

HUC 040801 Southwestern 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	7,533.3	2,908.6	118

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					
		Abundant	Common	High	Low	Scenario RCP45	Scenario RCP85	Scenario RCP45	Scenario RCP85	SHIFT RCP45	SHIFT RCP85				
Ash	3					Increase	14	13	Very Good	3	3	Likely	2	2	
Hickory	2					No Change	11	13	Good	12	10	Infill	19	22	
Maple	4	Abundant	6	High	17	22	Decrease	20	19	Fair	11	14	Migrate	7	8
Oak	7	Common	19	Medium	23	34	New	15	16	Poor	6	7			
Pine	4	Rare	26	Low	25	12	Unknown	11	10	Very Poor	12	8			
Other	31	Absent	18	FIA	6					FIA Only	3	3			
	51		69		71	68		71	71				28	32	
										Unknown	5	4			
											52	49			

Potential Changes in Climate Variables

Temperature (°F)

Scenario	2009	2039	2069	2099		
Annual	CCSM45	40.0	41.1	42.8	42.8	
Average	CCSM85	40.0	41.5	43.2	45.2	
	GFDL45	40.0	41.9	43.5	44.2	
	GFDL85	40.0	41.9	44.2	46.9	
	HAD45	40.0	41.9	43.9	45.0	
	HAD85	40.0	42.1	44.6	48.0	
Growing Season	CCSM45	50.3	51.3	52.7	52.8	
	CCSM85	50.3	51.6	53.2	55.5	
May—Sep	GFDL45	50.3	52.8	54.7	55.7	
	GFDL85	50.3	52.9	55.5	58.7	
	HAD45	50.3	52.4	53.8	55.3	
	HAD85	50.3	52.1	54.8	58.2	
Coldest Month	CCSM45	24.2	25.2	27.0	26.8	
	CCSM85	24.2	25.9	27.2	28.6	
Average	GFDL45	24.2	25.6	26.6	27.0	
	GFDL85	24.2	26.1	27.0	28.4	
	HAD45	24.2	25.2	27.5	27.6	
	HAD85	24.2	26.5	28.2	30.6	
Warmest Month	CCSM45	54.0	55.2	56.1	56.2	
	CCSM85	54.0	55.7	56.7	58.0	
Average	GFDL45	54.0	56.1	57.1	57.8	
	GFDL85	54.0	56.5	57.9	59.6	
	HAD45	54.0	56.3	57.0	58.1	
	HAD85	54.0	56.4	58.0	60.5	

Precipitation (in)

Scenario	2009	2039	2069	2099		
Annual	CCSM45	18.6	18.4	17.9	18.8	
Total	CCSM85	18.6	18.9	18.4	18.9	
	GFDL45	18.6	19.8	21.6	21.1	
	GFDL85	18.6	19.9	21.6	22.2	
	HAD45	18.6	19.4	20.2	20.0	
	HAD85	18.6	20.2	19.3	21.4	
Growing Season	CCSM45	9.6	9.8	9.2	9.5	
	CCSM85	9.6	9.8	9.3	9.0	
May—Sep	GFDL45	9.6	9.8	10.6	10.4	
	GFDL85	9.6	10.2	10.0	9.9	
	HAD45	9.6	9.6	8.9	9.3	
	HAD85	9.6	9.8	8.0	8.7	

