

HUC 102902 Gasconade

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 9,261.8 3,576.0 276

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	Reliability	Adaptability	Potential Change in Habitat Suitability		Capability to Cope or Persist		Migration Potential	
							Scenario	Scenario	Scenario	Scenario	SHIFT	SHIFT
							RCP45	RCP85	RCP45	RCP85	RCP45	RCP85
Ash	3			High	16	23	Increase	22	26	Very Good	10	11
Hickory	5			Medium	24	41	No Change	10	10	Good	15	20
Maple	4	Abundant	4	Low	29	9	Decrease	17	13	Fair	9	6
Oak	11	Common	24	FIA	6		New	13	15	Poor	7	4
Pine	1	Rare	27				Unknown	13	11	Very Poor	7	8
Other	31	Absent	18							FIA Only	4	4
	55		73		75	73		75	75	Unknown	7	5
											59	58

Potential Changes in Climate Variables

Temperature (°F)

Scenario	2009	2039	2069	2099	
Annual	CCSM45	48.6	50.0	51.4	51.6
Average	CCSM85	48.6	50.3	52.1	54.4
	GFDL45	48.6	50.6	52.3	53.0
	GFDL85	48.6	50.7	52.8	55.6
	HAD45	48.6	50.5	52.6	53.7
	HAD85	48.6	50.7	54.1	56.7
Growing	CCSM45	60.1	61.7	62.8	63.2
Season	CCSM85	60.1	62.1	63.9	66.8
May—Sep	GFDL45	60.1	62.4	64.6	65.8
	GFDL85	60.1	62.8	65.3	68.8
	HAD45	60.1	62.3	64.2	65.4
	HAD85	60.1	62.5	66.8	69.2
Coldest	CCSM45	30.4	31.9	32.9	33.3
Month	CCSM85	30.4	32.5	33.4	34.6
Average	GFDL45	30.4	33.6	33.8	34.0
	GFDL85	30.4	32.3	33.2	33.7
	HAD45	30.4	31.2	33.0	33.1
	HAD85	30.4	32.4	34.1	35.4
Warmest	CCSM45	64.6	66.3	67.0	67.3
Month	CCSM85	64.6	66.7	67.7	68.9
Average	GFDL45	64.6	67.6	68.7	69.5
	GFDL85	64.6	67.6	68.8	71.2
	HAD45	64.6	67.1	68.4	69.0
	HAD85	64.6	68.0	70.4	71.5

Precipitation (in)

Scenario	2009	2039	2069	2099	
Annual	CCSM45	32.2	31.6	34.8	33.7
Total	CCSM85	32.2	33.2	34.1	34.4
	GFDL45	32.2	35.7	36.7	36.6
	GFDL85	32.2	35.5	40.3	40.2
	HAD45	32.2	32.0	33.8	33.8
	HAD85	32.2	34.0	31.3	33.2
Growing	CCSM45	15.0	14.2	15.6	14.8
Season	CCSM85	15.0	15.1	14.5	14.7
May—Sep	GFDL45	15.0	16.7	16.1	16.7
	GFDL85	15.0	16.6	18.1	17.8
	HAD45	15.0	14.4	14.6	14.4
	HAD85	15.0	15.1	12.5	12.9

