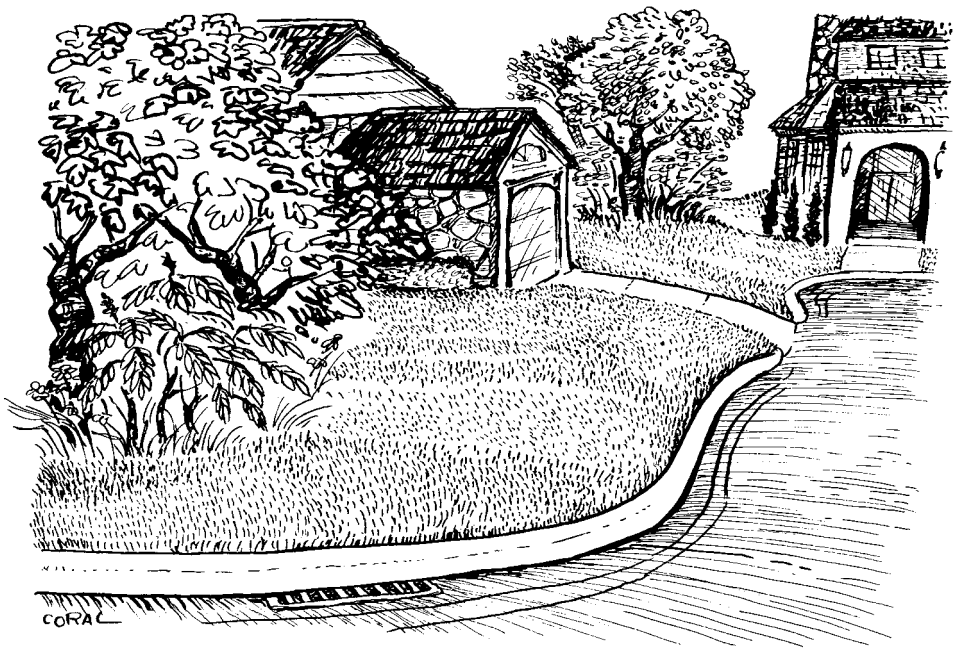


Chapter 8: Heavily Used Areas Can Contribute to Biodiversity

Heavily used areas, such as urban areas, residential areas, industrial developments, military bases, roadsides and parks must meet certain human needs, limiting their value for biodiversity. However, these areas can be planned and managed so they can have some value for biodiversity conservation and minimize negative impacts on natural resources.

Greater diversity yields more diverse options for environmental designers who must endeavor to incorporate a balance between natural systems and human activities on the earth's surface. Without recognition of the potential for conserving biodiversity, the designer's attempts to create sustainable solutions are limited. Biodiversity provides natural design opportunities that can lead to more creative solutions. Often the best designs are built around the natural patterns present, which the designer can use as the basis for a sustainable design solution.

Sustainable designs are those that have the potential to last and evolve with a minimum of wasteful energy inputs. Greater diversity of plant and animal life actually helps maintain the system. Designs that are artificial usually require continual energy inputs, making the project cost much higher in the long-term. Artificiality depends in part on wasteful practices to reverse natural processes. A monoculture such as a lawn is a good example of energy waste and the requirement for the production and use of environmentally damaging products. A greater diversity of species allows the system to evolve and come into balance as it provides for a more natural environment and for even greater diversity of organisms.

The skilled environmental designer has the ability and knowledge to recognize the biodiversity that

already exists within a system and the potential for even greater diversity. Such a designer seeks out the necessary information and expertise in order to perform appropriate inventory and analysis before making design decisions. Lower client costs and more attractive design solutions will result in a higher public appreciation of biodiversity and a sustainable environment. This awareness will increase the demand for skilled environmental design professionals and aid in the marketability of design services.

Biodiversity has great aesthetic value to many people. Natural communities and fish and wildlife are increasing in popularity for their beauty. Homeowners increasingly are interested in using native plants in their landscaping to attract various wildlife species, especially birds and butterflies. Natural areas and developments designed to blend into the surrounding environment are more appealing to many people than highly altered and structured developments.

Natural environments offer an abundance of recreational opportunities that have been largely ignored, especially in the urban setting. Although most outdoor recreational activities are associated with rural areas, many also can be enjoyed in suburban and urban environments. Nature parks or greenbelts with native vegetation provide areas for children and adults to explore and gain direct contact with the environment. Interpretive trails provide opportunities for relaxing exercise while educating visitors about biodiversity. Wildlife viewing, bird feeding, walking along nature trails, hunting, fishing and other nature-related activities allow people to escape from their hectic schedules and enjoy the intricacies of a functioning natural community.

