

	sq. km	sq. mi	FIA Plots
Area of Region	57,293	22,121	1,473

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	
		Abundant	Common	High	Low	Scenario	Scenario	Scenario	Scenario	SHIFT	SHIFT
				Reliability	Adaptability	RCP45	RCP85	RCP45	RCP85	RCP45	RCP85
Ash	3										
Hickory	5										
Maple	7	4		28	27	Increase	19	26	Very Good	7	7
Oak	13	20		39	64	No Change	18	15	Good	11	17
Pine	4	57		40	21	Decrease	33	29	Fair	12	10
Other	49	36		11		New	30	33	Poor	18	17
	81	117		118	112	Unknown	18	15	Very Poor	19	16
							118	118	FIA Only	5	5
									Unknown	7	4
										79	76

Potential Changes in Climate Variables

Temperature (°F)

Scenario	2009	2039	2069	2099
Annual	48.7	50.5	52.6	52.8
Average	48.7	51.0	53.4	56.4
GFDL45	48.7	51.9	54.3	55.5
GFDL85	48.7	51.8	55.6	59.9
HAD45	48.7	51.3	54.5	56.2
HAD85	48.7	51.3	55.5	60.4
Growing Season	65.2	67.2	68.8	69.2
May—Sep	65.2	67.3	69.7	73.2
GFDL45	65.2	68.6	71.3	72.7
GFDL85	65.2	68.5	72.7	77.2
HAD45	65.2	67.8	70.7	72.9
HAD85	65.2	67.2	72.0	77.1
Coldest Month	23.6	25.1	26.8	27.4
Average	23.6	26.1	27.2	29.3
GFDL45	23.6	26.9	28.4	29.5
GFDL85	23.6	27.1	28.9	31.2
HAD45	23.6	25.4	28.0	28.3
HAD85	23.6	26.5	28.6	31.6
Warmest Month	71.5	73.7	74.7	74.7
Average	71.5	74.0	75.5	77.1
GFDL45	71.5	74.2	75.9	77.1
GFDL85	71.5	75.0	77.5	80.1
HAD45	71.5	74.3	75.8	76.9
HAD85	71.5	73.6	76.1	79.5

Precipitation (in)

Scenario	2009	2039	2069	2099
Annual	48.8	48.6	47.6	53.3
Total	48.8	49.2	51.5	55.0
GFDL45	48.8	53.0	56.1	54.4
GFDL85	48.8	51.5	54.7	57.4
HAD45	48.8	50.5	53.8	53.0
HAD85	48.8	53.2	53.1	55.1
Growing Season	20.2	22.0	20.5	22.3
May—Sep	20.2	20.8	22.1	22.0
GFDL45	20.2	20.3	20.0	20.6
GFDL85	20.2	20.5	20.0	20.3
HAD45	20.2	21.2	21.0	20.8
HAD85	20.2	20.9	20.4	21.1

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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Section 221A

