

HUC 070801 Upper Mississippi-Skunk-Wapsipicon 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	26,694	10,307	130

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	7	20	Increase	14	15	Very Good	3	3	Likely	0	0
Hickory	4			Medium	24	33	No Change	16	13	Good	10	9	Infill	27	28
Maple	4	Abundant	0	Low	28	11	Decrease	15	17	Fair	11	12	Migrate	4	8
Oak	11	Common	12	FIA	7		New	10	10	Poor	10	10			
Pine	1	Rare	40				Unknown	11	11	Very Poor	11	10			
Other	29	Absent	12							FIA Only	5	5			
	52		64		66	64		66	66	Unknown	4	4			
											54	53			

Potential Changes in Climate Variables

Temperature (°F)

Scenario	2009	2039	2069	2099		
Annual	CCSM45	42.2	43.4	44.7	44.9	
Average	CCSM85	42.2	43.8	45.3	47.0	
	GFDL45	42.2	45.5	45.2	45.9	
	GFDL85	42.2	43.9	45.8	48.3	
	HAD45	42.2	43.7	45.7	46.7	
	HAD85	42.2	44.1	46.7	49.3	
Growing Season	CCSM45	53.0	54.3	55.5	55.9	
	CCSM85	53.0	54.9	56.3	58.3	
May—Sep	GFDL45	53.0	57.1	56.6	57.7	
	GFDL85	53.0	55.2	57.3	60.4	
	HAD45	53.0	54.6	56.2	57.4	
	HAD85	53.0	54.8	57.8	60.3	
Coldest Month	CCSM45	24.7	25.8	27.1	27.3	
	CCSM85	24.7	26.3	27.2	28.3	
Average	GFDL45	24.7	26.9	27.4	27.7	
	GFDL85	24.7	26.7	27.6	28.5	
	HAD45	24.7	25.5	27.6	27.6	
	HAD85	24.7	27.2	29.0	30.5	
Warmest Month	CCSM45	56.5	57.8	58.6	59.0	
	CCSM85	56.5	58.7	59.7	60.7	
Average	GFDL45	56.5	58.5	59.3	60.2	
	GFDL85	56.5	58.9	59.9	62.0	
	HAD45	56.5	58.1	59.3	59.8	
	HAD85	56.5	59.0	60.7	62.2	

Precipitation (in)

