

HUC 102400 Missouri-Nishnabotna

HUC 6 Watershed Climate Change Atlas Tree Species

Current and Potential Future Habitat, Capability, and Migration

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

	sq. km	sq. mi	FIA Plots
Area of Region	35,237	13,605	148

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	6	18	Increase	9	11	Very Good	0	0	
Hickory	2			Medium	23	35	No Change	17	15	Good	8	8	
Maple	3	Abundant	0	Low	28	8	Decrease	15	15	Fair	10	11	
Oak	11	Common	4	FIA	6		New	11	11	Poor	9	8	
Pine	2	Rare	43				Unknown	11	11	Very Poor	13	13	
Other	27	Absent	16							FIA Only	4	4	
	47		63		63	61		63	63	Unknown	5	5	
											49	49	
												26	30

Potential Changes in Climate Variables

Temperature (°F)

Scenario	2009	2039	2069	2099
Annual	46.9	48.3	49.9	50.4
Average	46.9	48.8	50.7	52.9
GFDL45	46.9	51.3	50.7	51.6
GFDL85	46.9	49.1	51.4	54.7
HAD45	46.9	48.8	51.1	52.2
HAD85	46.9	49.2	52.7	55.6
Growing Season	61.0	62.7	64.2	64.9
May—Sep	61.0	63.3	65.2	67.6
GFDL45	61.0	66.7	65.6	67.1
GFDL85	61.0	63.8	66.5	70.6
HAD45	61.0	62.7	64.4	65.7
HAD85	61.0	63.2	67.0	69.5
Coldest Month	24.5	26.0	27.2	27.7
Average	24.5	26.4	27.4	28.7
GFDL45	24.5	27.2	27.6	27.9
GFDL85	24.5	26.5	27.7	28.7
HAD45	24.5	26.0	28.3	28.3
HAD85	24.5	27.9	30.4	32.1
Warmest Month	65.8	67.7	68.8	69.4
Average	65.8	68.9	70.1	71.5
GFDL45	65.8	68.6	69.7	70.8
GFDL85	65.8	69.0	70.1	73.1
HAD45	65.8	67.3	68.7	69.3
HAD85	65.8	68.7	70.9	72.4

Precipitation (in)

Scenario	2009	2039	2069	2099
Annual	26.6	26.5	27.1	25.7
Total	26.6	26.6	26.7	27.3
GFDL45	26.6	29.7	31.1	30.3
GFDL85	26.6	29.6	32.7	31.5
HAD45	26.6	29.3	29.9	29.5
HAD85	26.6	28.1	27.2	29.8
Growing Season	16.5	16.1	16.3	15.2
May—Sep	16.5	15.8	15.5	15.7
GFDL45	16.5	18.5	18.5	17.8
GFDL85	16.5	18.4	19.6	18.1
HAD45	16.5	17.2	17.6	17.5
HAD85	16.5	16.6	15.2	15.4

