

Current and Potential Future Habitat, Capability, and Migration

	sq. km	sq. mi	FIA Plots
Area of Region	25,027	9,663.0	1,529

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			
		Model	Reliability	Adaptability	Scenario	Scenario	Scenario	Scenario	SHIFT	SHIFT			
		High	18	15	RCP45	RCP85	RCP45	RCP85	RCP45	RCP85			
Ash	2				Increase	18	18	Very Good	3	4	Likely	0	0
Hickory	0				No Change	1	3	Good	13	13	Infill	6	6
Maple	5	Abundant	8		Decrease	13	11	Fair	9	8	Migrate	8	14
Oak	3	Common	9		New	21	26	Poor	3	3		14	20
Pine	4	Rare	19		Unknown	14	9	Very Poor	4	3			
Other	22	Absent	30	FIA				FIA Only	3	3			
	36		66			67	67	Unknown	10	5			
									45	39			

Potential Changes in Climate Variables

Temperature (°F)

Scenario	2009	2039	2069	2099		
Annual	CCSM45	37.9	39.4	42.3	42.6	
Average	CCSM85	37.9	40.3	43.5	47.2	
	GFDL45	37.9	41.2	44.1	45.9	
	GFDL85	37.9	41.5	45.4	51.0	
	HAD45	37.9	41.3	44.6	46.7	
	HAD85	37.9	41.7	45.8	51.9	
Growing Season	CCSM45	58.6	60.1	62.7	63.0	
	CCSM85	58.6	61.1	63.9	67.9	
May—Sep	GFDL45	58.6	62.6	66.3	68.5	
	GFDL85	58.6	63.1	67.5	73.7	
	HAD45	58.6	61.7	64.3	66.7	
	HAD85	58.6	61.6	65.5	71.4	
Coldest Month	CCSM45	4.7	6.0	8.5	8.5	
	CCSM85	4.7	5.6	8.1	10.5	
Average	GFDL45	4.7	8.1	10.3	11.0	
	GFDL85	4.7	9.2	11.1	14.7	
	HAD45	4.7	7.1	11.2	11.2	
	HAD85	4.7	10.4	13.4	17.7	
Warmest Month	CCSM45	65.3	67.1	68.6	69.0	
	CCSM85	65.3	68.4	70.3	72.7	
Average	GFDL45	65.3	69.7	71.4	73.0	
	GFDL85	65.3	70.2	72.6	75.7	
	HAD45	65.3	68.6	69.7	71.6	
	HAD85	65.3	68.7	70.7	74.7	

Precipitation (in)

Scenario	2009	2039	2069	2099		
Annual	CCSM45	29.0	29.9	30.1	29.2	
Total	CCSM85	29.0	28.6	30.1	29.6	
	GFDL45	29.0	31.2	32.7	31.3	
	GFDL85	29.0	32.1	34.1	34.0	
	HAD45	29.0	30.6	29.1	29.7	
	HAD85	29.0	30.2	30.6	32.0	
Growing Season	CCSM45	18.1	18.4	17.7	17.4	
	CCSM85	18.1	17.2	17.6	16.5	
May—Sep	GFDL45	18.1	19.6	19.6	19.0	
	GFDL85	18.1	20.2	20.8	19.4	
	HAD45	18.1	18.2	16.3	16.5	
	HAD85	18.1	17.9	16.2	15.8	

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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Section 212L

EcoMap 2007
Climate Change Atlas Tree Species

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Northern Research Station
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Iverson, Peters, Prasad, Matthews

