

### Current and Potential Future Habitat, Capability, and Migration

	sq. km	sq. mi	FIA Plots
Area of Region	42,954	16,585	1,244

### 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	Scenario	Scenario	Scenario	SHIFT	SHIFT				
				High	24	RCP45	RCP85	RCP45	RCP85	RCP45	RCP85				
Ash	3					Increase	15	13	Very Good	11	6	Likely	0	0	
Hickory	2			Medium	27	44	No Change	12	11	Good	5	13	Infill	30	27
Maple	5	Abundant	3	Low	30	13	Decrease	19	22	Fair	11	6	Migrate	7	13
Oak	7	Common	28	FIA	10		New	21	23	Poor	7	8			
Pine	4	Rare	25				Unknown	18	16	Very Poor	12	12			
Other	35	Absent	25							FIA Only	6	6			
	<b>56</b>		<b>81</b>		<b>85</b>	<b>81</b>		<b>85</b>	<b>85</b>	Unknown	8	6			
											<b>60</b>	<b>57</b>			

### Potential Changes in Climate Variables

#### Temperature (°F)

Scenario	2009	2039	2069	2099		
Annual	CCSM45	45.8	47.8	50.7	50.9	
Average	CCSM85	45.8	48.6	51.4	54.9	
	GFDL45	45.8	49.5	51.3	52.6	
	GFDL85	45.8	49.1	52.5	57.2	
	HAD45	45.8	48.7	52.5	54.3	
	HAD85	45.8	49.3	53.8	59.0	
Growing Season	CCSM45	65.3	67.5	70.0	70.3	
	CCSM85	65.3	68.3	70.9	75.1	
May—Sep	GFDL45	65.3	69.6	71.9	73.9	
	GFDL85	65.3	69.4	73.3	78.9	
	HAD45	65.3	68.4	71.4	73.5	
	HAD85	65.3	68.6	73.5	78.7	
Coldest Month	CCSM45	14.3	16.2	18.9	19.1	
	CCSM85	14.3	17.0	19.0	21.3	
Average	GFDL45	14.3	17.9	19.4	19.7	
	GFDL85	14.3	18.2	19.8	22.2	
	HAD45	14.3	15.5	19.8	19.6	
	HAD85	14.3	19.0	22.4	25.7	
Warmest Month	CCSM45	71.6	74.1	75.6	76.2	
	CCSM85	71.6	75.4	77.2	79.5	
Average	GFDL45	71.6	74.9	76.5	78.1	
	GFDL85	71.6	76.0	77.9	81.7	
	HAD45	71.6	74.8	76.7	77.9	
	HAD85	71.6	76.1	78.8	82.4	

#### Precipitation (in)

Scenario	2009	2039	2069	2099		
Annual	CCSM45	34.4	34.4	34.2	34.0	
Total	CCSM85	34.4	33.6	34.4	34.4	
	GFDL45	34.4	37.2	40.6	38.4	
	GFDL85	34.4	38.0	41.0	40.0	
	HAD45	34.4	36.1	36.8	36.7	
	HAD85	34.4	36.0	35.6	38.1	
Growing Season	CCSM45	20.9	20.6	20.1	20.5	
	CCSM85	20.9	19.9	20.1	19.0	
May—Sep	GFDL45	20.9	22.1	24.0	22.0	
	GFDL85	20.9	22.9	23.3	21.6	
	HAD45	20.9	21.1	20.1	20.4	
	HAD85	20.9	20.7	18.5	18.9	

**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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# Northwoods Driftless