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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Common Name	Scientific Name	Range	MR	%Cell	FIAsum	FIAiv	ChngCl45	ChngCl85	Adap	Abund	Capabil45	Capabil85	SHIFT45	SHIFT85	SSO	N
green ash	Fraxinus pennsylvanica	WSH	Low	52.8	1144.1	18.6	Sm. dec.	Sm. dec.	Medium	Abundant	Fair	Fair			0	1
red maple	Acer rubrum	WDH	High	59.6	1060.8	12.8	Sm. dec.	Sm. dec.	High	Abundant	Good	Good			1	2
quaking aspen	Populus tremuloides	WDH	High	46.7	664.8	10.7	Sm. dec.	Lg. dec.	Medium	Abundant	Fair	Fair			0	3
red pine	Pinus resinosa	NSH	Medium	15.7	538.5	17.3	Sm. dec.	Lg. dec.	Low	Abundant	Fair	Poor	Infill +	Infill +	0	4
eastern white pine	Pinus strobus	WDH	High	25.2	516.6	12.2	Lg. dec.	Lg. dec.	Low	Abundant	Poor	Poor	Infill +	Infill +	0	5
bigtooth aspen	Populus grandidentata	NSL	Medium	20.3	506.7	8.4	Lg. dec.	Lg. dec.	Medium	Abundant	Fair	Fair			0	6
jack pine	Pinus banksiana	NSH	Medium	12.2	460.6	13.5	Lg. dec.	Lg. dec.	High	Common	Fair	Fair	Infill +	Infill +	1	7
northern red oak	Quercus rubra	WDH	Medium	21.5	318.5	8.2	No change	No change	High	Common	Good	Good	Infill ++	Infill ++	1	8
American elm	Ulmus americana	WDH	Medium	50.1	261.3	5.3	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	9
white ash	Fraxinus americana	WDL	Medium	16.3	248.7	10.1	No change	No change	Low	Common	Poor	Poor			0	10
northern pin oak	Quercus ellipsoidalis	NSH	Medium	14.8	202.4	12.0	Lg. dec.	Lg. dec.	High	Common	Fair	Fair	Infill +	Infill +	1	11
eastern cottonwood	Populus deltoides	NSH	Low	10.4	179.4	8.4	Sm. inc.	Sm. inc.	Medium	Common	Good	Good	Infill ++	Infill ++	2	12
American basswood	Tilia americana	WSL	Medium	21.2	170.7	6.5	Sm. inc.	No change	Medium	Common	Good	Fair			1	13
northern white-cedar	Thuja occidentalis	WSH	High	12.6	167.5	7.8	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor	Infill +	Infill +	0	14
paper birch	Betula papyrifera	WDH	High	27.4	148.4	3.0	No change	No change	Medium	Common	Fair	Fair			1	15
black cherry	Prunus serotina	WDL	Medium	32.6	124.1	2.4	Lg. inc.	Lg. inc.	Low	Common	Good	Good			1	16
silver maple	Acer saccharinum	NSH	Low	8.9	117.3	8.9	No change	No change	High	Common	Good	Good	Infill ++	Infill ++	2	17
black oak	Quercus velutina	WDH	High	13.5	105.0	3.4	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good	Infill ++	Infill ++	1	18
white oak	Quercus alba	WDH	Medium	20.7	91.3	4.2	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good	Infill ++	Infill ++	1	19
bur oak	Quercus macrocarpa	NDH	Medium	14.9	91.2	7.6	Sm. dec.	Sm. dec.	High	Common	Fair	Fair	Infill +	Infill +	2	20
balsam fir	Abies balsamea	NDH	High	12.1	68.0	2.7	Lg. dec.	Lg. dec.	Low	Common	Very Poor	Very Poor			0	21
Scots pine	Pinus sylvestris	NSH	FIA	5.8	61.3	8.9	Unknown	Unknown	NA	Common	NNIS	NNIS			0	22
white spruce	Picea glauca	NSL	Medium	6.4	59.6	7.2	Very Lg. dec.	Very Lg. dec.	Medium	Common	Lost	Lost			0	23
black ash	Fraxinus nigra	WSH	Medium	12.1	57.5	2.5	Lg. dec.	Lg. dec.	Low	Common	Very Poor	Very Poor			0	24
sugar maple	Acer saccharum	WDH	High	11	56.7	9.2	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good	Infill ++	Infill ++	1	25
Norway spruce	Picea abies	NSH	FIA	1.3	44.7	33.7	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	26
swamp white oak	Quercus bicolor	NSL	Low	6	37.3	3.9	Sm. inc.	No change	Medium	Rare	Fair	Poor	Infill +	Infill +	2	27
boxelder	Acer negundo	WSH	Low	10	22.8	2.4	Sm. inc.	Sm. inc.	High	Rare	Good	Good	Infill ++	Infill ++	2	28
balsam poplar	Populus balsamifera	NSH	Medium	8.7	22.7	1.4	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	29
tamarack (native)	Larix laricina	NSH	High	4.6	21.5	2.3	No change	No change	Low	Rare	Very Poor	Very Poor			2	30
pin cherry	Prunus pensylvanica	NSL	Low	0.2	19.6	2.5	Lg. dec.	Very Lg. dec.	Medium	Rare	Very Poor	Lost			0	31
black spruce	Picea mariana	NSH	High	3.4	19.2	2.6	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	32
blackgum	Nyssa sylvatica	WDL	Medium	0.5	16.8	1.8	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	2	33
American beech	Fagus grandifolia	WDH	High	3.3	16.1	1.9	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair	Infill +	Infill +	2	34
serviceberry	Amelanchier spp.	NSL	Low	10	13.5	0.7	Lg. dec.	Very Lg. dec.	Medium	Rare	Very Poor	Lost			0	35
eastern hemlock	Tsuga canadensis	NSH	High	4.7	11.7	1.4	No change	No change	Low	Rare	Very Poor	Very Poor			2	36
mockernut hickory	Carya alba	WDL	Medium	0.7	11.4	4.2	Sm. dec.	No change	High	Rare	Poor	Fair	Infill +	Infill +	2	37
American hornbeam; musclev	Carpinus caroliniana	WSL	Low	3.4	11.0	2.4	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			2	38
black walnut	Juglans nigra	WDH	Low	5	7.8	22.0	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	39
yellow birch	Betula alleghaniensis	NDL	High	2.3	6.1	2.3	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	40
black willow	Salix nigra	NSH	Low	3.4	5.8	1.1	No change	Lg. inc.	Low	Rare	Very Poor	Fair		Infill +	2	41
pin oak	Quercus palustris	NSH	Low	1.3	5.2	3.9	No change	Lg. inc.	Low	Rare	Very Poor	Fair		Infill +	2	42
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	2	4.2	1.2	Sm. inc.	No change	High	Rare	Good	Fair	Infill ++	Infill +	2	43
Siberian elm	Ulmus pumila	NDH	FIA	5	2.6	7.2	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	44
red mulberry	Morus rubra	NSL	Low	5	2.0	5.5	No change	No change	Medium	Rare	Poor	Poor		Infill +	2	45
bitternut hickory	Carya cordiformis	WSL	Low	0.1	1.9	0.1	Lg. inc.	Lg. inc.	High	Rare	Good	Good			2	46
American mountain-ash	Sorbus americana	NSL	Low	1.8	1.4	1.4	Lg. dec.	Lg. dec.	Low	Rare	Very Poor	Very Poor			0	47



