

HUC 040700 Northwestern Lake Huron

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	21,099	8,146.3	745

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	15	18	Increase	17	18	Very Good	8	8	Likely	1	1
Hickory	0			Medium	23	33	No Change	8	5	Good	9	10	Infill	6	8
Maple	6	Abundant	9	Low	22	11	Decrease	16	18	Fair	11	8	Migrate	8	14
Oak	6	Common	16	FIA	5		New	17	17	Poor	7	9			
Pine	4	Rare	21				Unknown	7	7	Very Poor	6	3			
Other	27	Absent	18							FIA Only	2	2			
	46		64		65	62		65	65	Unknown	2	2			
											45	42			

Potential Changes in Climate Variables

Temperature (°F)

Scenario	2009	2039	2069	2099		
Annual	CCSM45	40.3	41.6	44.0	43.9	
Average	CCSM85	40.3	42.2	44.5	47.1	
	GFDL45	40.3	42.6	45.0	46.0	
	GFDL85	40.3	43.0	45.9	49.7	
	HAD45	40.3	42.9	45.3	46.7	
	HAD85	40.3	43.1	46.2	50.7	
Growing Season	CCSM45	53.7	54.8	56.6	56.7	
	CCSM85	53.7	55.3	57.3	60.2	
May—Sep	GFDL45	53.7	56.7	59.7	61.2	
	GFDL85	53.7	57.3	60.9	65.2	
	HAD45	53.7	56.2	57.8	59.6	
	HAD85	53.7	56.0	59.0	63.3	
Coldest Month	CCSM45	19.9	21.1	23.4	23.0	
	CCSM85	19.9	21.9	23.7	25.6	
Average	GFDL45	19.9	21.2	22.8	23.3	
	GFDL85	19.9	22.0	23.3	25.4	
	HAD45	19.9	21.3	24.2	24.5	
	HAD85	19.9	23.1	25.0	28.7	
Warmest Month	CCSM45	58.4	59.8	60.9	61.2	
	CCSM85	58.4	60.5	61.8	63.3	
Average	GFDL45	58.4	61.7	63.0	64.1	
	GFDL85	58.4	62.2	64.0	66.2	
	HAD45	58.4	61.0	61.7	63.0	
	HAD85	58.4	61.2	62.9	65.9	

Precipitation (in)

Scenario	2009	2039	2069	2099		
Annual	CCSM45	22.9	23.0	22.7	23.4	
Total	CCSM85	22.9	23.4	22.8	23.7	
	GFDL45	22.9	24.4	26.1	25.6	
	GFDL85	22.9	24.6	26.4	26.8	
	HAD45	22.9	24.1	25.2	24.8	
	HAD85	22.9	24.8	24.8	26.9	
Growing Season	CCSM45	11.6	12.0	11.4	11.7	
	CCSM85	11.6	11.9	11.0	10.9	
May—Sep	GFDL45	11.6	11.8	12.7	12.4	
	GFDL85	11.6	12.4	12.1	11.7	
	HAD45	11.6	11.7	10.9	11.1	
	HAD85	11.6	11.9	10.2	10.8	