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
hackberry	Celtis occidentalis	WDH	Medium	48.3	109.8	15.1	No change	No change	High	Common	Good	Good	Infill ++	Infill ++	1	1
American elm	Ulmus americana	WDH	Medium	50.8	93.0	11.1	No change	No change	Medium	Common	Fair	Fair	Infill +	Infill +	1	2
honeylocust	Gleditsia triacanthos	NSH	Low	37.3	86.4	16.6	Sm. dec.	Sm. dec.	High	Common	Fair	Fair	Infill +	Infill +	1	3
black walnut	Juglans nigra	WDH	Low	47.4	75.1	11.4	No change	No change	Medium	Common	Fair	Fair	Infill +	Infill +	1	4
red mulberry	Morus rubra	NSL	Low	45	47.9	6.6	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	1	5
eastern cottonwood	Populus deltoides	NSH	Low	16.3	43.7	19.4	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	6
eastern redcedar	Juniperus virginiana	WDH	Medium	27.7	42.9	16.5	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair	Infill +	Infill +	2	7
bur oak	Quercus macrocarpa	NDH	Medium	27.9	41.9	13.3	Sm. inc.	No change	High	Rare	Good	Fair	Infill ++	Infill +	2	8
boxelder	Acer negundo	WSH	Low	18.2	32.7	10.3	Sm. dec.	No change	High	Rare	Poor	Fair	Infill +	Infill +	2	9
Osage-orange	Maclura pomifera	NDH	Medium	27	29.5	12.8	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	2	10
silver maple	Acer saccharinum	NSH	Low	5.1	27.2	30.3	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	2	11
black cherry	Prunus serotina	WDL	Medium	20.3	24.3	9.8	Lg. dec.	Lg. dec.	Low	Rare	Very Poor	Very Poor			2	12
northern red oak	Quercus rubra	WDH	Medium	10.2	21.8	6.0	No change	Sm. dec.	High	Rare	Fair	Poor	Infill +	Infill +	2	13
bitternut hickory	Carya cordiformis	WSL	Low	20.9	20.6	5.6	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	2	14
green ash	Fraxinus pennsylvanica	WSH	Low	21.7	19.6	5.0	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	2	15
shagbark hickory	Carya ovata	WSL	Medium	14.2	19.5	5.5	Sm. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			2	16
slippery elm	Ulmus rubra	WSL	Low	31.5	17.7	4.9	No change	Sm. inc.	Medium	Rare	Poor	Fair	Infill +	Infill +	1	17
black willow	Salix nigra	NSH	Low	14.7	16.8	7.2	No change	Sm. inc.	Low	Rare	Very Poor	Poor		Infill +	2	18
American basswood	Tilia americana	WSL	Medium	15.9	16.3	6.2	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			2	19
chinkapin oak	Quercus muehlenbergii	NSL	Medium	11.1	15.7	6.1	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			2	20
black oak	Quercus velutina	WDH	High	12.7	14.0	5.6	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair	Infill +	Infill +	2	21
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	14.7	13.6	4.9	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor	Infill +	Infill +	2	22
Siberian elm	Ulmus pumila	NDH	FIA	6.5	7.6	7.3	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	23
eastern redbud	Cercis canadensis	NSL	Low	6	7.2	3.2	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	24
white ash	Fraxinus americana	WDL	Medium	7.7	6.8	4.1	No change	No change	Low	Rare	Very Poor	Very Poor			2	25
black locust	Robinia pseudoacacia	NDH	Low	5.3	6.6	6.7	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	26
sycamore	Platanus occidentalis	NSL	Low	3.9	5.0	8.2	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	27
pin oak	Quercus palustris	NSH	Low	2.8	4.1	4.9	Sm. dec.	No change	Low	Rare	Very Poor	Very Poor			0	28
Kentucky coffeetree	Gymnocladus dioicus	NSLX	FIA	7	3.1	2.8	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	29
shingle oak	Quercus imbricaria	NDH	Medium	4.3	3.1	2.3	No change	Sm. dec.	Medium	Rare	Poor	Very Poor			0	30
white oak	Quercus alba	WDH	Medium	3.8	1.9	2.9	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	2	31
sugar maple	Acer saccharum	WDH	High	0.3	1.0	3.6	No change	Sm. inc.	High	Rare	Fair	Good	Infill +		2	32
post oak	Quercus stellata	WDH	High	0.3	0.8	2.6	Lg. inc.	Lg. inc.	High	Rare	Good	Good			2	33
peachleaf willow	Salix amygdaloides	NSLX	FIA	1.4	0.7	4.6	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	34
pawpaw	Asimina triloba	NSL	Low	1.9	0.7	2.4	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	35
wild plum	Prunus americana	NSLX	FIA	1.6	0.7	2.8	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	36
serviceberry	Amelanchier spp.	NSL	Low	0.3	0.6	2.1	Sm. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	37
chokecherry	Prunus virginiana	NSLX	FIA	1.1	0.6	8.4	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	38
flowering dogwood	Cornus florida	WDL	Medium	2.3	0.5	3.7	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			2	39
red pine	Pinus resinosa	NSH	Medium	0.8	0.3	2.5	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor			0	40
Scots pine	Pinus sylvestris	NSH	FIA	1.1	0.2	2.4	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	41
sugarberry	Celtis laevigata	NDH	Medium	0.3	0.2	0.6	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	42
northern pin oak	Quercus ellipsoidalis	NSH	Medium	0.2	0.2	0.5	Very Lg. dec.	Very Lg. dec.	High	Rare	Lost	Lost			0	43
swamp white oak	Quercus bicolor	NSL	Low	1.1	0.1	0.9	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	44
Ohio buckeye	Aesculus glabra	NSL	Low	0.1	0.1	0.1	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	45
common persimmon	Diospyros virginiana	NSL	Low	0.3	0.0	0.1	Lg. inc.	Lg. inc.	High	Rare	Good	Good			2	46
blackjack oak	Quercus marilandica	NSL	Medium	0.3	0.0	0.1	Lg. inc.	Lg. inc.	High	Rare	Good	Good			2	47



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ashe juniper	Juniperus ashei	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	48
striped maple	Acer pensylvanicum	NSL	Medium	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	49
cittamwood/gum bumelia	Sideroxylon lanuginosum ssp.	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	50
pignut hickory	Carya glabra	WDL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	51
pecan	Carya illinoensis	NSH	Low	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++	3	52
black hickory	Carya texana	NDL	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	53
mockernut hickory	Carya alba	WDL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate +	3	54
blue ash	Fraxinus quadrangulata	NSL	Low	0	0	0	Unknown	Unknown	Low	Absent	Unknown	Unknown			0	55
bigleaf magnolia	Magnolia macrophylla	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	56
pin cherry	Prunus pensylvanica	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	57
water oak	Quercus nigra	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	58
Shumard oak	Quercus shumardii	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate +	3	59
bluejack oak	Quercus incana	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	60
sassafras	Sassafras albidum	WSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	61
winged elm	Ulmus alata	WDL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	62
cedar elm	Ulmus crassifolia	NDH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			3	63