

Current and Potential Future Habitat, Capability, and Migration

	sq. km	sq. mi	FIA Plots
Area of Region	5,537.2	2,137.9	280

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	3			High	19	19	Increase	11	11	Very Good	7	7
Hickory	0			Medium	25	36	No Change	6	5	Good	6	5
Maple	4	Abundant	8	Low	24	14	Decrease	15	16	Fair	8	7
Oak	3	Common	16	FIA	1		New	27	30	Poor	7	10
Pine	3	Rare	9				Unknown	10	7	Very Poor	3	0
Other	20	Absent	33							FIA Only	1	1
	33		66		69	69		69	69	Unknown	9	6
											41	36

Potential Changes in Climate Variables

Temperature (°F)

Scenario	2009	2039	2069	2099		
Annual	CCSM45	41.1	42.7	45.8	45.9	
Average	CCSM85	41.1	43.6	46.8	50.4	
	GFDL45	41.1	44.4	47.2	48.8	
	GFDL85	41.1	44.7	48.4	53.9	
	HAD45	41.1	44.5	47.9	49.9	
	HAD85	41.1	44.9	49.0	55.0	
Growing Season	CCSM45	60.1	61.8	64.3	64.5	
	CCSM85	60.1	62.6	65.4	69.4	
May—Sep	GFDL45	60.1	64.3	67.8	70.1	
	GFDL85	60.1	64.7	69.0	75.3	
	HAD45	60.1	63.4	66.1	68.5	
	HAD85	60.1	63.3	67.5	73.4	
Coldest Month	CCSM45	11.1	12.5	15.0	15.0	
	CCSM85	11.1	12.5	14.9	17.4	
Average	GFDL45	11.1	14.1	16.2	16.7	
	GFDL85	11.1	15.1	16.9	20.2	
	HAD45	11.1	13.2	17.5	17.3	
	HAD85	11.1	16.6	19.5	23.6	
Warmest Month	CCSM45	67.0	68.8	70.3	70.7	
	CCSM85	67.0	69.8	71.7	74.1	
Average	GFDL45	67.0	71.1	72.8	74.4	
	GFDL85	67.0	71.9	74.2	77.4	
	HAD45	67.0	70.7	71.9	73.8	
	HAD85	67.0	70.8	72.9	76.9	

Precipitation (in)

Scenario	2009	2039	2069	2099		
Annual	CCSM45	31.4	32.8	32.7	32.4	
Total	CCSM85	31.4	30.8	32.0	32.1	
	GFDL45	31.4	34.4	35.9	34.2	
	GFDL85	31.4	34.1	37.4	37.0	
	HAD45	31.4	33.0	32.7	33.2	
	HAD85	31.4	33.0	34.3	35.6	
Growing Season	CCSM45	17.6	18.1	17.0	17.2	
	CCSM85	17.6	16.9	16.8	15.7	
May—Sep	GFDL45	17.6	19.4	19.2	18.3	
	GFDL85	17.6	19.1	20.4	18.6	
	HAD45	17.6	17.4	16.1	16.2	
	HAD85	17.6	17.3	15.8	15.7	

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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EcoMap 2007
Climate Change Atlas Tree Species

