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One x One Degree
Climate Change Atlas Tree Species
Current and Potential Future Habitat, Capability, and Migration

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Iverson, Peters, Prasad, Matthews

	sq. km	sq. mi	FIA Plots
Area of Region	1,612.7	622.7	100

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	0
Maple	2
Oak	1
Pine	3
Other	19
	28

Abundance	
Abundant	11
Common	11
Rare	6
Absent	22
	50

	Model Reliability	Adaptability
High	15	15
Medium	21	28
Low	17	11
FIA	1	
	54	**54**

Potential Change in Habitat Suitability	Scenario RCP45	Scenario RCP85
Increase	16	14
No Change	2	3
Decrease	9	10
New	21	21
Unknown	6	6
	54	**54**

Capability to Cope or Persist	Scenario RCP45	Scenario RCP85
Very Good	6	6
Good	10	8
Fair	7	9
Poor	2	1
Very Poor	2	2
FIA Only	1	1
Unknown	5	5
	33	**32**

Migration Potential	SHIFT RCP45	SHIFT RCP85
Likely	0	0
Infill	2	2
Migrate	5	14
	7	**16**

Potential Changes in Climate Variables

Temperature (°F)

	Scenario	2009	2039	2069	2099
Annual Average	CCSM45	42.5	44.2	47.4	47.3
	CCSM85	42.5	45.1	48.1	51.7
	GFDL45	42.5	46.5	48.8	50.1
	GFDL85	42.5	46.1	49.9	55.1
	HAD45	42.5	46.0	49.3	51.2
	HAD85	42.5	46.3	50.5	56.5
Growing Season May—Sep	CCSM45	60.2	61.6	64.0	64.1
	CCSM85	60.2	62.2	64.9	68.6
	GFDL45	60.2	65.6	68.6	70.7
	GFDL85	60.2	65.2	70.0	76.0
	HAD45	60.2	63.5	65.7	68.2
	HAD85	60.2	63.2	67.2	73.1
Coldest Month Average	CCSM45	16.0	17.5	20.3	19.8
	CCSM85	16.0	18.2	20.6	23.1
	GFDL45	16.0	18.0	19.9	20.4
	GFDL85	16.0	18.8	20.5	23.2
	HAD45	16.0	18.1	22.1	22.3
	HAD85	16.0	20.6	23.5	28.2
Warmest Month Average	CCSM45	66.7	68.6	70.0	70.2
	CCSM85	66.7	69.3	71.1	73.0
	GFDL45	66.7	71.4	73.3	74.7
	GFDL85	66.7	72.1	74.6	77.4
	HAD45	66.7	70.3	71.1	73.2
	HAD85	66.7	70.4	72.5	76.6

Precipitation (in)

