

# HUC 080203 Lower White

## 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	14,119	5,451.4	178

### 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	3			High	16	24	Increase	26	26	Very Good	9	10	Likely	4	4
Hickory	8			Medium	33	47	No Change	14	17	Good	19	18	Infill	37	37
Maple	5	Abundant	0	Low	31	11	Decrease	23	20	Fair	8	8	Migrate	1	4
Oak	15	Common	30	FIA	3		New	13	14	Poor	14	15		42	45
Pine	2	Rare	36				Unknown	7	6	Very Poor	13	12			
Other	33	Absent	17							FIA Only	3	3			
	<b>66</b>		<b>83</b>		<b>83</b>	<b>82</b>		<b>83</b>	<b>83</b>	Unknown	4	3			
											<b>70</b>	<b>69</b>			

### Potential Changes in Climate Variables

#### Temperature (°F)

	Scenario	2009	2039	2069	2099	
Annual Average	CCSM45	51.5	52.7	54.0	54.2	
	CCSM85	51.5	52.9	54.5	56.4	
	GFDL45	51.5	53.9	54.7	55.3	
	GFDL85	51.5	53.4	55.4	57.8	
	HAD45	51.5	53.3	55.2	56.1	
	HAD85	51.5	53.4	56.5	58.9	
Growing Season (May—Sep)	CCSM45	61.6	62.7	63.7	64.1	
	CCSM85	61.6	63.1	64.7	67.0	
	GFDL45	61.6	64.5	65.3	66.5	
	GFDL85	61.6	64.0	66.3	69.3	
	HAD45	61.6	63.9	65.7	66.5	
	HAD85	61.6	64.0	68.3	70.5	
Coldest Month (Average)	CCSM45	36.1	37.6	38.4	38.6	
	CCSM85	36.1	37.7	38.4	39.5	
	GFDL45	36.1	38.7	38.8	38.9	
	GFDL85	36.1	37.0	37.9	38.3	
	HAD45	36.1	36.8	38.1	38.3	
	HAD85	36.1	37.6	38.7	39.8	
Warmest Month (Average)	CCSM45	65.2	66.2	66.9	67.0	
	CCSM85	65.2	66.8	67.4	68.6	
	GFDL45	65.2	68.2	68.6	69.4	
	GFDL85	65.2	67.9	69.0	70.9	
	HAD45	65.2	68.0	69.3	69.5	
	HAD85	65.2	68.6	71.3	72.0	

#### Precipitation (in)

	Scenario	2009	2039	2069	2099	
Annual Total	CCSM45	32.5	32.8	35.9	34.7	
	CCSM85	32.5	34.0	35.8	36.8	
	GFDL45	32.5	35.9	38.8	37.7	
	GFDL85	32.5	35.9	38.8	40.0	
	HAD45	32.5	31.4	34.5	36.0	
	HAD85	32.5	34.7	30.5	33.9	
Growing Season (May—Sep)	CCSM45	11.3	10.8	11.1	11.1	
	CCSM85	11.3	10.8	10.2	10.6	
	GFDL45	11.3	12.5	13.1	13.2	
	GFDL85	11.3	13.1	14.1	14.2	
	HAD45	11.3	10.2	10.6	10.0	
	HAD85	11.3	11.1	8.1	8.2	

