

HUC 050702 Big Sandy

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	11,119	4,293.0	412

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	2		High	23	Increase	25	31	Very Good	7	9	Likely	1	1
Hickory	5		Medium	28	No Change	13	11	Good	20	24	Infill	9	12
Maple	7	Abundant 6	Low	37	Decrease	29	25	Fair	13	10	Migrate	2	8
Oak	10	Common 27	FIA	8	New	14	18	Poor	12	12			
Pine	5	Rare 42			Unknown	15	11	Very Poor	14	11			
Other	46	Absent 21						FIA Only	4	4			
	75	96		96	92		96	77	73			12	21

Potential Changes in Climate Variables

Temperature (°F)

Scenario	2009	2039	2069	2099	
Annual	48.9	50.3	52.0	52.1	
Average	48.9	50.6	52.4	54.7	
GFDL45	48.9	50.9	53.0	53.6	
GFDL85	48.9	51.2	53.8	56.6	
HAD45	48.9	50.7	53.2	54.2	
HAD85	48.9	51.0	54.3	57.4	
Growing Season	59.9	61.4	63.0	63.4	
May—Sep	59.9	61.7	63.6	66.6	
GFDL45	59.9	62.3	64.9	65.8	
GFDL85	59.9	62.9	66.0	69.1	
HAD45	59.9	62.3	64.7	66.0	
HAD85	59.9	62.5	67.0	70.2	
Coldest Month	31.9	33.3	34.2	34.5	
Average	31.9	34.0	34.6	35.6	
GFDL45	31.9	34.7	34.8	35.3	
GFDL85	31.9	33.6	34.3	35.1	
HAD45	31.9	32.3	33.9	34.1	
HAD85	31.9	32.9	34.1	35.4	
Warmest Month	63.8	65.4	66.3	66.5	
Average	63.8	65.6	66.8	68.2	
GFDL45	63.8	66.5	68.0	68.7	
GFDL85	63.8	67.4	69.4	71.2	
HAD45	63.8	66.6	68.5	69.3	
HAD85	63.8	67.6	70.7	72.5	

Precipitation (in)

Scenario	2009	2039	2069	2099	
Annual	32.9	34.8	37.0	37.2	
Total	32.9	36.8	37.5	40.7	
GFDL45	32.9	36.1	37.0	39.6	
GFDL85	32.9	34.9	38.2	39.5	
HAD45	32.9	33.0	33.9	33.9	
HAD85	32.9	33.5	31.9	33.5	
Growing Season	15.4	16.4	17.1	17.1	
May—Sep	15.4	17.0	16.6	17.5	
GFDL45	15.4	17.0	16.6	17.5	
GFDL85	15.4	15.8	16.7	17.1	
HAD45	15.4	15.6	14.5	14.7	
HAD85	15.4	15.5	13.7	14.2	

