

# Upper Delaware Scenic and Recreational River

# National Park

## Climate Change Atlas Tree Species

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

Landscape Change Research Group  
Iverson, Peters, Prasad, Matthews  
USFS Northern Research Station  
Delaware, OH

Common Name	Scientific Name	Range	MR	%Cell	FIAsum	FIAiv	ChngCl45	ChngCl85	Adap	Abund	Capabil45	Capabil85	SHIFT45	SHIFT85	SSO	N
red maple	Acer rubrum	WDH	High	94	2158.38	23.95	Sm. dec.	Sm. dec.	High	Abundant	Good	Good				1 1
sugar maple	Acer saccharum	WDH	High	70.2	822.76	12.45	No change	No change	High	Abundant	Very Good	Very Good				1 2
eastern hemlock	Tsuga canadensis	NSH	High	57.1	745.21	13.04	Sm. dec.	Lg. dec.	Low	Abundant	Fair	Poor				0 3
American beech	Fagus grandifolia	WDH	High	52.4	646.98	12.35	Sm. dec.	Sm. dec.	Medium	Abundant	Fair	Fair				0 4
chestnut oak	Quercus prinus	NDH	High	39.3	573.46	16.08	Sm. inc.	Sm. inc.	High	Abundant	Very Good	Very Good				1 5
sweet birch	Betula lenta	NDH	High	70.2	488.43	7.51	No change	Sm. dec.	Low	Common	Poor	Poor				0 6
eastern white pine	Pinus strobus	WDH	High	34.5	484.92	14.05	Sm. dec.	Sm. dec.	Low	Common	Poor	Poor				0 7
white ash	Fraxinus americana	WDL	Medium	63.1	477.26	7.56	Sm. inc.	No change	Low	Common	Fair	Poor				1 8
white oak	Quercus alba	WDH	Medium	41.7	473.32	12.46	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good				1 9
black cherry	Prunus serotina	WDL	Medium	56	457.04	8.77	Sm. inc.	No change	Low	Common	Fair	Poor				1 10
northern red oak	Quercus rubra	WDH	Medium	48.8	342.52	7.59	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good				1 11
yellow birch	Betula alleghaniensis	NDL	High	60.7	302.98	4.99	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor				0 12
scarlet oak	Quercus coccinea	WDL	Medium	21.4	217.93	10.17	Sm. inc.	Sm. inc.	Medium	Common	Good	Good				1 13
pignut hickory	Carya glabra	WDL	Medium	28.6	128.75	5.19	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good				1 14
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	38.1	94.21	2.74	No change	Sm. inc.	High	Common	Good	Very Good				1 15
black oak	Quercus velutina	WDH	High	25	80.83	3.97	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good				1 16
serviceberry	Amelanchier spp.	NSL	Low	31	78.8	2.55	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor				0 17
American elm	Ulmus americana	WDH	Medium	23.8	69.11	3.95	No change	Sm. inc.	Medium	Common	Fair	Good				1 18
American basswood	Tilia americana	WSL	Medium	17.9	56.3	3.15	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good				1 19
pitch pine	Pinus rigida	NSH	High	15.5	50.21	3.25	Sm. dec.	Lg. dec.	Medium	Common	Poor	Poor				0 20
white spruce	Picea glauca	NSL	Medium	3.6	48.51	13.58	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor				0 21
striped maple	Acer pensylvanicum	NSL	Medium	15.5	38.36	2.48	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor				0 22
red spruce	Picea rubens	NDH	High	7.1	36.6	5.12	Lg. dec.	Lg. dec.	Low	Rare	Very Poor	Very Poor				0 23
quaking aspen	Populus tremuloides	WDH	High	16.7	33.85	2.63	Sm. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor				0 24
shagbark hickory	Carya ovata	WSL	Medium	13.1	33.75	3.62	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++		1 25
bigtooth aspen	Populus grandidentata	NSL	Medium	9.5	31.83	3.34	No change	No change	Medium	Rare	Poor	Poor				1 26
sassafras	Sassafras albidum	WSL	Low	10.7	29.12	2.72	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good				1 27
red pine	Pinus resinosa	NSH	Medium	2.4	29.05	12.2	Very Lg. dec.	Very Lg. dec.	Low	Rare	Lost	Lost				0 28
gray birch	Betula populifolia	NSL	Low	9.5	28	2.94	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor				0 29
American hornbeam; muscle	Carpinus caroliniana	WSL	Low	25	25.82	1.25	Sm. dec.	Sm. inc.	Medium	Rare	Very Poor	Fair				1 30
blackgum	Nyssa sylvatica	WDL	Medium	16.7	23.37	1.84	Lg. inc.	Lg. inc.	High	Rare	Good	Good				1 31
chokecherry	Prunus virginiana	NSLX	FIA	3.6	23.04	6.45	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only				0 32
swamp white oak	Quercus bicolor	NSL	Low	2.4	22.56	9.47	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor				2 33
pin cherry	Prunus pensylvanica	NSL	Low	4.8	21.77	4.57	Lg. dec.	Very Lg. dec.	Medium	Rare	Very Poor	Lost				0 34
Norway spruce	Picea abies	NSH	FIA	3.6	20.92	5.86	Unknown	Unknown	NA	Rare	NNIS	NNIS				0 35
sycamore	Platanus occidentalis	NSL	Low	2.4	16.17	6.79	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++		2 36
black walnut	Juglans nigra	WDH	Low	2.4	15.69	6.59	No change	Lg. inc.	Medium	Rare	Poor	Good	Infill +	Infill ++		1 37
black willow	Salix nigra	NSH	Low	1.2	15.44	12.97	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor				2 38
eastern redcedar	Juniperus virginiana	WDH	Medium	8.3	12.65	4.09	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++		1 39
Scotch pine	Pinus sylvestris	NSH	FIA	1.2	11.75	9.87	Unknown	Unknown	NA	Rare	NNIS	NNIS				0 40
bitternut hickory	Carya cordiformis	WSL	Low	6	10.43	1.75	No change	Lg. inc.	High	Rare	Fair	Good	Infill +	Infill ++		2 41
yellow-poplar	Liriodendron tulipifera	WDH	High	3.6	9.35	2.62	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++		1 42
green ash	Fraxinus pennsylvanica	WSH	Low	6	7.44	11.92	No change	Sm. inc.	Medium	Rare	Poor	Fair	Infill +	Infill +		2 43
mockernut hickory	Carya alba	WDL	Medium	10.7	7.4	1.13	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++		1 44
flowering dogwood	Cornus florida	WDL	Medium	4.8	5.35	1.12	No change	No change	Medium	Rare	Poor	Poor		Infill +		1 45
ailanthus	Ailanthus altissima	NSL	FIA	1.2	4.56	3.83	Unknown	Unknown	NA	Rare	NNIS	NNIS				0 46
butternut	Juglans cinerea	NSLX	FIA	1.2	4.17	3.5	Unknown	Unknown	Low	Rare	FIA Only	FIA Only				0 47
pin oak	Quercus palustris	NSH	Low	4.8	2.31	7.75	No change	Sm. inc.	Low	Rare	Very Poor	Poor		Infill +		2 48
boxelder	Acer negundo	WSH	Low	1.2	2.02	1.7	No change	Sm. inc.	High	Rare	Fair	Good	Infill +			2 49
slippery elm	Ulmus rubra	WSL	Low	2.4	1.26	0.53	No change	Sm. inc.	Medium	Rare	Poor	Fair		Infill +		2 50
paper birch	Betula papyrifera	WDH	High	1.2	1.11	0.93	No change	Very Lg. dec.	Medium	Rare	Poor	Lost	Infill +			2 51
bear oak; scrub oak	Quercus ilicifolia	NSLX	FIA	1.2	1.07	0.9	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only				0 52
balsam fir	Abies balsamea	NDH	High	1.2	1.02	0.86	Very Lg. dec.	Very Lg. dec.	Low	Rare	Lost	Lost				0 53



