

G1405

Landscape Sustainability

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This NebGuide describes how you can use aesthetic, functional and environmentally sound design principles to create a sustainable landscape.

“Sustainable landscapes” commonly describes landscapes that support environmental quality and conservation of natural resources. For many people, a sustainable landscape is hard to understand or visualize. Other terms such as xeriscape, native landscape and environmentally friendly landscape have been used interchangeably to describe sustainable landscapes.

A well-designed sustainable landscape reflects a high level of self-sufficiency. Once established, it should grow and mature virtually on its own – as if nature had planted it. This self-sufficiency can be difficult to attain, however, due to the environmental stresses and artificial conditions placed on plants in urban areas. In addition, many residents may not be comfortable with the informality (less plant pruning, use of native plants which may lack the desirable aesthetic features of typical landscape plants, etc.) normally reflected in a sustainable landscape.

Adjusting to an informal landscape may take time for many homeowners, but implementing just one or a few principles of sustainable design can significantly benefit home landscapes. These benefits may include enhanced landscape beauty; less environmental decline; more effective use of water, pesticides and other chemical resources; more valuable wildlife habitat; and cost savings from reduced maintenance, labor and resource use.

Aesthetic and Functional Design Principles

There are many design principles typically reflected in a well-designed landscape. Although sustainable landscapes may appear more “natural” and less manicured, they still rely on all of the standard design principles to create a visually appealing combination of plants and materials.

Aesthetic principles including accent, contrast, harmony,

repetition and unity ensure the design is attractive, visually compatible and has a “sense of fit” with the surrounding landscape.

Functional principles dictate the design will be usable and will meet certain health and safety criteria. For example, drainage must be routed away from the foundation of a home, sidewalks and outdoor spaces should be sized appropriately for homeowner and visitor use, and landscapes should include areas dedicated to private, public and utility needs.

Environmental Design Principles

Environmental design is the third category of design principles. The focus of these principles is to:

- 1) enhance landscape microclimate,
- 2) increase biodiversity,
- 3) reduce resource inputs and resource waste, and
- 4) maximize re-use of resources.

The diagrams on pages 2 and 3 illustrate how these principles can be implemented in a typical residential landscape.

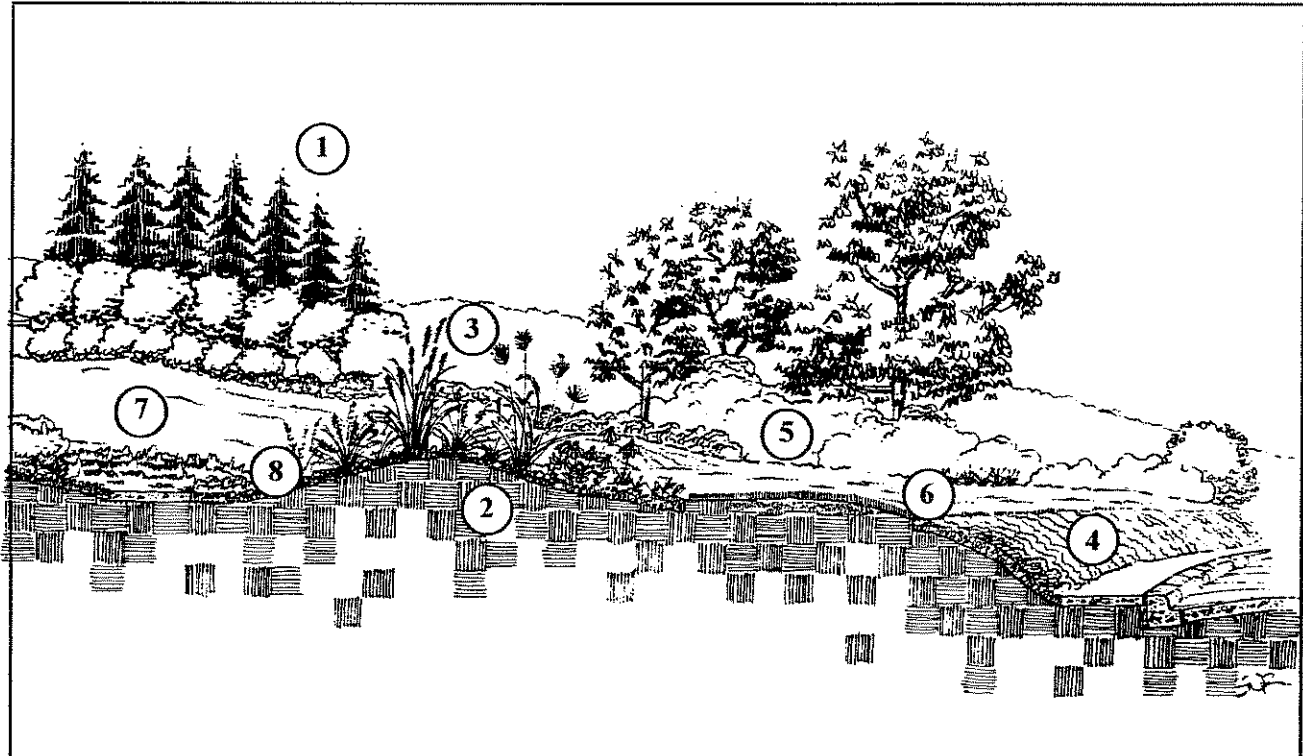
Enhancing landscape microclimates can be accomplished through channeling or screening winds, shading structures and outdoor living areas from the summer sun while providing for winter sun exposure, and increasing or decreasing humidity (or the perception of humidity) through adjustments in air movement. These enhancements can lead to lower energy and water use, healthier plants which are capable of resisting diseases and insects with less chemical assistance, and more usable outdoor living space.