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Common Name	Scientific Name	Range	MR	%Cell	FIAsum	FIAiv	ChngCl45	ChngCl85	Adap	Abund	Capabil45	Capabil85	SHIFT45	SHIFT85	SSO	N
quaking aspen	Populus tremuloides	WDH	High	94.8	2513.9	18.6	Sm. dec.	Sm. dec.	Medium	Abundant	Fair	Fair			0	1
balsam fir	Abies balsamea	NDH	High	95.4	1549.8	11.8	Lg. dec.	Lg. dec.	Low	Abundant	Poor	Poor			0	2
paper birch	Betula papyrifera	WDH	High	97.5	1449.2	10.3	Sm. dec.	Lg. dec.	Medium	Abundant	Fair	Fair			0	3
black spruce	Picea mariana	NSH	High	85.1	1370.1	12.2	Lg. dec.	Lg. dec.	Medium	Abundant	Fair	Fair			0	4
northern white-cedar	Thuja occidentalis	WSH	High	50.1	633.8	8.4	Sm. dec.	No change	Medium	Abundant	Fair	Good			1	5
jack pine	Pinus banksiana	NSH	Medium	50	556.1	9.5	Sm. dec.	Sm. dec.	High	Abundant	Good	Good			1	6
red maple	Acer rubrum	WDH	High	77.6	540.4	5.2	Lg. inc.	Lg. inc.	High	Abundant	Very Good	Very Good			1	7
black ash	Fraxinus nigra	WSH	Medium	57.2	520.2	6.1	Sm. inc.	No change	Low	Abundant	Good	Fair			1	8
tamarack (native)	Larix laricina	NSH	High	46.7	404.3	6.0	Sm. inc.	Sm. inc.	Low	Common	Fair	Fair			1	9
white spruce	Picea glauca	NSL	Medium	81	402.7	3.3	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	10
red pine	Pinus resinosa	NSH	Medium	41.9	322.1	6.1	Sm. inc.	Sm. inc.	Low	Common	Fair	Fair			1	11
sugar maple	Acer saccharum	WDH	High	28.3	269.7	6.5	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	12
eastern white pine	Pinus strobus	WDH	High	43.6	265.7	4.9	Lg. inc.	Lg. inc.	Low	Common	Good	Good			1	13
balsam poplar	Populus balsamifera	NSH	Medium	42.7	180.5	2.8	Sm. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	14
bigtooth aspen	Populus grandidentata	NSL	Medium	27.9	94.6	2.4	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	15
yellow birch	Betula alleghaniensis	NDL	High	22.2	91.0	2.9	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good			1	16
mountain maple	Acer spicatum	NSL	Low	48.9	76.5	1.2	Lg. dec.	Lg. dec.	High	Common	Fair	Fair			1	17
American basswood	Tilia americana	WSL	Medium	13.1	38.1	1.8	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	18
northern red oak	Quercus rubra	WDH	Medium	16.4	30.9	1.3	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	1	19
American elm	Ulmus americana	WDH	Medium	11.4	22.7	1.3	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	20
green ash	Fraxinus pennsylvanica	WSH	Low	7.4	20.8	1.8	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	21
peachleaf willow	Salix amygdaloides	NSLX	FIA	9.1	18.0	0.9	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	22
chokecherry	Prunus virginiana	NSLX	FIA	18.6	12.8	0.6	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	23
bur oak	Quercus macrocarpa	NDH	Medium	4	12.7	1.3	Lg. inc.	Lg. inc.	High	Rare	Good	Good			2	24
serviceberry	Amelanchier spp.	NSL	Low	17.9	11.8	0.5	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	25
pin cherry	Prunus pensylvanica	NSL	Low	17.9	11.1	0.5	Lg. dec.	Very Lg. dec.	Medium	Rare	Very Poor	Lost			0	26
American mountain-ash	Sorbus americana	NSL	Low	12.7	10.6	0.7	Lg. dec.	Lg. dec.	Low	Rare	Very Poor	Very Poor			0	27
northern pin oak	Quercus ellipsoidalis	NSH	Medium	4.1	7.2	1.6	Lg. inc.	Lg. inc.	High	Rare	Good	Good			2	28
silver maple	Acer saccharinum	NSH	Low	0.7	7.0	4.3	No change	Lg. inc.	High	Rare	Fair	Good			2	29
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	5.1	6.2	0.8	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	2	30
black willow	Salix nigra	NSH	Low	5.7	5.5	0.7	Sm. dec.	No change	Low	Rare	Very Poor	Very Poor			2	31
black cherry	Prunus serotina	WDL	Medium	3.5	1.3	0.3	Lg. inc.	Lg. inc.	Low	Rare	Fair	Fair	Infill +	Infill +	2	32
boxelder	Acer negundo	WSH	Low	1.1	1.3	1.0	Lg. inc.	Lg. inc.	High	Rare	Good	Good			2	33
slippery elm	Ulmus rubra	WSL	Low	0.3	1.2	2.2	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	34
Scots pine	Pinus sylvestris	NSH	FIA	0.4	1.0	2.6	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	35
wild plum	Prunus americana	NSLX	FIA	0.5	0.2	0.2	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	36
ashe juniper	Juniperus ashei	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	37
eastern redcedar	Juniperus virginiana	WDH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate ++	3	38
eastern hemlock	Tsuga canadensis	NSH	High	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat	Migrate ++	Migrate +	3	39
striped maple	Acer pensylvanicum	NSL	Medium	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	40
Ohio buckeye	Aesculus glabra	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	41
sweet birch	Betula lenta	NDH	High	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			0	42
American hornbeam; muscle	Carpinus caroliniana	WSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	43
bitternut hickory	Carya cordiformis	WSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	44
shellbark hickory	Carya laciniosa	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	45
shagbark hickory	Carya ovata	WSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	46
hackberry	Celtis occidentalis	WDH	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate +	3	47



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eastern redbud	<i>Cercis canadensis</i>	NSL	Low	0	0	0	Unknown	New Habitat	Medium	Absent	Unknown	New Habitat			0	48
American beech	<i>Fagus grandifolia</i>	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	49
white ash	<i>Fraxinus americana</i>	WDL	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	50
honeylocust	<i>Gleditsia triacanthos</i>	NSH	Low	0	0	0	Unknown	New Habitat	High	Absent	Unknown	New Habitat			3	51
American holly	<i>Ilex opaca</i>	NSL	Medium	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	52
black walnut	<i>Juglans nigra</i>	WDH	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	53
sweetgum	<i>Liquidambar styraciflua</i>	WDH	High	0	0	0	Unknown	New Habitat	Medium	Absent	Unknown	New Habitat			0	54
cucumbertree	<i>Magnolia acuminata</i>	NSL	Low	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown			0	55
bigleaf magnolia	<i>Magnolia macrophylla</i>	NSL	Low	0	0	0	Unknown	New Habitat	Medium	Absent	Unknown	New Habitat			0	56
sycamore	<i>Platanus occidentalis</i>	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	57
eastern cottonwood	<i>Populus deltoides</i>	NSH	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	58
white oak	<i>Quercus alba</i>	WDH	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	59
swamp white oak	<i>Quercus bicolor</i>	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	60
scarlet oak	<i>Quercus coccinea</i>	WDL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	61
chinkapin oak	<i>Quercus muehlenbergii</i>	NSL	Medium	0	0	0	Unknown	New Habitat	Medium	Absent	Unknown	New Habitat			0	62
chestnut oak	<i>Quercus prinus</i>	NDH	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			0	63
black oak	<i>Quercus velutina</i>	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	64
live oak	<i>Quercus virginiana</i>	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	65
black locust	<i>Robinia pseudoacacia</i>	NDH	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	66
cedar elm	<i>Ulmus crassifolia</i>	NDH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			0	67