

HUC 040202 Southeastern Lake Superior

HUC 6 Watershed Climate Change Atlas Tree Species

USDA Forest Service
Northern Research Station
Landscape Change Research Group
Iverson, Peters, Prasad, Matthews

Current and Potential Future Habitat, Capability, and Migration

	sq. km	sq. mi	FIA Plots
Area of Region	5,356.1	2,068.0	242

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	17	16	Increase	13	13	Very Good	4	4	Likely	0	0
Hickory	0			Medium	21	28	No Change	6	5	Good	11	11	Infill	6	6
Maple	5	Abundant	10	Low	15	11	Decrease	12	13	Fair	9	9	Migrate	5	11
Oak	1	Common	10	FIA	3		New	22	22	Poor	3	3		11	17
Pine	4	Rare	14				Unknown	3	3	Very Poor	4	1			
Other	21	Absent	22							FIA Only	2	2			
	34		56		56	55		56	56	Unknown	0	0			
											33	30			

Potential Changes in Climate Variables

Temperature (°F)

	Scenario	2009	2039	2069	2099	
Annual Average	CCSM45	37.6	38.5	40.5	40.4	
	CCSM85	37.6	39.1	41.0	43.2	
	GFDL45	37.6	39.5	41.5	42.4	
	GFDL85	37.6	39.8	42.2	45.5	
	HAD45	37.6	39.7	41.6	42.8	
HAD85	37.6	39.9	42.3	46.0		
Growing Season (May—Sep)	CCSM45	48.3	49.1	50.5	50.6	
	CCSM85	48.3	49.5	51.1	53.4	
	GFDL45	48.3	51.1	53.6	55.0	
	GFDL85	48.3	51.5	54.5	58.3	
	HAD45	48.3	50.2	51.5	52.9	
HAD85	48.3	50.1	52.3	55.8		
Coldest Month Average	CCSM45	21.3	22.3	24.0	23.6	
	CCSM85	21.3	22.6	24.0	25.7	
	GFDL45	21.3	22.4	23.7	24.1	
	GFDL85	21.3	23.0	24.1	25.9	
	HAD45	21.3	22.6	25.1	25.4	
HAD85	21.3	24.3	25.8	29.0		
Warmest Month Average	CCSM45	52.1	53.2	54.1	54.2	
	CCSM85	52.1	53.6	54.7	55.9	
	GFDL45	52.1	55.1	56.4	57.3	
	GFDL85	52.1	55.6	57.2	58.8	
	HAD45	52.1	54.1	54.5	55.7	
HAD85	52.1	54.1	55.3	57.6		

Precipitation (in)

	Scenario	2009	2039	2069	2099	
Annual Total	CCSM45	19.6	20.3	20.5	20.4	
	CCSM85	19.6	19.9	19.9	20.7	
	GFDL45	19.6	20.9	22.1	21.9	
	GFDL85	19.6	20.7	22.7	23.2	
	HAD45	19.6	20.7	21.6	21.3	
HAD85	19.6	21.2	22.1	23.1		
Growing Season (May—Sep)	CCSM45	9.4	9.7	9.3	9.3	
	CCSM85	9.4	9.2	9.0	8.7	
	GFDL45	9.4	9.7	10.3	10.2	
	GFDL85	9.4	9.9	10.3	10.0	
	HAD45	9.4	9.6	9.1	9.0	
HAD85	9.4	9.8	8.7	9.1		