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peachleaf willow	Salix amygdaloides	NSLX	FIA	1.2	1.2	0.8	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	48
butternut	Juglans cinerea	NSLX	FIA	5.2	1.1	3.2	Unknown	Unknown	Low	Rare	FIA Only	FIA Only			0	49
chokecherry	Prunus virginiana	NSLX	FIA	0.7	0.8	0.3	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	50
eastern redcedar	Juniperus virginiana	WDH	Medium	1.2	0.3	0.2	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	51
black maple	Acer nigrum	NSH	Low	0	0	0	Unknown	Unknown	High	Modeled	Unknown	Unknown			0	52
mountain maple	Acer spicatum	NSL	Low	0	0	0	Unknown	Unknown	High	Absent	Unknown	Unknown			0	53
pignut hickory	Carya glabra	WDL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	54
shagbark hickory	Carya ovata	WSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +	3	55
black hickory	Carya texana	NDL	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	56
hackberry	Celtis occidentalis	WDH	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	57
eastern redbud	Cercis canadensis	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	58
flowering dogwood	Cornus florida	WDL	Medium	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown			0	59
common persimmon	Diospyros virginiana	NSL	Low	0	0	0	Unknown	New Habitat	High	Absent	Unknown	New Habitat			3	60
honeylocust	Gleditsia triacanthos	NSH	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate +	3	61
sweetgum	Liquidambar styraciflua	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	62
yellow-poplar	Liriodendron tulipifera	WDH	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	63
Osage-orange	Maclura pomifera	NDH	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	64
bigleaf magnolia	Magnolia macrophylla	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	65
sycamore	Platanus occidentalis	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	66
blackjack oak	Quercus marilandica	NSL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			0	67
post oak	Quercus stellata	WDH	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			3	68
black locust	Robinia pseudoacacia	NDH	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	69
sassafras	Sassafras albidum	WSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate ++	Migrate +	3	70
slippery elm	Ulmus rubra	WSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +	3	71