## NIACS EVAS Region Climate Change Atlas Tree Species

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Common Name	Scientific Name	Range	MR	%Cell	FIAsum	FIAiv	ChngCl45	ChngCl85	Adap	Abund	Capabil45	Capabil85	SHIFT45	SHIFT85	SSO	N
American elm	Ulmus americana	WDH	Medium	82.8	852.9	11.4	No change	No change	Medium	Abundant	Good	Good	Infill ++	Infill ++	2	1
boxelder	Acer negundo	WDH	Low	64.1	578.4	10.5	No change	Sm. dec.	High	Abundant	Very Good	Good	Infill ++	Infill ++	2	2
northern red oak	Quercus rubra	WDH	Medium	60.8	572.1	9.8	No change	Sm. dec.	High	Abundant	Very Good	Good	Infill ++	Infill ++	2	3
white oak	Quercus alba	WDH	Medium	59.7	446.5	7.5	Sm. inc.	No change	High	Common	Very Good	Good	Infill ++	Infill ++	2	4
black cherry	Prunus serotina	WDL	Medium	78.7	409.5	5.7	Sm. inc.	No change	Low	Common	Fair	Poor	Infill +	Infill +	2	5
American basswood	Tilia americana	WSL	Medium	62.1	401.7	7.4	No change	Sm. dec.	Medium	Common	Fair	Poor	Infill +	Infill +	2	6
bur oak	Quercus macrocarpa	NDH	Medium	46.1	377.9	9.3	Sm. inc.	No change	High	Common	Very Good	Good	Infill ++	Infill ++	2	7
black walnut	Juglans nigra	WDH	Low	45.1	335.0	9.1	Sm. inc.	Sm. inc.	Medium	Common	Good	Good	Infill ++	Infill ++	2	8
red maple	Acer rubrum	WDH	High	26.7	331.0	8.9	Sm. dec.	Lg. dec.	High	Common	Fair	Fair	Infill +	Infill +	2	9
sugar maple	Acer saccharum	WDH	High	42.2	316.2	9.2	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good	Infill ++	Infill ++	2	10
shagbark hickory	Carya ovata	WSL	Medium	47.6	316.1	6.9	No change	Sm. dec.	Medium	Common	Fair	Poor	Infill +	Infill +	2	11
black oak	Quercus velutina	WDH	High	34.7	313.6	8.2	Sm. inc.	Sm. inc.	Medium	Common	Good	Good	Infill ++	Infill ++	2	12
eastern white pine	Pinus strobus	WDH	High	20.4	260.0	10.1	Lg. dec.	Lg. dec.	Low	Common	Very Poor	Very Poor			2	13
quaking aspen	Populus tremuloides	WDH	High	34.6	238.0	5.9	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor	Infill +	Infill +	2	14
bitternut hickory	Carya cordiformis	WSL	Low	50.6	228.0	5.1	No change	No change	High	Common	Good	Good	Infill ++	Infill ++	2	15
slippery elm	Ulmus rubra	WSL	Low	58.2	226.2	4.4	No change	No change	Medium	Common	Fair	Fair	Infill +	Infill +	2	16
silver maple	Acer saccharinum	NSH	Low	14.2	224.0	16.0	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good	Infill ++	Infill ++	2	17
paper birch	Betula papyrifera	WDH	High	35.9	218.9	5.8	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor	Infill +	Infill +	2	18
bigtooth aspen	Populus grandidentata	NSL	Medium	29.7	171.2	5.0	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor	Infill +	Infill +	2	19
white ash	Fraxinus americana	WDL	Medium	34.2	154.0	4.8	Sm. inc.	Lg. inc.	Low	Common	Fair	Good	Infill +	Infill ++	2	20
northern pin oak	Quercus ellipsoidalis	NSH	Medium	22.1	147.6	5.2	Lg. dec.	Lg. dec.	High	Common	Fair	Fair	Infill +		2	21
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	41.9	144.6	4.0	Sm. inc.	No change	High	Common	Very Good	Good	Infill ++	Infill ++	2	22
eastern redcedar	Juniperus virginiana	WDH	Medium	24.8	134.7	6.7	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good	Infill ++	Infill ++	2	23
red pine	Pinus resinosa	NSH	Medium	12.5	133.8	9.2	Sm. dec.	Lg. dec.	Low	Common	Poor	Very Poor	Infill +		2	24
green ash	Fraxinus pennsylvanica	WSH	Low	21.4	111.2	5.6	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good	Infill ++	Infill ++	2	25
jack pine	Pinus banksiana	NSH	Medium	7.1	105.1	7.5	Sm. dec.	Sm. dec.	High	Common	Fair	Fair			0	26
hackberry	Celtis occidentalis	WDH	Medium	33.1	94.2	3.1	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good	Infill ++	Infill ++	2	27
black ash	Fraxinus nigra	WSH	Medium	21.4	64.4	3.6	Lg. dec.	Lg. dec.	Low	Common	Very Poor	Very Poor			2	28
black locust	Robinia pseudoacacia	NDH	Low	5.9	62.8	6.6	No change	Sm. inc.	Medium	Common	Fair	Good	Infill +		2	29
red mulberry	Morus alba	NSL	Low	7	58.7	6.6	No change	No change	Medium	Common	Fair	Fair	Infill +	Infill +	2	30
eastern cottonwood	Populus deltoides	NSH	Low	11.4	51.1	5.7	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good	Infill ++	Infill ++	2	31
black willow	Salix nigra	NSH	Low	4	35.8	10.3	Sm. dec.	No change	Low	Rare	Very Poor	Very Poor			2	32
white spruce	Picea glauca	NSL	Medium	4	30.0	10.1	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	33
river birch	Betula nigra	NSL	Low	3.6	29.7	5.4	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	34
swamp white oak	Quercus bicolor	NSL	Low	3.6	24.3	5.7	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	35
black maple	Acer nigrum	NSH	Low	3.6	23.2	11.5	Sm. dec.	Lg. dec.	High	Rare	Poor	Poor			0	36
white mulberry	Morus alba	NSL	FIA	7.6	22.7	4.8	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	37
butternut	Juglans cinerea	NSLX	FIA	9.3	20.0	2.2	Unknown	Unknown	Low	Rare	FIA Only	FIA Only			0	38
Scots pine	Pinus sylvestris	NSH	FIA	1.4	17.0	6.6	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	39
wild plum	Prunus americana	NSLX	FIA	3.3	11.7	3.7	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	40
serviceberry	Amelanchier spp.	NSL	Low	3.3	10.3	2.2	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	41
peachleaf willow	Salix amygdaloides	NSLX	FIA	0.7	10.0	14.3	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	42
chinkapin oak	Quercus muehlenbergii	NSL	Medium	1.1	9.8	7.8	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair	Infill +	Infill +	2	43
chokecherry	Prunus virginiana	NSLX	FIA	7.8	9.2	1.1	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	44
Siberian elm	Ulmus pumila	NDH	FIA	3	9.1	8.6	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	45
American hornbeam; musclev	Carpinus caroliniana	WSL	Low	5.9	8.7	1.4	Sm. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	46
Norway spruce	Picea abies	NSH	FIA	0.7	7.8	11.2	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	47



