



Section 212K

EcoMap 2007  
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

| Common Name                | Scientific Name        | Range | MR     | %Cell | FIAsum | FIAiv | ChngCl45  | ChngCl85  | Adap   | Abund    | Capabil45 | Capabil85 | SHIFT45   | SHIFT85   | SSO | N  |
|----------------------------|------------------------|-------|--------|-------|--------|-------|-----------|-----------|--------|----------|-----------|-----------|-----------|-----------|-----|----|
| quaking aspen              | Populus tremuloides    | WDH   | High   | 89.5  | 2269.8 | 17.2  | Sm. dec.  | Sm. dec.  | Medium | Abundant | Fair      | Fair      |           |           | 0   | 1  |
| red maple                  | Acer rubrum            | WDH   | High   | 84.1  | 1026.3 | 7.9   | No change | No change | High   | Abundant | Very Good | Very Good |           |           | 1   | 2  |
| northern red oak           | Quercus rubra          | WDH   | Medium | 71.7  | 787.1  | 6.5   | No change | No change | High   | Abundant | Very Good | Very Good |           |           | 1   | 3  |
| black ash                  | Fraxinus nigra         | WSH   | Medium | 64.4  | 771.9  | 8.1   | Sm. dec.  | Sm. dec.  | Low    | Abundant | Fair      | Fair      |           |           | 0   | 4  |
| bur oak                    | Quercus macrocarpa     | NDH   | Medium | 66.5  | 670.4  | 7.1   | No change | No change | High   | Abundant | Very Good | Very Good |           |           | 1   | 5  |
| red pine                   | Pinus resinosa         | NSH   | Medium | 34.3  | 652.7  | 11.4  | No change | No change | Low    | Abundant | Fair      | Fair      |           |           | 0   | 6  |
| paper birch                | Betula papyrifera      | WDH   | High   | 75.6  | 631.4  | 5.4   | No change | Sm. dec.  | Medium | Abundant | Good      | Fair      |           |           | 1   | 7  |
| American basswood          | Tilia americana        | WSL   | Medium | 57.5  | 529.3  | 6.3   | No change | No change | Medium | Abundant | Good      | Good      |           |           | 1   | 8  |
| northern pin oak           | Quercus ellipsoidalis  | NSH   | Medium | 31.7  | 483.9  | 9.9   | Sm. inc.  | No change | High   | Common   | Very Good | Good      |           |           | 1   | 9  |
| sugar maple                | Acer saccharum         | WDH   | High   | 51.9  | 441.5  | 4.8   | Sm. inc.  | Sm. inc.  | High   | Common   | Very Good | Very Good |           |           | 1   | 10 |
| jack pine                  | Pinus banksiana        | NSH   | Medium | 26.8  | 394.4  | 11.8  | Sm. dec.  | Sm. dec.  | High   | Common   | Fair      | Fair      |           |           | 1   | 11 |
| green ash                  | Fraxinus pennsylvanica | WSH   | Low    | 55.8  | 391.0  | 4.8   | Sm. inc.  | Sm. inc.  | Medium | Common   | Good      | Good      |           |           | 1   | 12 |
| tamarack (native)          | Larix laricina         | NSH   | High   | 31.3  | 378.7  | 8.0   | Sm. inc.  | Sm. inc.  | Low    | Common   | Fair      | Fair      |           |           | 1   | 13 |
| bigtooth aspen             | Populus grandidentata  | NSL   | Medium | 42.8  | 341.4  | 5.1   | No change | Sm. dec.  | Medium | Common   | Fair      | Poor      |           |           | 1   | 14 |
| balsam fir                 | Abies balsamea         | NDH   | High   | 32.6  | 292.8  | 4.5   | Sm. dec.  | No change | Low    | Common   | Poor      | Poor      |           |           | 0   | 15 |
| American elm               | Ulmus americana        | WDH   | Medium | 61.1  | 272.6  | 3.1   | Lg. inc.  | Lg. inc.  | Medium | Common   | Very Good | Very Good |           |           | 1   | 16 |
| eastern white pine         | Pinus strobus          | WDH   | High   | 32.2  | 252.8  | 3.7   | Lg. inc.  | Sm. inc.  | Low    | Common   | Good      | Fair      |           |           | 1   | 17 |
| black spruce               | Picea mariana          | NSH   | High   | 24.5  | 246.1  | 6.7   | Lg. dec.  | Lg. dec.  | Medium | Common   | Poor      | Poor      |           |           | 0   | 18 |
| eastern hophornbeam; ironw | Ostrya virginiana      | WSL   | Low    | 48.6  | 115.1  | 1.4   | Sm. inc.  | Sm. inc.  | High   | Common   | Very Good | Very Good |           |           | 1   | 19 |