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	87.5	1910.8	15.1	No change	No change	High	Abundant	Very Good	Very Good			1	1
white oak	Quercus alba	WDH	Medium	88.4	1817.2	15.0	Sm. dec.	Sm. dec.	High	Abundant	Good	Good			1	2
black oak	Quercus velutina	WDH	High	85.3	1789.8	16.3	Sm. dec.	Sm. dec.	Medium	Abundant	Fair	Fair			0	3
eastern redcedar	Juniperus virginiana	WDH	Medium	72.3	1045.9	9.3	No change	No change	Medium	Abundant	Good	Good			1	4
black hickory	Carya texana	NDL	High	72.6	409.9	4.6	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	5
black walnut	Juglans nigra	WDH	Low	54.9	405.5	5.7	No change	No change	Medium	Common	Fair	Fair			1	6
shortleaf pine	Pinus echinata	WDH	High	17.8	346.4	14.0	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	7
blackjack oak	Quercus marilandica	NSL	Medium	47.3	331.9	4.8	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	8
American elm	Ulmus americana	WDL	Medium	58.6	302.0	4.1	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	9
mockernut hickory	Carya alba	WDL	Medium	53.4	267.4	4.0	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	10
northern red oak	Quercus rubra	WDH	Medium	50.7	259.1	3.7	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	11
chinkapin oak	Quercus muehlenbergii	NSL	Medium	32.4	172.9	3.4	No change	No change	Medium	Common	Fair	Fair			1	12
flowering dogwood	Cornus florida	WDL	Medium	58.4	164.2	2.4	Sm. dec.	No change	Medium	Common	Poor	Fair			1	13
hackberry	Celtis occidentalis	WDH	Medium	35.2	151.4	3.4	Sm. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	14
sycamore	Platanus occidentalis	NSL	Low	18.3	145.7	7.4	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good			1	15
bitternut hickory	Carya cordiformis	WSL	Low	39.8	144.7	3.3	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	16
slippery elm	Ulmus rubra	WSL	Low	46.8	136.8	2.5	No change	Sm. inc.	Medium	Common	Fair	Good			1	17
Shumard oak	Quercus shumardii	NSL	Low	22.4	136.1	5.1	Sm. dec.	No change	High	Common	Fair	Good			1	18
black cherry	Prunus serotina	WDL	Medium	38.2	115.5	2.3	Lg. inc.	Lg. inc.	Low	Common	Good	Good			1	19
white ash	Fraxinus americana	WDL	Medium	37.2	111.9	2.1	Lg. inc.	Lg. inc.	Low	Common	Good	Good			1	20
red mulberry	Morus rubra	NSL	Low	32.1	105.3	2.2	Sm. dec.	No change	Medium	Common	Poor	Fair			1	21
honeylocust	Gleditsia triacanthos	NSH	Low	20.4	99.1	2.0	Sm. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	22
shagbark hickory	Carya ovata	WSL	Medium	18.3	84.1	2.9	No change	Sm. inc.	Medium	Common	Fair	Good			1	23
sassafras	Sassafras albidum	WSL	Low	43.2	83.2	1.5	Lg. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	24
boxelder	Acer negundo	WSH	Low	9	71.7	6.9	Sm. dec.	No change	High	Common	Fair	Good			1	25
common persimmon	Diospyros virginiana	NSL	Low	18.2	62.3	1.5	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	26
sugar maple	Acer saccharum	WDH	High	12	61.8	3.9	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good	Infill ++	Infill ++	1	27
scarlet oak	Quercus coccinea	WDL	Medium	16.2	60.5	2.3	Lg. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	28
shingle oak	Quercus imbricaria	NDH	Medium	14.3	39.4	2.6	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	29
green ash	Fraxinus pennsylvanica	WSH	Low	15.9	37.1	1.8	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			1	30
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	9.1	35.3	2.4	No change	No change	High	Rare	Fair	Fair			1	31
eastern redbud	Cercis canadensis	NSL	Low	22.2	33.7	0.8	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			1	32
blackgum	Nyssa sylvatica	WDL	Medium	18	33.3	1.3	Lg. inc.	Lg. inc.	High	Rare	Good	Good			1	33
red maple	Acer rubrum	WDH	High	17.2	32.1	1.5	Lg. inc.	Lg. inc.	High	Rare	Good	Good			1	34
silver maple	Acer saccharinum	NSH	Low	5.3	21.9	4.0	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			0	35
Osage-orange	Maclura pomifera	NDH	Medium	2.4	21.3	1.8	No change	Sm. inc.	High	Rare	Fair	Good		Infill ++	2	36
American basswood	Tilia americana	WSL	Medium	3.2	19.0	5.7	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	37
pignut hickory	Carya glabra	WDL	Medium	11.1	18.9	1.6	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	38
winged elm	Ulmus alata	WDL	Medium	4.4	15.3	1.7	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	2	39
black willow	Salix nigra	NSH	Low	2.6	10.6	2.7	No change	No change	Low	Rare	Very Poor	Very Poor			2	40
Ohio buckeye	Aesculus glabra	NSL	Low	4	8.9	2.0	Sm. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	41
Siberian elm	Ulmus pumila	NDH	FIA	1.1	8.3	7.7	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	42
Kentucky coffeetree	Gymnocladus dioicus	NSLX	FIA	1.5	7.5	3.2	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	43
swamp white oak	Quercus bicolor	NSL	Low	1.1	5.2	4.8	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	44
sugarberry	Celtis laevigata	NDH	Medium	2	4.3	1.8	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	45
serviceberry	Amelanchier spp.	NSL	Low	6.4	4.2	0.4	Very Lg. dec.	Lg. dec.	Medium	Rare	Lost	Very Poor			0	46
bur oak	Quercus macrocarpa	NDH	Medium	2.2	4.0	1.9	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			0	47

