

HUC 051401 Lower Ohio-Salt

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	15,743	6,078.5	396

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	20	Increase	24	29	Very Good	7	11	Likely	1	1
Hickory	6			Medium	29	No Change	17	13	Good	23	20	Infill	9	9
Maple	6	Abundant	3	Low	35	Decrease	25	24	Fair	9	10	Migrate	5	5
Oak	15	Common	30	FIA	10	New	12	14	Poor	14	13			
Pine	5	Rare	43			Unknown	16	14	Very Poor	11	10			
Other	41	Absent	17						FIA Only	6	6			
	76		93		94		94	94	Unknown	6	4		15	15
										76	74			

Potential Changes in Climate Variables

Temperature (°F)

Scenario	2009	2039	2069	2099	
Annual	50.7	52.1	54.0	54.2	
Average	50.7	52.5	54.6	57.1	
GFDL45	50.7	52.9	54.9	55.5	
GFDL85	50.7	53.0	55.7	58.7	
HAD45	50.7	52.8	55.5	56.6	
HAD85	50.7	53.2	56.8	60.2	
Growing Season	63.2	64.6	66.2	66.8	
May—Sep	63.2	65.0	67.3	70.5	
GFDL45	63.2	65.8	68.2	69.3	
GFDL85	63.2	66.1	69.4	72.8	
HAD45	63.2	65.8	68.4	69.9	
HAD85	63.2	66.2	71.2	74.5	
Coldest Month	31.0	32.1	33.4	33.9	
Average	31.0	33.3	34.1	35.4	
GFDL45	31.0	34.3	34.4	34.7	
GFDL85	31.0	32.8	33.7	34.2	
HAD45	31.0	31.9	33.8	34.0	
HAD85	31.0	32.9	34.5	35.9	
Warmest Month	67.5	68.8	69.8	70.2	
Average	67.5	69.3	70.8	72.2	
GFDL45	67.5	70.1	71.5	72.3	
GFDL85	67.5	70.5	72.5	74.6	
HAD45	67.5	70.7	72.8	73.6	
HAD85	67.5	72.1	75.7	77.4	

Precipitation (in)

Scenario	2009	2039	2069	2099	
Annual	36.9	37.4	41.2	40.0	
Total	36.9	39.8	40.6	43.5	
GFDL45	36.9	41.8	43.8	46.2	
GFDL85	36.9	40.6	44.5	47.2	
HAD45	36.9	37.7	39.8	39.1	
HAD85	36.9	37.7	36.0	39.3	
Growing Season	15.9	15.4	16.9	16.3	
May—Sep	15.9	16.2	15.4	16.3	
GFDL45	15.9	18.1	17.6	18.2	
GFDL85	15.9	17.2	17.6	18.1	
HAD45	15.9	15.8	14.6	14.6	
HAD85	15.9	15.5	12.4	12.8	

