

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

	sq. km	sq. mi	FIA Plots
Area of Region	8,532.9	3,294.6	442

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	Scenario	Scenario	Scenario	SHIFT	SHIFT				
				High	13	15	Increase	18	17	Very Good	8	10	Likely	3	3
Ash	2			Medium	19	27	No Change	7	8	Good	12	11	Infill	4	4
Hickory	1			Low	18	10	Decrease	8	8	Fair	8	7	Migrate	6	8
Maple	5	Abundant	10	FIA	2		New	17	17	Poor	2	2			
Oak	4	Common	11				Unknown	2	2	Very Poor	2	2			
Pine	3	Rare	14							FIA Only	2	2			
Other	20	Absent	17							Unknown	0	0			
	35		52		52	52		52	52		34	34		13	15

Potential Changes in Climate Variables

Temperature (°F)

	Scenario	2009	2039	2069	2099	
Annual	CCSM45	40.8	42.4	45.4	45.8	
	Average CCSM85	40.8	43.3	46.6	50.3	
	GFDL45	40.8	43.7	46.4	48.1	
	GFDL85	40.8	44.1	47.6	52.8	
	HAD45	40.8	43.8	47.6	49.6	
HAD85	40.8	44.4	48.8	54.6		
Growing Season	CCSM45	61.4	63.1	65.7	66.1	
	CCSM85	61.4	64.1	67.2	71.4	
	GFDL45	61.4	64.6	68.1	70.2	
	GFDL85	61.4	65.4	69.2	75.0	
	HAD45	61.4	64.5	67.7	69.9	
HAD85	61.4	64.5	68.9	74.9		
Coldest Month	CCSM45	7.2	9.0	11.3	11.7	
	CCSM85	7.2	8.8	11.2	13.7	
	Average GFDL45	7.2	10.9	12.7	13.3	
	GFDL85	7.2	11.5	13.3	16.6	
	HAD45	7.2	9.0	13.3	13.1	
HAD85	7.2	12.7	16.0	19.9		
Warmest Month	CCSM45	68.0	69.9	71.4	72.0	
	CCSM85	68.0	71.3	73.4	75.9	
	Average GFDL45	68.0	71.4	72.9	74.6	
	GFDL85	68.0	72.2	74.3	77.6	
	HAD45	68.0	71.4	73.0	74.7	
HAD85	68.0	71.8	74.1	78.1		

Precipitation (in)

	Scenario	2009	2039	2069	2099	
Annual	CCSM45	28.6	29.4	29.2	28.8	
	Total CCSM85	28.6	28.3	28.5	28.4	
	GFDL45	28.6	31.7	33.1	30.5	
	GFDL85	28.6	31.7	34.5	33.5	
	HAD45	28.6	30.6	28.7	30.5	
HAD85	28.6	30.4	29.9	31.6		
Growing Season	CCSM45	18.3	18.2	17.5	17.5	
	CCSM85	18.3	17.6	16.6	15.9	
	GFDL45	18.3	20.5	20.5	18.8	
	GFDL85	18.3	20.4	21.2	19.5	
	HAD45	18.3	18.7	16.7	17.3	
HAD85	18.3	18.3	16.2	16.0		

