

	sq. km	sq. mi	FIA Plots
Area of Region	44,359	17,127	564

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	3			High	18	28	Increase	27	32	Very Good	4	6	Likely	1	1
Hickory	7			Medium	33	50	No Change	18	15	Good	22	25	Infill	27	27
Maple	5	Abundant	0	Low	37	13	Decrease	25	23	Fair	16	13	Migrate	2	4
Oak	19	Common	27	FIA	7		New	11	11	Poor	13	14			
Pine	5	Rare	50				Unknown	14	14	Very Poor	15	12			
Other	38	Absent	17							FIA Only	4	4			
	77		94		95	91		95	95	Unknown	7	7			
											81	81			

Potential Changes in Climate Variables

Temperature (°F)

	Scenario	2009	2039	2069	2099	
Annual Average	CCSM45	55.3	57.2	59.2	59.5	
	CCSM85	55.3	57.6	60.1	63.1	
	GFDL45	55.3	60.4	60.6	61.4	
	GFDL85	55.3	58.2	61.5	65.3	
	HAD45	55.3	58.1	61.4	63.0	
HAD85	55.3	58.5	63.2	67.3		
Growing Season (May—Sep)	CCSM45	72.2	74.2	75.7	76.5	
	CCSM85	72.2	74.7	77.2	80.8	
	GFDL45	72.2	78.4	78.2	79.7	
	GFDL85	72.2	75.7	79.5	84.3	
	HAD45	72.2	75.4	78.5	80.5	
HAD85	72.2	75.9	82.0	85.9		
Coldest Month (Average)	CCSM45	28.7	30.4	31.9	32.2	
	CCSM85	28.7	31.6	32.7	34.2	
	GFDL45	28.7	33.4	33.6	34.2	
	GFDL85	28.7	31.6	32.8	33.5	
	HAD45	28.7	30.4	32.9	33.0	
HAD85	28.7	31.5	33.9	35.8		
Warmest Month (Average)	CCSM45	78.0	79.9	80.9	81.6	
	CCSM85	78.0	80.8	82.5	84.3	
	GFDL45	78.0	81.3	82.6	83.6	
	GFDL85	78.0	81.7	83.7	86.6	
	HAD45	78.0	81.7	84.0	84.9	
HAD85	78.0	83.5	87.4	89.5		

Precipitation (in)

	Scenario	2009	2039	2069	2099	
Annual Total	CCSM45	43.6	42.1	47.1	45.7	
	CCSM85	43.6	45.6	46.3	48.2	
	GFDL45	43.6	50.2	52.9	54.3	
	GFDL85	43.6	49.3	55.4	57.3	
	HAD45	43.6	44.1	47.1	46.8	
HAD85	43.6	45.6	43.7	47.5		
Growing Season (May—Sep)	CCSM45	19.1	17.8	19.4	18.3	
	CCSM85	19.1	18.9	18.1	18.6	
	GFDL45	19.1	21.9	22.1	22.8	
	GFDL85	19.1	21.6	22.8	23.3	
	HAD45	19.1	18.3	17.5	17.4	
HAD85	19.1	18.5	15.3	15.4		