EcoMap 2007
Climate Change Atlas Tree Species

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Northern Research Station
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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
red maple	Acer rubrum	WDH	High	89.5	2030.2	20.2	Sm. dec.	Sm. dec.	High	Abundant	Good	Good			1	1
eastern white pine	Pinus strobus	WDH	High	63.1	1347.4	18.9	Lg. dec.	Lg. dec.	Low	Abundant	Poor	Poor			0	2
northern red oak	Quercus rubra	WDH	Medium	74.5	889.3	10.3	No change	Sm. dec.	High	Abundant	Very Good	Good			1	3
eastern hemlock	Tsuga canadensis	NSH	High	44.9	625.3	11.2	Sm. dec.	Lg. dec.	Low	Abundant	Fair	Poor			0	4
sweet birch	Betula lenta	NDH	High	53.3	438.9	7.2	Sm. dec.	Sm. dec.	Low	Common	Poor	Poor			0	5
black oak	Quercus velutina	WDH	High	54.3	383.5	6.8	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	6
white ash	Fraxinus americana	WDL	Medium	52.4	358.3	5.8	Sm. inc.	No change	Low	Common	Fair	Poor			1	7
white oak	Quercus alba	WDH	Medium	57.2	339.3	5.8	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	8
sugar maple	Acer saccharum	WDH	High	40.9	333.4	6.4	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	9
American beech	Fagus grandifolia	WDH	High	42.5	260.9	5.0	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	10
scarlet oak	Quercus coccinea	WDL	Medium	32.9	244.1	7.8	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	11
black cherry	Prunus serotina	WDL	Medium	41.2	206.9	4.6	Lg. inc.	Lg. inc.	Low	Common	Good	Good			1	12
pitch pine	Pinus rigida	NSH	High	14.3	175.3	12.0	Sm. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	13
yellow birch	Betula alleghaniensis	NDL	High	38.3	173.0	4.0	No change	No change	Medium	Common	Fair	Fair			1	14
chestnut oak	Quercus prinus	NDH	High	13.7	131.1	7.7	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good	Infill ++	Infill ++	1	15
paper birch	Betula papyrifera	WDH	High	30.8	104.0	2.6	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	16
eastern redcedar	Juniperus virginiana	WDH	Medium	13.6	101.1	6.6	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good	Infill ++	Infill ++	1	17
pignut hickory	Carya glabra	WDL	Medium	25.1	96.3	3.6	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	18
yellow-poplar	Liriodendron tulipifera	WDH	High	9.6	88.9	7.4	No change	Sm. inc.	High	Common	Good	Very Good	Infill ++	Infill ++	1	19
American elm	Ulmus americana	WDH	Medium	22.1	86.0	3.4	No change	No change	Medium	Common	Fair	Fair			1	20
bigtooth aspen	Populus grandidentata	NSL	Medium	17.8	73.7	3.7	No change	No change	Medium	Common	Fair	Fair			1	21
quaking aspen	Populus tremuloides	WDH	High	14.7	61.4	3.2	No change	No change	Medium	Common	Fair	Fair			1	22
balsam fir	Abies balsamea	NDH	High	9	53.4	4.3	Sm. dec.	Sm. dec.	Low	Common	Poor	Poor	Infill +	Infill +	2	23
blackgum	Nyssa sylvatica	WDL	Medium	15.8	53.1	3.0	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	24
shagbark hickory	Carya ovata	WSL	Medium	18.2	49.5	2.8	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair			1	25
gray birch	Betula populifolia	NSL	Low	18.3	43.9	2.0	No change	Sm. inc.	Medium	Rare	Poor	Fair			1	26
black locust	Robinia pseudoacacia	NDH	Low	5.3	36.4	7.4	No change	Sm. inc.	Medium	Rare	Poor	Fair	Infill +	Infill +	1	27
black walnut	Juglans nigra	WDH	Low	3.3	31.6	10.0	Sm. dec.	No change	Medium	Rare	Very Poor	Poor		Infill +	2	28
sassafras	Sassafras albidum	WSL	Low	15.9	31.4	2.0	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			1	29
red spruce	Picea rubens	NDH	High	9.2	28.1	1.9	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor			2	30
swamp white oak	Quercus bicolor	NSL	Low	4.6	26.8	6.1	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	31
American basswood	Tilia americana	WSL	Medium	7.6	26.0	2.9	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	1	32
mockernut hickory	Carya alba	WDL	Medium	8.2	25.5	2.5	Sm. inc.	Sm. inc.	High	Rare	Good	Good	Infill ++	Infill ++	1	33
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	12.2	22.1	1.3	No change	Lg. inc.	High	Rare	Fair	Good			1	34
red pine	Pinus resinosa	NSH	Medium	6.1	22.0	3.7	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor			2	35
green ash	Fraxinus pennsylvanica	WSH	Low	4.6	21.3	4.8	No change	Sm. inc.	Medium	Rare	Poor	Fair	Infill +	Infill +	1	36
Norway maple	Acer platanoides	NSL	FIA	6.2	17.7	4.0	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	37
silver maple	Acer saccharinum	NSH	Low	1.9	15.7	9.8	Sm. dec.	No change	High	Rare	Poor	Fair	Infill +	Infill +	2	38
flowering dogwood	Cornus florida	WDL	Medium	4.6	14.7	2.9	Sm. dec.	No change	Medium	Rare	Very Poor	Poor		Infill +	2	39
American hornbeam; musclev	Carpinus caroliniana	WSL	Low	10.2	14.5	1.3	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good			1	40
black ash	Fraxinus nigra	WSH	Medium	2.9	13.0	3.9	Lg. dec.	Lg. dec.	Low	Rare	Very Poor	Very Poor			2	41
serviceberry	Amelanchier spp.	NSL	Low	5.4	11.5	1.5	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	42
slippery elm	Ulmus rubra	WSL	Low	1.4	10.2	7.0	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			2	43
striped maple	Acer pensylvanicum	NSL	Medium	5.6	9.6	1.2	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	44
bitternut hickory	Carya cordiformis	WSL	Low	4.4	9.4	2.6	No change	Sm. inc.	High	Rare	Fair	Good	Infill +	Infill ++	2	45