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-DGP30 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
eastern redcedar	Juniperus virginiana	WDH	Medium	67.1	1116.2	14.9	No change	No change	Medium	Abundant	Good	Good			1	1
sugar maple	Acer saccharum	WDH	High	79.6	1012.8	11.3	Sm. dec.	Sm. dec.	High	Abundant	Good	Good			1	2
yellow-poplar	Liriodendron tulipifera	WDH	High	57.6	525.4	7.8	Lg. dec.	Lg. dec.	High	Abundant	Good	Good			1	3
white oak	Quercus alba	WDH	Medium	47.5	482.8	8.1	No change	No change	High	Common	Good	Good			1	4
white ash	Fraxinus americana	WDL	Medium	60.9	476.9	6.7	No change	No change	Low	Common	Poor	Poor			0	5
red maple	Acer rubrum	WDH	High	47.1	361.6	5.7	Sm. dec.	Sm. dec.	High	Common	Fair	Fair			1	6
pignut hickory	Carya glabra	WDL	Medium	50.4	259.7	4.8	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	7
chinkapin oak	Quercus muehlenbergii	NSL	Medium	44.3	252.0	4.9	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	8
chestnut oak	Quercus prinus	NDH	High	24.7	250.1	9.8	Lg. dec.	Lg. dec.	High	Common	Fair	Fair			1	9
sassafras	Sassafras albidum	WSL	Low	51	234.7	4.0	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	10
black walnut	Juglans nigra	WDH	Low	52.5	233.7	3.9	No change	Sm. inc.	Medium	Common	Fair	Good			1	11
black locust	Robinia pseudoacacia	NDH	Low	26.9	222.2	7.5	No change	No change	Medium	Common	Fair	Fair			1	12
American elm	Ulmus americana	WDH	Medium	47.3	218.6	4.4	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good			1	13
hackberry	Celtis occidentalis	WDH	Medium	46.3	216.2	4.9	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	14
green ash	Fraxinus pennsylvanica	WSH	Low	43.1	205.8	5.7	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	15
black oak	Quercus velutina	WDH	High	32.5	196.5	4.9	Lg. inc.	Sm. inc.	Medium	Common	Very Good	Good			1	16
American beech	Fagus grandifolia	WDH	High	46	196.2	3.9	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	17
northern red oak	Quercus rubra	WDH	Medium	49.9	193.8	3.5	No change	No change	High	Common	Good	Good			1	18
bitternut hickory	Carya cordiformis	WSL	Low	38.3	186.7	4.8	No change	Sm. inc.	High	Common	Good	Very Good			1	19
black cherry	Prunus serotina	WDL	Medium	47.1	185.7	3.2	No change	No change	Low	Common	Poor	Poor			0	20
shagbark hickory	Carya ovata	WSL	Medium	42.8	160.4	2.9	Sm. inc.	No change	Medium	Common	Good	Fair			1	21
sycamore	Platanus occidentalis	NSL	Low	32.3	159.4	5.3	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	22
Virginia pine	Pinus virginiana	NDH	High	25	138.3	7.2	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	23
blackgum	Nyssa sylvatica	WDL	Medium	37.8	137.1	3.2	No change	Sm. inc.	High	Common	Good	Very Good			1	24
post oak	Quercus stellata	WDH	High	11.8	133.4	11.0	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good	Infill ++	Infill ++	1	25
slippery elm	Ulmus rubra	WSL	Low	47.9	120.7	2.4	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good			1	26
boxelder	Acer negundo	WSH	Low	31	111.9	4.8	Sm. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	27
flowering dogwood	Cornus florida	WDL	Medium	42.8	89.4	1.9	No change	No change	Medium	Common	Fair	Fair			1	28
eastern redbud	Cercis canadensis	NSL	Low	39.9	83.1	1.8	No change	No change	Medium	Common	Fair	Fair			1	29
scarlet oak	Quercus coccinea	WDL	Medium	19.6	76.5	3.5	Sm. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	30
Shumard oak	Quercus shumardii	NSL	Low	17.5	66.9	3.4	No change	Sm. inc.	High	Common	Good	Very Good			1	31
sweetgum	Liquidambar styraciflua	WDH	High	17.5	63.2	3.4	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	32
Osage-orange	Maclura pomifera	NDH	Medium	15.1	57.7	5.3	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	33
common persimmon	Diospyros virginiana	NSL	Low	23.1	44.8	1.8	Lg. inc.	Lg. inc.	High	Rare	Good	Good			1	34
mockernut hickory	Carya alba	WDL	Medium	20	44.5	2.1	Lg. inc.	Lg. inc.	High	Rare	Good	Good			1	35
eastern white pine	Pinus strobus	WDH	High	2.4	43.6	16.2	Lg. dec.	Lg. dec.	Low	Rare	Very Poor	Very Poor			0	36
honeylocust	Gleditsia triacanthos	NSH	Low	15	42.2	2.0	Lg. inc.	Lg. inc.	High	Rare	Good	Good			1	37
pin oak	Quercus palustris	NSH	Low	7.2	42.1	3.5	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor			0	38
Ohio buckeye	Aesculus glabra	NSL	Low	12.6	29.9	1.9	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	39
blue ash	Fraxinus quadrangulata	NSL	Low	9.7	29.6	2.9	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor			0	40
ailanthus	Ailanthus altissima	NSL	FIA	7.5	28.8	3.1	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	41
shingle oak	Quercus imbricaria	NDH	Medium	8.1	22.0	3.1	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	42
red mulberry	Morus rubra	NSL	Low	15	21.6	1.5	No change	Sm. inc.	Medium	Rare	Poor	Fair			1	43
shellbark hickory	Carya laciniosa	NSL	Low	10.6	20.5	1.5	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair	Infill +	Infill +	1	44
winged elm	Ulmus alata	WDL	Medium	9.6	20.3	1.6	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	45
sourwood	Oxydendrum arboreum	NDL	High	6.1	19.1	1.8	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	1	46
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	20.3	19.1	1.0	Lg. inc.	Lg. inc.	High	Rare	Good	Good			1	47

