S43 E86

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

USDA **Forest Service**
Northern Research Station
Landscape Change Research Group
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	sq. km	sq. mi	FIA Plots
Area of Region	3,706.5	1,431.1	114

Species Information

The columns below provide breif 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	Reliability	Adaptability	Potential Change in Habitat Suitability			Capability to Cope or Persist			Migration Potential		
									Scenario RCP45	Scenario RCP85		Scenario RCP45	Scenario RCP85		SHIFT RCP45	SHIFT RCP85
Ash	3															
Hickory	1															
Maple	5	Abundant	7	High	20	18	Increase	10	10	Very Good	5	5	Likely	2	2
Oak	6	Common	18	Medium	23	33	No Change	6	6	Good	7	7	Infill	5	5
Pine	4	Rare	20	Low	18	11	Decrease	26	26	Fair	8	7	Migrate	4	6
Other	26	Absent	18	FIA	3		New	16	17	Poor	10	12		**11**	**13**
45		**63**		**64**	**62**		Unknown	6	5	Very Poor	6	6			
							64	**64**		FIA Only	1	1			
										Unknown	3	2			
										40	**40**				

Potential Changes in Climate Variables

Temperature (°F)

	Scenario	2009	2039	2069	2099	
Annual	CCSM45	46.7	48.6	51.6	51.5	
Average	CCSM85	46.7	49.3	52.2	55.6	
	GFDL45	46.7	49.7	52.4	53.6	
	GFDL85	46.7	50.0	53.5	58.0	
	HAD45	46.7	50.0	53.3	55.2	
	HAD85	46.7	50.2	54.7	60.2	
Growing	CCSM45	63.7	65.4	67.8	68.1	
Season	CCSM85	63.7	66.0	68.6	72.5	
May—Sep	GFDL45	63.7	67.5	70.9	72.8	
	GFDL85	63.7	68.0	72.3	77.6	
	HAD45	63.7	67.4	69.8	72.2	
	HAD85	63.7	66.9	71.9	77.7	
Coldest	CCSM45	21.5	23.3	26.3	25.9	
Month	CCSM85	21.5	24.4	26.7	28.8	
Average	GFDL45	21.5	23.7	25.2	25.5	
	GFDL85	21.5	24.6	25.9	28.0	
	HAD45	21.5	23.0	26.6	26.8	
	HAD85	21.5	25.1	27.9	31.7	
Warmest	CCSM45	69.8	71.8	73.2	73.6	
Month	CCSM85	69.8	72.8	74.4	76.4	
Average	GFDL45	69.8	73.3	75.0	76.2	
	GFDL85	69.8	74.2	76.3	79.1	
	HAD45	69.8	74.1	75.3	77.1	
	HAD85	69.8	74.4	77.3	81.5	

Precipitation (in)

	Scenario	2009	2039	2069	2099	
Annual	CCSM45	35.1	34.5	34.0	34.9	
Total	CCSM85	35.1	35.6	35.4	35.9	
	GFDL45	35.1	37.4	41.0	40.7	
	GFDL85	35.1	39.0	42.7	43.9	
	HAD45	35.1	36.1	38.0	37.7	
	HAD85	35.1	38.0	36.6	39.7	
Growing	CCSM45	16.5	16.8	16.1	16.5	
Season	CCSM85	16.5	16.9	16.8	15.9	
May—Sep	GFDL45	16.5	16.9	19.4	19.3	
	GFDL85	16.5	18.8	19.1	19.9	
	HAD45	16.5	16.1	15.3	15.9	
	HAD85	16.5	16.8	13.8	14.9	

