



## HABITATS

### South Dakota Forests

---

---

# URBAN FORESTS

## What Is An Urban Forest?

While South Dakota is known as a rural state, it does have a number of urban centers, such as Sioux Falls, Rapid City, Aberdeen, and Watertown. These cities, and the other 306 incorporated communities, are home to 71% of the state's population. In New England and other parts of the eastern United States, early European settlers needed to clear land to build villages and towns. On the prairies, the European settlers had to plant trees! You can still spot a nearby prairie town by looking for a water tower and a large cluster of trees.

## What Are Urban Forest Growing Conditions?

Depending on the size of the community, growing conditions can be much different than the surrounding prairie. In Sioux Falls, large areas are covered by asphalt, concrete and other building materials. This creates summer temperatures warmer than the surrounding area. This is why large cities are called "heat islands." The winter temperatures are a little warmer also. Wind velocities and the relative humidity are generally lower. While the warmer winter temperatures and reduced wind speed mean that trees can be planted farther north in cities than they can in the countryside, the hotter, drier summers are tougher on all trees.

Not only is the *microclimate* in a city dif-

ferent from the surrounding countryside, so are the soils. In cities, most of the natural soils have been disturbed or removed. The rich, well-drained natural soils have been replaced with sterile, poorly-drained earth mixtures. Because of the composition of materials used to construct and maintain buildings and roads, the soils become more *alkaline*. The soils are also low in oxygen because of the pavement and compaction from foot traffic.

Air pollution from cars and industry can stunt the growth of trees. While road salt saves lives by reducing the amount of ice on roads and highways, it can also injure trees. The salt spray damages the winter buds, which causes the shoots to grow abnormally the following spring.

## Why Are They Important?

Many times tree planting projects are called beautification projects because of the pleasing shapes and patterns, fragrant blossoms, and seasonal splashes of color that they provide. But, trees provide more than beauty. Trees reduce air pollution. They help settle out, trap and hold *particulate pollutants* that cause human health problems. Trees absorb carbon dioxide and other gases and, in turn, replenish the atmosphere with oxygen.

Strategically placed trees can be as effective as other energy saving home improvements. Planting shade trees in the

right location around a house can save up to 30% in air conditioning costs. Evergreens planted on the north and west side of a house to serve as a wind-break can reduce heating costs by 10% to 50%.

Urban trees provide essential shelter and food for a wide variety of songbirds, small mammals, and other wildlife that are comfortable living close to people. Conifers, such as spruce, that are green all winter long, are the most beneficial types of tree shelter in urban forests. The fruits, seeds, foliage, buds, and insects associated with urban trees are all valuable sources of food for animals. And of course, the trees provide prime nesting habitat for birds and squirrels. In many city cemeteries of South Dakota, people can even see great horned owls nesting in the tops of the bigger trees.

### **What Trees Are Best Suited To Urban Areas?**

Probably the worst threat for trees in urban areas is the poor soil, particularly the low oxygen levels in these soils. Tree roots need to breathe to live and, if the roots do not receive enough air, they begin to die. As they die, the top of the tree begins to die. Surprisingly, one group of trees has adapted to growing in soils containing low oxygen levels. They are the same trees that naturally occur on

flood plains. These trees periodically have their roots covered by water when a river floods. This same flood often deposits a new soil layer as the waters retreat. The flooding and new soil deposits reduce the oxygen level of the soil, so trees growing in this environment must adapt. Some species can move oxygen down from the trunk, others can develop new roots very quickly, but regardless of their adaptive strategy, they can survive low oxygen sites. This means flood plain species are usually the ones best suited to urban sites. Some of our most common urban shade trees, American elm, basswood and silver maples, are all flood plain species.

### **What Trees Are Most Popular In S.D. Cities?**

South Dakota is a large state with a variety of climate and soil conditions. The best trees to grow in Yankton are not the same for Buffalo. The most popular trees throughout the state today are honeylocust, hackberry, and green ash. American elm used to be a popular tree until Dutch elm disease entered the state. While elms are no longer widely planted, they are still very common in many communities. Information on these trees can be found in fact sheets in the S.D. Flora section under trees. Several other commonly introduced tree species are written in Natural Source fact sheets.

#### **Glossary**

**Microclimate** - the climate in the immediate vicinity of a location.

**Alkaline** - having the qualities of a base (pH greater than 7) that can neutralize acids.

**Particulate pollutants** - soot or other fine substances that contaminate the air, often arising from industrial smokestacks or car exhaust.

#### **References**

Ferrell, E.K., P.E. Collins and W.G. Macksam, 1957. Trees of South Dakota. Cooperative Extension Service Circular 566. SDSU.

Fowells, H.A., 1965. Silvics of Forest Trees of the U. S. USDA Agriculture Handbook No. 271.

Mall, G and S. Young, 1992. Growing Greener Cities. Living Planet Press, Los Angeles, California.

#### **Written by:**

Dr. John Ball, SDSU, Brookings, SD 57007.

Dave Erickson, SD Division of Forestry, Pierre, SD 57501.

Brian L. Garbisch, student in Wildlife and Fisheries Science Dept., SDSU, Brookings SD.

#### **Reviewed by:**

Craig Brown, SD Division of Forestry, Watertown, SD 57201.

Publication of the *Urban Forests* fact sheet was funded by the S.D. Department of Agriculture, Division of Forestry, Pierre, SD.