HUC 121003 San Antonio

HUC 6 Watershed
Climate Change Atlas Tree Species
Current and Potential Future Habitat, Capability, and Migration

USDA Forest Service
Northern Research Station
Landscape Change Research Group
Iverson, Peters, Prasad, Matthews

	sq. km	sq. mi	FIA Plots
Area of Region	10,863	4,194.1	107

Species Information

The columns below provide breif 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
Ash	2
Hickory	3
Maple	1
Oak	5
Pine	0
Other	15
	26

Abundance	
Abundant	2
Common	5
Rare	19
Absent	5
	31

	Model Reliability	Adaptability
High	6	10
Medium	15	16
Low	10	5
FIA	1	
	32	**31**

Potential Change in Habitat Suitability	Scenario RCP45	Scenario RCP85
Increase	4	4
No Change	3	6
Decrease	18	15
New	4	4
Unknown	3	3
	32	**32**

Capability to Cope or Persist	Scenario RCP45	Scenario RCP85
Very Good	1	1
Good	3	4
Fair	4	4
Poor	7	7
Very Poor	10	9
FIA Only	1	1
Unknown	2	2
	28	**28**

Migration Potential	SHIFT RCP45	SHIFT RCP85
Likely	1	1
Infill	3	3
Migrate	3	3
	7	**7**

Potential Changes in Climate Variables

Temperature (°F)

	Scenario	2009	2039	2069	2099
Annual Average	CCSM45	55.0	55.9	56.7	57.1
	CCSM85	55.0	56.1	57.4	59.0
	GFDL45	55.0	57.7	57.7	58.8
	GFDL85	55.0	56.7	58.8	61.1
	HAD45	55.0	56.3	57.8	58.3
	HAD85	55.0	56.6	58.6	60.6
Growing Season May—Sep	CCSM45	62.7	63.5	64.2	64.6
	CCSM85	62.7	63.9	65.1	66.8
	GFDL45	62.7	66.0	66.0	67.6
	GFDL85	62.7	65.0	67.3	70.2
	HAD45	62.7	64.1	65.3	65.7
	HAD85	62.7	64.4	66.4	68.2
Coldest Month Average	CCSM45	42.9	44.4	44.8	45.0
	CCSM85	42.9	44.2	44.8	45.7
	GFDL45	42.9	45.1	45.1	45.2
	GFDL85	42.9	43.5	44.2	44.5
	HAD45	42.9	43.4	44.3	44.6
	HAD85	42.9	45.0	45.8	46.8
Warmest Month Average	CCSM45	65.2	65.9	66.4	66.5
	CCSM85	65.2	66.3	66.8	67.6
	GFDL45	65.2	68.1	68.5	69.2
	GFDL85	65.2	68.2	69.2	71.0
	HAD45	65.2	66.7	67.3	67.6
	HAD85	65.2	67.1	68.2	68.9

Precipitation (in)

	Scenario	2009	2039	2069	2099
Annual Total	CCSM45	20.5	22.5	23.4	20.6
	CCSM85	20.5	21.7	22.7	22.2
	GFDL45	20.5	19.4	22.9	17.9
	GFDL85	20.5	19.3	20.1	18.9
	HAD45	20.5	21.3	20.2	21.6
	HAD85	20.5	20.7	19.4	20.8
Growing Season May—Sep	CCSM45	10.0	11.7	11.6	10.4
	CCSM85	10.0	11.3	10.9	10.4
	GFDL45	10.0	9.4	12.1	9.0
	GFDL85	10.0	9.8	10.1	9.5
	HAD45	10.0	9.8	9.7	10.8
	HAD85	10.0	10.1	9.3	10.0

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.

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.

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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	35	1480.5	42.2	No change	No change	Medium	Abundant	Good	Good			0	1
live oak	Quercus virginiana	NDH	High	61.8	653.0	18.1	Sm. inc.	Sm. inc.	Medium	Abundant	Very Good	Very Good			1	2
post oak	Quercus stellata	WDH	High	13.9	213.2	20.1	Sm. dec.	Sm. dec.	High	Common	Fair	Fair			1	3
blackjack oak	Quercus marilandica	NSL	Medium	14.9	146.8	18.2	Lg. dec.	Lg. dec.	High	Common	Fair	Fair			1	4
sugarberry	Celtis laevigata	NDH	Medium	31.3	96.5	10.4	Lg. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	5
cedar elm	Ulmus crassifolia	NDH	Medium	32.8	68.2	10.7	Lg. inc.	Lg. inc.	Low	Common	Good	Good			1	6
black hickory	Carya texana	NDL	High	4.3	67.2	12.4	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	7
hackberry	Celtis occidentalis	WDH	Medium	35.9	59.0	7.0	Sm. dec.	Sm. dec.	High	Common	Fair	Fair			1	8
black cherry	Prunus serotina	WDL	Medium	9.5	48.5	5.4	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor			0	9
bald cypress	Taxodium distichum	NSH	Medium	0.9	30.7	33.3	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	10
pecan	Carya illinoinensis	NSH	Low	4.2	20.4	10.3	Sm. dec.	No change	Low	Rare	Very Poor	Very Poor			2	11
cittamwood/gum bumelia	Sideroxylon lanuginosum ssp.	NSL	Low	13.5	18.2	3.1	Lg. inc.	Lg. inc.	High	Rare	Good	Good			1	12
black walnut	Juglans nigra	WDH	Low	6.9	15.2	2.9	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	13
black willow	Salix nigra	NSH	Low	4.5	11.3	3.2	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor			0	14
sycamore	Platanus occidentalis	NSL	Low	0.8	7.6	6.8	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	15
boxelder	Acer negundo	WSH	Low	2	6.0	3.4	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor	Infill +	Infill +	2	16
pignut hickory	Carya glabra	WDL	Medium	0.9	5.1	5.5	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	17
Texas ash	Fraxinus texensis	NDH	FIA	0.3	4.2	1.4	Unknown	Unknown	NA	Rare	FIA Only	FIA Only			0	18
Osage-orange	Maclura pomifera	NDH	Medium	1.3	3.4	5.3	Sm. dec.	No change	High	Rare	Poor	Fair			0	19
green ash	Fraxinus pennsylvanica	WSH	Low	1.1	2.4	3.1	Sm. dec.	No change	Medium	Rare	Very Poor	Poor		Infill +	1	20
American elm	Ulmus americana	WDH	Medium	1.1	1.4	1.9	No change	No change	Medium	Rare	Poor	Poor			0	21
eastern redcedar	Juniperus virginiana	WDH	Medium	1.6	0.9	1.7	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good	Infill +		2	22
white oak	Quercus alba	WDH	Medium	1.1	0.7	0.9	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			0	23
slippery elm	Ulmus rubra	WSL	Low	3.7	0.6	2.7	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	24
southern red oak	Quercus falcata	WDL	Medium	1	0.4	0.5	Lg. dec.	Sm. dec.	High	Rare	Poor	Poor			0	25
red mulberry	Morus rubra	NSL	Low	2.4	0.3	0.7	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	26
loblolly pine	Pinus taeda	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	27
mockernut hickory	Carya alba	WDL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	28
swamp tupelo	Nyssa biflora	NDH	Medium	0	0	0	Unknown	Unknown	Low	Absent	Unknown	Unknown			0	29
bur oak	Quercus macrocarpa	NDH	Medium	0	0	0	Unknown	Unknown	High	Modeled	Unknown	Unknown			0	30
water oak	Quercus nigra	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +	3	31
bluejack oak	Quercus incana	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	32