| white spruce               | Picea glauca           | NSL   | Medium | 22.6  | 103.6  | 2.6   | Sm. dec.  | No change | Medium | Common   | Poor      | Fair      |           |           | 1   | 20 |
| silver maple               | Acer saccharinum       | NSH   | Low    | 4.4   | 92.4   | 7.8   | No change | No change | High   | Common   | Good      | Good      | Infill ++ | Infill ++ | 1   | 21 |
| white oak                  | Quercus alba           | WDH   | Medium | 14.6  | 83.3   | 2.9   | Lg. inc.  | Lg. inc.  | High   | Common   | Very Good | Very Good | Infill ++ | Infill ++ | 1   | 22 |
| black cherry               | Prunus serotina        | WDL   | Medium | 33.5  | 73.1   | 1.0   | Lg. inc.  | Lg. inc.  | Low    | Common   | Good      | Good      |           |           | 1   | 23 |
| balsam poplar              | Populus balsamifera    | NSH   | Medium | 9     | 69.1   | 4.0   | Lg. dec.  | Lg. dec.  | Medium | Common   | Poor      | Poor      |           |           | 0   | 24 |
| boxelder                   | Acer negundo           | WSH   | Low    | 12    | 64.3   | 3.3   | Lg. inc.  | Lg. inc.  | High   | Common   | Very Good | Very Good | Infill ++ | Infill ++ | 1   | 25 |
| yellow birch               | Betula alleghaniensis  | NDL   | High   | 17.9  | 48.4   | 1.9   | Sm. inc.  | Sm. inc.  | Medium | Rare     | Fair      | Fair      |           |           | 1   | 26 |
| Scots pine                 | Pinus sylvestris       | NSH   | FIA    | 1.9   | 39.1   | 5.6   | Unknown   | Unknown   | NA     | Rare     | NNIS      | NNIS      |           |           | 0   | 27 |
| northern white-cedar       | Thuja occidentalis     | WSH   | High   | 7.6   | 38.7   | 3.0   | Sm. inc.  | Lg. inc.  | Medium | Rare     | Fair      | Good      | Infill +  | Infill ++ | 2   | 28 |
| black willow               | Salix nigra            | NSH   | Low    | 0.6   | 35.2   | 29.4  | Lg. dec.  | No change | Low    | Rare     | Very Poor | Very Poor |           |           | 2   | 29 |
| butternut                  | Juglans cinerea        | NSLX  | FIA    | 9.8   | 28.5   | 2.3   | Unknown   | Unknown   | Low    | Rare     | FIA Only  | FIA Only  |           |           | 0   | 30 |
| eastern cottonwood         | Populus deltoides      | NSH   | Low    | 1.2   | 26.5   | 14.1  | No change | Sm. inc.  | Medium | Rare     | Poor      | Fair      | Infill +  | Infill +  | 2   | 31 |
| chokecherry                | Prunus virginiana      | NSLX  | FIA    | 19.1  | 24.3   | 0.7   | Unknown   | Unknown   | Medium | Rare     | FIA Only  | FIA Only  |           |           | 0   | 32 |
| American hornbeam; musclev | Carpinus caroliniana   | WSL   | Low    | 18.4  | 20.9   | 0.8   | Lg. dec.  | Lg. dec.  | Medium | Rare     | Very Poor | Very Poor |           |           | 0   | 33 |
| serviceberry               | Amelanchier spp.       | NSL   | Low    | 19.1  | 19.1   | 0.6   | Lg. dec.  | Lg. dec.  | Medium | Rare     | Very Poor | Very Poor |           |           | 0   | 34 |
| white ash                  | Fraxinus americana     | WDL   | Medium | 5.2   | 18.6   | 1.0   | Lg. inc.  | Lg. inc.  | Low    | Rare     | Fair      | Fair      | Infill +  | Infill +  | 1   | 35 |
| slippery elm               | Ulmus rubra            | WSL   | Low    | 5.6   | 17.0   | 3.3   | No change | No change | Medium | Rare     | Poor      | Poor      | Infill +  | Infill +  | 2   | 36 |
| eastern redcedar           | Juniperus virginiana   | WDH   | Medium | 1.3   | 15.6   | 3.8   | Lg. inc.  | Lg. inc.  | Medium | Rare     | Good      | Good      |           |           | 2   | 37 |
| black walnut               | Juglans nigra          | WDH   | Low    | 1     | 12.3   | 4.4   | Lg. inc.  | Lg. inc.  | Medium | Rare     | Good      | Good      |           |           | 2   | 38 |
| bitternut hickory          | Carya cordiformis      | WSL   | Low    | 7.1   | 11.4   | 1.2   | No change | Sm. inc.  | High   | Rare     | Fair      | Good      | Infill +  | Infill ++ | 2   | 39 |
| Siberian elm               | Ulmus pumila           | NDH   | FIA    | 0.5   | 9.0    | 19.0  | Unknown   | Unknown   | NA     | Rare     | NNIS      | NNIS      |           |           | 0   | 40 |