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Common Name	Scientific Name	Range	MR	%Cell	FIAsum	FIAiv	ChngCl45	ChngCl85	Adap	Abund	Capabil45	Capabil85	SHIFT45	SHIFT85	SSO	N
yellow birch	Betula alleghaniensis	NDL	High	2.1	6.2	2.1	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	48
honeylocust	Gleditsia triacanthos	NSH	Low	1.6	4.2	2.9	Lg. inc.	Lg. inc.	High	Rare	Good	Good			2	49
tamarack (native)	Larix laricina	NSH	High	0.2	3.1	1.1	No change	No change	Low	Rare	Very Poor	Very Poor			0	50
black spruce	Picea mariana	NSH	High	0.1	2.2	0.6	Sm. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	51
rock elm	Ulmus thomasii	NSLX	FIA	1.4	2.0	1.4	Unknown	Unknown	Low	Rare	FIA Only	FIA Only			0	52
pin cherry	Prunus pensylvanica	NSL	Low	0.9	1.4	1.1	Lg. dec.	Very Lg. dec.	Medium	Rare	Very Poor	Lost			0	53
balsam fir	Abies balsamea	NDH	High	0.5	1.4	3.0	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor			0	54
northern catalpa	Catalpa speciosa	NSHX	FIA	0.2	0.6	1.1	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	55
northern white-cedar	Thuja occidentalis	WSH	High	0.2	0.6	2.5	No change	Lg. inc.	Medium	Rare	Poor	Good			0	56
slash pine	Pinus elliotii	NDH	High	0	0	0	Unknown	New Habitat	Medium	Absent	Unknown	New Habitat			0	57
Virginia pine	Pinus virginiana	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	58
eastern hemlock	Tsuga canadensis	NSH	High	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			3	59
mountain maple	Acer spicatum	NSL	Low	0	0	0	Unknown	Unknown	High	Absent	Unknown	Unknown			0	60
Ohio buckeye	Aesculus glabra	NSL	Low	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown			0	61
pawpaw	Asimina triloba	NSL	Low	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown			0	62
gray birch	Betula populifolia	NSL	Low	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown			0	63
cittamwood/gum bumelia	Sideroxylon lanuginosum ssp.	NSL	Low	0	0	0	Unknown	New Habitat	High	Absent	Unknown	New Habitat			3	64
pignut hickory	Carya glabra	WDL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	65
pecan	Carya illinoensis	NSH	Low	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			3	66
black hickory	Carya texana	NDL	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	67
mockernut hickory	Carya alba	WDL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	68
sugarberry	Celtis laevigata	NDH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	69
eastern redbud	Cercis canadensis	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	70
flowering dogwood	Cornus florida	WDL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	71
common persimmon	Diospyros virginiana	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate +	3	72
American beech	Fagus grandifolia	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	73
blue ash	Fraxinus quadrangulata	NSL	Low	0	0	0	Unknown	Unknown	Low	Absent	Unknown	Unknown			0	74
yellow-poplar	Liriodendron tulipifera	WDH	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate +	3	75
Osage-orange	Maclura pomifera	NDH	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	76
blackgum	Nyssa sylvatica	WDL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate +	3	77
sycamore	Platanus occidentalis	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	78
balsam poplar	Populus balsamifera	NSH	Medium	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown			0	79
scarlet oak	Quercus coccinea	WDL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	80
shingle oak	Quercus imbricaria	NDH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	81
blackjack oak	Quercus marilandica	NSL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate ++	3	82
Shumard oak	Quercus shumardii	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			3	83
post oak	Quercus stellata	WDH	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	84
sassafras	Sassafras albidum	WSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	85