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southern red oak	Quercus falcata	WDL	Medium	3	18.4	3.6	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	2	48
yellow buckeye	Aesculus flava	NSL	Low	6.5	16.0	2.4	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor			0	49
silver maple	Acer saccharinum	NSH	Low	2.8	16.0	5.0	No change	Sm. inc.	High	Rare	Fair	Good	Infill +	Infill ++	2	50
American hornbeam; musclee	Carpinus caroliniana	WSL	Low	10.6	10.5	0.6	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			1	51
American basswood	Tilia americana	WSL	Medium	3.8	10.4	2.0	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	52
Siberian elm	Ulmus pumila	NDH	FIA	0.2	7.8	3.0	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	53
bur oak	Quercus macrocarpa	NDH	Medium	2.3	6.5	2.4	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			0	54
northern catalpa	Catalpa speciosa	NSHX	FIA	0.8	6.5	1.9	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	55
shortleaf pine	Pinus echinata	WDH	High	0.6	6.5	10.2	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	56
eastern cottonwood	Populus deltoides	NSH	Low	1.9	6.2	3.3	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	57
pawpaw	Asimina triloba	NSL	Low	4.8	6.2	1.2	Sm. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	58
black maple	Acer nigrum	NSH	Low	1.7	5.4	2.5	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			0	59
Kentucky coffeetree	Gymnocladus dioicus	NSLX	FIA	0.6	2.9	1.1	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	60
serviceberry	Amelanchier spp.	NSL	Low	2.4	2.8	1.1	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	61
black willow	Salix nigra	NSH	Low	0.8	2.7	1.1	Sm. inc.	Lg. inc.	Low	Rare	Poor	Fair	Infill +	Infill +	2	62
swamp chestnut oak	Quercus michauxii	NSL	Low	0.6	2.5	4.0	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	63
paulownia	Paulownia tomentosa	NSL	FIA	0.5	1.8	2.1	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	64
sugarberry	Celtis laevigata	NDH	Medium	1.1	1.1	0.8	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	65
bigtooth aspen	Populus grandidentata	NSL	Medium	0.8	1.1	0.5	Very Lg. dec.	Very Lg. dec.	Medium	Rare	Lost	Lost			0	66
wild plum	Prunus americana	NSLX	FIA	0.4	1.1	1.0	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	67
Scots pine	Pinus sylvestris	NSH	FIA	1.2	0.7	0.5	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	68
pitch pine	Pinus rigida	NSH	High	0.5	0.6	0.8	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	69
American chestnut	Castanea dentata	NSLX	FIA	0.3	0.6	0.5	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	70
swamp white oak	Quercus bicolor	NSL	Low	0.9	0.5	0.3	Very Lg. dec.	Very Lg. dec.	Medium	Rare	Lost	Lost			0	71
black hickory	Carya texana	NDL	High	0.6	0.4	0.5	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	72
striped maple	Acer pensylvanicum	NSL	Medium	0.6	0.3	0.5	Sm. dec.	No change	Medium	Rare	Very Poor	Poor			0	73
blackjack oak	Quercus marilandica	NSL	Medium	0.6	0.3	0.5	Lg. inc.	Lg. inc.	High	Rare	Good	Good			2	74
butternut	Juglans cinerea	NSLX	FIA	0.6	0.3	0.4	Unknown	Unknown	Low	Rare	FIA Only	FIA Only			0	75
rock elm	Ulmus thomasii	NSLX	FIA	0.5	0.2	0.2	Unknown	Unknown	Low	Rare	FIA Only	FIA Only			0	76
ashe juniper	Juniperus ashei	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	77
slash pine	Pinus elliottii	NDH	High	0	0	0	Unknown	New Habitat	Medium	Absent	Unknown	New Habitat			3	78
loblolly pine	Pinus taeda	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++	3	79
mountain maple	Acer spicatum	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			3	80
yellow birch	Betula alleghaniensis	NDL	High	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	81
river birch	Betula nigra	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +	3	82
cittamwood/gum bumelia	Sideroxylon lanuginosum ssp.	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			3	83
pecan	Carya illinoensis	NSH	Low	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	84
black ash	Fraxinus nigra	WSH	Medium	0	0	0	Unknown	New Habitat	Low	Absent	Unknown	New Habitat			3	85
American holly	Ilex opaca	NSL	Medium	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown			0	86
cucumbertree	Magnolia acuminata	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	87
pin cherry	Prunus pensylvanica	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	88
cherrybark oak; swamp red o	Quercus pagoda	NSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	89
water oak	Quercus nigra	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	90
Nuttall oak	Quercus texana	NSH	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			0	91
willow oak	Quercus phellos	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	92
live oak	Quercus virginiana	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	93
cedar elm	Ulmus crassifolia	NDH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			3	94

