Lyndon B Johnson

National Forests and Grasslands
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	9,200.0	3,552.1	111

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	6
Pine	0
Other	19
	32

Abundance	
Abundant	1
Common	5
Rare	26
Absent	2
	34

	Model Reliability	Adaptability
High	5	11
Medium	11	18
Low	15	4
FIA	3	
	34	**33**

Potential Change in Habitat Suitability	Scenario RCP45	Scenario RCP85
Increase	9	11
No Change	5	4
Decrease	15	14
New	1	1
Unknown	4	4
	34	**34**

Capability to Cope or Persist	Scenario RCP45	Scenario RCP85
Very Good	1	1
Good	5	8
Fair	5	5
Poor	11	8
Very Poor	6	7
FIA Only	3	3
Unknown	1	1
	32	**33**

Migration Potential	SHIFT RCP45	SHIFT RCP85
Likely	0	0
Infill	14	12
Migrate	1	1
	15	**13**

Potential Changes in Climate Variables

Temperature (°F)

	Scenario	2009	2039	2069	2099
Annual Average	CCSM45	63.7	65.1	66.6	67.4
	CCSM85	63.7	65.8	67.8	70.2
	GFDL45	63.7	68.8	68.0	69.6
	GFDL85	63.7	66.5	69.5	73.3
	HAD45	63.7	65.8	68.4	69.3
	HAD85	63.7	66.1	70.2	73.4
Growing Season May—Sep	CCSM45	78.4	79.7	81.3	82.1
	CCSM85	78.4	80.8	82.5	85.6
	GFDL45	78.4	85.2	83.7	86.4
	GFDL85	78.4	82.4	85.9	90.8
	HAD45	78.4	80.5	82.7	83.3
	HAD85	78.4	81.0	85.5	88.3
Coldest Month Average	CCSM45	41.6	43.8	44.6	45.1
	CCSM85	41.6	43.8	44.7	46.0
	GFDL45	41.6	44.9	44.9	45.2
	GFDL85	41.6	42.4	43.8	44.0
	HAD45	41.6	42.2	44.4	44.8
	HAD85	41.6	44.7	46.5	48.1
Warmest Month Average	CCSM45	84.3	85.3	86.3	86.6
	CCSM85	84.3	86.5	87.0	88.9
	GFDL45	84.3	89.6	89.8	91.9
	GFDL85	84.3	89.6	91.4	95.5
	HAD45	84.3	86.4	87.6	87.8
	HAD85	84.3	87.2	89.5	90.4

Precipitation (in)

	Scenario	2009	2039	2069	2099
Annual Total	CCSM45	36.1	37.2	37.0	36.1
	CCSM85	36.1	35.0	37.9	38.0
	GFDL45	36.1	37.3	42.7	35.5
	GFDL85	36.1	36.7	39.8	38.6
	HAD45	36.1	36.4	35.3	37.7
	HAD85	36.1	37.2	33.0	36.0
Growing Season May—Sep	CCSM45	16.7	17.9	16.3	16.8
	CCSM85	16.7	16.7	16.4	15.9
	GFDL45	16.7	17.6	20.7	17.0
	GFDL85	16.7	17.9	19.3	18.0
	HAD45	16.7	16.6	16.1	16.9
	HAD85	16.7	16.7	13.6	15.0

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.

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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	68.5	1321.8	54.6	Sm. dec.	Sm. dec.	High	Abundant	Good	Good			1	1
blackjack oak	Quercus marilandica	NSL	Medium	43.5	209.5	16.0	Sm. dec.	Sm. dec.	High	Common	Fair	Fair			1	2
cedar elm	Ulmus crassifolia	NDH	Medium	55.4	195.1	18.8	Sm. inc.	Sm. inc.	Low	Common	Fair	Fair			1	3
American elm	Ulmus americana	WDH	Medium	41.3	142.7	12.7	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	4
live oak	Quercus virginiana	NDH	High	13	115.4	24.2	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good	Infill ++	Infill ++	2	5
sugarberry	Celtis laevigata	NDH	Medium	63	64.6	7.8	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	6
Texas ash	Fraxinus texensis	NDH	FIA	13	46.9	7.5	Unknown	Unknown	NA	Rare	FIA Only	FIA Only			0	7
pecan	Carya illinoinensis	NSH	Low	33.7	44.9	8.9	Sm. inc.	Lg. inc.	Low	Rare	Poor	Fair			1	8
Shumard oak	Quercus shumardii	NSL	Low	8.7	44.7	8.6	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor	Infill +		2	9
ashe juniper	Juniperus ashei	NDH	High	5.4	42.5	22.3	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good			0	10
eastern redcedar	Juniperus virginiana	WDH	Medium	25	38.6	7.5	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	11
mockernut hickory	Carya alba	WDL	Medium	1.1	37.0	34.0	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor			0	12
common persimmon	Diospyros virginiana	NSL	Low	2.2	22.9	10.5	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor	Infill +	Infill +	1	13
Osage-orange	Maclura pomifera	NDH	Medium	28.3	22.7	8.8	No change	Sm. inc.	High	Rare	Fair	Good	Infill +	Infill ++	1	14
honeylocust	Gleditsia triacanthos	NSH	Low	21.7	22.4	16.5	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor	Infill +	Infill +	1	15
green ash	Fraxinus pennsylvanica	WSH	Low	18.5	21.8	10.6	No change	Sm. inc.	Medium	Rare	Poor	Fair	Infill +	Infill +	1	16
hackberry	Celtis occidentalis	WDH	Medium	25	14.7	3.4	Sm. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	1	17
cittamwood/gum bumelia	Sideroxylon lanuginosum ssp.	NSL	Low	19.6	12.1	3.5	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	1	18
eastern cottonwood	Populus deltoides	NSH	Low	8.7	10.8	19.9	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	19
black willow	Salix nigra	NSH	Low	17.4	10.4	9.5	No change	No change	Low	Rare	Very Poor	Very Poor			0	20
winged elm	Ulmus alata	WDL	Medium	18.5	9.3	5.8	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good	Infill +	Infill ++	1	21
boxelder	Acer negundo	WSH	Low	5.4	7.0	9.1	Sm. dec.	No change	High	Rare	Poor	Fair	Infill +	Infill +	2	22
bur oak	Quercus macrocarpa	NDH	Medium	4.3	6.4	23.6	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor	Infill +		2	23
eastern redbud	Cercis canadensis	NSL	Low	14.1	5.4	2.7	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	24
red mulberry	Morus rubra	NSL	Low	5.4	3.8	5.3	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	25
white ash	Fraxinus americana	WDL	Medium	1.1	2.5	2.3	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor			0	26
black locust	Robinia pseudoacacia	NDH	Low	1.1	2.4	2.2	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	27
black walnut	Juglans nigra	WDH	Low	4.3	1.7	6.4	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	28
black hickory	Carya texana	NDL	High	1.1	1.7	1.6	Very Lg. dec.	Sm. dec.	Medium	Rare	Lost	Very Poor			0	29
slippery elm	Ulmus rubra	WSL	Low	8.7	1.3	2.3	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	1	30
wild plum	Prunus americana	NSLX	FIA	1.1	1.0	0.9	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	31
durand oak	Quercus sinuata var. sinuata	NSL	FIA	4.3	0.1	0.2	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	32
pawpaw	Asimina triloba	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	33
water oak	Quercus nigra	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++	3	34