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-DGP30 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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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
quaking aspen	Populus tremuloides	WDH	High	89.2	2301.2	17.1	Sm. dec.	Sm. dec.	Medium	Abundant	Fair	Fair			0	1
black ash	Fraxinus nigra	WSH	Medium	88.8	1278.2	10.0	Sm. dec.	Sm. dec.	Low	Abundant	Fair	Fair			0	2
tamarack (native)	Larix laricina	NSH	High	57.2	1069.2	15.2	No change	No change	Low	Abundant	Fair	Fair			0	3
red maple	Acer rubrum	WDH	High	94.6	986.2	7.7	No change	No change	High	Abundant	Very Good	Very Good			1	4
bur oak	Quercus macrocarpa	NDH	Medium	74.1	769.2	6.3	No change	No change	High	Abundant	Very Good	Very Good			1	5
black spruce	Picea mariana	NSH	High	45.1	681.9	11.4	Sm. dec.	Sm. dec.	Medium	Abundant	Fair	Fair			0	6
paper birch	Betula papyrifera	WDH	High	87.1	639.8	5.1	No change	No change	Medium	Abundant	Good	Good			1	7
American basswood	Tilia americana	WSL	Medium	77.6	636.2	5.9	No change	No change	Medium	Abundant	Good	Good			1	8
northern red oak	Quercus rubra	WDH	Medium	62.6	593.2	6.7	Sm. inc.	No change	High	Abundant	Very Good	Very Good			1	9
sugar maple	Acer saccharum	WDH	High	71.8	564.7	6.3	Sm. inc.	Sm. inc.	High	Abundant	Very Good	Very Good			1	10
green ash	Fraxinus pennsylvanica	WSH	Low	78.8	394.2	3.5	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	11
balsam fir	Abies balsamea	NDH	High	53.4	297.3	3.7	Sm. inc.	Lg. inc.	Low	Common	Fair	Good			1	12
American elm	Ulmus americana	WDH	Medium	71.5	226.7	2.1	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	13
bigtooth aspen	Populus grandidentata	NSL	Medium	36.9	201.1	3.3	Sm. inc.	No change	Medium	Common	Good	Fair			1	14
northern white-cedar	Thuja occidentalis	WSH	High	11.8	141.7	6.7	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good	Infill ++	Infill ++	1	15
balsam poplar	Populus balsamifera	NSH	Medium	26.6	130.2	3.1	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	16
red pine	Pinus resinosa	NSH	Medium	15.5	127.8	4.8	Lg. inc.	Lg. inc.	Low	Common	Good	Good			1	17
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	51.6	122.7	1.7	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	18
yellow birch	Betula alleghaniensis	NDL	High	23	68.1	2.0	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good			1	19
white spruce	Picea glauca	NSL	Medium	27.7	63.3	2.1	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good			1	20
eastern white pine	Pinus strobus	WDH	High	21	60.4	2.1	Lg. inc.	Lg. inc.	Low	Common	Good	Good			1	21
silver maple	Acer saccharinum	NSH	Low	6.3	48.7	4.0	No change	Sm. inc.	High	Rare	Fair	Good	Infill +	Infill ++	1	22
jack pine	Pinus banksiana	NSH	Medium	6.5	40.3	3.8	No change	No change	High	Rare	Fair	Fair			1	23
northern pin oak	Quercus ellipsoidalis	NSH	Medium	6.9	33.8	3.3	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	1	24
butternut	Juglans cinerea	NSLX	FIA	10.9	27.2	1.8	Unknown	Unknown	Low	Rare	FIA Only	FIA Only			0	25
serviceberry	Amelanchier spp.	NSL	Low	13.5	16.7	1.0	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	26
American hornbeam; musclev	Carpinus caroliniana	WSL	Low	13.3	16.6	1.1	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	27
boxelder	Acer negundo	WSH	Low	6.7	16.6	1.9	Lg. inc.	Lg. inc.	High	Rare	Good	Good			1	28
chokecherry	Prunus virginiana	NSLX	FIA	22	16.1	0.6	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	29
black cherry	Prunus serotina	WDL	Medium	11.1	10.5	0.5	Lg. inc.	Lg. inc.	Low	Rare	Fair	Fair	Infill +	Infill +	1	30
pin cherry	Prunus pensylvanica	NSL	Low	8.4	7.4	0.6	Very Lg. dec.	Very Lg. dec.	Medium	Rare	Lost	Lost			0	31
white oak	Quercus alba	WDH	Medium	3.4	3.7	0.6	Lg. inc.	Lg. inc.	High	Rare	Good	Good			2	32
mountain maple	Acer spicatum	NSL	Low	5.9	2.6	0.4	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor			1	33
bitternut hickory	Carya cordiformis	WSL	Low	2.3	1.9	0.8	Lg. inc.	Lg. inc.	High	Rare	Good	Good			2	34
hackberry	Celtis occidentalis	WDH	Medium	1.2	0.9	0.7	Lg. inc.	Lg. inc.	High	Rare	Good	Good			2	35
eastern redcedar	Juniperus virginiana	WDH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +	3	36
eastern hemlock	Tsuga canadensis	NSH	High	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat	Migrate +		3	37
pignut hickory	Carya glabra	WDL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	38
shagbark hickory	Carya ovata	WSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	39
mockernut hickory	Carya alba	WDL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			0	40
white ash	Fraxinus americana	WDL	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat	Likely +	Likely +	3	41
black walnut	Juglans nigra	WDH	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	42
red mulberry	Morus rubra	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	43
sycamore	Platanus occidentalis	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	44
eastern cottonwood	Populus deltoides	NSH	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	45
swamp white oak	Quercus bicolor	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	46
post oak	Quercus stellata	WDH	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			0	47

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Northern Research Station
Landscape Change Research Group
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Common Name	Scientific Name	Range	MR	%Cell	FIAsum	FIAiv	ChngCl45	ChngCl85	Adap	Abund	Capabil45	Capabil85	SHIFT45	SHIFT85	SSO	N
black oak	Quercus velutina	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	48
black locust	Robinia pseudoacacia	NDH	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	49
black willow	Salix nigra	NSH	Low	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat	Likely +	Likely +	3	50
sassafras	Sassafras albidum	WSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	51
slippery elm	Ulmus rubra	WSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++	3	52