| pin cherry                 | Prunus pensylvanica    | NSL   | Low    | 9.2   | 8.2    | 0.5   | Lg. dec.  | Lg. dec.  | Medium | Rare     | Very Poor | Very Poor |           |           | 0   | 41 |
| eastern hemlock            | Tsuga canadensis       | NSH   | High   | 1     | 6.7    | 0.7   | Sm. inc.  | Sm. inc.  | Low    | Rare     | Poor      | Poor      | Infill +  | Infill +  | 2   | 42 |
| peachleaf willow           | Salix amygdaloides     | NSLX  | FIA    | 0.5   | 2.5    | 5.2   | Unknown   | Unknown   | Medium | Rare     | FIA Only  | FIA Only  |           |           | 0   | 43 |
| hackberry                  | Celtis occidentalis    | WDH   | Medium | 0.6   | 2.4    | 1.0   | Lg. inc.  | Lg. inc.  | High   | Rare     | Good      | Good      |           |           | 2   | 44 |
| mountain maple             | Acer spicatum          | NSL   | Low    | 3.9   | 2.1    | 0.3   | Lg. dec.  | Lg. dec.  | High   | Rare     | Poor      | Poor      |           |           | 1   | 45 |
| wild plum                  | Prunus americana       | NSLX  | FIA    | 0.8   | 1.7    | 1.3   | Unknown   | Unknown   | Medium | Rare     | FIA Only  | FIA Only  |           |           | 0   | 46 |
| swamp white oak            | Quercus bicolor        | NSL   | Low    | 0.7   | 1.1    | 0.9   | Lg. inc.  | Lg. inc.  | Medium | Rare     | Good      | Good      |           |           | 2   | 47 |



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| Common Name                 | Scientific Name                     | Range | MR     | %Cell | FIAsum | FIAiv | ChngCl45    | ChngCl85    | Adap   | Abund   | Capabil45   | Capabil85   | SHIFT45    | SHIFT85   | SSO | N    |
|-----------------------------|-------------------------------------|-------|--------|-------|--------|-------|-------------|-------------|--------|---------|-------------|-------------|------------|-----------|-----|------|
| Norway spruce               | <i>Picea abies</i>                  | NSH   | FIA    | 0.1   | 0.5    | 0.2   | Unknown     | Unknown     | NA     | Rare    | NNIS        | NNIS        |            |           |     | 0 48 |
| black oak                   | <i>Quercus velutina</i>             | WDH   | High   | 0.5   | 0.4    | 0.8   | Lg. inc.    | Lg. inc.    | Medium | Rare    | Good        | Good        |            |           |     | 2 49 |
| black maple                 | <i>Acer nigrum</i>                  | NSH   | Low    | 0     | 0      | 0     | Unknown     | Unknown     | High   | Modeled | Unknown     | Unknown     |            |           |     | 0 50 |
| striped maple               | <i>Acer pensylvanicum</i>           | NSL   | Medium | 0     | 0      | 0     | Unknown     | Unknown     | Medium | Absent  | Unknown     | Unknown     |            |           |     | 0 51 |
| Ohio buckeye                | <i>Aesculus glabra</i>              | NSL   | Low    | 0     | 0      | 0     | Unknown     | Unknown     | Medium | Modeled | Unknown     | Unknown     |            |           |     | 0 52 |
| cittamwood/gum bumelia      | <i>Sideroxylon lanuginosum ssp.</i> | NSL   | Low    | 0     | 0      | 0     | Unknown     | New Habitat | High   | Absent  | Unknown     | New Habitat |            |           |     | 0 53 |
| pignut hickory              | <i>Carya glabra</i>                 | WDL   | Medium | 0     | 0      | 0     | New Habitat | New Habitat | Medium | Absent  | New Habitat | New Habitat |            |           |     | 0 54 |
| shagbark hickory            | <i>Carya ovata</i>                  | WSL   | Medium | 0     | 0      | 0     | New Habitat | New Habitat | Medium | Absent  | New Habitat | New Habitat | Migrate +  | Migrate + |     | 3 55 |
| black hickory               | <i>Carya texana</i>                 | NDL   | High   | 0     | 0      | 0     | New Habitat | New Habitat | Medium | Absent  | New Habitat | New Habitat |            |           |     | 0 56 |
| mockernut hickory           | <i>Carya alba</i>                   | WDL   | Medium | 0     | 0      | 0     | New Habitat | New Habitat | High   | Absent  | New Habitat | New Habitat |            |           |     | 3 57 |