**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
sugarberry	Celtis laevigata	NDH	Medium	41.4	365.3	8.5	Sm. inc.	Sm. inc.	Medium	Common	Good	Good	Infill ++	Infill ++	1	1
green ash	Fraxinus pennsylvanica	WSH	Low	64.3	316.5	6.3	No change	No change	Medium	Common	Fair	Fair			1	2
loblolly pine	Pinus taeda	WDH	High	21.4	311.8	21.3	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good	Infill ++	Infill ++	1	3
sweetgum	Liquidambar styraciflua	WDH	High	45.4	271.0	9.1	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good			1	4
overcup oak	Quercus lyrata	NSL	Medium	44.3	260.1	9.0	No change	No change	Low	Common	Poor	Poor	Infill +	Infill +	0	5
willow oak	Quercus phellos	NSL	Low	38.6	259.3	7.7	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	6
water tupelo	Nyssa aquatica	NSH	Medium	22.5	256.6	19.1	Lg. dec.	Lg. dec.	Low	Common	Very Poor	Very Poor			0	7
boxelder	Acer negundo	WSH	Low	17	207.5	9.1	Sm. dec.	Sm. dec.	High	Common	Fair	Fair	Infill +	Infill +	1	8
post oak	Quercus stellata	WDH	High	28.7	192.3	9.2	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good	Infill ++	Infill ++	1	9
winged elm	Ulmus alata	WDL	Medium	49	189.5	5.7	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	10
Nuttall oak	Quercus texana	NSH	Medium	36.9	176.5	5.9	Sm. dec.	Sm. dec.	High	Common	Fair	Fair			0	11
red maple	Acer rubrum	WDH	High	38.5	153.7	6.3	No change	No change	High	Common	Good	Good	Infill ++	Infill ++	1	12
slippery elm	Ulmus rubra	WSL	Low	46	147.3	4.5	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	13
white oak	Quercus alba	WDH	Medium	35.6	147.1	6.8	No change	No change	High	Common	Good	Good	Infill ++	Infill ++	1	14
common persimmon	Diospyros virginiana	NSL	Low	56.4	136.1	3.2	No change	No change	High	Common	Good	Good			1	15
black hickory	Carya texana	NDL	High	23.3	133.8	8.4	No change	No change	Medium	Common	Fair	Fair	Infill +	Infill +	1	16
southern red oak	Quercus falcata	WDL	Medium	22.3	128.6	6.4	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good	Infill ++	Infill ++	1	17
black willow	Salix nigra	NSH	Low	24.5	125.7	8.4	Lg. inc.	Lg. inc.	Low	Common	Good	Good	Infill ++	Infill ++	1	18
bald cypress	Taxodium distichum	NSH	Medium	19.5	123.4	5.5	Sm. inc.	Sm. inc.	Medium	Common	Good	Good	Infill ++	Infill ++	1	19
water hickory	Carya aquatica	NSL	Medium	30.2	122.8	5.3	Sm. inc.	Sm. inc.	Medium	Common	Good	Good	Infill ++	Infill ++	1	20
water oak	Quercus nigra	WDH	High	34.4	117.8	4.4	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good	Infill ++	Infill ++	1	21
American elm	Ulmus americana	WDH	Medium	33.9	105.0	2.9	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good	Infill ++	Infill ++	1	22
mockernut hickory	Carya alba	WDL	Medium	36.1	98.9	4.4	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	23
water elm	Planera aquatica	NSL	Low	21.2	89.9	4.0	No change	No change	Medium	Common	Fair	Fair	Infill +	Infill +	1	24
cherrybark oak; swamp red o.	Quercus pagoda	NSL	Medium	31.2	86.3	5.0	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good	Infill ++	Infill ++	1	25
black cherry	Prunus serotina	WDL	Medium	25.9	65.9	5.0	Sm. dec.	No change	Low	Common	Poor	Poor	Infill +	Infill +	0	26
pecan	Carya illinoensis	NSH	Low	14.8	60.5	4.7	Lg. inc.	Lg. inc.	Low	Common	Good	Good	Infill ++	Infill ++	1	27
eastern redcedar	Juniperus virginiana	WDH	Medium	16	56.4	6.7	Sm. inc.	Sm. inc.	Medium	Common	Good	Good	Infill ++	Infill ++	1	28
blackgum	Nyssa sylvatica	WDL	Medium	22.8	52.8	3.4	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good	Infill ++	Infill ++	1	29
shagbark hickory	Carya ovata	WSL	Medium	20.2	50.2	5.5	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor	Infill +	Infill +	0	30
shortleaf pine	Pinus echinata	WDH	High	5.9	38.2	5.6	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	31
waterlocust	Gleditsia aquatica	NSLX	FIA	9.5	37.5	3.4	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	32
white ash	Fraxinus americana	WDL	Medium	9.3	32.6	4.1	Sm. dec.	No change	Low	Rare	Very Poor	Very Poor			2	33
American hornbeam; muscle	Carpinus caroliniana	WSL	Low	18.3	28.4	2.7	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	34
pawpaw	Asimina triloba	NSL	Low	2.7	28.1	3.7	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	35
sassafras	Sassafras albidum	WSL	Low	13.7	26.8	4.5	Sm. dec.	No change	Medium	Rare	Very Poor	Poor		Infill +	1	36
silver maple	Acer saccharinum	NSH	Low	7.3	25.8	2.2	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor	Infill +	Infill +	2	37
swamp chestnut oak	Quercus michauxii	NSL	Low	12.8	24.7	2.7	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	2	38
sycamore	Platanus occidentalis	NSL	Low	7	23.7	1.7	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	39
pignut hickory	Carya glabra	WDL	Medium	4.8	23.2	4.9	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			2	40
Shumard oak	Quercus shumardii	NSL	Low	7	19.7	3.9	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	2	41
blackjack oak	Quercus marilandica	NSL	Medium	12	18.9	3.8	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	2	42
black oak	Quercus velutina	WDH	High	10.6	18.3	3.5	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	2	43
hackberry	Celtis occidentalis	WDH	Medium	7.9	18.3	2.5	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	2	44
eastern cottonwood	Populus deltoides	NSH	Low	7	16.2	1.9	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	45
honeylocust	Gleditsia triacanthos	NSH	Low	13.9	15.7	1.8	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	2	46
American beech	Fagus grandifolia	WDH	High	2.3	15.5	6.4	No change	No change	Medium	Rare	Poor	Poor	Infill +		2	47



