

HUC 110902 Lower Canadian

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	17,699	6,833.7	233

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	2			High	12	22	Increase	15	21	Very Good	2	2
Hickory	6			Medium	24	37	No Change	15	12	Good	10	12
Maple	2	Abundant	1	Low	27	7	Decrease	20	17	Fair	13	16
Oak	12	Common	13	FIA	8		New	11	11	Poor	13	11
Pine	3	Rare	44				Unknown	10	10	Very Poor	12	9
Other	33	Absent	12							FIA Only	3	3
	58		70		71	66		71	71	Unknown	2	2
											55	55

Potential Changes in Climate Variables

Temperature (°F)

Scenario	2009	2039	2069	2099		
Annual	CCSM45	49.0	50.0	51.0	51.4	
Average	CCSM85	49.0	50.4	51.6	53.3	
	GFDL45	49.0	51.5	51.8	52.6	
	GFDL85	49.0	50.7	52.4	54.7	
	HAD45	49.0	50.3	51.9	52.5	
	HAD85	49.0	50.5	53.1	55.0	
Growing Season	CCSM45	58.1	59.2	60.2	60.6	
	CCSM85	58.1	59.7	61.0	63.0	
May—Sep	GFDL45	58.1	61.4	61.5	63.0	
	GFDL85	58.1	60.5	62.5	65.3	
	HAD45	58.1	59.5	60.9	61.4	
	HAD85	58.1	59.8	62.8	64.4	
Coldest Month	CCSM45	35.2	36.6	37.2	37.5	
	CCSM85	35.2	36.7	37.1	38.1	
Average	GFDL45	35.2	37.3	37.4	37.6	
	GFDL85	35.2	35.8	36.7	37.0	
	HAD45	35.2	35.5	36.9	37.0	
	HAD85	35.2	36.8	37.9	38.9	
Warmest Month	CCSM45	61.8	62.8	63.5	63.7	
	CCSM85	61.8	63.5	64.0	65.1	
Average	GFDL45	61.8	64.8	65.2	66.3	
	GFDL85	61.8	64.6	65.7	68.1	
	HAD45	61.8	63.1	64.0	64.2	
	HAD85	61.8	63.8	65.3	66.0	

Precipitation (in)

Scenario	2009	2039	2069	2099		
Annual	CCSM45	23.8	23.3	24.1	23.6	
Total	CCSM85	23.8	23.1	24.3	24.4	
	GFDL45	23.8	24.7	27.3	24.7	
	GFDL85	23.8	24.9	27.4	26.6	
	HAD45	23.8	24.5	24.9	25.7	
	HAD85	23.8	25.5	22.1	24.4	
Growing Season	CCSM45	11.6	10.9	10.8	10.9	
	CCSM85	11.6	11.1	10.6	10.8	
May—Sep	GFDL45	11.6	12.0	13.2	12.2	
	GFDL85	11.6	12.5	13.8	12.8	
	HAD45	11.6	11.8	11.8	12.0	
	HAD85	11.6	12.0	9.4	10.5	