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
white oak	Quercus alba	WDH	Medium	44.7	211.9	10.2	No change	Sm. dec.	High	Common	Good	Fair			1	1
hackberry	Celtis occidentalis	WDH	Medium	65.1	174.5	7.6	Sm. dec.	Sm. dec.	High	Common	Fair	Fair			1	2
sugar maple	Acer saccharum	WDH	High	35.9	166.9	7.1	No change	No change	High	Common	Good	Good	Infill ++	Infill ++	1	3
pignut hickory	Carya glabra	WDL	Medium	45.3	156.0	7.3	Sm. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	4
American elm	Ulmus americana	WDH	Medium	77.4	155.0	5.6	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	5
green ash	Fraxinus pennsylvanica	WSH	Low	64.4	136.8	6.5	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	6
silver maple	Acer saccharinum	NSH	Low	33.6	136.6	12.4	No change	No change	High	Common	Good	Good			1	7
black oak	Quercus velutina	WDH	High	49.8	134.0	6.5	No change	No change	Medium	Common	Fair	Fair			1	8
yellow-poplar	Liriodendron tulipifera	WDH	High	12.8	116.8	8.9	Lg. dec.	Lg. dec.	High	Common	Fair	Fair	Infill +	Infill +	2	9
boxelder	Acer negundo	WSH	Low	41.4	114.1	6.8	No change	No change	High	Common	Good	Good			1	10
sassafras	Sassafras albidum	WSL	Low	50	106.8	5.0	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	11
shingle oak	Quercus imbricaria	NDH	Medium	43.4	105.6	8.0	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	12
shagbark hickory	Carya ovata	WSL	Medium	62.8	105.4	5.4	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	13
white ash	Fraxinus americana	WDL	Medium	38	90.0	4.7	Sm. inc.	Sm. inc.	Low	Common	Fair	Fair			1	14
black cherry	Prunus serotina	WDL	Medium	62.5	86.3	4.8	No change	No change	Low	Common	Poor	Poor			0	15
red maple	Acer rubrum	WDH	High	34.1	82.3	7.3	No change	No change	High	Common	Good	Good	Infill ++	Infill ++	1	16
black walnut	Juglans nigra	WDH	Low	47.6	79.1	5.3	No change	No change	Medium	Common	Fair	Fair			1	17
post oak	Quercus stellata	WDH	High	26.5	77.2	7.7	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good	Infill ++	Infill ++	1	18
honeylocust	Gleditsia triacanthos	NSH	Low	28.3	77.1	8.1	No change	Sm. inc.	High	Common	Good	Very Good			1	19
sweetgum	Liquidambar styraciflua	WDH	High	19.2	76.8	6.7	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good	Infill ++	Infill ++	1	20
black willow	Salix nigra	NSH	Low	10.3	71.0	10.8	No change	Sm. inc.	Low	Common	Poor	Fair	Infill +	Infill +	1	21
northern red oak	Quercus rubra	WDH	Medium	24	64.4	4.0	Sm. dec.	Sm. dec.	High	Common	Fair	Fair	Infill +	Infill +	1	22
sycamore	Platanus occidentalis	NSL	Low	28.8	61.6	5.3	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good			1	23
eastern cottonwood	Populus deltoides	NSH	Low	18.6	61.2	8.9	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor	Infill +	Infill +	0	24
bitternut hickory	Carya cordiformis	WSL	Low	30.4	52.0	4.2	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good	Infill ++	Infill ++	1	25
winged elm	Ulmus alata	WDL	Medium	18	51.5	4.2	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good	Infill ++	Infill ++	1	26
shortleaf pine	Pinus echinata	WDH	High	5.4	51.4	14.7	No change	No change	Medium	Common	Fair	Fair	Infill +	Infill +	2	27
mockernut hickory	Carya alba	WDL	Medium	33.1	49.2	3.5	Sm. inc.	Lg. inc.	High	Rare	Good	Good			1	28
pin oak	Quercus palustris	NSH	Low	31.9	49.1	7.1	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor			0	29
eastern redcedar	Juniperus virginiana	WDH	Medium	21.9	47.9	4.4	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	30
slippery elm	Ulmus rubra	WSL	Low	42.4	40.9	2.5	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good			1	31
Osage-orange	Maclura pomifera	NDH	Medium	11	37.6	10.0	No change	Lg. inc.	High	Rare	Fair	Good	Infill +	Infill ++	2	32
black locust	Robinia pseudoacacia	NDH	Low	6.9	34.2	8.8	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	1	33
common persimmon	Diospyros virginiana	NSL	Low	33.6	26.4	3.4	Lg. inc.	Lg. inc.	High	Rare	Good	Good			1	34
red mulberry	Morus rubra	NSL	Low	26.2	22.9	2.4	Sm. dec.	No change	Medium	Rare	Very Poor	Poor			1	35
blackgum	Nyssa sylvatica	WDL	Medium	14.3	21.2	2.4	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	1	36
eastern redbud	Cercis canadensis	NSL	Low	19.7	21.1	2.5	Sm. dec.	No change	Medium	Rare	Very Poor	Poor			1	37
river birch	Betula nigra	NSL	Low	15.9	19.4	5.8	Lg. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	38
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	12.9	19.2	1.8	Sm. inc.	Sm. inc.	High	Rare	Good	Good	Infill ++	Infill ++	1	39
cherrybark oak; swamp red o.	Quercus pagoda	NSL	Medium	12.8	16.8	3.2	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	2	40
flowering dogwood	Cornus florida	WDL	Medium	17.3	15.1	1.4	No change	Sm. inc.	Medium	Rare	Poor	Fair	Infill +	Infill +	1	41
American beech	Fagus grandifolia	WDH	High	5.3	13.7	2.3	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	42
bur oak	Quercus macrocarpa	NDH	Medium	13	12.3	3.3	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor	Infill +		2	43
pecan	Carya illinoensis	NSH	Low	9	12.3	2.2	Lg. inc.	Lg. inc.	Low	Rare	Fair	Fair	Infill +	Infill +	2	44
chinkapin oak	Quercus muehlenbergii	NSL	Medium	13.8	10.5	1.4	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	1	45
loblolly pine	Pinus taeda	WDH	High	1.8	10.4	10.1	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	46
black hickory	Carya texana	NDL	High	4.2	9.2	2.0	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good	Infill +	Infill ++	2	47