Another benefit of enhancing biodiversity is the potential for reducing the need for additional regulations, or even for easing current regulations. Incorporating biodiversity concerns into our activities will provide additional habitat for species that are declining and keep them from needing special protection. Populations of species currently listed as threatened or endangered may recover and no longer need individual attention. Other environmental regulations, such as those ensuring water quality, might be less necessary as ecosystem health improves. Incorporating biodiversity into economic activities can ensure the greatest flexibility in land management and limit regulations to those necessary only for controlling irresponsible actions that degrade our environment.

Ways Heavily Used Areas Can Contribute to Biodiversity

Planning

Environmental planning provides an important tool to assist with decision-making at any development scale. The process involves the careful inventory of natural and cultural resources and the analysis of these identified resources in order to provide environmentally sensitive and sustainable development. Rather than planning a construction project and leveling the area to match the plan, proper planning should focus on designing the project to "fit" the existing landscape or natural community. As our resources are finite, it is necessary to conserve and replenish the environment, providing for maximum biodiversity within a variety of habitats. Negative impacts from unplanned activities or greatly altered landscapes lead to environmental degradation and require costly monetary and energy expenditures to redress the balance.

All activities have environmental repercussions and careful planning can help alleviate the resulting costs. This process can be applied at the site scale, where the location and orientation of objects on the land will have a direct impact on the desired outcome. This either results in a balance or a costly imbalance requiring necessary energy inputs. The improper location of human development can result in direct damage to the environment, such as the location of a landfill over an aquifer, resulting in the eventual need for expensive water treatment. More subtle and indirect impacts such as loss of habitat have more permanent impact, causing loss of biodiversity that results in our inability to benefit from the natural environment.

When environmental planning is employed, the results can provide an appreciation and enhancement of the natural world. Sensitivity to complex biodiversity allows us to observe nature in a variety of settings. A greater diversity provides us a greater capacity for understanding our role as part of a complex system. Our future will therefore depend on responsible environmental planning.

Education or Recreation

Many urban organizations conduct or support environmental education programs. These usually focus on topics or issues that are relevant to the group's interests. Schools, governmental agencies and private organizations educate a variety of age levels about biodiversity and conservation. Outdoor classrooms provide active educational activities and direct benefits for biodiversity through habitat development and improvement. Likewise, nature parks provide recreation, education and conservation functions.

Management Practices

Today, land resources are under tremendous pressure for housing, industry, recreation, farming and other uses. With our escalating population growth, this trend can be expected to continue, leading to disastrous and irreversible effects on biodiversity. However, local, state and federal agencies, municipalities and private landowners can positively impact biodiversity through a balanced approach to land use. Aldo Leopold stated, "When we see land as a community to which we belong, we may begin to use it with love and respect. There is no other way for land to survive the impact of mechanized man."

As land is developed, numerous opportunities arise to preserve relatively undisturbed land resources essential to maintaining biodiversity without significantly hampering development. It is important specifically to preserve a diversity of native habitats. For example, when developing an area consisting of prairie and wooded bottomland, one might be prone to preserve only the wooded areas. This could decrease the biodiversity potential in the area, depending upon adjacent land uses. Many techniques also are available to restore and enhance developed land to foster biodiversity conservation objectives. For example, greenways or corridors can be established and maintained within floodplain areas. Upland reserves or natural areas can be conserved with linkages maintained by these greenways or corridors. This can and should cross property boundaries and should be accomplished on both small and large scales. In other words, to preserve biodiversity in developing areas, land-use patterns should consist of a mosaic of natural and developed areas, with the natural areas interconnected by corridors. This

reduces or eliminates natural-area fragmentation and isolation, which greatly decreases biodiversity. Other techniques include:

- Reducing or eliminating artificial boundaries and barriers, such as certain types of fencing and reservoir dams.
- Constructing wetlands for wastewater and stormwater treatment and wildlife habitat.
- Restoring channelized stream systems and naturally vegetated floodplains.
- Constructing wetlands in conjunction with farm ponds or urban park ponds.
- Preserving, restoring and enhancing a diversity of native habitats (e.g., woodlands, prairies, wetlands) and wildlife populations specific to the ecoregion.
- Restoring or mimicking natural patterns of disturbance, such as fire and flooding.
- Retaining snags, rock outcrops and other natural features.
- Using biological pest controls whenever possible
- Using native plants for landscaping in urban and suburban areas, as opposed to traditional non-native ornamentals.