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
post oak	Quercus stellata	WDH	High	61.4	1279.4	24.8	No change	Sm. dec.	High	Abundant	Very Good	Good			1	1
eastern redcedar	Juniperus virginiana	WDH	Medium	78.6	445.1	14.8	No change	No change	Medium	Common	Fair	Fair			1	2
blackjack oak	Quercus marilandica	NSL	Medium	52.7	337.6	8.9	No change	No change	High	Common	Good	Good			1	3
winged elm	Ulmus alata	WDL	Medium	45.1	299.7	6.7	No change	No change	Medium	Common	Fair	Fair			1	4
shortleaf pine	Pinus echinata	WDH	High	9.5	200.6	10.5	No change	No change	Medium	Common	Fair	Fair	Infill +	Infill +	1	5
black oak	Quercus velutina	WDH	High	29	191.0	7.2	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	6
black hickory	Carya texana	NDL	High	41	175.3	5.4	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	7
American elm	Ulmus americana	WDH	Medium	42.5	139.1	6.1	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	8
green ash	Fraxinus pennsylvanica	WSH	Low	23.7	109.8	6.8	No change	Sm. inc.	Medium	Common	Fair	Good			1	9
common persimmon	Diospyros virginiana	NSL	Low	26.1	89.4	3.8	Sm. dec.	Sm. dec.	High	Common	Fair	Fair			1	10
Osage-orange	Maclura pomifera	NDH	Medium	21	73.7	6.5	No change	Sm. inc.	High	Common	Good	Very Good			1	11
mockernut hickory	Carya alba	WDL	Medium	17	66.9	3.0	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good	Infill ++	Infill ++	1	12
water oak	Quercus nigra	WDH	High	6.9	66.7	9.3	No change	No change	Medium	Common	Fair	Fair	Infill +	Infill +	2	13
sycamore	Platanus occidentalis	NSL	Low	6.7	57.3	8.5	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor	Infill +	Infill +	0	14
white ash	Fraxinus americana	WDL	Medium	20	49.4	3.7	Sm. inc.	Sm. inc.	Low	Rare	Poor	Poor	Infill +	Infill +	1	15
hackberry	Celtis occidentalis	WDH	Medium	33.6	42.2	6.2	Sm. dec.	No change	High	Rare	Poor	Fair			1	16
honeylocust	Gleditsia triacanthos	NSH	Low	8.8	41.9	6.1	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	1	17
black willow	Salix nigra	NSH	Low	15.2	39.9	5.9	No change	Sm. inc.	Low	Rare	Very Poor	Poor			1	18
sugarberry	Celtis laevigata	NDH	Medium	19.5	26.8	2.8	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			1	19
slippery elm	Ulmus rubra	WSL	Low	16.9	25.4	3.5	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good			1	20
black walnut	Juglans nigra	WDH	Low	19.8	25.4	5.6	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	21
pecan	Carya illinoensis	NSH	Low	20.6	25.4	5.6	Lg. inc.	Lg. inc.	Low	Rare	Fair	Fair	Infill +	Infill +	1	22
black locust	Robinia pseudoacacia	NDH	Low	11.1	25.3	11.2	Sm. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	23
boxelder	Acer negundo	WSH	Low	10.5	21.1	2.6	Sm. dec.	No change	High	Rare	Poor	Fair	Infill +	Infill +	1	24
northern red oak	Quercus rubra	WDH	Medium	14.6	20.7	2.3	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	1	25
eastern cottonwood	Populus deltoides	NSH	Low	11.8	19.3	8.2	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair	Infill +	Infill +	2	26
cittamwood/gum bumelia	Sideroxylon lanuginosum ssp.	NSL	Low	21.2	19.1	2.4	Lg. inc.	Lg. inc.	High	Rare	Good	Good			1	27
cherrybark oak; swamp red o.	Quercus pagoda	NSL	Medium	0.7	16.1	12.9	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			2	28
chinkapin oak	Quercus muehlenbergii	NSL	Medium	18.1	15.1	3.8	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	29
Siberian elm	Ulmus pumila	NDH	FIA	7	13.1	10.1	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	30
loblolly pine	Pinus taeda	WDH	High	1.4	10.4	4.9	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	31
southern red oak	Quercus falcata	WDL	Medium	0.7	9.6	2.2	Lg. inc.	Lg. inc.	High	Rare	Good	Good			2	32
pin oak	Quercus palustris	NSH	Low	3.4	8.9	3.1	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor			0	33
red mulberry	Morus rubra	NSL	Low	10.8	8.7	1.3	Lg. dec.	Sm. inc.	Medium	Rare	Very Poor	Fair		Infill +	1	34
bitternut hickory	Carya cordiformis	WSL	Low	10.5	8.4	1.5	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor	Infill +	Infill +	1	35
bur oak	Quercus macrocarpa	NDH	Medium	5.9	8.3	6.0	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			0	36
Shumard oak	Quercus shumardii	NSL	Low	10.1	6.3	1.9	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	1	37
sassafras	Sassafras albidum	WSL	Low	4.4	6.1	1.2	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair	Infill +	Infill +	2	38
black cherry	Prunus serotina	WDL	Medium	4.1	5.7	0.6	Sm. inc.	Sm. inc.	Low	Rare	Poor	Poor	Infill +	Infill +	2	39
eastern redbud	Cercis canadensis	NSL	Low	19.7	5.5	0.6	Sm. dec.	Sm. inc.	Medium	Rare	Very Poor	Fair			1	40
river birch	Betula nigra	NSL	Low	3.2	4.6	3.3	No change	Sm. inc.	Medium	Rare	Poor	Fair	Infill +	Infill +	2	41
white mulberry	Morus alba	NSL	FIA	3.4	4.4	3.1	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	42
wild plum	Prunus americana	NSLX	FIA	4.3	3.3	0.6	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	43
paulownia	Paulownia tomentosa	NSL	FIA	1.9	3.0	17.5	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	44
blackgum	Nyssa sylvatica	WDL	Medium	0.3	2.4	0.3	Lg. inc.	Lg. inc.	High	Rare	Good	Good			2	45
white oak	Quercus alba	WDH	Medium	0.4	2.3	0.8	Lg. inc.	Lg. inc.	High	Rare	Good	Good			2	46
flowering dogwood	Cornus florida	WDL	Medium	1.3	1.9	0.5	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	47



