Chequamegon

National Forests and Grasslands
Climate Change Atlas Tree Species
Current and Potential Future Habitat, Capability, and Migration

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Iverson, Peters, Prasad, Matthews

	sq. km	sq. mi	FIA Plots
Area of Region	11,815	4,561.9	799

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
Ash	3
Hickory	1
Maple	4
Oak	4
Pine	4
Other	24
	40

Abundance	
Abundant	5
Common	20
Rare	15
Absent	20
	60

	Model Reliability	Adaptability
High	15	16
Medium	22	31
Low	17	11
FIA	6	
	60	**58**

Potential Change in Habitat Suitability	Scenario RCP45	Scenario RCP85
Increase	15	16
No Change	7	7
Decrease	12	11
New	18	19
Unknown	8	7
	60	**60**

Capability to Cope or Persist	Scenario RCP45	Scenario RCP85
Very Good	7	7
Good	9	10
Fair	7	6
Poor	7	8
Very Poor	3	1
FIA Only	4	4
Unknown	2	1
	39	**37**

Migration Potential	SHIFT RCP45	SHIFT RCP85
Likely	2	2
Infill	4	4
Migrate	7	10
	13	**16**

Potential Changes in Climate Variables

Temperature (°F)

	Scenario	2009	2039	2069	2099
Annual Average	CCSM45	40.8	42.5	45.6	45.7
	CCSM85	40.8	43.4	46.5	50.1
	GFDL45	40.8	43.8	46.8	48.3
	GFDL85	40.8	44.3	47.9	53.3
	HAD45	40.8	44.1	47.6	49.5
	HAD85	40.8	44.6	48.7	54.5
Growing Season May—Sep	CCSM45	60.7	62.5	65.1	65.3
	CCSM85	60.7	63.3	66.1	70.3
	GFDL45	60.7	64.3	68.0	70.2
	GFDL85	60.7	65.1	69.3	75.4
	HAD45	60.7	64.1	66.8	69.2
	HAD85	60.7	64.0	68.3	74.3
Coldest Month Average	CCSM45	9.1	10.5	13.1	13.2
	CCSM85	9.1	10.6	12.9	15.4
	GFDL45	9.1	12.4	14.4	14.9
	GFDL85	9.1	13.1	15.0	18.2
	HAD45	9.1	10.9	15.2	15.1
	HAD85	9.1	14.5	17.4	21.3
Warmest Month Average	CCSM45	67.1	69.0	70.6	71.0
	CCSM85	67.1	70.1	72.0	74.5
	GFDL45	67.1	71.0	72.6	74.3
	GFDL85	67.1	71.8	74.1	77.4
	HAD45	67.1	70.8	72.0	73.8
	HAD85	67.1	71.2	73.4	77.5

Precipitation (in)

	Scenario	2009	2039	2069	2099
Annual Total	CCSM45	32.0	33.5	32.8	33.1
	CCSM85	32.0	31.6	32.1	32.5
	GFDL45	32.0	35.1	36.4	34.7
	GFDL85	32.0	34.9	38.0	37.0
	HAD45	32.0	33.4	33.3	33.9
	HAD85	32.0	33.1	34.5	35.8
Growing Season May—Sep	CCSM45	19.3	19.8	18.5	19.1
	CCSM85	19.3	18.8	18.5	17.5
	GFDL45	19.3	21.0	21.0	19.8
	GFDL85	19.3	20.9	21.8	19.8
	HAD45	19.3	19.1	17.8	18.0
	HAD85	19.3	18.7	17.2	17.3

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.

Cite as: Iverson, L.R.; Prasad, A.M.; Peters, M.P.; Matthews, S.N. 2019. Facilitating Adaptive Forest Management under Climate Change: A Spatially Specific Synthesis of 125 Species for Habitat Changes and Assisted Migration over the Eastern United States. Forests. 10(11): 989. https://doi.org/10.3390/f10110989.

