warmest Month	CCSM45	66.0	67.8	69.4	69.7	
	CCSM85	66.0	68.7	70.6	72.9	
Average	GFDL45	66.0	70.4	72.1	73.7	
	GFDL85	66.0	71.1	73.5	76.5	
	HAD45	66.0	69.6	70.6	72.5	
	HAD85	66.0	69.8	71.8	75.8	

Precipitation (in)

Scenario	2009	2039	2069	2099		
Annual	CCSM45	32.5	34.2	33.8	33.7	
Total	CCSM85	32.5	32.1	33.1	33.5	
	GFDL45	32.5	35.4	36.9	35.8	
	GFDL85	32.5	35.1	38.5	38.2	
	HAD45	32.5	34.0	34.6	34.8	
	HAD85	32.5	34.1	35.9	37.1	
Growing Season	CCSM45	17.7	18.4	17.1	17.5	
Season	CCSM85	17.7	17.2	17.3	16.1	
May—Sep	GFDL45	17.7	19.3	19.3	18.7	
	GFDL85	17.7	19.1	20.4	18.9	
	HAD45	17.7	17.5	16.9	16.5	
	HAD85	17.7	17.4	16.0	16.2	

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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Section 212J

EcoMap 2007
Climate Change Atlas Tree Species

USDA Forest Service
Northern Research Station
Landscape Change Research Group
Iverson, Peters, Prasad, Matthews