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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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
yellow-poplar	Liriodendron tulipifera	WDH	High	96.2	1836.2	12.5	Lg. dec.	Lg. dec.	High	Abundant	Good	Good			1	1
red maple	Acer rubrum	WDH	High	92	1043.3	6.8	Sm. dec.	Sm. dec.	High	Abundant	Good	Good			1	2
chestnut oak	Quercus prinus	NDH	High	79.8	866.1	7.2	No change	No change	High	Abundant	Very Good	Very Good			1	3
white oak	Quercus alba	WDH	Medium	77	721.2	5.9	Sm. inc.	Sm. inc.	High	Abundant	Very Good	Very Good			1	4
American beech	Fagus grandifolia	WDH	High	85	720.2	5.8	Sm. dec.	Sm. dec.	Medium	Abundant	Fair	Fair			0	5
sugar maple	Acer saccharum	WDH	High	86.6	681.2	5.1	Sm. dec.	Sm. dec.	High	Abundant	Good	Good			1	6
black locust	Robinia pseudoacacia	NDH	Low	72.8	463.5	4.3	Sm. dec.	No change	Medium	Common	Poor	Fair			1	7
black oak	Quercus velutina	WDH	High	75.7	416.0	3.8	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good			1	8
northern red oak	Quercus rubra	WDH	Medium	73.2	382.6	3.4	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	9
pignut hickory	Carya glabra	WDL	Medium	75.7	362.9	3.2	No change	No change	Medium	Common	Fair	Fair			1	10
scarlet oak	Quercus coccinea	WDL	Medium	57.7	322.8	3.6	No change	No change	Medium	Common	Fair	Fair			1	11
mockernut hickory	Carya alba	WDL	Medium	65.1	302.0	3.0	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	12
sourwood	Oxydendrum arboreum	NDL	High	83.8	301.5	2.4	Sm. dec.	Sm. dec.	High	Common	Fair	Fair			1	13
sweet birch	Betula lenta	NDH	High	60.6	273.4	2.7	Sm. dec.	Sm. dec.	Low	Common	Poor	Poor			0	14
sassafras	Sassafras albidum	WSL	Low	71.1	271.0	2.7	No change	No change	Medium	Common	Fair	Fair			1	15
white ash	Fraxinus americana	WDL	Medium	68.8	255.6	2.6	No change	Sm. inc.	Low	Common	Poor	Fair			1	16
American basswood	Tilia americana	WSL	Medium	53.5	235.5	3.2	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	17
blackgum	Nyssa sylvatica	WDL	Medium	74	233.2	2.3	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	18
sycamore	Platanus occidentalis	NSL	Low	34.7	222.5	4.7	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	19
eastern hemlock	Tsuga canadensis	NSH	High	30.7	218.5	4.2	Sm. dec.	Sm. dec.	Low	Common	Poor	Poor			0	20
Virginia pine	Pinus virginiana	NDH	High	28.9	214.9	5.2	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	21
eastern redbud	Cercis canadensis	NSL	Low	53.1	161.9	2.1	Sm. dec.	No change	Medium	Common	Poor	Fair			1	22
shagbark hickory	Carya ovata	WSL	Medium	55.7	156.6	1.8	No change	Sm. dec.	Medium	Common	Fair	Poor			1	23
pitch pine	Pinus rigida	NSH	High	17.6	140.5	4.6	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	24
eastern white pine	Pinus strobus	WDH	High	9.4	122.2	7.4	No change	No change	Low	Common	Poor	Poor			0	25
cucumbertree	Magnolia acuminata	NSL	Low	44.8	121.1	1.8	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	26
flowering dogwood	Cornus florida	WDL	Medium	57.8	113.7	1.4	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	27
black cherry	Prunus serotina	WDL	Medium	24.6	99.3	1.9	Lg. inc.	Lg. inc.	Low	Common	Good	Good			1	28
American elm	Ulmus americana	WDH	Medium	37.3	99.1	2.0	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good			1	29
yellow buckeye	Aesculus flava	NSL	Low	22.9	92.8	2.6	Lg. dec.	Lg. dec.	Low	Common	Very Poor	Very Poor			0	30
bitternut hickory	Carya cordiformis	WSL	Low	41.2	91.1	1.6	Sm. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	31
slippery elm	Ulmus rubra	WSL	Low	35.7	71.2	1.3	No change	Sm. inc.	Medium	Common	Fair	Good			1	32
ailanthus	Ailanthus altissima	NSL	FIA	17.3	62.6	1.8	Unknown	Unknown	NA	Common	NNIS	NNIS			0	33
black walnut	Juglans nigra	WDH	Low	22.8	48.6	1.4	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			1	34
sweetgum	Liquidambar styraciflua	WDH	High	11.7	45.5	3.9	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	35
paulownia	Paulownia tomentosa	NSL	FIA	10.8	44.4	3.3	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	36
mountain or Fraser magnolia	Magnolia fraseri	NSL	Low	15.9	43.4	1.6	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor			0	37
shortleaf pine	Pinus echinata	WDH	High	14.7	43.0	1.9	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	38
American hornbeam; muscley	Carpinus caroliniana	WSL	Low	26.1	41.2	1.1	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good			1	39
yellow birch	Betula alleghaniensis	NDL	High	7.2	40.7	2.8	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	40
boxelder	Acer negundo	WSH	Low	9.9	40.6	2.4	No change	No change	High	Rare	Fair	Fair			1	41
serviceberry	Amelanchier spp.	NSL	Low	27.3	35.1	0.7	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	42
silver maple	Acer saccharinum	NSH	Low	1	27.0	4.9	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			0	43
black willow	Salix nigra	NSH	Low	3.8	25.6	3.5	No change	Sm. inc.	Low	Rare	Very Poor	Poor		Infill +	1	44
eastern redcedar	Juniperus virginiana	WDH	Medium	4.5	22.8	5.1	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	45
American chestnut	Castanea dentata	NSLX	FIA	5.4	21.2	3.3	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	46
chinkapin oak	Quercus muehlenbergii	NSL	Medium	10.2	18.6	1.4	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	47