In accomplishing the above tasks, one should always keep in mind the big picture. Landowners should know which ecoregion they are in. This will give direction to land-use and management efforts, thereby ensuring the sustainability of that ecoregion. As an example, a landowner living in the Central Great Plains ecoregion would not necessarily want to encourage the establishment of wooded uplands, but rather a prairie with wooded bottomlands. Ideally, landowners should work with their neighbors when managing their lands to better coordinate and complement each other's management practices.

Ways Heavily Used Areas Can Enhance Biodiversity

Landscaping for Biodiversity

Traditional landscaping, in general, focuses on creating an environment that contrasts significantly with the natural communities that characterize the area. Because many people concentrate on a relatively small number of plants for landscaping, both residential and industrial yards show little variation among different regions of the state or nation and little

consideration is given to plants that might occur there naturally. Most of the popular landscape trees, shrubs and flowers provide minimal benefit for native wildlife species like birds and butterflies. As a result, many urban areas provide little benefit to biodiversity and often serve as sources of invasive exotic plants that degrade biodiversity in surrounding areas.

The benefits of using native plants in landscaping are many. Many native species are as attractive in landscaped situations as popular exotic ornamentals. These add to the beauty of the yard by attracting wildlife to native food or cover. Native plants are adapted to the local environment and require less input of fertilizer, pesticides and water than exotics. By featuring native species, landscapers can develop a yard that is unique to their ecosystem.

One unfortunate restriction in using native plants is the difficulty in locating sources for them. Many species that are ideally suited for landscaping are not commercially available or are very difficult to locate. Most people are unaware of these species and select readily available exotics. These plants should not be collected from public lands and only a few specimens should ever be transplanted from wild populations occurring on the owner's property. Native species should be produced commercially and promoted in local nurseries. Most of the wildflower mixes that are commercially available contain several exotic species that are able to reproduce in the wild. Although some native species may be readily obtained, a concerted effort should be directed toward expanding the market and supply for many of Oklahoma's native plants.

Design yards for wildlife. Homeowners can help conserve biodiversity by designing their yards to resemble natural communities. Because yards must serve several functions, they cannot be expected to exactly replicate natural conditions. However, homeowners can incorporate habitat into the landscaped yard in many ways. Because of Oklahoma's wide range of ecosystems, it is difficult to make general recommendations that would be applicable to all yards in the state. In some eco-regions, planting native trees and shrubs to approximate a forest would be beneficial for biodiversity. However, in western ecoregions where prairies are the dominant feature, planting trees and shrubs that might invade prairies could actually degrade the region's native diversity. Therefore, homeowners should determine what natural communities are typical of their area and concentrate on these.

"Wildscaping" yards attracts wildlife, providing hours of enjoyment and enhancing the yard's aesthetics.

Below are some generalized recommendations on attracting wildlife to your yard:

- Feature species native to your part of the state.
- In forested ecoregions, plant trees, shrubs and vines that produce small fruits or nuts. Select those that will provide a variety of vertical layers (ground, shrub, small tree, tree).
- In prairie-dominated ecoregions, create miniature prairies of native grasses and wildflowers.
- Plant wildflowers that attract hummingbirds and butterflies.
- Plant a variety of trees, shrubs and other plants in clumped arrangements to attract more wildlife species.
- Create rock and log piles for lizards to bask and hide in.
- Provide a water source.
- Build a pool or small wetland for frogs, toads and dragonflies.
- Uncap chimneys for chimney swifts.
- Erect bird and bat houses to attract beneficial insect-eaters.
- Provide bird, hummingbird and butterfly feeders.

- Provide a variety of foods (seeds, nuts, fruit, suet and nectar).
- Minimize pesticide use and allow your wildlife to control pests.
- Retain snags (dead trees) in safe areas for woodpeckers and other cavity nesters.

A Few Recommended Oklahoma Plantings

Wildflowers for Butterflies

Purple coneflower	Butterfly weed
Black-eyed Susan	Sunflowers
Blazing star	Indian blanket
Bee balm	*Coreopsis*

Wildflowers for Hummingbirds

Salvia	Bee balm
Coral honeysuckle	*Penstemon*
Trumpet creeper	Cardinal flower
Fire pink	Jewelweed (east)

Native Trees

Hackberry/sugarberry	Red maple (east)
Oaks	Pecan
Black walnut	Persimmon
Deciduous holly	Wild plum
Flowering dogwood (east)	Black gum (east)

Native shrubs

Blackberry	Rusty blackhaw
Elderberry	Yaupon holly (east)
American beautyberry	Rough-leaf dogwood
Sumac	

Native Vines

Coral honeysuckle	Passionflower
Trumpet creeper	Cross vine
Virginia creeper	Greenbriar
Grape	

In all cases, landscapers should conduct some research to determine which plants are native to their ecoregion and are suited for their local conditions. The Oklahoma Native Plant Society and state service foresters are among those with information on native plants suitable for landscaping. Not only will the information help in designing the landscape, but it also will enhance the owner's appreciation and ability to manage the plants.