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
red pine	Pinus resinosa	NSH	Medium	55.1	1841.6	25.6	Lg. dec.	Lg. dec.	Low	Abundant	Poor	Poor			0	1
red maple	Acer rubrum	WDH	High	74.6	1588.1	13.8	Sm. dec.	Sm. dec.	High	Abundant	Good	Good			1	2
white oak	Quercus alba	WDH	Medium	57.7	853.8	10.2	No change	No change	High	Abundant	Very Good	Very Good			1	3
northern red oak	Quercus rubra	WDH	Medium	51	695.3	7.3	Sm. dec.	Sm. dec.	High	Abundant	Good	Good			1	4
eastern white pine	Pinus strobus	WDH	High	53.6	624.6	7.2	Sm. dec.	Lg. dec.	Low	Abundant	Fair	Poor			0	5
black oak	Quercus velutina	WDH	High	36.2	602.2	10.9	Sm. inc.	Sm. inc.	Medium	Abundant	Very Good	Very Good			1	6
quaking aspen	Populus tremuloides	WDH	High	29.2	512.2	7.7	Sm. dec.	Lg. dec.	Medium	Abundant	Fair	Fair			0	7
silver maple	Acer saccharinum	NSH	Low	19.6	497.9	15.1	No change	No change	High	Common	Good	Good			1	8
black cherry	Prunus serotina	WDL	Medium	60.9	412.1	5.1	Sm. inc.	Sm. inc.	Low	Common	Fair	Fair			1	9
Scots pine	Pinus sylvestris	NSH	FIA	12.8	361.0	26.4	Unknown	Unknown	NA	Common	NNIS	NNIS			0	10
eastern hemlock	Tsuga canadensis	NSH	High	30.2	351.3	8.8	Lg. dec.	Lg. dec.	Low	Common	Very Poor	Very Poor			0	11
American beech	Fagus grandifolia	WDH	High	45.1	327.2	5.3	No change	Sm. dec.	Medium	Common	Fair	Poor			1	12
jack pine	Pinus banksiana	NSH	Medium	22.2	277.3	5.8	Sm. dec.	Sm. dec.	High	Common	Fair	Fair			1	13
bigtooth aspen	Populus grandidentata	NSL	Medium	38.1	265.5	3.4	Sm. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	14
green ash	Fraxinus pennsylvanica	WSH	Low	29.9	249.3	5.2	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good			1	15
sugar maple	Acer saccharum	WDH	High	36.9	246.1	5.7	Sm. inc.	No change	High	Common	Very Good	Good			1	16
northern pin oak	Quercus ellipsoidalis	NSH	Medium	37.6	215.2	2.9	Lg. dec.	Lg. dec.	High	Common	Fair	Fair			1	17
American basswood	Tilia americana	WSL	Medium	24	198.9	6.6	No change	Sm. dec.	Medium	Common	Fair	Poor			1	18
black ash	Fraxinus nigra	WSH	Medium	21.9	91.5	2.5	Lg. dec.	Lg. dec.	Low	Common	Very Poor	Very Poor			0	19
American elm	Ulmus americana	WDH	Medium	32.8	91.1	2.0	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	20
northern white-cedar	Thuja occidentalis	WSH	High	10.8	87.6	5.7	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	21
black willow	Salix nigra	NSH	Low	1.6	87.4	18.9	Sm. dec.	Sm. dec.	Low	Common	Poor	Poor		Infill +	2	22
sassafras	Sassafras albidum	WSL	Low	26.6	74.8	1.7	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	23
white ash	Fraxinus americana	WDL	Medium	11.1	66.6	4.8	Lg. inc.	Lg. inc.	Low	Common	Good	Good			1	24
yellow birch	Betula alleghaniensis	NDL	High	17.3	57.2	1.5	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	25
black locust	Robinia pseudoacacia	NDH	Low	2.7	44.5	16.5	No change	Sm. inc.	Medium	Rare	Poor	Fair	Infill +	Infill +	2	26
mountain maple	Acer spicatum	NSL	Low	2.2	41.0	12.4	Very Lg. dec.	Very Lg. dec.	High	Rare	Lost	Lost			0	27
Norway spruce	Picea abies	NSH	FIA	2.7	39.7	14.7	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	28
serviceberry	Amelanchier spp.	NSL	Low	14.9	26.1	1.2	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	29
American hornbeam; muscle	Carpinus caroliniana	WSL	Low	18.1	25.8	0.9	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	30
bitternut hickory	Carya cordiformis	WSL	Low	7.7	22.5	2.8	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			1	31
blackgum	Nyssa sylvatica	WDL	Medium	7.3	21.9	2.3	Sm. inc.	Sm. inc.	High	Rare	Good	Good	Infill ++	Infill ++	1	32
boxelder	Acer negundo	WSH	Low	5.4	21.7	4.0	Sm. dec.	No change	High	Rare	Poor	Fair			1	33
bur oak	Quercus macrocarpa	NDH	Medium	5.4	19.5	1.9	Lg. dec.	Very Lg. dec.	High	Rare	Poor	Lost			0	34
paper birch	Betula papyrifera	WDH	High	7.6	17.2	1.1	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	1	35
white spruce	Picea glauca	NSL	Medium	2.7	14.8	5.5	Very Lg. dec.	Very Lg. dec.	Medium	Rare	Lost	Lost			0	36
tamarack (native)	Larix laricina	NSH	High	2.7	12.5	4.6	Lg. dec.	Lg. dec.	Low	Rare	Very Poor	Very Poor			0	37
eastern cottonwood	Populus deltoides	NSH	Low	2.6	11.4	4.1	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	2	38
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	13.1	11.1	0.8	Very Lg. dec.	Lg. dec.	High	Rare	Lost	Poor			1	39
black spruce	Picea mariana	NSH	High	2.7	10.7	4.0	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	40
swamp white oak	Quercus bicolor	NSL	Low	5.3	10.1	1.8	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair	Infill +		2	41
balsam fir	Abies balsamea	NDH	High	5.5	6.7	0.5	Very Lg. dec.	Very Lg. dec.	Low	Rare	Lost	Lost			0	42
chokecherry	Prunus virginiana	NSLX	FIA	4.2	4.7	0.7	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	43
flowering dogwood	Cornus florida	WDL	Medium	2.7	2.6	1.0	Very Lg. dec.	No change	Medium	Rare	Lost	Poor			0	44
balsam poplar	Populus balsamifera	NSH	Medium	0.1	2.0	0.0	Very Lg. dec.	Very Lg. dec.	Medium	Rare	Lost	Lost			0	45
eastern redcedar	Juniperus virginiana	WDH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++	3	46
shortleaf pine	Pinus echinata	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	47

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loblolly pine	Pinus taeda	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate ++	3	48
Virginia pine	Pinus virginiana	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	49
pignut hickory	Carya glabra	WDL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	50
black hickory	Carya texana	NDL	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	51
mockernut hickory	Carya alba	WDL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	52
black walnut	Juglans nigra	WDH	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	53
sweetgum	Liquidambar styraciflua	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	54
yellow-poplar	Liriodendron tulipifera	WDH	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Likely +	Likely +	3	55
bigleaf magnolia	Magnolia macrophylla	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	56
pin cherry	Prunus pensylvanica	NSL	Low	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown			0	57
scarlet oak	Quercus coccinea	WDL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +	3	58
southern red oak	Quercus falcata	WDL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			0	59
blackjack oak	Quercus marilandica	NSL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			3	60
pin oak	Quercus palustris	NSH	Low	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat		Migrate +	3	61
post oak	Quercus stellata	WDH	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			3	62
American mountain-ash	Sorbus americana	NSL	Low	0	0	0	Unknown	New Habitat	Low	Absent	Unknown	New Habitat			0	63
winged elm	Ulmus alata	WDL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	64

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