

HUC 111203 North Fork Red

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	13,328	5,145.9	18

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	0			High	6	9	Increase	3	3	Very Good	0	0
Hickory	1			Medium	10	20	No Change	6	6	Good	2	2
Maple	1	Abundant	0	Low	14	3	Decrease	10	10	Fair	3	3
Oak	3	Common	0	FIA	3		New	7	7	Poor	7	7
Pine	0	Rare	22				Unknown	7	7	Very Poor	6	6
Other	17	Absent	9							FIA Only	2	2
	22		31		33	32		33	33	Unknown	4	4
											24	24

Potential Changes in Climate Variables

Temperature (°F)

	Scenario	2009	2039	2069	2099	
Annual Average	CCSM45	47.8	48.7	49.6	50.0	
	CCSM85	47.8	49.1	50.1	51.7	
	GFDL45	47.8	51.3	50.4	51.3	
	GFDL85	47.8	49.5	51.2	53.5	
	HAD45	47.8	49.0	50.5	51.1	
	HAD85	47.8	49.2	51.7	53.3	
Growing Season (May—Sep)	CCSM45	56.8	57.8	58.8	59.2	
	CCSM85	56.8	58.2	59.2	61.2	
	GFDL45	56.8	61.5	60.1	61.5	
	GFDL85	56.8	59.1	61.2	64.1	
	HAD45	56.8	57.8	59.1	59.5	
	HAD85	56.8	58.2	60.8	62.1	
Coldest Month (Average)	CCSM45	34.7	35.9	36.3	36.8	
	CCSM85	34.7	36.1	36.3	37.3	
	GFDL45	34.7	36.6	36.6	36.7	
	GFDL85	34.7	35.3	36.0	36.4	
	HAD45	34.7	35.2	36.5	36.5	
	HAD85	34.7	36.5	37.6	38.5	
Warmest Month (Average)	CCSM45	60.3	61.4	62.2	62.4	
	CCSM85	60.3	61.9	62.3	63.5	
	GFDL45	60.3	63.2	63.6	64.8	
	GFDL85	60.3	63.3	64.4	67.0	
	HAD45	60.3	61.3	62.1	62.1	
	HAD85	60.3	62.0	63.1	63.8	

Precipitation (in)

	Scenario	2009	2039	2069	2099	
Annual Total	CCSM45	15.5	15.9	15.8	15.2	
	CCSM85	15.5	15.3	16.4	15.7	
	GFDL45	15.5	15.8	18.1	15.8	
	GFDL85	15.5	15.9	17.0	16.0	
	HAD45	15.5	17.0	16.0	16.5	
	HAD85	15.5	15.9	14.0	16.4	
Growing Season (May—Sep)	CCSM45	8.8	8.5	8.4	8.2	
	CCSM85	8.8	8.6	8.8	8.3	
	GFDL45	8.8	8.9	10.4	9.0	
	GFDL85	8.8	9.5	10.0	9.1	
	HAD45	8.8	9.7	9.3	9.4	
	HAD85	8.8	8.4	7.3	8.8	

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.

Cite as: Iverson, L.R.; Prasad, A.M.; Peters, M.P.; Matthews, S.N. 2019. Facilitating Adaptive Forest Management under Climate Change: A Spatially Specific Synthesis of 125 Species for Habitat Changes and Assisted Migration over the Eastern United States. *Forests*. 10(11): 989. <https://doi.org/10.3390/f10110989>.



Current and Potential Future Habitat, Capability, and Migration

Common Name	Scientific Name	Range	MR	%Cell	FIAsum	FIAiv	ChngCl45	ChngCl85	Adap	Abund	Capabil45	Capabil85	SHIFT45	SHIFT85	SSO	N
black willow	Salix nigra	NSH	Low	23.5	42.3	26.2	Lg. dec.	Lg. dec.	Low	Rare	Very Poor	Very Poor			0	1
black locust	Robinia pseudoacacia	NDH	Low	26.2	30.1	24.8	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	2
American elm	Ulmus americana	WDH	Medium	24.8	23.8	25.0	No change	No change	Medium	Rare	Poor	Poor			1	3
Siberian elm	Ulmus pumila	NDH	FIA	24.7	18.7	18.3	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	4
eastern redcedar	Juniperus virginiana	WDH	Medium	11.6	17.9	11.0	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair			1	5
cittamwood/gum bumelia	Sideroxylon lanuginosum ssp.	NSL	Low	10.5	17.7	7.7	Sm. inc.	Sm. inc.	High	Rare	Good	Good			1	6
black walnut	Juglans nigra	WDH	Low	3.7	15.4	18.3	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	7
eastern cottonwood	Populus deltoides	NSH	Low	14.6	11.8	18.5	No change	No change	Medium	Rare	Poor	Poor			1	8
post oak	Quercus stellata	WDH	High	0.1	11.2	1.2	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	2	9
Osage-orange	Maclura pomifera	NDH	Medium	13.7	11.1	17.0	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			1	10
hackberry	Celtis occidentalis	WDH	Medium	6.3	8.3	12.8	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor	Infill +	Infill +	1	11
honeylocust	Gleditsia triacanthos	NSH	Low	10.1	6.0	14.3	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor	Infill +	Infill +	1	12
red mulberry	Morus rubra	NSL	Low	15.6	6.0	9.7	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	13
sugarberry	Celtis laevigata	NDH	Medium	5.5	5.1	27.2	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	1	14
common persimmon	Diospyros virginiana	NSL	Low	3.1	4.4	13.1	Very Lg. dec.	Very Lg. dec.	High	Rare	Lost	Lost			0	15
blackjack oak	Quercus marilandica	NSL	Medium	0.1	2.9	0.3	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	2	16
slippery elm	Ulmus rubra	WSL	Low	0.8	2.1	0.6	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	17
sugar maple	Acer saccharum	WDH	High	0.1	1.5	0.2	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			0	18
Kentucky coffeetree	Gymnocladus dioicus	NSLX	FIA	0.7	0.9	0.6	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	19
pecan	Carya illinoensis	NSH	Low	5.5	0.9	4.5	No change	No change	Low	Rare	Very Poor	Very Poor			2	20
wild plum	Prunus americana	NSLX	FIA	0.1	0.7	0.1	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	21
northern red oak	Quercus rubra	WDH	Medium	0.1	0.1	0.0	Sm. inc.	Sm. inc.	High	Rare	Good	Good			0	22
ashe juniper	Juniperus ashei	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	23
striped maple	Acer pensylvanicum	NSL	Medium	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	24
serviceberry	Amelanchier spp.	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	25
shellbark hickory	Carya laciniosa	NSL	Low	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown			0	26
black hickory	Carya texana	NDL	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	27
green ash	Fraxinus pennsylvanica	WSH	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate ++	3	28
bigleaf magnolia	Magnolia macrophylla	NSL	Low	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown			0	29
chinkapin oak	Quercus muehlenbergii	NSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	30
black oak	Quercus velutina	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	31
live oak	Quercus virginiana	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++	3	32
cedar elm	Ulmus crassifolia	NDH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++	3	33