In general, low-maintenance yards are more attractive to wildlife than those that are highly manicured. Naturally growing shrubs and trees provide more fruit and better nesting and escape cover than trimmed shrubs or hedges. Buffalo grass, a native turf grass, requires minimal amounts of fertilizer and water and only needs occasional mowing. Low-maintenance landscaping also helps biodiversity by lowering water demand and decreasing the inflow of chemicals into downstream aquatic communities.

Yards landscaped for wildlife can be very attractive and appear well maintained. The Oklahoma Nongame Wildlife Program operates a "Wildscapes Program" that provides information on attracting wildlife to yards and certifies yards that meet certain criteria as "wildscapes." The National Wildlife Federation and National Institute for Urban Wildlife operate similar programs on a national level.

Include biodiversity in development plans. Although development for housing or industrial use often destroys natural communities, proper planning and design can minimize these impacts and allow biodiversity and development to occur together.

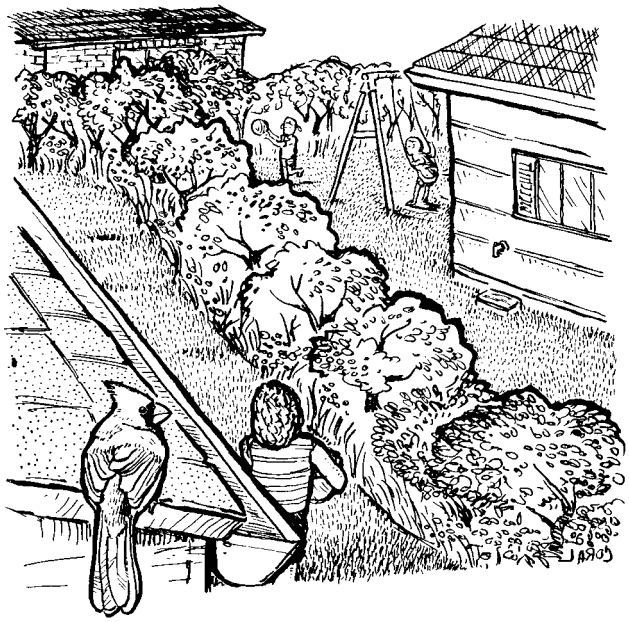
During construction, special features—wetlands, streams or caves—should be identified and avoided. In forested areas, the developer can leave as many trees and shrubs undisturbed as possible to retain the forested nature of the site. Small or especially valuable trees that must be removed may be transplanted into a yard area. Cleared brush may be mulched and used to prevent erosion during construction or to create brush piles for wildlife. Minimal soil disturbance and erosion controls will help minimize sedimentation of nearby streams. The Natural Resources Conservation Service, Urban and Community Forestry Program, operated by Oklahoma Department of Agriculture—Forestry Services, and private consultants can help landowners or developers with these planning efforts.

A few undeveloped lots could be planted with native trees, shrubs, grasses and wildflowers to serve as temporary nurseries for residents of the new development. Trees and shrubs that must be cleared could be moved to these lots. As the remaining lots are developed, plants in the nursery lots could be used by new homeowners for landscaping purposes. These

plants also could be used for landscaping greenbelts in the subdivision to provide wildlife habitat. As these plants are removed, the lots could then be developed. Not only will this improve biodiversity by making native plants easily available to homeowners for landscaping, but it also will provide habitat while the nursery plots are remain undeveloped.

Planned greenbelt or common areas may be designed as wildlife habitats to attract desired species, such as birds and butterflies, to the subdivision. These should resemble the natural communities present in the area. Trails could be built to encourage residents to use greenbelts for exercise and relaxation. Interpretive signs would inform visitors about the wildlife and plants present and increase their appreciation for the site. Birdhouses could be erected and monitored by residents. Bat houses would encourage bats to use the area and control mosquitos near water. These areas also could serve educational purposes for nearby schools.

For professional advice about minimizing development impacts or enhancing the area's biodiversity, planners should consult with appropriate governmental agencies or private environmental consultants.



Developing habitats in greenbelts and other common areas can enhance their attraction for residents.