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
southern red oak	Quercus falcata	WDL	Medium	3.1	8.9	2.5	Lg. inc.	Lg. inc.	High	Rare	Good	Good			2	48
shellbark hickory	Carya laciniosa	NSL	Low	10.1	7.0	5.6	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good	Infill +	Infill ++	2	49
bald cypress	Taxodium distichum	NSH	Medium	1.7	6.2	8.0	Sm. dec.	No change	Medium	Rare	Very Poor	Poor		Infill +	2	50
scarlet oak	Quercus coccinea	WDL	Medium	3.1	5.7	1.7	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			2	51
swamp white oak	Quercus bicolor	NSL	Low	10.2	5.5	2.9	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	52
sugarberry	Celtis laevigata	NDH	Medium	6.2	5.4	2.6	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	53
Ohio buckeye	Aesculus glabra	NSL	Low	0.6	4.9	6.1	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	54
eastern white pine	Pinus strobus	WDH	High	1.8	4.7	4.5	Lg. dec.	Lg. dec.	Low	Rare	Very Poor	Very Poor			0	55
blackjack oak	Quercus marilandica	NSL	Medium	4.1	4.6	2.3	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	2	56
white mulberry	Morus alba	NSL	FIA	6.2	4.3	2.1	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	57
pumpkin ash	Fraxinus profunda	NSH	FIA	0.4	4.2	9.1	Unknown	Unknown	NA	Rare	FIA Only	FIA Only			0	58
northern catalpa	Catalpa speciosa	NSHX	FIA	1.6	3.8	6.1	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	59
pawpaw	Asimina triloba	NSL	Low	7.9	3.3	1.0	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	60
American basswood	Tilia americana	WSL	Medium	3.6	3.0	2.3	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	61
water tupelo	Nyssa aquatica	NSH	Medium	0.7	2.7	7.8	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor			0	62
Shumard oak	Quercus shumardii	NSL	Low	1.5	2.5	2.8	Sm. inc.	Lg. inc.	High	Rare	Good	Good			2	63
chestnut oak	Quercus prinus	NDH	High	0.2	2.0	8.9	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	2	64
ailanthus	Ailanthus altissima	NSL	FIA	2	1.8	2.0	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	65
serviceberry	Amelanchier spp.	NSL	Low	1.8	1.3	0.5	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	66
cucumbertree	Magnolia acuminata	NSL	Low	1	1.2	0.7	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	67
American hornbeam; muscle	Carpinus caroliniana	WSL	Low	2.5	1.1	0.7	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	68
Scots pine	Pinus sylvestris	NSH	FIA	1.8	0.6	5.3	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	69
overcup oak	Quercus lyrata	NSL	Medium	0.3	0.5	0.9	Lg. inc.	Lg. inc.	Low	Rare	Fair	Fair	Infill +	Infill +	2	70
swamp chestnut oak	Quercus michauxii	NSL	Low	0.4	0.4	0.8	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good			2	71
black maple	Acer nigrum	NSH	Low	1.1	0.3	0.8	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			0	72
red pine	Pinus resinosa	NSH	Medium	0.9	0.2	4.0	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor			0	73
Kentucky coffeetree	Gymnocladus dioicus	NSLX	FIA	0.9	0.1	1.8	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	74
nuttall oak	Quercus texana	NSH	Medium	0.2	0.1	0.2	No change	Lg. inc.	High	Rare	Fair	Good			0	75
butternut	Juglans cinerea	NSLX	FIA	0.9	0.0	0.3	Unknown	Unknown	Low	Rare	FIA Only	FIA Only			0	76
willow oak	Quercus phellos	NSL	Low	0.5	0.0	0.2	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	77
ashe juniper	Juniperus ashei	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	78
Virginia pine	Pinus virginiana	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +	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
striped maple	Acer pensylvanicum	NSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	81
mountain maple	Acer spicatum	NSL	Low	0	0	0	Unknown	Unknown	High	Absent	Unknown	Unknown			0	82
yellow birch	Betula alleghaniensis	NDL	High	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	83
cittamwood/gum bumelia	Sideroxylon lanuginosum ssp.	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate ++	3	84
water hickory	Carya aquatica	NSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	85
black ash	Fraxinus nigra	WSH	Medium	0	0	0	Unknown	Unknown	Low	Absent	Unknown	Unknown			0	86
blue ash	Fraxinus quadrangulata	NSL	Low	0	0	0	Unknown	Unknown	Low	Absent	Unknown	Unknown			0	87
bigleaf magnolia	Magnolia macrophylla	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	88
sourwood	Oxydendrum arboreum	NDL	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			3	89
redbay	Persea borbonia	NSL	Low	0	0	0	Unknown	Unknown	High	Absent	Unknown	Unknown			0	90
bigtooth aspen	Populus grandidentata	NSL	Medium	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown			0	91
pin cherry	Prunus pensylvanica	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	92
water oak	Quercus nigra	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	93
live oak	Quercus virginiana	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	94

CentralHardwood IL

NIACS EVAS Region

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

Common Name	Scientific Name	Range	MR	%Cell	FIAsum	FIAiv	ChngCl45	ChngCl85	Adap	Abund	Capabil45	Capabil85	SHIFT45	SHIFT85	SSO	N
cedar elm	Ulmus crassifolia	NDH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			3	95