ailanthus	Ailanthus altissima	NSL	FIA	4.2	9.3	4.2	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	46
Norway spruce	Picea abies	NSH	FIA	2.4	7.4	3.3	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
hackberry	Celtis occidentalis	WDH	Medium	0.2	7.3	3.2	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor	Infill +	Infill +	2	48
Scots pine	Pinus sylvestris	NSH	FIA	0.6	6.8	3.9	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	49
pin oak	Quercus palustris	NSH	Low	1.9	6.7	3.3	No change	No change	Low	Rare	Very Poor	Very Poor			2	50
sycamore	Platanus occidentalis	NSL	Low	0.7	6.4	12.2	No change	Lg. inc.	Medium	Rare	Poor	Good	Infill +		2	51
black spruce	Picea mariana	NSH	High	0.7	6.1	8.7	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	52
pin cherry	Prunus pensylvanica	NSL	Low	2.5	6.0	1.8	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	53
Siberian elm	Ulmus pumila	NDH	FIA	0.1	5.8	25.2	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	54
bear oak; scrub oak	Quercus ilicifolia	NSLX	FIA	3.2	5.6	2.2	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	55
white spruce	Picea glauca	NSLX	Medium	0.9	5.5	3.7	Very Lg. dec.	Very Lg. dec.	Medium	Rare	Lost	Lost			0	56
eastern cottonwood	Populus deltoides	NSH	Low	1.1	5.5	4.2	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			2	57
Atlantic white-cedar	Chamaecyparis thyoides	NSH	Low	1.4	4.7	3.3	No change	No change	Low	Rare	Very Poor	Very Poor			2	58
black willow	Salix nigra	NSH	Low	1.2	4.6	4.9	Sm. dec.	No change	Low	Rare	Very Poor	Very Poor			2	59
American chestnut	Castanea dentata	NSLX	FIA	5.2	4.4	1.1	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	60
boxelder	Acer negundo	WSH	Low	0.9	3.3	1.9	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	2	61
butternut	Juglans cinerea	NSLX	FIA	1.2	2.7	4.4	Unknown	Unknown	Low	Rare	FIA Only	FIA Only			0	62
tamarack (native)	Larix laricina	NSH	High	1.4	2.3	1.5	Lg. dec.	Lg. dec.	Low	Rare	Very Poor	Very Poor			0	63
balsam poplar	Populus balsamifera	NSH	Medium	0.4	1.7	4.8	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	64
post oak	Quercus stellata	WDH	High	1.8	1.6	2.2	Lg. inc.	Lg. inc.	High	Rare	Good	Good			2	65
honeylocust	Gleditsia triacanthos	NSH	Low	0.1	1.5	3.4	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor		Infill +	2	66
bur oak	Quercus macrocarpa	NDH	Medium	0.2	1.2	6.4	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			0	67
American holly	Ilex opaca	NSL	Medium	0.7	0.8	1.1	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	68
American mountain-ash	Sorbus americana	NSL	Low	0.2	0.7	0.4	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor			0	69
red mulberry	Morus rubra	NSL	Low	0.1	0.7	1.9	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	70
chokecherry	Prunus virginiana	NSLX	FIA	0.3	0.5	0.4	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	71
swamp chestnut oak	Quercus michauxii	NSL	Low	0.2	0.4	2.1	No change	Lg. inc.	Medium	Rare	Poor	Good	Infill +		2	72
white mulberry	Morus alba	NSL	FIA	0.7	0.3	7.3	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	73
sweetgum	Liquidambar styraciflua	WDH	High	0.4	0.3	4.1	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	74
northern white-cedar	Thuja occidentalis	WSH	High	0.4	0.2	0.6	Very Lg. dec.	Very Lg. dec.	Medium	Rare	Lost	Lost			0	75
northern pin oak	Quercus ellipsoidalis	NSH	Medium	0.6	0.2	3.0	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			0	76
river birch	Betula nigra	NSL	Low	0.2	0.2	1.2	Sm. dec.	No change	Medium	Rare	Very Poor	Poor		Infill +	2	77
shellbark hickory	Carya laciniosa	NSL	Low	0	0.1	0.1	Very Lg. dec.	Very Lg. dec.	Medium	Rare	Lost	Lost			0	78
mountain maple	Acer spicatum	NSL	Low	0.2	0.1	0.6	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			0	79
northern catalpa	Catalpa speciosa	NSHX	FIA	0.2	0.1	0.6	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	80
chinkapin oak	Quercus muehlenbergii	NSL	Medium	0.2	0.1	0.6	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good			2	81
shortleaf pine	Pinus echinata	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	82
slash pine	Pinus elliotii	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	83
longleaf pine	Pinus palustris	NSH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	84
Table Mountain pine	Pinus pungens	NSL	Low	0	0	0	Unknown	Unknown	High	Absent	Unknown	Unknown			0	85
pond pine	Pinus serotina	NSH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	86
loblolly pine	Pinus taeda	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++	3	87
Virginia pine	Pinus virginiana	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +	3	88
bald cypress	Taxodium distichum	NSH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	89
florida maple	Acer barbatum	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			3	90
Ohio buckeye	Aesculus glabra	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	91
cittamwood/gum bumelia	Sideroxylon lanuginosum ssp.	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			0	92
water hickory	Carya aquatica	NSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	93
pecan	Carya illinoensis	NSH	Low	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			3	94