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
sugar maple	Acer saccharum	WDH	High	78.8	2537.0	15.1	Sm. dec.	Sm. dec.	High	Abundant	Good	Good			1	1
red maple	Acer rubrum	WDH	High	99.3	2205.9	10.4	No change	No change	High	Abundant	Very Good	Very Good			1	2
northern white-cedar	Thuja occidentalis	WSH	High	73.7	1469.2	10.8	Sm. dec.	Sm. dec.	Medium	Abundant	Fair	Fair			0	3
jack pine	Pinus banksiana	NSH	Medium	31.2	990.3	14.0	Sm. dec.	Sm. dec.	High	Abundant	Good	Good			1	4
balsam fir	Abies balsamea	NDH	High	92.2	799.2	4.3	Sm. dec.	Sm. dec.	Low	Abundant	Fair	Fair			0	5
red pine	Pinus resinosa	NSH	Medium	43.2	773.9	7.7	Sm. inc.	No change	Low	Abundant	Good	Fair			1	6
American beech	Fagus grandifolia	WDH	High	67.7	684.4	5.3	No change	No change	Medium	Abundant	Good	Good			1	7
eastern white pine	Pinus strobus	WDH	High	62.8	681.0	5.0	Sm. inc.	Sm. inc.	Low	Abundant	Good	Good			1	8
black spruce	Picea mariana	NSH	High	67.1	604.4	5.1	Sm. dec.	Sm. dec.	Medium	Abundant	Fair	Fair			0	9
eastern hemlock	Tsuga canadensis	NSH	High	62	596.4	5.3	No change	Sm. dec.	Low	Abundant	Fair	Fair			0	10
paper birch	Betula papyrifera	WDH	High	68.9	427.8	3.0	No change	No change	Medium	Common	Fair	Fair			1	11
quaking aspen	Populus tremuloides	WDH	High	45.2	328.5	3.1	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	12
yellow birch	Betula alleghaniensis	NDL	High	66	315.0	2.3	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	13
black cherry	Prunus serotina	WDL	Medium	49.6	258.9	2.3	Lg. inc.	Lg. inc.	Low	Common	Good	Good			1	14
tamarack (native)	Larix laricina	NSH	High	30.1	214.8	4.4	Sm. inc.	Sm. inc.	Low	Common	Fair	Fair			1	15
white spruce	Picea glauca	NSL	Medium	65.1	202.1	1.5	No change	No change	Medium	Common	Fair	Fair			1	16
bigtooth aspen	Populus grandidentata	NSL	Medium	18.4	201.2	2.8	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	17
northern red oak	Quercus rubra	WDH	Medium	7.4	138.5	5.6	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good	Infill ++	Infill ++	1	18
black ash	Fraxinus nigra	WSH	Medium	31.9	120.6	1.8	Lg. inc.	Lg. inc.	Low	Common	Good	Good			1	19
silver maple	Acer saccharinum	NSH	Low	1.9	93.4	50.0	No change	Sm. inc.	High	Rare	Fair	Good	Infill +	Infill ++	1	20
balsam poplar	Populus balsamifera	NSH	Medium	15.1	86.9	4.0	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	21
pin cherry	Prunus pensylvanica	NSL	Low	10.6	40.4	1.3	Lg. dec.	Very Lg. dec.	Medium	Rare	Very Poor	Lost			0	22
American basswood	Tilia americana	WSL	Medium	6.1	37.4	1.3	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	23
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	19	36.1	0.7	Lg. inc.	Lg. inc.	High	Rare	Good	Good			1	24
American elm	Ulmus americana	WDH	Medium	7.6	31.5	2.2	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	2	25
white ash	Fraxinus americana	WDL	Medium	3.4	15.5	1.1	Lg. inc.	Lg. inc.	Low	Rare	Fair	Fair	Infill +	Infill +	2	26
striped maple	Acer pensylvanicum	NSL	Medium	3.7	13.0	0.5	Lg. dec.	Very Lg. dec.	Medium	Rare	Very Poor	Lost			0	27
Scots pine	Pinus sylvestris	NSH	FIA	1.9	12.1	6.5	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	28
serviceberry	Amelanchier spp.	NSL	Low	15.5	11.1	0.2	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	29
peachleaf willow	Salix amygdaloides	NSLX	FIA	4.2	9.1	0.9	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	30
green ash	Fraxinus pennsylvanica	WSH	Low	3.6	7.9	0.4	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	2	31
chokecherry	Prunus virginiana	NSLX	FIA	4.5	4.2	0.5	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	32
mountain maple	Acer spicatum	NSL	Low	6.2	4.0	0.5	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor			1	33
American mountain-ash	Sorbus americana	NSL	Low	4.2	2.2	0.2	Lg. dec.	Very Lg. dec.	Low	Rare	Very Poor	Lost			0	34
eastern redcedar	Juniperus virginiana	WDH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	35
boxelder	Acer negundo	WSH	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate +	3	36
sweet birch	Betula lenta	NDH	High	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			0	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 +	3	39
mockernut hickory	Carya alba	WDL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			0	40
black walnut	Juglans nigra	WDH	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	41
yellow-poplar	Liriodendron tulipifera	WDH	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			0	42
blackgum	Nyssa sylvatica	WDL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			0	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
white oak	Quercus alba	WDH	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++	3	46
swamp white oak	Quercus bicolor	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	47



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scarlet oak	Quercus coccinea	WDL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	48
northern pin oak	Quercus ellipsoidal	NSH	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	49
bur oak	Quercus macrocarpa	NDH	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	50
pin oak	Quercus palustris	NSH	Low	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			3	51
chestnut oak	Quercus prinus	NDH	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			0	52
post oak	Quercus stellata	WDH	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			0	53
black oak	Quercus velutina	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++	3	54
black locust	Robinia pseudoacacia	NDH	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	55
sassafras	Sassafras albidum	WSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	56