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
quaking aspen	Populus tremuloides	WDH	High	72.1	985.6	10.7	Sm. dec.	Sm. dec.	Medium	Abundant	Fair	Fair			0	1
northern white-cedar	Thuja occidentalis	WDH	High	43.1	963.5	15.2	Sm. dec.	Sm. dec.	Medium	Abundant	Fair	Fair			0	2
red maple	Acer rubrum	WDH	High	79.6	893.8	9.6	No change	No change	High	Abundant	Very Good	Very Good			1	3
sugar maple	Acer saccharum	WDH	High	41.1	727.2	13.8	No change	No change	High	Abundant	Very Good	Very Good			1	4
jack pine	Pinus banksiana	NSH	Medium	35.9	717.9	18.1	Lg. dec.	Lg. dec.	High	Abundant	Good	Good			1	5
red pine	Pinus resinosa	NSH	Medium	47.1	717.9	13.1	Sm. dec.	Sm. dec.	Low	Abundant	Fair	Fair			0	6
balsam fir	Abies balsamea	NDH	High	68	706.2	8.4	Lg. dec.	Lg. dec.	Low	Abundant	Poor	Poor			0	7
bigtooth aspen	Populus grandidentata	NSL	Medium	57	565.2	8.7	Sm. dec.	Lg. dec.	Medium	Abundant	Fair	Fair			0	8
northern red oak	Quercus rubra	WDH	Medium	44.5	530.8	9.9	No change	No change	High	Abundant	Very Good	Very Good			1	9
eastern white pine	Pinus strobus	WDH	High	55.5	478.2	7.0	No change	Sm. dec.	Low	Common	Poor	Poor			0	10
paper birch	Betula papyrifera	WDH	High	61.1	316.3	3.9	No change	Sm. dec.	Medium	Common	Fair	Poor			1	11
white spruce	Picea glauca	NSL	Medium	40	224.9	4.5	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	12
black spruce	Picea mariana	NSH	High	34.3	199.3	4.8	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	13
balsam poplar	Populus balsamifera	NSH	Medium	34.1	195.8	4.7	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	14
northern pin oak	Quercus ellipsoidalis	NSH	Medium	24.1	182.6	8.1	No change	No change	High	Common	Good	Good			1	15
white oak	Quercus alba	WDH	Medium	22.2	145.0	6.1	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good	Infill ++	Infill ++	1	16
black ash	Fraxinus nigra	WSH	Medium	34.4	125.3	3.1	Sm. inc.	Sm. inc.	Low	Common	Fair	Fair			1	17
tamarack (native)	Larix laricina	NSH	High	24	121.8	4.1	Sm. inc.	Sm. inc.	Low	Common	Fair	Fair			1	18
American basswood	Tilia americana	WSL	Medium	23.5	117.9	4.7	Lg. inc.	Sm. inc.	Medium	Common	Very Good	Good			1	19
white ash	Fraxinus americana	WDL	Medium	26.7	115.8	3.2	Sm. inc.	Lg. inc.	Low	Common	Fair	Good			1	20
black cherry	Prunus serotina	WDL	Medium	38.1	114.9	2.3	Lg. inc.	Lg. inc.	Low	Common	Good	Good			1	21
American beech	Fagus grandifolia	WDH	High	23.5	114.1	3.7	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good	Infill ++	Infill ++	1	22
black oak	Quercus velutina	WDH	High	17.8	83.0	4.2	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good	Infill ++	Infill ++	1	23
green ash	Fraxinus pennsylvanica	WSH	Low	17.8	76.2	3.6	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	24
American elm	Ulmus americana	WDH	Medium	22	53.5	2.1	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	25
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	22.6	48.9	1.6	No change	Sm. dec.	High	Rare	Fair	Poor			1	26
eastern hemlock	Tsuga canadensis	NSH	High	12.7	39.9	2.3	Lg. inc.	Sm. inc.	Low	Rare	Fair	Poor	Infill +	Infill +	1	27
silver maple	Acer saccharinum	NSH	Low	2.8	37.3	15.8	Sm. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	2	28
yellow birch	Betula alleghaniensis	NDL	High	11.6	33.0	2.0	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair	Infill +	Infill +	1	29
Scots pine	Pinus sylvestris	NSH	FIA	2.9	31.8	6.9	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	30
pin cherry	Prunus pensylvanica	NSL	Low	6.5	29.1	3.4	Lg. dec.	Very Lg. dec.	Medium	Rare	Very Poor	Lost			0	31
serviceberry	Amelanchier spp.	NSL	Low	20	25.4	1.0	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	32
Norway spruce	Picea abies	NSH	FIA	2.2	16.7	8.8	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	33
peachleaf willow	Salix amygdaloides	NSLX	FIA	3.1	8.0	2.2	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	34
chokecherry	Prunus virginiana	NSLX	FIA	6.1	4.4	0.8	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	35
striped maple	Acer pensylvanicum	NSL	Medium	2	2.8	0.2	Lg. dec.	Very Lg. dec.	Medium	Rare	Very Poor	Lost			0	36
Siberian elm	Ulmus pumila	NDH	FIA	0.6	2.2	4.5	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	37
bur oak	Quercus macrocarpa	NDH	Medium	1	1.8	1.7	Lg. inc.	Lg. inc.	High	Rare	Good	Good			2	38
slippery elm	Ulmus rubra	WSL	Low	1.6	1.8	1.2	No change	No change	Medium	Rare	Poor	Poor		Infill +	2	39
mountain maple	Acer spicatum	NSL	Low	2.9	1.6	0.3	Lg. dec.	Very Lg. dec.	High	Rare	Poor	Lost			0	40
boxelder	Acer negundo	WSH	Low	0.2	1.6	1.1	Lg. inc.	Lg. inc.	High	Rare	Good	Good			2	41
eastern cottonwood	Populus deltoides	NSL	Low	0.1	1.3	0.6	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	42
swamp white oak	Quercus bicolor	NSH	Low	0.6	1.0	2.1	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	43
American hornbeam; muscle	Carpinus caroliniana	WSL	Low	1.7	1.0	0.7	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	44
flowering dogwood	Cornus florida	WDL	Medium	0.6	0.3	0.5	Lg. dec.	Sm. inc.	Medium	Rare	Very Poor	Fair		Infill +	2	45
American mountain-ash	Sorbus americana	NSL	Low	0.7	0.1	0.0	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor			0	46
eastern redcedar	Juniperus virginiana	WDH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	47



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Common Name	Scientific Name	Range	MR	%Cell	FIAsum	FIAiv	ChngCl45	ChngCl85	Adap	Abund	Capabil45	Capabil85	SHIFT45	SHIFT85	SSO	N
bitternut hickory	<i>Carya cordiformis</i>	WSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	48
pignut hickory	<i>Carya glabra</i>	WDL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	49
shagbark hickory	<i>Carya ovata</i>	WSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	50
mockernut hickory	<i>Carya alba</i>	WDL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate +	3	51
hackberry	<i>Celtis occidentalis</i>	WDH	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate +	3	52
black walnut	<i>Juglans nigra</i>	WDH	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	53
yellow-poplar	<i>Liriodendron tulipifera</i>	WDH	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate +	3	54
Osage-orange	<i>Maclura pomifera</i>	NDH	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			3	55
cucumbertree	<i>Magnolia acuminata</i>	NSL	Low	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown			0	56
bigleaf magnolia	<i>Magnolia macrophylla</i>	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	57
red mulberry	<i>Morus rubra</i>	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	58
blackgum	<i>Nyssa sylvatica</i>	WDL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	59
sycamore	<i>Platanus occidentalis</i>	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	60
pin oak	<i>Quercus palustris</i>	NSH	Low	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat		Migrate +	3	61
post oak	<i>Quercus stellata</i>	WDH	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			0	62
black locust	<i>Robinia pseudoacacia</i>	NDH	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +	3	63
black willow	<i>Salix nigra</i>	NSH	Low	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	64
sassafras	<i>Sassafras albidum</i>	WSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	65