	Scenario	2009	2039	2069	2099
Annual Total	CCSM45	28.9	29.8	29.5	29.9
	CCSM85	28.9	29.5	29.2	30.3
	GFDL45	28.9	31.1	32.9	32.5
	GFDL85	28.9	31.0	33.9	35.0
	HAD45	28.9	30.1	31.4	31.4
	HAD85	28.9	30.9	32.3	33.9
Growing Season May—Sep	CCSM45	14.8	15.2	14.4	14.7
	CCSM85	14.8	14.7	14.2	13.8
	GFDL45	14.8	15.6	16.4	16.1
	GFDL85	14.8	15.9	16.2	16.3
	HAD45	14.8	14.8	14.0	14.1
	HAD85	14.8	15.1	13.4	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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Common Name	Scientific Name	Range	MR	%Cell	FIAsum	FIAiv	ChngCl45	ChngCl85	Adap	Abund	Capabil45	Capabil85	SHIFT45	SHIFT85	SSO	N
northern white-cedar	Thuja occidentalis	WSH	High	84.7	2973.6	12.2	Sm. dec.	Lg. dec.	Medium	Abundant	Fair	Fair			0	1
balsam fir	Abies balsamea	NDH	High	89.1	1439.0	5.3	Lg. dec.	Lg. dec.	Low	Abundant	Poor	Poor			0	2
red maple	Acer rubrum	WDH	High	86.6	1037.0	5.0	Sm. inc.	Sm. inc.	High	Abundant	Very Good	Very Good			1	3
quaking aspen	Populus tremuloides	WDH	High	74.5	945.2	3.4	Sm. inc.	Sm. inc.	Medium	Abundant	Very Good	Very Good			1	4
black spruce	Picea mariana	NSH	High	59.2	885.3	4.9	Lg. dec.	Lg. dec.	Medium	Abundant	Fair	Fair			0	5
red pine	Pinus resinosa	NSH	Medium	53.6	859.8	8.1	No change	Sm. dec.	Low	Abundant	Fair	Fair			0	6
balsam poplar	Populus balsamifera	NSH	Medium	60.9	751.5	3.3	Lg. dec.	Lg. dec.	Medium	Abundant	Fair	Fair			0	7
jack pine	Pinus banksiana	NSH	Medium	37.9	651.9	7.5	Sm. dec.	Sm. dec.	High	Abundant	Good	Good			1	8
white spruce	Picea glauca	NSL	Medium	79.6	628.6	2.8	Lg. dec.	Lg. dec.	Medium	Abundant	Fair	Fair			0	9
eastern white pine	Pinus strobus	WDH	High	51.1	556.9	4.3	Sm. inc.	No change	Low	Abundant	Good	Fair			1	10
paper birch	Betula papyrifera	WDH	High	85.1	507.0	1.8	No change	No change	Medium	Abundant	Good	Good			1	11
eastern hemlock	Tsuga canadensis	NSH	High	48.2	449.9	4.9	Sm. dec.	Lg. dec.	Low	Common	Poor	Very Poor			0	12
tamarack (native)	Larix laricina	NSH	High	50.6	394.2	3.0	Sm. inc.	Sm. inc.	Low	Common	Fair	Fair			1	13
sugar maple	Acer saccharum	WDH	High	37	389.5	2.2	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	14
black ash	Fraxinus nigra	WSH	Medium	56.7	282.3	2.1	Sm. inc.	Sm. inc.	Low	Common	Fair	Fair			1	15
bigtooth aspen	Populus grandidentata	NSL	Medium	44	278.5	2.9	Sm. inc.	No change	Medium	Common	Good	Fair			1	16
northern red oak	Quercus rubra	WDH	Medium	18.6	124.8	3.2	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	17
black cherry	Prunus serotina	WDL	Medium	35	118.5	0.9	Lg. inc.	Lg. inc.	Low	Common	Good	Good			1	18
yellow birch	Betula alleghaniensis	NDL	High	48.2	114.7	1.0	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	19
green ash	Fraxinus pennsylvanica	WSH	Low	29.6	112.9	1.5	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	20
white ash	Fraxinus americana	WDL	Medium	14.7	109.4	4.3	Lg. inc.	Lg. inc.	Low	Common	Good	Good	Infill ++	Infill ++	1	21
American beech	Fagus grandifolia	WDH	High	20.4	85.8	1.0	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good	Infill ++	Infill ++	1	22
peachleaf willow	Salix amygdaloides	NSLX	FIA	0.4	28.5	0.3	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	23
American elm	Ulmus americana	WDH	Medium	20.5	22.2	0.4	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			1	24
American basswood	Tilia americana	WSL	Medium	9.9	15.1	0.3	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			1	25
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	18.7	9.7	0.4	Lg. inc.	Lg. inc.	High	Rare	Good	Good			1	26
serviceberry	Amelanchier spp.	NSL	Low	10.8	3.1	0.2	Lg. dec.	Very Lg. dec.	Medium	Rare	Very Poor	Lost			0	27
pin cherry	Prunus pensylvanica	NSL	Low	2.7	2.5	0.2	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	28
eastern redcedar	Juniperus virginiana	WDH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate ++	3	29
boxelder	Acer negundo	WSH	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate +	3	30
striped maple	Acer pensylvanicum	NSL	Medium	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown			0	31
silver maple	Acer saccharinum	NSH	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++	3	32
mountain maple	Acer spicatum	NSL	Low	0	0	0	Unknown	Unknown	High	Modeled	Unknown	Unknown			0	33
pignut hickory	Carya glabra	WDL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	34
shagbark hickory	Carya ovata	WSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	35
mockernut hickory	Carya alba	WDL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			0	36
flowering dogwood	Cornus florida	WDL	Medium	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	37
honeylocust	Gleditsia triacanthos	NSH	Low	0	0	0	Unknown	Unknown	High	Modeled	Unknown	Unknown			0	38
black walnut	Juglans nigra	WDH	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	39
blackgum	Nyssa sylvatica	WDL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			0	40
sycamore	Platanus occidentalis	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	41
eastern cottonwood	Populus deltoides	NSH	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate ++	3	42
white oak	Quercus alba	WDH	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	43
swamp white oak	Quercus bicolor	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	44
northern pin oak	Quercus ellipsoidalis	NSH	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++	3	45
bur oak	Quercus macrocarpa	NDH	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate +	3	46
pin oak	Quercus palustris	NSH	Low	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			3	47

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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	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			0	48
black oak	Quercus velutina	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	49
live oak	Quercus virginiana	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	50
black locust	Robinia pseudoacacia	NDH	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	51
black willow	Salix nigra	NSH	Low	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat		Migrate +	3	52
sassafras	Sassafras albidum	WSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	53
American mountain-ash	Sorbus americana	NSL	Low	0	0	0	Unknown	Unknown	Low	Modeled	Unknown	Unknown			0	54