

Tallgrass Prairie

National Park 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	8,400.0	3,243.3	22

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	5	11	Increase	5	5	Very Good	0	0
Hickory	2			Medium	15	25	No Change	5	6	Good	3	3
Maple	1	Abundant	0	Low	20	5	Decrease	12	11	Fair	5	5
Oak	3	Common	1	FIA	1		New	14	14	Poor	6	7
Pine	0	Rare	22				Unknown	5	5	Very Poor	8	7
Other	15	Absent	18							FIA Only	1	1
	23		41		41	41		41	41	Unknown	4	4
											17	23

Potential Changes in Climate Variables

Temperature (°F)

Scenario	2009	2039	2069	2099	
Annual	54.8	56.7	58.6	59.1	
Average	54.8	57.3	59.5	62.1	
GFDL45	54.8	61.0	59.8	61.0	
GFDL85	54.8	57.7	60.6	64.8	
HAD45	54.8	57.3	60.2	61.3	
HAD85	54.8	57.6	62.5	65.5	
Growing Season	72.6	74.8	76.8	77.4	
May—Sep	72.6	80.9	78.7	80.9	
GFDL45	72.6	80.9	78.7	80.9	
GFDL85	72.6	76.3	79.7	85.0	
HAD45	72.6	74.6	77.0	78.1	
HAD85	72.6	75.3	80.6	83.3	
Coldest Month	27.5	29.3	30.5	31.2	
Average	27.5	31.3	31.8	31.9	
GFDL45	27.5	31.3	31.8	31.8	
GFDL85	27.5	29.5	30.7	31.8	
HAD45	27.5	29.1	31.8	31.6	
HAD85	27.5	31.0	33.5	35.4	
Warmest Month	79.4	82.0	83.2	83.8	
Average	79.4	83.7	84.9	86.5	
GFDL45	79.4	83.7	84.9	86.5	
GFDL85	79.4	83.9	85.2	89.5	
HAD45	79.4	81.5	83.1	83.7	
HAD85	79.4	83.4	86.0	87.4	

Precipitation (in)

Scenario	2009	2039	2069	2099	
Annual	35.6	34.6	35.9	34.2	
Total	35.6	36.0	35.7	37.0	
GFDL45	35.6	38.7	41.0	39.2	
GFDL85	35.6	39.5	45.7	42.7	
HAD45	35.6	39.1	38.1	38.6	
HAD85	35.6	37.2	34.5	38.3	
Growing Season	21.8	20.1	21.0	19.6	
May—Sep	21.8	24.0	24.3	23.4	
GFDL45	21.8	24.0	24.3	23.4	
GFDL85	21.8	24.6	28.1	25.5	
HAD45	21.8	22.8	23.3	23.1	
HAD85	21.8	21.8	19.5	20.5	

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
Osage-orange	Maclura pomifera	NDH	Medium	33.3	95.6	45.9	Sm. dec.	Sm. dec.	High	Common	Fair	Fair	Infill +	Infill +	2	1
hackberry	Celtis occidentalis	WDH	Medium	38.1	48.2	20.3	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	2	2
green ash	Fraxinus pennsylvanica	WSH	Low	42.9	43.8	16.4	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			2	3
American elm	Ulmus americana	WDH	Medium	47.6	42.5	14.3	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair	Infill +	Infill +	2	4
bur oak	Quercus macrocarpa	NDH	Medium	28.6	30.4	17.0	Lg. dec.	Sm. dec.	High	Rare	Poor	Poor	Infill +	Infill +	2	5
white ash	Fraxinus americana	WDL	Medium	9.5	20.5	34.4	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor			2	6
honeylocust	Gleditsia triacanthos	NSH	Low	28.6	17.2	9.6	Sm. inc.	Sm. inc.	High	Rare	Good	Good	Infill ++	Infill ++	2	7
eastern redcedar	Juniperus virginiana	WDH	Medium	14.3	17.1	19.2	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	8
bitternut hickory	Carya cordiformis	WSL	Low	19	16.4	13.8	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor		Infill +	2	9
slippery elm	Ulmus rubra	WSL	Low	19	13.6	11.5	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			2	10
northern red oak	Quercus rubra	WDH	Medium	9.5	11.6	19.5	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor		Infill +	2	11
black walnut	Juglans nigra	WDH	Low	23.8	10.6	7.1	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	2	12
eastern cottonwood	Populus deltoides	NSH	Low	4.8	10.4	34.8	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	13
sycamore	Platanus occidentalis	NSL	Low	9.5	10.2	17.2	No change	No change	Medium	Rare	Poor	Poor		Infill +	2	14
Kentucky coffeetree	Gymnocladus dioicus	NSLX	FIA	19	7.8	6.5	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			2	15
red mulberry	Morus rubra	NSL	Low	19	7.3	6.1	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair	Infill +	Infill +	2	16
boxelder	Acer negundo	WSH	Low	4.8	4.9	16.6	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	2	17
chinkapin oak	Quercus muehlenbergii	NSL	Medium	4.8	3.2	10.6	Sm. dec.	No change	Medium	Rare	Very Poor	Poor			0	18
eastern redbud	Cercis canadensis	NSL	Low	9.5	2.4	4.1	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	19
shagbark hickory	Carya ovata	WSL	Medium	4.8	1.2	4.1	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	20
pawpaw	Asimina triloba	NSL	Low	4.8	1.1	3.5	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	21
American basswood	Tilia americana	NSL	Medium	4.8	0.3	1.1	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	22
Ohio buckeye	Aesculus glabra	NSL	Low	4.8	0.1	0.4	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	23
ashe juniper	Juniperus ashei	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	24
serviceberry	Amelanchier spp.	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	25
cittamwood/gum bumelia	Sideroxylon lanuginosum ssp.	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	26
pecan	Carya illinoensis	NSH	Low	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	27
black hickory	Carya texana	NDL	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	28
sugarberry	Celtis laevigata	NDH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +	3	29
black ash	Fraxinus nigra	WSH	Medium	0	0	0	Unknown	Unknown	Low	Absent	Unknown	Unknown			0	30
bigleaf magnolia	Magnolia macrophylla	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	31
pin cherry	Prunus pensylvanica	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	32
blackjack oak	Quercus marilandica	NSL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++	3	33
Shumard oak	Quercus shumardii	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate +	3	34
post oak	Quercus stellata	WDH	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++	3	35
black oak	Quercus velutina	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	36
live oak	Quercus virginiana	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	37
black locust	Robinia pseudoacacia	NDH	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	38
black willow	Salix nigra	NSH	Low	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat	Likely +	Likely +	3	39
winged elm	Ulmus alata	WDL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	40
cedar elm	Ulmus crassifolia	NDH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			3	41