

# HUC 111101 Robert S. Kerr 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	19,271	7,440.6	405

#### 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	3			19	25	Increase	26	33	Very Good	10	13			
Hickory	7			30	52	No Change	18	12	Good	19	20			
Maple	5	Abundant	3	Low	35	10	Decrease	19	18	Fair	9	9		
Oak	16	Common	28	FIA	7		New	12	13	Poor	14	10		
Pine	2	Rare	39			Unknown	16	15	Very Poor	11	11			
Other	37	Absent	18					FIA Only	4	4				
	<b>70</b>	<b>88</b>						Unknown	9	8				
									<b>76</b>	<b>75</b>	Likely	10	2	
												Infill	18	19
												Migrate	3	6
													<b>22</b>	<b>27</b>

#### Potential Changes in Climate Variables

##### Temperature (°F)

	Scenario	2009	2039	2069	2099	
Annual	CCSM45	53.2	54.6	56.0	56.3	
	CCSM85	53.2	55.1	56.8	58.9	
	GFDL45	53.2	55.7	56.9	57.8	
	GFDL85	53.2	55.5	57.6	60.4	
	HAD45	53.2	55.0	57.1	58.1	
	HAD85	53.2	55.2	58.6	61.2	
Growing Season	CCSM45	64.7	66.0	67.3	67.7	
	CCSM85	64.7	66.8	68.4	71.1	
	GFDL45	64.7	67.6	69.0	70.7	
	GFDL85	64.7	67.6	70.0	73.6	
	HAD45	64.7	66.6	68.6	69.5	
	HAD85	64.7	66.9	71.1	73.4	
Coldest Month	CCSM45	35.8	37.6	38.4	38.7	
	CCSM85	35.8	37.8	38.5	39.7	
	GFDL45	35.8	38.7	39.0	39.0	
	GFDL85	35.8	36.8	37.9	38.4	
	HAD45	35.8	36.3	38.0	38.1	
	HAD85	35.8	37.6	39.1	40.3	
Warmest Month	CCSM45	69.3	70.6	71.4	71.6	
	CCSM85	69.3	71.6	72.1	73.5	
	GFDL45	69.3	73.0	73.8	74.9	
	GFDL85	69.3	72.8	74.0	76.8	
	HAD45	69.3	71.4	72.6	73.0	
	HAD85	69.3	72.3	74.5	75.3	

##### Precipitation (in)

	Scenario	2009	2039	2069	2099	
Annual	CCSM45	36.0	34.7	36.4	35.9	
	CCSM85	36.0	35.1	36.9	37.1	
	GFDL45	36.0	37.9	41.3	38.0	
	GFDL85	36.0	38.2	42.5	41.7	
	HAD45	36.0	36.3	38.3	39.2	
	HAD85	36.0	39.1	33.9	36.7	
Growing Season	CCSM45	16.2	15.0	14.9	15.0	
	CCSM85	16.2	15.5	14.3	15.1	
	GFDL45	16.2	17.2	18.0	17.3	
	GFDL85	16.2	17.5	19.6	18.3	
	HAD45	16.2	16.1	16.4	16.3	
	HAD85	16.2	17.0	12.9	13.8	