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Common Name	Scientific Name	Range	MR	%Cell	FIAsum	FIAiv	ChngCl45	ChngCl85	Adap	Abund	Capabil45	Capabil85	SHIFT45	SHIFT85	SSO	N
pawpaw	Asimina triloba	NSL	Low	8	18.5	1.5	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	48
loblolly pine	Pinus taeda	WDH	High	0.7	18.5	15.0	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	49
green ash	Fraxinus pennsylvanica	WSH	Low	15.9	17.3	1.0	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			1	50
striped maple	Acer pensylvanicum	NSL	Medium	7.9	16.7	1.4	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	51
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	14.7	16.3	0.6	Lg. inc.	Lg. inc.	High	Rare	Good	Good			1	52
post oak	Quercus stellata	WDH	High	7.5	16.2	2.0	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	2	53
southern red oak	Quercus falcata	WDL	Medium	8.1	12.9	1.4	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	1	54
common persimmon	Diospyros virginiana	NSL	Low	6.1	10.8	0.8	No change	Sm. inc.	High	Rare	Fair	Good	Infill +	Infill ++	1	55
red mulberry	Morus rubra	NSL	Low	6.7	8.1	0.8	Sm. dec.	No change	Medium	Rare	Very Poor	Poor			1	56
hackberry	Celtis occidentalis	WDH	Medium	4.7	7.3	0.8	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	2	57
white mulberry	Morus alba	NSL	FIA	0.1	6.8	1.3	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	58
butternut	Juglans cinerea	NSLX	FIA	4.4	6.0	0.6	Unknown	Unknown	Low	Rare	FIA Only	FIA Only			0	59
northern catalpa	Catalpa speciosa	NSHX	FIA	1.8	4.4	2.5	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	60
shellbark hickory	Carya laciniosa	NSL	Low	0.8	4.1	0.5	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	61
American holly	Ilex opaca	NSL	Medium	4.2	4.0	0.9	Sm. dec.	No change	Medium	Rare	Very Poor	Poor		Infill +	1	62
bigleaf magnolia	Magnolia macrophylla	NSL	Low	4.5	3.2	0.7	Sm. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	63
honeylocust	Gleditsia triacanthos	NSH	Low	1.4	2.8	1.0	No change	Sm. inc.	High	Rare	Fair	Good			2	64
Ohio buckeye	Aesculus glabra	NSL	Low	1.3	2.7	1.1	Sm. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	65
rock elm	Ulmus thomasii	NSLX	FIA	0.9	2.1	2.3	Unknown	Unknown	Low	Rare	FIA Only	FIA Only			0	66
Shumard oak	Quercus shumardii	NSL	Low	0.1	1.7	0.2	Sm. dec.	Sm. inc.	High	Rare	Poor	Good			2	67
black maple	Acer nigrum	NSH	Low	1.7	1.7	0.9	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			0	68
sugarberry	Celtis laevigata	NDH	Medium	0.7	1.4	1.1	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	69
eastern cottonwood	Populus deltoides	NSH	Low	0.9	1.0	1.1	Very Lg. dec.	Very Lg. dec.	Medium	Rare	Lost	Lost			0	70
winged elm	Ulmus alata	WDL	Medium	1.1	0.8	0.3	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	71
pin cherry	Prunus pensylvanica	NSL	Low	0.1	0.7	0.1	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	72
river birch	Betula nigra	NSL	Low	0.9	0.5	0.6	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good	Infill +	Infill ++	2	73
shingle oak	Quercus imbricaria	NDH	Medium	0.5	0.4	0.2	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	74
Norway maple	Acer platanoides	NSL	FIA	0.9	0.3	0.3	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	75
ashe juniper	Juniperus ashei	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	76
slash pine	Pinus elliotii	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	77
longleaf pine	Pinus palustris	NSH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	78
northern white-cedar	Thuja occidentalis	WSH	High	0	0	0	Unknown	New Habitat	Medium	Absent	Unknown	New Habitat			3	79
florida maple	Acer barbatum	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	80
cittamwood/gum bumelia	Sideroxylon lanuginosum ssp.	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			3	81
pecan	Carya illinoensis	NSH	Low	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat		Migrate +	3	82
black hickory	Carya texana	NDL	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	83
black ash	Fraxinus nigra	WSH	Medium	0	0	0	Unknown	Unknown	Low	Absent	Unknown	Unknown			0	84
silverbell	Halesia spp.	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	85
southern magnolia	Magnolia grandiflora	NSL	Low	0	0	0	Unknown	New Habitat	Medium	Absent	Unknown	New Habitat			3	86
swamp tupelo	Nyssa biflora	NDH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			3	87
bigtooth aspen	Populus grandidentata	NSL	Medium	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	88
overcup oak	Quercus lyrata	NSL	Medium	0	0	0	Unknown	New Habitat	Low	Absent	Unknown	New Habitat			3	89
blackjack oak	Quercus marilandica	NSL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Likely +	Likely +	3	90
water oak	Quercus nigra	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	91
pin oak	Quercus palustris	NSH	Low	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat		Migrate +	3	92
willow oak	Quercus phellos	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	93
live oak	Quercus virginiana	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	94

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Common Name	Scientific Name	Range	MR	%Cell	FIAsum	FIaiv	ChngCl45	ChngCl85	Adap	Abund	Capabil45	Capabil85	SHIFT45	SHIFT85	SSO	N
bluejack oak	Quercus incana	NSL	Low	0	0	0	Unknown	New Habitat	Medium	Absent	Unknown	New Habitat		Migrate +	3	95
cedar elm	Ulmus crassifolia	NDH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			0	96