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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	94.9	1628.0	16.8	Sm. dec.	Sm. dec.	Medium	Abundant	Fair	Fair			0	1
red maple	Acer rubrum	WDH	High	98.3	1377.5	13.8	No change	No change	High	Abundant	Very Good	Very Good			1	2
sugar maple	Acer saccharum	WDH	High	88.6	1213.4	13.7	Sm. dec.	Sm. dec.	High	Abundant	Good	Good			1	3
balsam fir	Abies balsamea	NDH	High	90.7	801.7	8.6	Lg. dec.	Lg. dec.	Low	Abundant	Poor	Poor			0	4
black ash	Fraxinus nigra	WSH	Medium	79	558.4	7.0	Sm. dec.	Sm. dec.	Low	Abundant	Fair	Fair			0	5
red pine	Pinus resinosa	NSH	Medium	41.2	444.9	10.6	No change	No change	Low	Common	Poor	Poor			0	6
paper birch	Betula papyrifera	WDH	High	89.8	406.4	4.4	No change	No change	Medium	Common	Fair	Fair			1	7
tamarack (native)	Larix laricina	NSH	High	55	404.4	7.4	No change	No change	Low	Common	Poor	Poor			0	8
black spruce	Picea mariana	NSH	High	48.2	312.3	6.5	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	9
northern red oak	Quercus rubra	WDH	Medium	59.6	308.5	5.1	Lg. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	10
northern white-cedar	Thuja occidentalis	WSH	High	39.8	284.8	7.2	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	11
American basswood	Tilia americana	WSL	Medium	64.2	281.2	4.4	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	12
bigtooth aspen	Populus grandidentata	NSL	Medium	54.5	269.0	4.9	Sm. inc.	No change	Medium	Common	Good	Fair			1	13
yellow birch	Betula alleghaniensis	NDL	High	75.1	264.7	3.5	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	14
eastern white pine	Pinus strobus	WDH	High	53.8	243.4	4.5	Lg. inc.	Sm. inc.	Low	Common	Good	Fair			1	15
eastern hemlock	Tsuga canadensis	NSH	High	51.5	200.2	3.9	No change	No change	Low	Common	Poor	Poor			0	16
jack pine	Pinus banksiana	NSH	Medium	15.2	193.0	12.7	Sm. dec.	Sm. dec.	High	Common	Fair	Fair			1	17
white spruce	Picea glauca	NSL	Medium	58.6	143.7	2.4	No change	Sm. inc.	Medium	Common	Fair	Good			1	18
black cherry	Prunus serotina	WDL	Medium	68.6	124.1	1.8	Lg. inc.	Lg. inc.	Low	Common	Good	Good			1	19
American elm	Ulmus americana	WDH	Medium	46.4	112.1	2.4	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	20
white ash	Fraxinus americana	WDL	Medium	47.1	92.6	2.0	Lg. inc.	Lg. inc.	Low	Common	Good	Good			1	21
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	62.4	92.5	1.5	Sm. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	22
northern pin oak	Quercus ellipsoidalis	NSH	Medium	19.2	90.3	4.6	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good	Infill ++	Infill ++	1	23
green ash	Fraxinus pennsylvanica	WSH	Low	39.9	61.6	1.5	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	24
bur oak	Quercus macrocarpa	NDH	Medium	11.8	50.8	4.3	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good	Infill ++	Infill ++	2	25
American hornbeam; muscle	Carpinus caroliniana	WSL	Low	32.2	41.3	1.3	Sm. dec.	No change	Medium	Rare	Very Poor	Poor			1	26
chokecherry	Prunus virginiana	NSLX	FIA	25.2	13.9	0.5	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	27
pin cherry	Prunus pensylvanica	NSL	Low	15.2	13.6	0.9	Lg. dec.	Very Lg. dec.	Medium	Rare	Very Poor	Lost			0	28
serviceberry	Amelanchier spp.	NSL	Low	18.2	10.0	0.5	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	29
silver maple	Acer saccharinum	NSH	Low	0.8	9.3	10.9	No change	Lg. inc.	High	Rare	Fair	Good	Infill +	Infill ++	2	30
butternut	Juglans cinerea	NSLX	FIA	2.5	4.3	1.7	Unknown	Unknown	Low	Rare	FIA Only	FIA Only			0	31
balsam poplar	Populus balsamifera	NSH	Medium	4.2	3.5	0.8	Very Lg. dec.	Very Lg. dec.	Medium	Rare	Lost	Lost			0	32
slippery elm	Ulmus rubra	WSL	Low	2.5	2.1	0.8	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good	Infill +	Infill ++	2	33
bitternut hickory	Carya cordiformis	WSL	Low	1.7	1.1	0.7	Lg. inc.	Lg. inc.	High	Rare	Good	Good			2	34
mountain maple	Acer spicatum	NSL	Low	4.1	1.1	0.3	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor			1	35
white oak	Quercus alba	WDH	Medium	1.7	1.1	0.6	Lg. inc.	Lg. inc.	High	Rare	Good	Good			2	36
Norway spruce	Picea abies	NSH	FIA	0.8	0.7	0.8	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	37
Scots pine	Pinus sylvestris	NSH	FIA	0.8	0.4	0.5	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	38
peachleaf willow	Salix amygdaloides	NSLX	FIA	0.8	0.3	0.4	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	39
rock elm	Ulmus thomasii	NSLX	FIA	0.8	0.2	0.3	Unknown	Unknown	Low	Rare	FIA Only	FIA Only			0	40
eastern redcedar	Juniperus virginiana	WDH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	41
red spruce	Picea rubens	NDH	High	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			0	42
boxelder	Acer negundo	WSH	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Likely +	Likely +	3	43
pignut hickory	Carya glabra	WDL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	44
shagbark hickory	Carya ovata	WSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	45
mockernut hickory	Carya alba	WDL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			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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flowering dogwood	Cornus florida	WDL	Medium	0	0	0	Unknown	New Habitat	Medium	Absent	Unknown	New Habitat			3	48
American beech	Fagus grandifolia	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	49
black walnut	Juglans nigra	WDH	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	50
yellow-poplar	Liriodendron tulipifera	WDH	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			3	51
bigleaf magnolia	Magnolia macrophylla	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	52
blackgum	Nyssa sylvatica	WDL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate +	3	53
sycamore	Platanus occidentalis	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	54
eastern cottonwood	Populus deltoides	NSH	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	55
swamp white oak	Quercus bicolor	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +	3	56
scarlet oak	Quercus coccinea	WDL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	57
black oak	Quercus velutina	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++	3	58
black locust	Robinia pseudoacacia	NDH	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	59
sassafras	Sassafras albidum	WSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	60