**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
post oak	Quercus stellata	WDH	High	82.7	1881.9	21.4	No change	No change	High	Abundant	Very Good	Very Good			1	1
shortleaf pine	Pinus echinata	WDH	High	30.1	955.6	20.8	Sm. inc.	Sm. inc.	Medium	Abundant	Very Good	Very Good			1	2
eastern redcedar	Juniperus virginiana	WDH	Medium	52.9	540.2	8.0	No change	Sm. inc.	Medium	Abundant	Good	Very Good			1	3
black oak	Quercus velutina	WDH	High	65.5	494.1	7.9	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	4
white oak	Quercus alba	WDH	Medium	33.6	450.4	9.7	No change	No change	High	Common	Good	Good			1	5
winged elm	Ulmus alata	WDL	Medium	75.6	435.0	5.5	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	6
black hickory	Carya texana	NDL	High	65.2	422.9	5.6	No change	No change	Medium	Common	Fair	Fair			1	7
blackjack oak	Quercus marilandica	NSL	Medium	64.1	384.2	6.0	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	8
mockernut hickory	Carya alba	WDL	Medium	58.1	314.0	4.8	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	9
northern red oak	Quercus rubra	WDH	Medium	35.6	192.9	4.0	No change	No change	High	Common	Good	Good			1	10
green ash	Fraxinus pennsylvanica	WSH	Low	24	182.4	6.8	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	11
American elm	Ulmus americana	WDH	Medium	43.9	181.3	5.2	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	12
common persimmon	Diospyros virginiana	NSL	Low	28	127.5	4.3	No change	No change	High	Common	Good	Good			1	13
sycamore	Platanus occidentalis	NSL	Low	21.1	126.3	5.8	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	14
southern red oak	Quercus falcata	WDL	Medium	17.9	120.1	6.1	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	15
loblolly pine	Pinus taeda	WDH	High	7	117.3	14.3	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good	Infill ++	Infill ++	1	16
sugarberry	Celtis laevigata	NDH	Medium	30.7	104.3	4.7	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	17
blackgum	Nyssa sylvatica	WDL	Medium	22.8	97.7	3.0	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	18
honeylocust	Gleditsia triacanthos	NSH	Low	25.8	95.0	5.0	No change	Sm. inc.	High	Common	Good	Very Good			1	19
black cherry	Prunus serotina	WDL	Medium	36.8	84.0	2.2	Sm. inc.	Lg. inc.	Low	Common	Fair	Good			1	20
water oak	Quercus nigra	WDH	High	12.3	83.2	6.9	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good	Infill ++	Infill ++	1	21
black walnut	Juglans nigra	WDH	Low	20.6	79.0	4.4	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	22
white ash	Fraxinus americana	WDL	Medium	37.2	78.8	2.3	Lg. inc.	Lg. inc.	Low	Common	Good	Good			1	23
bitternut hickory	Carya cordiformis	WSL	Low	21.7	68.3	3.5	Sm. dec.	Sm. dec.	High	Common	Fair	Fair	Infill +	Infill +	1	24
hackberry	Celtis occidentalis	WDH	Medium	25.2	60.4	2.8	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	25
black willow	Salix nigra	NSH	Low	7.3	60.2	8.7	No change	No change	Low	Common	Poor	Poor	Infill +	Infill +	0	26
slippery elm	Ulmus rubra	WSL	Low	20	58.9	2.7	No change	Sm. inc.	Medium	Common	Fair	Good			1	27
river birch	Betula nigra	NSL	Low	3.5	57.7	15.9	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	1	28
boxelder	Acer negundo	WSH	Low	13.7	57.3	5.0	No change	Sm. inc.	High	Common	Good	Very Good			1	29
pecan	Carya illinoensis	NSH	Low	16	55.9	7.1	Lg. inc.	Lg. inc.	Low	Common	Good	Good	Infill ++	Infill ++	1	30
red mulberry	Morus rubra	NSL	Low	23.5	52.5	1.9	Sm. dec.	No change	Medium	Common	Poor	Fair			1	31
sassafras	Sassafras albidum	WSL	Low	17.3	52.1	3.4	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	32
flowering dogwood	Cornus florida	WDL	Medium	20.9	49.8	2.0	No change	Sm. inc.	Medium	Rare	Poor	Fair			1	33
red maple	Acer rubrum	WDH	High	16.7	49.2	2.4	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	1	34
sweetgum	Liquidambar styraciflua	WDH	High	8.8	47.6	4.2	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	35
florida maple	Acer barbatum	NSL	Low	8.5	41.7	2.8	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor	Infill +	Infill +	1	36
eastern cottonwood	Populus deltoides	NSH	Low	1.9	40.2	14.0	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			2	37
chinkapin oak	Quercus muehlenbergii	NSL	Medium	17.7	35.9	2.3	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	1	38
Shumard oak	Quercus shumardii	NSL	Low	10.9	35.7	4.0	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	1	39
Osage-orange	Maclura pomifera	NDH	Medium	7.3	34.5	4.8	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	1	40
silver maple	Acer saccharinum	NSH	Low	7.4	33.6	7.5	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor	Infill +	Infill +	2	41
black locust	Robinia pseudoacacia	NDH	Low	8.4	28.6	4.2	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	42
pin oak	Quercus palustris	NSH	Low	4	25.3	4.0	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor			0	43
eastern redbud	Cercis canadensis	NSL	Low	17.3	16.7	0.9	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good			1	44
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	11.6	13.3	1.0	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	1	45
shagbark hickory	Carya ovata	WSL	Medium	2.8	11.9	1.9	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			2	46
cedar elm	Ulmus crassifolia	NDH	Medium	3.7	9.9	4.8	Lg. inc.	Lg. inc.	Low	Rare	Fair	Fair	Infill +	Infill +	2	47