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Common Name	Scientific Name	Range	MR	%Cell	FIAsum	FIaiv	ChngCl45	ChngCl85	Adap	Abund	Capabil45	Capabil85	SHIFT45	SHIFT85	SSO	N
black hickory	<i>Carya texana</i>	NDL	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	95
sugarberry	<i>Celtis laevigata</i>	NDH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	96
eastern redbud	<i>Cercis canadensis</i>	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	97
common persimmon	<i>Diospyros virginiana</i>	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	98
Osage-orange	<i>Maclura pomifera</i>	NDH	Medium	0	0	0	Unknown	Unknown	High	Modeled	Unknown	Unknown			0	99
cucumbertree	<i>Magnolia acuminata</i>	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	100
sweetbay	<i>Magnolia virginiana</i>	NSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	101
bigleaf magnolia	<i>Magnolia macrophylla</i>	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	102
mountain or Fraser magnolia	<i>Magnolia fraseri</i>	NSL	Low	0	0	0	Unknown	New Habitat	Low	Absent	Unknown	New Habitat			0	103
water tupelo	<i>Nyssa aquatica</i>	NSH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			3	104
swamp tupelo	<i>Nyssa biflora</i>	NDH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	105
sourwood	<i>Oxydendrum arboreum</i>	NDL	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	106
redbay	<i>Persea borbonia</i>	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			3	107
water elm	<i>Planera aquatica</i>	NSL	Low	0	0	0	Unknown	New Habitat	Medium	Absent	Unknown	New Habitat			0	108
southern red oak	<i>Quercus falcata</i>	WDL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	109
cherrybark oak; swamp red o	<i>Quercus pagoda</i>	NSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	110
laurel oak	<i>Quercus laurifolia</i>	NDH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	111
overcup oak	<i>Quercus lyrata</i>	NSL	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			3	112
blackjack oak	<i>Quercus marilandica</i>	NSL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	113
water oak	<i>Quercus nigra</i>	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	114
willow oak	<i>Quercus phellos</i>	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	115
live oak	<i>Quercus virginiana</i>	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	116
bluejack oak	<i>Quercus incana</i>	NSL	Low	0	0	0	Unknown	New Habitat	Medium	Absent	Unknown	New Habitat			0	117
winged elm	<i>Ulmus alata</i>	WDL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	118

