

HUC 120902 Middle Colorado-Llano

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	21,387	8,257.7	394

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	Scenario	Scenario	Scenario	SHIFT	SHIFT			
				High	9	RCP45	RCP85	RCP45	RCP85	RCP45	RCP85			
Ash	3			4		Increase	3	4	Very Good	1	0	Likely	0	0
Hickory	3			15	22	No Change	7	6	Good	4	5	Infill	4	4
Maple	1	Abundant	2	16	6	Decrease	17	17	Fair	3	5	Migrate	0	0
Oak	9	Common	2	3		New	0	0	Poor	5	3		4	4
Pine	0	Rare	26			Unknown	11	11	Very Poor	14	13			
Other	14	Absent	7						FIA Only	3	3			
	30		37	38	37		38	38	Unknown	8	8			
										38	37			

Potential Changes in Climate Variables

Temperature (°F)

	Scenario	2009	2039	2069	2099	
Annual Average	CCSM45	58.1	59.2	60.2	60.8	
	CCSM85	58.1	59.6	61.2	63.1	
	GFDL45	58.1	60.6	61.4	62.7	
	GFDL85	58.1	60.3	62.7	65.6	
	HAD45	58.1	59.7	61.6	62.2	
	HAD85	58.1	60.2	62.7	65.0	
Growing Season (May—Sep)	CCSM45	68.1	69.1	70.0	70.6	
	CCSM85	68.1	69.7	71.2	73.4	
	GFDL45	68.1	71.1	72.1	74.1	
	GFDL85	68.1	71.1	73.8	77.4	
	HAD45	68.1	69.8	71.3	71.7	
	HAD85	68.1	70.3	73.0	75.0	
Coldest Month Average	CCSM45	42.8	44.6	45.0	45.4	
	CCSM85	42.8	44.4	45.1	46.2	
	GFDL45	42.8	45.5	45.5	45.6	
	GFDL85	42.8	43.8	44.6	44.9	
	HAD45	42.8	43.3	44.5	44.8	
	HAD85	42.8	45.4	46.5	47.7	
Warmest Month Average	CCSM45	71.6	72.4	73.1	73.2	
	CCSM85	71.6	73.1	73.6	74.8	
	GFDL45	71.6	75.2	75.6	76.7	
	GFDL85	71.6	75.5	76.7	79.1	
	HAD45	71.6	73.4	74.1	74.3	
	HAD85	71.6	73.9	75.3	76.2	

Precipitation (in)

	Scenario	2009	2039	2069	2099	
Annual Total	CCSM45	22.4	24.1	24.3	22.1	
	CCSM85	22.4	22.6	24.8	23.8	
	GFDL45	22.4	21.5	25.0	19.9	
	GFDL85	22.4	21.0	22.2	20.6	
	HAD45	22.4	23.3	22.3	24.1	
	HAD85	22.4	22.4	20.4	22.6	
Growing Season (May—Sep)	CCSM45	10.9	12.7	11.8	11.2	
	CCSM85	10.9	11.6	12.0	10.9	
	GFDL45	10.9	10.5	12.7	9.8	
	GFDL85	10.9	10.6	11.0	10.0	
	HAD45	10.9	10.7	10.6	12.1	
	HAD85	10.9	10.6	9.5	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
ashe juniper	Juniperus ashei	NDH	High	81.6	2843.6	41.1	No change	No change	Medium	Abundant	Good	Good			0	1
live oak	Quercus virginiana	NDH	High	86	2664.5	36.7	No change	No change	Medium	Abundant	Good	Good			1	2
cedar elm	Ulmus crassifolia	NDH	Medium	29.6	186.7	8.6	Lg. inc.	Lg. inc.	Low	Common	Good	Good			1	3
post oak	Quercus stellata	WDH	High	26.4	184.3	10.9	Sm. inc.	No change	High	Common	Very Good	Good			1	4
black walnut	Juglans nigra	WDH	Low	2.5	43.2	12.7	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			2	5
sugarberry	Celtis laevigata	NDH	Medium	14	37.7	4.0	No change	Sm. inc.	Medium	Rare	Poor	Fair			1	6
red mulberry	Morus rubra	NSL	Low	0.3	23.4	23.5	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	7
blackjack oak	Quercus marilandica	NSL	Medium	5.9	22.6	5.8	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	1	8
pecan	Carya illinoensis	NSH	Low	10.7	18.5	6.6	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor			0	9
cittamwood/gum bumelia	Sideroxylon lanuginosum ssp.	NSL	Low	11.1	18.3	3.1	Lg. inc.	Lg. inc.	High	Rare	Good	Good			1	10
hackberry	Celtis occidentalis	WDH	Medium	5.8	13.6	4.4	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	2	11
southern red oak	Quercus falcata	WDL	Medium	2.7	9.6	10.4	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			0	12
white ash	Fraxinus americana	WDL	Medium	0.2	8.2	4.9	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor			0	13
eastern redcedar	Juniperus virginiana	WDH	Medium	0.2	6.4	0.6	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			2	14
durand oak	Quercus sinuata var. sinuata	NSL	FIA	3.3	3.9	2.8	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	15
swamp chestnut oak	Quercus michauxii	NSL	Low	0.5	3.7	7.9	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	16
American elm	Ulmus americana	WDH	Medium	4.4	3.6	2.0	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	17
black cherry	Prunus serotina	WDL	Medium	2.9	3.3	4.5	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor			0	18
Osage-orange	Maclura pomifera	NDH	Medium	0.6	2.8	1.6	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	2	19
winged elm	Ulmus alata	WDL	Medium	0.9	2.1	1.9	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			2	20
bear oak; scrub oak	Quercus ilicifolia	NSLX	FIA	0.1	1.9	0.6	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	21
Nuttall oak	Quercus texana	NSH	Medium	0.5	1.9	4.0	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			0	22
pin oak	Quercus palustris	NSH	Low	0.5	1.5	3.2	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor			0	23
pignut hickory	Carya glabra	WDL	Medium	2.7	1.4	3.2	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	24
black hickory	Carya texana	NDL	High	3.3	1.2	0.9	Lg. dec.	Very Lg. dec.	Medium	Rare	Very Poor	Lost			0	25
boxelder	Acer negundo	WSH	Low	2.1	1.1	8.9	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			0	26
Texas ash	Fraxinus texensis	NDH	FIA	0.5	1.0	2.1	Unknown	Unknown	NA	Rare	FIA Only	FIA Only			0	27
slippery elm	Ulmus rubra	WSL	Low	0.5	1.0	2.1	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	28
eastern redbud	Cercis canadensis	NSL	Low	0.5	0.9	1.9	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	29
green ash	Fraxinus pennsylvanica	WSH	Low	0.5	0.3	0.1	No change	Sm. inc.	Medium	Rare	Poor	Fair	Infill +	Infill +	2	30
Ohio buckeye	Aesculus glabra	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	31
American hornbeam; muscley	Carpinus caroliniana	WSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	32
shellbark hickory	Carya laciniosa	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	33
flowering dogwood	Cornus florida	WDL	Medium	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	34
cucumbertree	Magnolia acuminata	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	35
sycamore	Platanus occidentalis	NSL	Low	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown			0	36
northern red oak	Quercus rubra	WDH	Medium	0	0	0	Unknown	Unknown	High	Absent	Unknown	Unknown			0	37
American mountain-ash	Sorbus americana	NSL	Low	0	0	0	Unknown	Unknown	Low	Absent	Unknown	Unknown			0	38