Biodiversity refers to the natural variety of plants, animals, fungi and microorganisms found in all ecosystems. Increasing biodiversity, whether in a backyard, neighborhood park or along regional creek brings many benefits to landscapes.

Planting landscapes that more closely reflect native plant communities can enhance biodiversity. To achieve this,

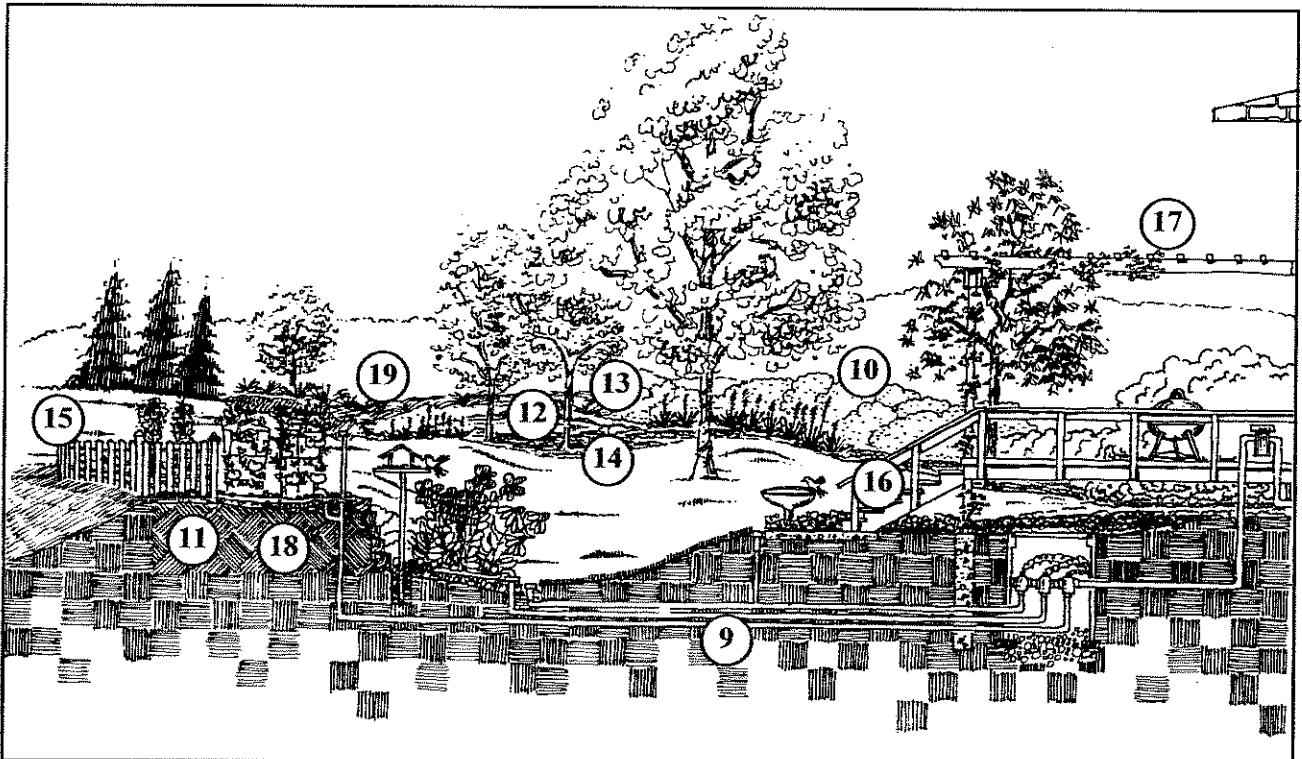
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Selecting Sustainable Design Prin