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Common Name	Scientific Name	Range	MR	%Cell	FIAsum	FIAiv	ChngCl45	ChngCl85	Adap	Abund	Capabil45	Capabil85	SHIFT45	SHIFT85	SSO	N
cittamwood/gum bumelia	Sideroxylon lanuginosum ssp.	NSL	Low	6.5	8.4	1.8	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	2	48
wild plum	Prunus americana	NSLX	FIA	6	7.4	1.0	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	49
pignut hickory	Carya glabra	WDL	Medium	7	7.4	1.2	No change	Sm. inc.	Medium	Rare	Poor	Fair	Infill +	Infill +	2	50
serviceberry	Amelanchier spp.	NSL	Low	7.5	7.3	0.8	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	51
bur oak	Quercus macrocarpa	NDH	Medium	2	4.6	1.0	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor		Infill +	2	52
sugar maple	Acer saccharum	WDH	High	1	4.2	4.1	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor			0	53
white mulberry	Morus alba	NSL	FIA	0.5	4.1	7.8	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	54
pawpaw	Asimina triloba	NSL	Low	1.6	2.6	0.8	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	55
willow oak	Quercus phellos	NSL	Low	0.5	2.0	1.5	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	56
swamp chestnut oak	Quercus michauxii	NSL	Low	0.5	1.9	3.7	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	57
paulownia	Paulownia tomentosa	NSL	FIA	0.3	1.9	2.4	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	58
overcup oak	Quercus lyrata	NSL	Medium	0.5	1.8	3.5	No change	No change	Low	Rare	Very Poor	Very Poor			2	59
Kentucky coffeetree	Gymnocladus dioicus	NSLX	FIA	0.5	1.7	3.3	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	60
American basswood	Tilia americana	WSL	Medium	4.5	1.5	0.9	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	61
cucumbertree	Magnolia acuminata	NSL	Low	0.5	1.4	2.7	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	62
waterlocust	Gleditsia aquatica	NSLX	FIA	0.5	1.2	2.3	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	63
bluejack oak	Quercus incana	NSL	Low	0.5	0.7	1.4	No change	Sm. inc.	Medium	Rare	Poor	Fair		Infill +	2	64
shellbark hickory	Carya laciniosa	NSL	Low	2.4	0.7	0.4	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	65
American beech	Fagus grandifolia	WDH	High	0.5	0.6	1.2	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good	Infill +		2	66
yellow-poplar	Liriodendron tulipifera	WDH	High	1.9	0.4	2.7	Lg. inc.	Lg. inc.	High	Rare	Good	Good			2	67
ailanthus	Ailanthus altissima	NSL	FIA	1.9	0.2	1.4	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	68
Texas ash	Fraxinus texensis	NDH	FIA	0.3	0.2	0.2	Unknown	Unknown	NA	Rare	FIA Only	FIA Only			0	69
cherrybark oak; swamp red o.	Quercus pagoda	NSL	Medium	1.8	0.1	0.4	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	70
ashe juniper	Juniperus ashei	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	71
slash pine	Pinus elliottii	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	72
longleaf pine	Pinus palustris	NSH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	73
pitch pine	Pinus rigida	NSH	High	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown			0	74
Virginia pine	Pinus virginiana	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	75
striped maple	Acer pensylvanicum	NSL	Medium	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	76
sweet birch	Betula lenta	NDH	High	0	0	0	Unknown	Unknown	Low	Absent	Unknown	Unknown			0	77
American hornbeam; musclev	Carpinus caroliniana	WSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +	3	78
black ash	Fraxinus nigra	WSH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			3	79
silverbell	Halesia spp.	NSL	Low	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown			0	80
American holly	Ilex opaca	NSL	Medium	0	0	0	Unknown	New Habitat	Medium	Absent	Unknown	New Habitat		Likely +	3	81
southern magnolia	Magnolia grandiflora	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	82
sweetbay	Magnolia virginiana	NSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	83
bigleaf magnolia	Magnolia macrophylla	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	84
mountain or Fraser magnolia	Magnolia fraseri	NSL	Low	0	0	0	Unknown	Unknown	Low	Absent	Unknown	Unknown			0	85
sourwood	Oxydendrum arboreum	NDL	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate +	3	86
pin cherry	Prunus pensylvanica	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	87
laurel oak	Quercus laurifolia	NDH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	88
Nuttall oak	Quercus texana	NSH	Medium	0	0	0	Unknown	Unknown	High	Modeled	Unknown	Unknown			0	89
chestnut oak	Quercus prinus	NDH	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			3	90
live oak	Quercus virginiana	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++	3	91