Scenario	2009	2039	2069	2099		
Annual	CCSM45	20.9	20.3	20.7	20.3	
Total	CCSM85	20.9	20.1	20.6	20.8	
	GFDL45	20.9	22.5	24.1	24.0	
	GFDL85	20.9	22.8	25.2	24.9	
	HAD45	20.9	22.5	22.8	22.7	
	HAD85	20.9	21.9	21.5	22.9	
Growing Season	CCSM45	12.1	11.7	11.8	11.4	
	CCSM85	12.1	11.1	11.3	11.1	
May—Sep	GFDL45	12.1	12.6	13.3	13.1	
	GFDL85	12.1	13.0	13.8	13.1	
	HAD45	12.1	12.5	11.9	12.2	
	HAD85	12.1	12.1	10.9	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
American elm	Ulmus americana	WDH	Medium	67.5	139.9	6.4	No change	No change	Medium	Common	Fair	Fair	Infill +	Infill +	1	1
silver maple	Acer saccharinum	NSH	Low	23.1	108.1	21.7	No change	No change	High	Common	Good	Good	Infill ++	Infill ++	2	2
white oak	Quercus alba	WDH	Medium	22.1	89.0	10.5	Sm. dec.	Lg. dec.	High	Common	Fair	Fair	Infill +	Infill +	2	3
black walnut	Juglans nigra	WDH	Low	35.7	83.2	6.1	No change	No change	Medium	Common	Fair	Fair	Infill +	Infill +	1	4
hackberry	Celtis occidentalis	WDH	Medium	44.5	67.4	6.8	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good	Infill ++	Infill ++	1	5
shagbark hickory	Carya ovata	WSL	Medium	28.3	65.2	7.1	Sm. dec.	Lg. dec.	Medium	Common	Poor	Poor	Infill +	Infill +	2	6
black cherry	Prunus serotina	WDL	Medium	44.9	64.9	4.3	Sm. dec.	Sm. dec.	Low	Common	Poor	Poor	Infill +	Infill +	0	7
boxelder	Acer negundo	WSH	Low	26.9	62.4	6.0	No change	No change	High	Common	Good	Good	Infill ++	Infill ++	2	8
honeylocust	Gleditsia triacanthos	NSH	Low	32.3	61.2	7.8	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good	Infill ++	Infill ++	2	9
black oak	Quercus velutina	WDH	High	23.5	60.6	7.7	No change	No change	Medium	Common	Fair	Fair	Infill +	Infill +	2	10
red mulberry	Morus rubra	NSL	Low	31.9	54.4	8.4	No change	No change	Medium	Common	Fair	Fair	Infill +	Infill +	1	11
Osage-orange	Maclura pomifera	NDH	Medium	20.9	54.3	9.9	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good	Infill ++	Infill ++	2	12
eastern redcedar	Juniperus virginiana	WDH	Medium	17.5	47.1	8.1	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good	Infill +	Infill ++	2	13
eastern cottonwood	Populus deltoides	NSH	Low	15.2	44.8	8.9	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair	Infill +	Infill +	2	14
northern red oak	Quercus rubra	WDH	Medium	22.1	39.3	6.4	No change	Sm. dec.	High	Rare	Fair	Poor	Infill +	Infill +	2	15
slippery elm	Ulmus rubra	WSL	Low	34.7	38.3	4.0	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	1	16
white ash	Fraxinus americana	WDL	Medium	23.6	36.3	3.6	No change	No change	Low	Rare	Very Poor	Very Poor			2	17
American basswood	Tilia americana	WSL	Medium	24.4	36.2	7.0	Sm. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			2	18
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	20.4	31.8	5.1	No change	Sm. dec.	High	Rare	Fair	Poor	Infill +	Infill +	2	19
bur oak	Quercus macrocarpa	NDH	Medium	24.8	31.7	8.2	Sm. inc.	Sm. inc.	High	Rare	Good	Good	Infill ++	Infill ++	2	20
bitternut hickory	Carya cordiformis	WSL	Low	27.6	28.7	3.4	Sm. inc.	No change	High	Rare	Good	Fair	Infill ++	Infill +	2	21
green ash	Fraxinus pennsylvanica	WSH	Low	24.3	22.7	3.6	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	2	22
black maple	Acer nigrum	NSH	Low	7.9	19.3	6.6	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor			0	23
black willow	Salix nigra	NSH	Low	10.2	17.9	8.4	Sm. dec.	Lg. inc.	Low	Rare	Very Poor	Fair		Infill +	2	24
black locust	Robinia pseudoacacia	NDH	Low	9.8	14.7	11.7	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	25
Ohio buckeye	Aesculus glabra	NSL	Low	3.6	14.5	6.8	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	26
shingle oak	Quercus imbricaria	NDH	Medium	12.3	14.5	3.5	Lg. inc.	Sm. inc.	Medium	Rare	Good	Fair	Infill ++	Infill +	2	27
white mulberry	Morus alba	NSL	FIA	4.7	7.5	8.0	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	28
mockernut hickory	Carya alba	WDL	Medium	8.9	6.9	3.7	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	2	29
northern catalpa	Catalpa speciosa	NSHX	FIA	0.8	6.8	7.5	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	30
wild plum	Prunus americana	NSLX	FIA	1.5	6.6	3.9	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	31
black ash	Fraxinus nigra	WSH	Medium	3	4.5	3.9	Lg. dec.	Lg. dec.	Low	Rare	Very Poor	Very Poor			0	32
sugar maple	Acer saccharum	WDH	High	8.2	3.8	3.5	Sm. inc.	Sm. inc.	High	Rare	Good	Good			2	33
Siberian elm	Ulmus pumila	NDH	FIA	4.4	3.5	6.8	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	34
bigtooth aspen	Populus grandidentata	NSL	Medium	1.8	3.5	12.6	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	35
swamp white oak	Quercus bicolor	NSL	Low	5.5	2.7	3.1	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	36
northern pin oak	Quercus ellipsoidalis	NSH	Medium	4.2	2.5	3.8	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor			0	37
river birch	Betula nigra	NSL	Low	2.6	2.2	4.3	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			2	38
quaking aspen	Populus tremuloides	WDH	High	1.7	1.7	1.5	Lg. dec.	Very Lg. dec.	Medium	Rare	Very Poor	Lost			0	39
Kentucky coffeetree	Gymnocladus dioicus	NSLX	FIA	1.4	1.6	15.5	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	40
chokecherry	Prunus virginiana	NSLX	FIA	2.8	0.9	1.3	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	41
eastern redbud	Cercis canadensis	NSL	Low	0.6	0.9	0.9	No change	Sm. inc.	Medium	Rare	Poor	Fair	Infill +	Infill +	2	42
chinkapin oak	Quercus muehlenbergii	NSL	Medium	1	0.8	0.5	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	43
pin oak	Quercus palustris	NSH	Low	0.2	0.6	0.8	Lg. inc.	Lg. inc.	Low	Rare	Fair	Fair	Infill +	Infill +	2	44
post oak	Quercus stellata	WDH	High	1.1	0.4	3.6	Lg. inc.	Lg. inc.	High	Rare	Good	Good			2	45
blackjack oak	Quercus marilandica	NSL	Medium	1.5	0.4	4.0	Lg. inc.	Lg. inc.	High	Rare	Good	Good			2	46
serviceberry	Amelanchier spp.	NSL	Low	1.4	0.3	1.1	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	47