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Common Name	Scientific Name	Range	MR	%Cell	FIAsum	FIAiv	ChngCl45	ChngCl85	Adap	Abund	Capabil45	Capabil85	SHIFT45	SHIFT85	SSO	N
mountain maple	<i>Acer spicatum</i>	NSL	Low	1.2	0.83	0.7	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor			0	54
American chestnut	<i>Castanea dentata</i>	NSLX	FIA	1.2	0.83	0.7	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	55
shortleaf pine	<i>Pinus echinata</i>	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate ++	3	56
loblolly pine	<i>Pinus taeda</i>	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate ++	3	57
Virginia pine	<i>Pinus virginiana</i>	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	58
florida maple	<i>Acer barbatum</i>	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			3	59
pecan	<i>Carya illinoensis</i>	NSH	Low	0	0	0	Unknown	New Habitat	Low	Absent	Unknown	New Habitat			3	60
black hickory	<i>Carya texana</i>	NDL	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	61
sugarberry	<i>Celtis laevigata</i>	NDH	Medium	0	0	0	Unknown	New Habitat	Medium	Absent	Unknown	New Habitat			0	62
hackberry	<i>Celtis occidentalis</i>	WDH	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Likely +	Likely +	3	63
eastern redbud	<i>Cercis canadensis</i>	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	64
common persimmon	<i>Diospyros virginiana</i>	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate +	3	65
sweetgum	<i>Liquidambar styraciflua</i>	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	66
mountain or Fraser magnolia	<i>Magnolia fraseri</i>	NSL	Low	0	0	0	Unknown	New Habitat	NA	Absent	Unknown	New Habitat			0	67
sourwood	<i>Oxydendrum arboreum</i>	NDL	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	68
southern red oak	<i>Quercus falcata</i>	WDL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate +	3	69
blackjack oak	<i>Quercus marilandica</i>	NSL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate ++	3	70
chinkapin oak	<i>Quercus muehlenbergii</i>	NSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	71
post oak	<i>Quercus stellata</i>	WDH	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	72
black locust	<i>Robinia pseudoacacia</i>	NDH	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +	3	73
American mountain-ash	<i>Sorbus americana</i>	NSL	Low	0	0	0	Unknown	Unknown	Low	Modeled	Unknown	Unknown			0	74
winged elm	<i>Ulmus alata</i>	WDL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	75