1. Windbreaks and shelterbelts conserve energy, control drifting snow, provide food and shelter for wildlife, screen unwanted views, filter dust and noise, and create microclimates which benefit plant health.
2. Berms (gradually sloped mounds of soil) help define landscape spaces by creating sloping "walls" along pathways or between different areas, elevate plants for better visibility, and improve drainage and growing conditions for plants in poor soil.
3. Ornamental grasses tolerate a wide variety of conditions, provide food and cover for wildlife and offer year-round visual interest. Many of these ornamental grasses are native to the Great Plains.
4. Groundcover plants used on steep slopes eliminate dangerous turf mowing conditions, lessen precipitation runoff and soil erosion, and provide additional visual interest and biodiversity.
5. Grouping similar plants into masses creates a stronger visual impact and interest in the landscape, copies natural plant community structure, and produces stronger edges in the landscape which are important for both aesthetics and habitat.
6. Selectively use higher maintenance turfgrasses in areas of high visibility, access and use.
7. Use lower maintenance turfgrasses and prairie or adapted grasses in areas of low use and access (not necessarily low visibility).
8. Use organic mulch in all planting beds to increase soil water retention, reduce weeds, visually strengthen bed lines through the color and texture contrast between the mulch and turf, minimize short-term swings in soil temperatures, and enhance soil structure and organic matter content.

Principles in a Residential Landscape



9. A properly designed, installed and calibrated irrigation system minimizes uneven or wasteful water application.
10. Group plants with similar water needs to avoid over or underwatering.
11. Use drip irrigation for shrub beds and other beds to minimize water waste.
12. Properly select plants for the conditions in which they are placed (example: sun and wind exposure, soil type and soil moisture conditions). Properly selected plants will ensure a healthy landscape with minimal need for chemicals or additional management.
13. Landscape "vertically" as nature does. Placing small plants and groundcovers under small trees under large trees enhances both visual and biological diversity.
14. Creating wildlife habitat draws birds and other animals, which add to the aesthetics of the landscape and offer biological control of unwanted insects.
15. Composting garden waste and applying the resulting organic matter in the landscape improves growing conditions and recycles valuable resources.
16. Using recycled and/or local-source building materials (plastic lumber, prairie fieldstone, etc.) can help develop markets for recycled products, lessen product and installation costs and visually tie developed landscapes to the character of natural landscapes.
17. Manipulating microclimates by using overhead vines, shade structures and trees enhances the livability of outdoor spaces.
18. Raised beds improve access to plants, make it easier to manage the soil, and improve growing conditions by increasing soil aeration and drainage.
19. Where feasible, use plantings to connect developed landscapes with natural landscape areas. These integrated landscapes are considered more environmentally valuable than small, scattered areas of vegetation.

develop understory/overstory vegetation similar to the layering of plants in a natural forest. Biodiversity also assumes plants are placed in conditions and environments where they would naturally grow. Biodiversity also can be increased by:

- using plants which provide habitat for wildlife and year-round aesthetic interest;
- considering alternative methods of storm drainage management such as detaining water on-site and allowing it to percolate through porous surfaces, or implementing flood control measures along creeks that are sensitive to existing vegetation and habitat; and
- preserving existing natural areas in urban settings that provide habitat as well as aesthetic or recreational value.

Reducing resources and minimizing waste in a landscape can be accomplished in many ways. For example, by choosing the correct plants and their locations, watering, pruning, and chemical applications will be reduced. Accepting insects and diseases that are not life-threatening to landscape plants (some leaf feeding or leafspot is OK, for example) is another way to reduce chemical use and other resources. Applying mulch to the soil under plants reduces weed growth that in turn reduces chemical treatments and use of gas-powered trimming equipment. In addition, the mulch improves soil quality over time, minimizing water waste caused by run-off and evaporation.

Soils are typically the most misunderstood and undervalued resource in urban landscapes. Soil quality and character significantly affect the growth and health of plants, and should be major considerations in landscape installation.

Whenever previously undisturbed landscape areas are slated for construction, the top 6 inches of soil should be scraped off and stockpiled. Save the soil and reuse it as the final layer of soil once construction is completed. Since a substantial

amount of root growth occurs in the top 6-12 inches of soil, this reused soil can significantly enhance the establishment and growing conditions for new plants. Drain-age and water retention are improved, oxygen storage is increased, and the living organisms in the soil are healthier. Whenever the topsoil is not available for reuse due to removal or severe compaction, organic amendments such as compost should be incorporated into the remaining soil to enhance its ability to support newly established plants.

Maximizing recycled resources has recently received notable attention in the form of recycling campaigns for everything from newspapers to used tires. Effective sustainable design not only incorporates recycled materials (paving materials, mulches, building materials, etc.), but also addresses how communities can recycle for the good of their landscapes.

Composting can be designed into a residential backyard garden for kitchen and yard waste, and also can be designed into a regional solid waste program aimed at reducing landfill while providing a source of organic matter for city/county park sites.

Getting Started

By implementing the principles outlined in this NebGuide, Nebraska's residential landscapes can be made more sustainable. Applying even the most basic of these principles — proper plant selection and placement for example — can benefit the aesthetics, environment and budget of the typical home landscape. Properly selected plants are healthy plants that have fewer insect and disease problems and therefore require less maintenance. Properly sized trees and shrubs need little pruning, and drought-tolerant perennials need minimal irrigation.

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