USDA Forest Service
Northern Research Station
Landscape Change Research Group
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	92.2	3829.1	18.2	Lg. dec.	Lg. dec.	Medium	Abundant	Fair	Fair			0	1
sugar maple	Acer saccharum	WDH	High	67.2	2042.9	7.5	No change	No change	High	Abundant	Very Good	Very Good			1	2
red maple	Acer rubrum	WDH	High	89.3	1872.5	7.3	No change	No change	High	Abundant	Very Good	Very Good			1	3
balsam fir	Abies balsamea	NDH	High	83.2	1255.7	5.7	Lg. dec.	Lg. dec.	Low	Abundant	Poor	Poor			0	4
paper birch	Betula papyrifera	WDH	High	69.7	1017.2	4.6	Sm. dec.	Sm. dec.	Medium	Abundant	Fair	Fair			0	5
black ash	Fraxinus nigra	WSH	Medium	73.7	847.5	4.0	Sm. dec.	Sm. dec.	Low	Abundant	Fair	Fair			0	6
eastern hemlock	Tsuga canadensis	NSH	High	29.1	564.0	4.7	Sm. dec.	Lg. dec.	Low	Abundant	Fair	Poor			0	7
red pine	Pinus resinosa	NSH	Medium	29.2	551.0	5.3	Sm. dec.	Sm. dec.	Low	Abundant	Fair	Fair			0	8
white spruce	Picea glauca	NSL	Medium	72.1	496.7	2.4	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	9
yellow birch	Betula alleghaniensis	NDL	High	45.5	472.0	2.4	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	10
American basswood	Tilia americana	WSL	Medium	57.1	459.2	2.8	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	11
northern red oak	Quercus rubra	WDH	Medium	50.4	455.4	2.7	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	12
bigtooth aspen	Populus grandidentata	NSL	Medium	42.7	422.5	2.6	No change	Sm. dec.	Medium	Common	Fair	Poor			1	13
eastern white pine	Pinus strobus	WDH	High	43	406.1	3.7	Sm. inc.	Sm. inc.	Low	Common	Fair	Fair			1	14
balsam poplar	Populus balsamifera	NSH	Medium	26.8	260.0	3.3	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor	Infill +	Infill +	0	15
white ash	Fraxinus americana	WDL	Medium	39.5	252.3	1.9	Lg. inc.	Lg. inc.	Low	Common	Good	Good			1	16
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	49.3	174.7	1.1	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	17
northern white-cedar	Thuja occidentalis	WSH	High	25	149.4	1.7	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	18
black spruce	Picea mariana	NSH	High	15.8	143.9	2.0	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	19
jack pine	Pinus banksiana	NSH	Medium	5.6	110.2	1.4	No change	Sm. dec.	High	Common	Good	Fair			1	20
northern pin oak	Quercus ellipsoidalis	NSH	Medium	9.4	109.4	2.0	No change	No change	High	Common	Good	Good	Infill ++	Infill ++	1	21
green ash	Fraxinus pennsylvanica	WDL	Low	40.9	94.3	0.9	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	22
American elm	Ulmus americana	WDH	Medium	26.5	93.2	1.3	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	23
tamarack (native)	Larix laricina	NSH	High	12.3	86.1	1.3	No change	No change	Low	Common	Poor	Poor			0	24
chokecherry	Prunus virginiana	NSLX	FIA	13.9	46.1	1.1	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	25
black cherry	Prunus serotina	WDL	Medium	24.2	42.4	0.5	Lg. inc.	Lg. inc.	Low	Rare	Fair	Fair			1	26
serviceberry	Amelanchier spp.	NSL	Low	25.6	40.3	0.7	Lg. dec.	Very Lg. dec.	Medium	Rare	Very Poor	Lost			0	27
bur oak	Quercus macrocarpa	NDH	Medium	11	21.1	1.4	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	2	28
American hornbeam; musclev	Carpinus caroliniana	WSL	Low	8.7	14.3	1.0	Sm. dec.	No change	Medium	Rare	Very Poor	Poor		Infill +	1	29
mountain maple	Acer spicatum	NSL	Low	7.8	9.7	0.4	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor			1	30
American mountain-ash	Sorbus americana	NSL	Low	0.2	6.3	0.4	Lg. dec.	Very Lg. dec.	Low	Rare	Very Poor	Lost			0	31
boxelder	Acer negundo	WSH	Low	2.4	4.3	0.2	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	2	32
pin cherry	Prunus pensylvanica	NSL	Low	3.6	3.6	0.1	Very Lg. dec.	Very Lg. dec.	Medium	Rare	Lost	Lost			0	33
eastern redcedar	Juniperus virginiana	WDH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	34
black maple	Acer nigrum	NSH	Low	0	0	0	Unknown	Unknown	High	Modeled	Unknown	Unknown			0	35
striped maple	Acer pensylvanicum	NSL	Medium	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown			0	36
silver maple	Acer saccharinum	NSH	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Likely +	Likely +	3	37
Ohio buckeye	Aesculus glabra	NSL	Low	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown			0	38
pawpaw	Asimina triloba	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	39
sweet birch	Betula lenta	NDH	High	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			0	40
bitternut hickory	Carya cordiformis	WSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	41
pignut hickory	Carya glabra	WDL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	42
shagbark hickory	Carya ovata	WDL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	43
mockernut hickory	Carya alba	WDL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			0	44
sugarberry	Celtis laevigata	NDH	Medium	0	0	0	Unknown	New Habitat	Medium	Absent	Unknown	New Habitat			0	45
hackberry	Celtis occidentalis	WDH	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate +	3	46
flowering dogwood	Cornus florida	WDL	Medium	0	0	0	Unknown	New Habitat	Medium	Absent	Unknown	New Habitat			0	47



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American beech	Fagus grandifolia	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	48
blue ash	Fraxinus quadrangulata	NSL	Low	0	0	0	Unknown	Unknown	Low	Absent	Unknown	Unknown				49
black walnut	Juglans nigra	WDH	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	50
sweetgum	Liquidambar styraciflua	WDH	High	0	0	0	Unknown	New Habitat	Medium	Absent	Unknown	New Habitat				51
yellow-poplar	Liriodendron tulipifera	WDH	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat				52
bigleaf magnolia	Magnolia macrophylla	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown				53
blackgum	Nyssa sylvatica	WDL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat				54
sycamore	Platanus occidentalis	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat				55
eastern cottonwood	Populus deltoides	NSH	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	56
white oak	Quercus alba	WDH	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	57
swamp white oak	Quercus bicolor	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	58
scarlet oak	Quercus coccinea	WDL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat				59
pin oak	Quercus palustris	NSH	Low	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat				60
chestnut oak	Quercus prinus	NDH	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat				61
post oak	Quercus stellata	WDH	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat				62
black oak	Quercus velutina	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++	3	63
live oak	Quercus virginiana	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat				64
black locust	Robinia pseudoacacia	NDH	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	65
black willow	Salix nigra	NSH	Low	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat	Likely +	Likely +	3	66
sassafras	Sassafras albidum	WSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat				67
cedar elm	Ulmus crassifolia	NDH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat				68
slippery elm	Ulmus rubra	WSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	69