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pignut hickory	<i>Carya glabra</i>	WDL	Medium	0.8	1.3	1.0	No change	No change	Medium	Rare	Poor	Poor			0	48
Kentucky coffeetree	<i>Gymnocladus dioicus</i>	NSLX	FIA	3.2	0.9	1.2	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	49
silver maple	<i>Acer saccharinum</i>	NSH	Low	0.8	0.8	0.5	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			0	50
northern catalpa	<i>Catalpa speciosa</i>	NSHX	FIA	0.2	0.8	0.4	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	51
Scots pine	<i>Pinus sylvestris</i>	NSH	FIA	0	0.7	0.1	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	52
serviceberry	<i>Amelanchier spp.</i>	NSL	Low	0.6	0.6	0.3	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	53
ailanthus	<i>Ailanthus altissima</i>	NSL	FIA	1.9	0.3	1.7	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	54
shellbark hickory	<i>Carya laciniosa</i>	NSL	Low	0.1	0.3	0.1	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	55
pawpaw	<i>Asimina triloba</i>	NSL	Low	0.6	0.2	0.4	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	56
American basswood	<i>Tilia americana</i>	WSL	Medium	1.6	0.2	0.8	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	57
eastern hophornbeam; ironw	<i>Ostrya virginiana</i>	WSL	Low	2.1	0.1	0.6	Lg. inc.	Lg. inc.	High	Rare	Good	Good			2	58
ashe juniper	<i>Juniperus ashei</i>	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	59
slash pine	<i>Pinus elliotii</i>	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	60
longleaf pine	<i>Pinus palustris</i>	NSH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	61
florida maple	<i>Acer barbatum</i>	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Likely +	Likely +	3	62
red maple	<i>Acer rubrum</i>	WDH	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Likely +	Likely +	3	63
American hornbeam; muscle	<i>Carpinus caroliniana</i>	WSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++	3	64
black ash	<i>Fraxinus nigra</i>	WSH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			3	65
sweetgum	<i>Liquidambar styraciflua</i>	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++	3	66
sourwood	<i>Oxydendrum arboreum</i>	NDL	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			3	67
pin cherry	<i>Prunus pensylvanica</i>	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	68
Nuttall oak	<i>Quercus texana</i>	NSH	Medium	0	0	0	Unknown	Unknown	High	Modeled	Unknown	Unknown			0	69
live oak	<i>Quercus virginiana</i>	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++	3	70
cedar elm	<i>Ulmus crassifolia</i>	NDH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++	3	71