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pignut hickory	<i>Carya glabra</i>	WDL	Medium	3	0.3	1.8	No change	Sm. dec.	Medium	Rare	Poor	Very Poor			0	48
American hornbeam; musclev	<i>Carpinus caroliniana</i>	WSL	Low	1.9	0.3	0.7	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	49
sycamore	<i>Platanus occidentalis</i>	NSL	Low	0.2	0.2	0.2	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	50
butternut	<i>Juglans cinerea</i>	NSLX	FIA	1.2	0.1	0.7	Unknown	Unknown	Low	Rare	FIA Only	FIA Only			0	51
eastern white pine	<i>Pinus strobus</i>	WDH	High	1.5	0.1	0.6	Lg. dec.	Lg. dec.	Low	Rare	Very Poor	Very Poor			0	52
red pine	<i>Pinus resinosa</i>	NSH	Medium	0	0	0	Unknown	Unknown	Low	Absent	Unknown	Unknown			0	53
striped maple	<i>Acer pensylvanicum</i>	NSL	Medium	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	54
gray birch	<i>Betula populifolia</i>	NSL	Low	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown			0	55
cittamwood/gum bumelia	<i>Sideroxylon lanuginosum ssp.</i>	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			3	56
pecan	<i>Carya illinoensis</i>	NSH	Low	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	57
black hickory	<i>Carya texana</i>	NDL	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	58
sugarberry	<i>Celtis laevigata</i>	NDH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	59
common persimmon	<i>Diospyros virginiana</i>	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	60
blue ash	<i>Fraxinus quadrangulata</i>	NSL	Low	0	0	0	Unknown	Unknown	Low	Modeled	Unknown	Unknown			0	61
yellow-poplar	<i>Liriodendron tulipifera</i>	WDH	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate +	3	62
Shumard oak	<i>Quercus shumardii</i>	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate +	3	63
sassafras	<i>Sassafras albidum</i>	WSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate ++	Migrate +	3	64
winged elm	<i>Ulmus alata</i>	WDL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate ++	3	65
cedar elm	<i>Ulmus crassifolia</i>	NDH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			2	66