S30 E97

One x One Degree
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	10,642	4,108.9	120

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	3
Hickory	3
Maple	1
Oak	9
Pine	1
Other	16
	33

Abundance	
Abundant	2
Common	4
Rare	27
Absent	3
	36

	Model Reliability	Adaptability
High	7	11
Medium	13	22
Low	15	4
FIA	3	
	38	**37**

Potential Change in Habitat Suitability	Scenario RCP45	Scenario RCP85
Increase	5	5
No Change	10	11
Decrease	15	14
New	0	0
Unknown	8	8
	38	**38**

Capability to Cope or Persist	Scenario RCP45	Scenario RCP85
Very Good	0	0
Good	4	5
Fair	7	7
Poor	11	10
Very Poor	8	8
FIA Only	3	3
Unknown	5	5
	38	**38**

Migration Potential	SHIFT RCP45	SHIFT RCP85
Likely	0	0
Infill	8	6
Migrate	0	0
	8	**6**

Potential Changes in Climate Variables

Temperature (°F)

	Scenario	2009	2039	2069	2099
Annual Average	CCSM45	67.5	69.1	70.2	70.9
	CCSM85	67.5	69.4	71.5	73.8
	GFDL45	67.5	72.3	71.6	73.1
	GFDL85	67.5	70.1	73.2	76.8
	HAD45	67.5	69.5	72.0	73.0
	HAD85	67.5	70.0	73.4	76.5
Growing Season May—Sep	CCSM45	80.4	81.9	82.6	83.5
	CCSM85	80.4	82.4	84.2	86.9
	GFDL45	80.4	86.5	85.1	87.6
	GFDL85	80.4	83.8	87.3	91.6
	HAD45	80.4	82.6	84.5	85.3
	HAD85	80.4	83.0	86.7	89.5
Coldest Month Average	CCSM45	47.6	49.9	50.5	50.8
	CCSM85	47.6	49.9	50.9	52.2
	GFDL45	47.6	51.3	51.2	51.4
	GFDL85	47.6	48.7	49.7	50.2
	HAD45	47.6	48.0	49.6	50.2
	HAD85	47.6	50.4	51.8	53.5
Warmest Month Average	CCSM45	84.8	86.0	86.6	86.9
	CCSM85	84.8	86.7	87.4	88.8
	GFDL45	84.8	89.2	89.6	91.0
	GFDL85	84.8	89.4	90.9	93.9
	HAD45	84.8	87.1	88.1	88.5
	HAD85	84.8	87.8	89.6	90.6

Precipitation (in)

	Scenario	2009	2039	2069	2099
Annual Total	CCSM45	34.2	33.9	37.6	34.3
	CCSM85	34.2	34.6	37.5	36.5
	GFDL45	34.2	33.9	39.5	31.8
	GFDL85	34.2	33.2	35.3	33.1
	HAD45	34.2	35.7	34.5	35.1
	HAD85	34.2	35.5	31.5	33.5
Growing Season May—Sep	CCSM45	15.1	16.0	16.5	15.4
	CCSM85	15.1	15.5	16.1	14.5
	GFDL45	15.1	15.7	19.4	14.6
	GFDL85	15.1	15.8	16.6	15.7
	HAD45	15.1	15.4	14.7	15.7
	HAD85	15.1	15.4	13.4	14.1

