

HUC 101401 Fort Randall Reservoir

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	26,263	10,140	16

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		RCP45	RCP85	RCP45	RCP85	RCP45	RCP85	
Ash	1			5	13	Increase	3	4	Very Good	0	0	
Hickory	0			12	19	No Change	8	7	Good	1	1	
Maple	1	Abundant	0	Low	14	1	Decrease	0	0	Fair	6	7
Oak	1	Common	0	FIA	3		New	17	18	Poor	4	3
Pine	0	Rare	14				Unknown	6	5	Very Poor	0	0
Other	11	Absent	19							FIA Only	2	2
	14		33		34	33		34	34	Unknown	3	2
											16	15

Potential Changes in Climate Variables

Temperature (°F)

Scenario	2009	2039	2069	2099		
Annual	CCSM45	41.2	42.4	43.8	44.3	
Average	CCSM85	41.2	42.7	44.4	46.4	
	GFDL45	41.2	44.9	44.0	44.9	
	GFDL85	41.2	42.9	44.8	47.6	
	HAD45	41.2	43.1	45.4	46.3	
	HAD85	41.2	43.4	46.6	49.2	
Growing Season	CCSM45	53.6	54.9	56.5	57.0	
	CCSM85	53.6	55.4	57.0	59.6	
May—Sep	GFDL45	53.6	58.4	57.2	58.4	
	GFDL85	53.6	55.7	57.9	61.4	
	HAD45	53.6	55.2	57.0	58.1	
	HAD85	53.6	55.4	58.1	60.8	
Coldest Month	CCSM45	22.4	23.7	24.4	25.0	
	CCSM85	22.4	23.1	24.0	25.4	
Average	GFDL45	22.4	24.4	24.8	25.1	
	GFDL85	22.4	24.3	25.1	26.3	
	HAD45	22.4	23.9	26.3	25.8	
	HAD85	22.4	25.8	28.8	29.9	
Warmest Month	CCSM45	58.3	59.9	61.1	61.5	
	CCSM85	58.3	60.7	61.8	63.6	
Average	GFDL45	58.3	60.5	61.4	62.1	
	GFDL85	58.3	61.0	61.9	64.2	
	HAD45	58.3	60.2	61.3	62.0	
	HAD85	58.3	60.6	62.2	64.0	

Precipitation (in)

Scenario	2009	2039	2069	2099		
Annual	CCSM45	13.5	13.9	13.4	13.2	
Total	CCSM85	13.5	13.4	13.9	14.1	
	GFDL45	13.5	16.0	17.4	16.7	
	GFDL85	13.5	15.6	17.8	17.4	
	HAD45	13.5	15.4	14.7	15.3	
	HAD85	13.5	14.6	15.2	16.3	
Growing Season	CCSM45	8.9	8.6	8.2	7.8	
	CCSM85	8.9	8.0	8.5	8.0	
May—Sep	GFDL45	8.9	10.6	11.4	10.6	
	GFDL85	8.9	10.4	11.3	10.8	
	HAD45	8.9	9.3	8.7	8.7	
	HAD85	8.9	8.7	8.5	8.0	

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
eastern redcedar	<i>Juniperus virginiana</i>	WDH	Medium	13.2	28.6	29.8	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair	Infill +	Infill +	2	1
green ash	<i>Fraxinus pennsylvanica</i>	WSH	Low	6.9	22.2	11.9	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	2
bur oak	<i>Quercus macrocarpa</i>	NDH	Medium	7.9	22.1	19.2	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	2	3
American elm	<i>Ulmus americana</i>	WDH	Medium	6.3	16.1	32.9	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	4
eastern cottonwood	<i>Populus deltoides</i>	NSH	Low	4.9	10.0	46.8	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	5
hackberry	<i>Celtis occidentalis</i>	WDH	Medium	3.8	7.8	13.7	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	2	6
peachleaf willow	<i>Salix amygdaloides</i>	NSLX	FIA	1.3	3.4	18.7	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	7
Siberian elm	<i>Ulmus pumila</i>	NDH	FIA	0.1	1.1	0.4	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	8
eastern hophornbeam; ironw	<i>Ostrya virginiana</i>	WSL	Low	6.7	1.0	2.7	No change	No change	High	Rare	Fair	Fair	Infill +		2	9
boxelder	<i>Acer negundo</i>	WSH	Low	0.6	0.9	2.2	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	2	10
American basswood	<i>Tilia americana</i>	WSL	Medium	4.1	0.5	2.2	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair	Infill +	Infill +	2	11
black walnut	<i>Juglans nigra</i>	WDH	Low	0.6	0.3	0.6	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	12
slippery elm	<i>Ulmus rubra</i>	WSL	Low	2.6	0.1	1.2	No change	Sm. inc.	Medium	Rare	Poor	Fair			0	13
chokecherry	<i>Prunus virginiana</i>	NSLX	FIA	2.6	0.1	1.0	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	14
ashe juniper	<i>Juniperus ashei</i>	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	15
sugar maple	<i>Acer saccharum</i>	WDH	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	16
mountain maple	<i>Acer spicatum</i>	NSL	Low	0	0	0	Unknown	Unknown	High	Absent	Unknown	Unknown			0	17
cittamwood/gum bumelia	<i>Sideroxylon lanuginosum</i> ssp.	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			0	18
black hickory	<i>Carya texana</i>	NDL	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	19
sugarberry	<i>Celtis laevigata</i>	NDH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	20
eastern redbud	<i>Cercis canadensis</i>	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	21
flowering dogwood	<i>Cornus florida</i>	WDL	Medium	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown			0	22
white ash	<i>Fraxinus americana</i>	WDL	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	23
honeylocust	<i>Gleditsia triacanthos</i>	NSH	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	24
Osage-orange	<i>Maclura pomifera</i>	NDH	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	25
red mulberry	<i>Morus rubra</i>	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	26
sycamore	<i>Platanus occidentalis</i>	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	27
blackjack oak	<i>Quercus marilandica</i>	NSL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			3	28
chinkapin oak	<i>Quercus muehlenbergii</i>	NSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	29
northern red oak	<i>Quercus rubra</i>	WDH	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	30
Shumard oak	<i>Quercus shumardii</i>	NSL	Low	0	0	0	Unknown	New Habitat	High	Absent	Unknown	New Habitat			0	31
post oak	<i>Quercus stellata</i>	WDH	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			3	32
live oak	<i>Quercus virginiana</i>	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	33
black locust	<i>Robinia pseudoacacia</i>	NDH	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	34