Current and Potential Future Habitat, Capability, and Migration

Common Name	Scientific Name	Range	MR	%Cell	FIAsum	FIAiv	ChngCl45	ChngCl85	Adap	Abund	Capabil45	Capabil85	SHIFT45	SHIFT85	SSO	N
sugar maple	Acer saccharum	WDH	High	97.3	3266.0	17.6	Sm. dec.	Sm. dec.	High	Abundant	Good	Good			1	1
red maple	Acer rubrum	WDH	High	99.5	1663.2	8.9	No change	No change	High	Abundant	Very Good	Very Good			1	2
quaking aspen	Populus tremuloides	WDH	High	92.2	1454.4	8.6	No change	No change	Medium	Abundant	Good	Good			1	3
balsam fir	Abies balsamea	NDH	High	98.7	1289.7	6.9	Sm. dec.	Sm. dec.	Low	Abundant	Fair	Fair			0	4
northern white-cedar	Thuja occidentalis	WSH	High	75.8	698.1	5.7	No change	No change	Medium	Abundant	Good	Good			1	5
eastern hemlock	Tsuga canadensis	NSH	High	78	681.9	4.3	Sm. dec.	Sm. dec.	Low	Abundant	Fair	Fair			0	6
yellow birch	Betula alleghaniensis	NDL	High	90	670.4	3.9	Sm. dec.	Sm. dec.	Medium	Abundant	Fair	Fair			0	7
black ash	Fraxinus nigra	WSH	Medium	87.4	549.6	3.9	No change	No change	Low	Abundant	Fair	Fair			0	8
American basswood	Tilia americana	WSL	Medium	71.6	428.4	3.2	Sm. inc.	No change	Medium	Common	Good	Fair			1	9
white spruce	Picea glauca	NSL	Medium	83.1	420.9	2.9	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	10
paper birch	Betula papyrifera	WDH	High	61.2	393.2	2.1	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	11
black spruce	Picea mariana	NSH	High	61.5	340.3	3.0	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	12
red pine	Pinus resinosa	NSH	Medium	30.7	321.1	4.0	Sm. inc.	Sm. inc.	Low	Common	Fair	Fair			1	13
eastern white pine	Pinus strobus	WDH	High	42.4	276.9	2.4	Lg. inc.	Lg. inc.	Low	Common	Good	Good			1	14
northern red oak	Quercus rubra	WDH	Medium	39.8	224.9	1.8	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	15
black cherry	Prunus serotina	WDL	Medium	81	202.8	1.6	Lg. inc.	Lg. inc.	Low	Common	Good	Good			1	16
tamarack (native)	Larix laricina	NSH	High	38.3	200.7	2.9	Sm. inc.	Sm. inc.	Low	Common	Fair	Fair			1	17
bigtooth aspen	Populus grandidentata	NSL	Medium	40	160.6	1.7	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	18
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	70.1	158.5	1.1	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	19
white ash	Fraxinus americana	WDL	Medium	44.9	149.7	1.4	Lg. inc.	Lg. inc.	Low	Common	Good	Good			1	20
American elm	Ulmus americana	WDH	Medium	46.7	92.9	1.1	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	21
jack pine	Pinus banksiana	NSH	Medium	9.2	87.0	3.0	No change	No change	High	Common	Good	Good	Infill ++	Infill ++	1	22
green ash	Fraxinus pennsylvanica	WSH	Low	18.7	38.2	0.8	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			1	23
chokecherry	Prunus virginiana	NSLX	FIA	14	22.2	0.3	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	24
northern pin oak	Quercus ellipsoidalis	NSH	Medium	3.4	19.1	0.5	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	2	25
silver maple	Acer saccharinum	NSH	Low	3.6	15.8	4.4	No change	Sm. inc.	High	Rare	Fair	Good	Infill +	Infill ++	2	26
balsam poplar	Populus balsamifera	NSH	Medium	8.1	10.3	0.8	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	27
serviceberry	Amelanchier spp.	NSL	Low	13.4	8.4	0.3	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	28
pin cherry	Prunus pensylvanica	NSL	Low	8.1	8.1	0.8	Lg. dec.	Very Lg. dec.	Medium	Rare	Very Poor	Lost			0	29
American hornbeam; musclev	Carpinus caroliniana	WSL	Low	3.9	7.4	0.4	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	1	30
Norway spruce	Picea abies	NSH	FIA	2.4	5.9	2.5	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	31
mountain maple	Acer spicatum	NSL	Low	11.9	5.1	0.3	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor			1	32
boxelder	Acer negundo	WSH	Low	4.7	3.6	0.7	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	2	33
black willow	Salix nigra	NSH	Low	2.4	2.6	1.1	Sm. inc.	Lg. inc.	Low	Rare	Poor	Fair	Infill +	Infill +	2	34
peachleaf willow	Salix amygdaloides	NSLX	FIA	1.2	0.4	0.4	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	35
eastern redcedar	Juniperus virginiana	WDL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	36
red spruce	Picea rubens	NDH	High	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			0	37
striped maple	Acer pensylvanicum	NSL	Medium	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown			0	38
sweet birch	Betula lenta	NDH	High	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			0	39
bitternut hickory	Carya cordiformis	WSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	40
pignut hickory	Carya glabra	WDL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	41
shagbark hickory	Carya ovata	WSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	42
sugarberry	Celtis laevigata	NDH	Medium	0	0	0	Unknown	New Habitat	Medium	Absent	Unknown	New Habitat			0	43
hackberry	Celtis occidentalis	WDH	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate +	3	44
flowering dogwood	Cornus florida	WDL	Medium	0	0	0	Unknown	New Habitat	Medium	Absent	Unknown	New Habitat			0	45
American beech	Fagus grandifolia	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	46
honeylocust	Gleditsia triacanthos	NSH	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			3	47



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Common Name	Scientific Name	Range	MR	%Cell	FIAsum	FIaiv	ChngCl45	ChngCl85	Adap	Abund	Capabil45	Capabil85	SHIFT45	SHIFT85	SSO	N
black walnut	Juglans nigra	WDH	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	48
yellow-poplar	Liriodendron tulipifera	WDH	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			3	49
bigleaf magnolia	Magnolia macrophylla	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	50
blackgum	Nyssa sylvatica	WDL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			0	51
sycamore	Platanus occidentalis	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	52
eastern cottonwood	Populus deltoides	NSH	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	53
white oak	Quercus alba	WDH	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	54
swamp white oak	Quercus bicolor	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	55
scarlet oak	Quercus coccinea	WDL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	56
bur oak	Quercus macrocarpa	NDH	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Likely +	Likely +	3	57
pin oak	Quercus palustris	NSH	Low	0	0	0	Unknown	New Habitat	Low	Absent	Unknown	New Habitat			3	58
chestnut oak	Quercus prinus	NDH	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			0	59
post oak	Quercus stellata	WDH	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			0	60
black oak	Quercus velutina	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++	3	61
live oak	Quercus virginiana	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	62
black locust	Robinia pseudoacacia	NDH	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	63
sassafras	Sassafras albidum	WSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	64
cedar elm	Ulmus crassifolia	NDH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			0	65
slippery elm	Ulmus rubra	WSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	66