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Common Name	Scientific Name	Range	MR	%Cell	FIAsum	FIAiv	ChngCI45	ChngCI85	Adap	Abund	Capabil45	Capabil85	SHIFT45	SHIFT85	SSO	N
cittamwood/gum bumelia	Sideroxylon lanuginosum ssp.	NSL	Low	4	3.9	0.6	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++		2	48
eastern cottonwood	Populus deltoides	NSH	Low	1.1	2.9	2.7	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	49
blue ash	Fraxinus quadrangulata	NSL	Low	1	2.4	2.1	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor			0	50
butternut	Juglans cinerea	NSLX	FIA	1.1	2.2	2.0	Unknown	Unknown	Low	Rare	FIA Only	FIA Only			0	51
American hornbeam; musclev	Carpinus caroliniana	WSL	Low	2.2	1.2	0.6	No change	Lg. inc.	Medium	Rare	Poor	Good	Infill ++		2	52
white mulberry	Morus alba	NSL	FIA	0.9	1.1	0.8	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	53
wild plum	Prunus americana	NSLX	FIA	0.9	0.8	0.7	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	54
peachleaf willow	Salix amygdaloides	NSLX	FIA	1.1	0.4	0.4	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	55
ashe juniper	Juniperus ashei	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	56
loblolly pine	Pinus taeda	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++	3	57
Virginia pine	Pinus virginiana	NDH	High	0	0	0	Unknown	New Habitat	Medium	Absent	Unknown	New Habitat	Migrate +		3	58
black maple	Acer nigrum	NSH	Low	0	0	0	Unknown	Unknown	High	Absent	Unknown	Unknown			0	59
pawpaw	Asimina triloba	NSL	Low	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown			0	60
yellow birch	Betula alleghaniensis	NDL	High	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown			0	61
pecan	Carya illinoensis	NSH	Low	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	62
American beech	Fagus grandifolia	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	63
black ash	Fraxinus nigra	WDH	Medium	0	0	0	Unknown	New Habitat	Low	Absent	Unknown	New Habitat			3	64
sweetgum	Liquidambar styraciflua	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	65
yellow-poplar	Liriodendron tulipifera	WDH	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +		3	66
cucumbertree	Magnolia acuminata	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	67
bignleaf magnolia	Magnolia macrophylla	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	68
southern red oak	Quercus falcata	WDL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++	3	69
water oak	Quercus nigra	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate ++	3	70
pin oak	Quercus palustris	NSH	Low	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat		Migrate +	3	71
chestnut oak	Quercus prinus	NDH	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			3	72
live oak	Quercus virginiana	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	73
black locust	Robinia pseudoacacia	NDH	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +	3	74
cedar elm	Ulmus crassifolia	NDH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat		Migrate ++	3	75