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cedar elm	Ulmus crassifolia	NDH	Medium	3	14.8	1.4	Lg. inc.	Lg. inc.	Low	Rare	Fair	Fair	Infill +	Infill +	2	48
bitternut hickory	Carya cordiformis	WSL	Low	6	14.2	1.4	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor	Infill +	Infill +	2	49
yellow-poplar	Liriodendron tulipifera	WDH	High	3	12.4	5.3	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			0	50
northern red oak	Quercus rubra	WDH	Medium	9.3	11.0	1.4	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor	Infill +	Infill +	2	51
red mulberry	Morus rubra	NSL	Low	7.5	10.2	0.9	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			2	52
black walnut	Juglans nigra	WDH	Low	4.4	8.9	2.3	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	53
flowering dogwood	Cornus florida	WDL	Medium	9.7	7.9	1.0	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	1	54
florida maple	Acer barbatum	NSL	Low	6.9	6.0	1.5	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			0	55
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	1.5	5.8	2.4	Sm. inc.	Sm. inc.	High	Rare	Good	Good			2	56
chinkapin oak	Quercus muehlenbergii	NSL	Medium	4	5.1	1.8	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	57
eastern redbud	Cercis canadensis	NSL	Low	6.7	3.9	1.2	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			2	58
swamp tupelo	Nyssa biflora	NDH	Medium	0.7	3.7	5.2	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor			2	59
pin oak	Quercus palustris	NSH	Low	1.3	2.0	1.3	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor			0	60
wild plum	Prunus americana	NSLX	FIA	0.7	1.8	2.6	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	61
sugar maple	Acer saccharum	WDH	High	0.4	1.7	1.4	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			0	62
American basswood	Tilia americana	WSL	Medium	0.4	1.1	0.9	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	63
shellbark hickory	Carya laciniosa	NSL	Low	0.6	0.8	1.0	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	64
river birch	Betula nigra	NSL	Low	2.7	0.5	0.2	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	65
Carolina ash	Fraxinus caroliniana	NSL	FIA	1.1	0.4	0.9	Unknown	Unknown	NA	Rare	FIA Only	FIA Only			0	66
ashe juniper	Juniperus ashei	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	67
slash pine	Pinus elliotii	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate ++	3	68
longleaf pine	Pinus palustris	NSH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	69
striped maple	Acer pensylvanicum	NSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	70
yellow buckeye	Aesculus flava	NSL	Low	0	0	0	Unknown	Unknown	Low	Absent	Unknown	Unknown			0	71
serviceberry	Amelanchier spp.	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +	3	72
cittamwood/gum bumelia	Sideroxylon lanuginosum ssp.	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Likely +	Likely +	3	73
black ash	Fraxinus nigra	WSH	Medium	0	0	0	Unknown	Unknown	Low	Absent	Unknown	Unknown			0	74
American holly	Ilex opaca	NSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +	3	75
Osage-orange	Maclura pomifera	NDH	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Likely +	Likely +	3	76
sweetbay	Magnolia virginiana	NSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	77
sourwood	Oxydendrum arboreum	NDL	High	0	0	0	Unknown	New Habitat	High	Absent	Unknown	New Habitat			3	78
pin cherry	Prunus pensylvanica	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	79
laurel oak	Quercus laurifolia	NDH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	80
chestnut oak	Quercus prinus	NDH	High	0	0	0	Unknown	Unknown	High	Absent	Unknown	Unknown			0	81
live oak	Quercus virginiana	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	82
bluejack oak	Quercus incana	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	83