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
ashe juniper	Juniperus ashei	NDH	High	40.5	1368.3	38.1	No change	No change	Medium	Abundant	Good	Good			0	1
live oak	Quercus virginiana	NDH	High	38.5	742.9	23.4	No change	No change	Medium	Abundant	Good	Good			1	2
post oak	Quercus stellata	WDH	High	42.7	430.9	23.4	Sm. dec.	Sm. dec.	High	Common	Fair	Fair			1	3
cedar elm	Ulmus crassifolia	NDH	Medium	64.8	334.4	15.5	Sm. inc.	No change	Low	Common	Fair	Poor			1	4
eastern redcedar	Juniperus virginiana	WDH	Medium	36.9	235.3	13.9	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	5
loblolly pine	Pinus taeda	WDH	High	5.5	123.6	26.8	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor	Infill +	Infill +	2	6
hackberry	Celtis occidentalis	WDH	Medium	19.4	43.2	8.3	No change	No change	High	Rare	Fair	Fair			1	7
blackjack oak	Quercus marilandica	NSL	Medium	21.8	39.6	5.8	Sm. inc.	Sm. inc.	High	Rare	Good	Good			1	8
pecan	Carya illinoinensis	NSH	Low	17.4	35.2	13.5	Sm. inc.	Lg. inc.	Low	Rare	Poor	Fair			1	9
green ash	Fraxinus pennsylvanica	WSH	Low	17.4	28.6	5.7	No change	No change	Medium	Rare	Poor	Poor			1	10
sugarberry	Celtis laevigata	NDH	Medium	24.1	27.5	4.7	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			1	11
cittamwood/gum bumelia	Sideroxylon lanuginosum ssp.	NSL	Low	35.1	20.3	3.9	Sm. dec.	No change	High	Rare	Poor	Fair			1	12
black walnut	Juglans nigra	WDH	Low	0.9	20.0	21.3	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	13
sycamore	Platanus occidentalis	NSL	Low	0.9	13.9	14.8	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	14
American elm	Ulmus americana	WDH	Medium	6.6	12.9	3.0	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	1	15
Osage-orange	Maclura pomifera	NDH	Medium	6.2	6.0	5.2	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	1	16
black oak	Quercus velutina	WDH	High	2.4	5.7	3.2	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	17
Shumard oak	Quercus shumardii	NSL	Low	4.7	5.5	3.7	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			0	18
winged elm	Ulmus alata	WDL	Medium	5.4	5.3	2.9	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	1	19
Texas ash	Fraxinus texensis	NDH	FIA	4.7	4.3	3.7	Unknown	Unknown	NA	Rare	FIA Only	FIA Only			0	20
red mulberry	Morus rubra	NSL	Low	0.9	3.2	3.4	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	21
water oak	Quercus nigra	WDH	High	4.6	3.1	1.0	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair	Infill +	Infill +	2	22
boxelder	Acer negundo	WSH	Low	3.8	2.2	9.2	No change	No change	High	Rare	Fair	Fair	Infill +		2	23
black cherry	Prunus serotina	WDL	Medium	0.4	1.7	0.8	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor			0	24
white ash	Fraxinus americana	WDL	Medium	1	1.3	0.6	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor			0	25
black hickory	Carya texana	NDL	High	2.4	1.2	0.4	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	26
durand oak	Quercus sinuata var. sinuata	NSL	FIA	1.5	1.1	0.6	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	27
slippery elm	Ulmus rubra	WSL	Low	1.7	0.9	0.3	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	28
bear oak; scrub oak	Quercus ilicifolia	NSLX	FIA	0.8	0.4	0.4	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	29
bur oak	Quercus macrocarpa	NDH	Medium	3.8	0.4	1.5	Sm. dec.	Lg. dec.	High	Rare	Poor	Poor			0	30
flowering dogwood	Cornus florida	WDL	Medium	2.3	0.2	0.1	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	31
bitternut hickory	Carya cordiformis	WSL	Low	0.8	0.1	0.1	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor			0	32
honeylocust	Gleditsia triacanthos	NSH	Low	1.5	0.1	0.1	No change	Lg. inc.	High	Rare	Fair	Good	Infill +		2	33
American hornbeam; muscle	Carpinus caroliniana	WSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	34
shellbark hickory	Carya laciniosa	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	35
eastern redbud	Cercis canadensis	NSL	Low	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown			0	36
blackgum	Nyssa sylvatica	WDL	Medium	0	0	0	Unknown	Unknown	High	Modeled	Unknown	Unknown			0	37
sassafras	Sassafras albidum	WSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	38