| sugarberry                  | <i>Celtis laevigata</i>             | NDH   | Medium | 0     | 0      | 0     | Unknown     | New Habitat | Medium | Absent  | Unknown     | New Habitat |            |           |     | 0 58 |
| eastern redbud              | <i>Cercis canadensis</i>            | NSL   | Low    | 0     | 0      | 0     | New Habitat | New Habitat | Medium | Absent  | New Habitat | New Habitat |            |           |     | 2 59 |
| flowering dogwood           | <i>Cornus florida</i>               | WDL   | Medium | 0     | 0      | 0     | Unknown     | Unknown     | Medium | Modeled | Unknown     | Unknown     |            |           |     | 0 60 |
| American beech              | <i>Fagus grandifolia</i>            | WDH   | High   | 0     | 0      | 0     | New Habitat | New Habitat | Medium | Absent  | New Habitat | New Habitat | Migrate +  | Migrate + |     | 3 61 |
| blue ash                    | <i>Fraxinus quadrangulata</i>       | NSL   | Low    | 0     | 0      | 0     | Unknown     | Unknown     | Low    | Absent  | Unknown     | Unknown     |            |           |     | 0 62 |
| honeylocust                 | <i>Gleditsia triacanthos</i>        | NSH   | Low    | 0     | 0      | 0     | New Habitat | New Habitat | High   | Absent  | New Habitat | New Habitat | Migrate +  | Migrate + |     | 3 63 |
| sweetgum                    | <i>Liquidambar styraciflua</i>      | WDH   | High   | 0     | 0      | 0     | Unknown     | New Habitat | Medium | Absent  | Unknown     | New Habitat |            |           |     | 0 64 |
| yellow-poplar               | <i>Liriodendron tulipifera</i>      | WDH   | High   | 0     | 0      | 0     | New Habitat | New Habitat | High   | Absent  | New Habitat | New Habitat |            |           |     | 3 65 |
| Osage-orange                | <i>Maclura pomifera</i>             | NDH   | Medium | 0     | 0      | 0     | New Habitat | New Habitat | High   | Absent  | New Habitat | New Habitat |            | Migrate + |     | 3 66 |
| bigleaf magnolia            | <i>Magnolia macrophylla</i>         | NSL   | Low    | 0     | 0      | 0     | Unknown     | Unknown     | Medium | Absent  | Unknown     | Unknown     |            |           |     | 0 67 |
| mountain or Fraser magnolia | <i>Magnolia fraseri</i>             | NSL   | Low    | 0     | 0      | 0     | Unknown     | Unknown     | Low    | Absent  | Unknown     | Unknown     |            |           |     | 0 68 |
| red mulberry                | <i>Morus rubra</i>                  | NSL   | Low    | 0     | 0      | 0     | New Habitat | New Habitat | Medium | Absent  | New Habitat | New Habitat |            | Migrate + |     | 3 69 |
| blackgum                    | <i>Nyssa sylvatica</i>              | WDL   | Medium | 0     | 0      | 0     | New Habitat | New Habitat | High   | Absent  | New Habitat | New Habitat |            |           |     | 2 70 |
| sycamore                    | <i>Platanus occidentalis</i>        | NSL   | Low    | 0     | 0      | 0     | New Habitat | New Habitat | Medium | Absent  | New Habitat | New Habitat |            |           |     | 3 71 |
| blackjack oak               | <i>Quercus marilandica</i>          | NSL   | Medium | 0     | 0      | 0     | New Habitat | New Habitat | High   | Absent  | New Habitat | New Habitat |            |           |     | 0 72 |
| Shumard oak                 | <i>Quercus shumardii</i>            | NSL   | Low    | 0     | 0      | 0     | New Habitat | New Habitat | High   | Absent  | New Habitat | New Habitat |            |           |     | 0 73 |
| post oak                    | <i>Quercus stellata</i>             | WDH   | High   | 0     | 0      | 0     | New Habitat | New Habitat | High   | Absent  | New Habitat | New Habitat |            |           |     | 0 74 |
| black locust                | <i>Robinia pseudoacacia</i>         | NDH   | Low    | 0     | 0      | 0     | New Habitat | New Habitat | Medium | Absent  | New Habitat | New Habitat | Migrate ++ | Migrate + |     | 3 75 |
| sassafras                   | <i>Sassafras albidum</i>            | WSL   | Low    | 0     | 0      | 0     | New Habitat | New Habitat | Medium | Absent  | New Habitat | New Habitat |            | Migrate + |     | 3 76 |