Outdoor Classrooms. Outdoor classrooms have proven to be effective tools in science and environmental education. Often including features such as wetlands, prairies and wildlife gardens, these areas provide hands-on opportunities for students to learn about subjects being taught in the classroom. Outdoor classrooms are constructed on suitable parts of the school's property and can be incorporated into the overall landscaping of the school yard. Grants or cost-share programs are available to assist with the construction of wetlands or other features on the project site. Trails and interpretive signs allow students, and even nearby residents, to explore the habitats and observe wildlife activities. Experiments and direct observation periods are incorporated into the classroom schedule and allow the students to learn about Oklahoma's natural communities.

Reduce Mowing

Although mowing is necessary for maintaining short vegetation in many circumstances, our culture has become enamored with the belief that un-mowed areas are "wastelands" or neglected. Although diverse, multilayered forests are viewed as beautiful, grasslands are expected to be uniform in composition and height, usually short. This has caused many areas, such as roadsides, state parks, greenbelts and other large public areas to be mowed for aesthetic reasons alone. Not only does this impact the area's biodiversity, but it also is very expensive to maintain.

Although mowing can help maintain habitat for prairie species, frequent mowing also reduces nest success for ground- and shrub-nesting birds and impacts other forms of wildlife as well. In many cases, mowing on a two- or three-year rotation would be sufficient to keep woody shrubs from invading grassland areas of concern.

Roadsides must be maintained relatively free of woody vegetation to maintain visibility for drivers. However, entire rights-of-way do not need to be mowed frequently to maintain them as grasslands. In forested ecoregions, wide rights-of-way could be planted with native trees and shrubs to minimize mowing needs without creating hazards for drivers. Only the federally required width immediately

adjacent to the roadway and hazardous intersections should be mowed multiple times per year. However, drivers often call the Department of Transportation, Turnpike Authority or county commissioner if the right-of-way does not appear "well kept." Although many of these areas are relatively narrow, some rights-of-way, especially along turnpikes, could provide valuable prairie habitat. Roadsides also may be important renesting areas for birds whose nests have been destroyed on bordering areas.

This mowing bias extends to regulations requiring residents of most cities to maintain their yard vegetation below a specified height. Although the intention of these ordinances may be to keep lawns from appearing "weedy," they impose serious restrictions on knowledgeable individuals who wish to feature grasslands in their gardens, even though their design and structure may be well planned and aesthetically appealing. The belief that unmowed grassy areas result in the presence of dangerous wildlife is often unfounded and based on a lack of knowledge about the wildlife that are assumed to be dangerous.

The public needs to be informed about the importance of grassland habitats and the wildlife and plants that depend upon them. People should learn that the dry, dead-looking period associated with prairies is necessary to allow wildflower seeds to mature and bloom beautifully in the future. Signs explaining why an area is not mowed frequently have been useful for reducing public demand for mowing in some circumstances.

Minimize Chemical Usage

Excessive chemical use is common in urban and other high-use areas. Because nearly all vegetative conditions desired in these areas are monocultures and are managed to grow continuously, heavy chemical applications are required to maintain these areas in such unnatural states. These chemicals impact biodiversity in the application area and also can travel into surrounding locations. The most significant impacts occur when chemicals enter aquatic communities through wind-blown drift, storm sewers, runoff water or groundwater.

Manicured lawns require extensive amounts of fertilizers, herbicides and pesticides. Because small quantities are used with each application, most homeowners are unaware of the impact they have on the surrounding environment. They also tend to have less training in handling and applying the chemicals than agricultural operators and misuse them more frequently. Lawn chemicals—primarily fertilizers and insecticides—are the most common cause of fish die-offs and degrade aquatic communities even when dead fish are not observed. These impacts seldom are attributed to a single application, but result from the combined chemical usage of many homeowners. Homeowners should become familiar with the chemical requirements of their lawns and with proper application procedures. Tolerance of low levels of weeds or insects also would help reduce chemical usage.

Salting ice or snow on roads not only causes rust problems for vehicles but also is toxic to vegetation growing near the road. Although a single application may not kill plants, the salt will accumulate during successive applications. Alternative methods of ice control should be explored to lessen this impact while controlling snow and ice for travel safety. Urea, ashes and sand are some possibilities that may have lower impacts on adjacent communities.

Parks: More Than Swingsets and Ballfields

Although the importance of greenspace, such as greenbelts and parks, has been recognized to ensure a good quality of life, the value of these areas for biodiversity is usually very limited. City parks typically are a series of ballfields and playgrounds with little value for wildlife or biodiversity. Although these are important parts of the community, open spaces could be designed to provide a wider variety of recreational opportunities for residents.

Traditional parks could be designed to include wildlife habitat between ballfields or in corners. Golf course roughs could feature natural communities, such as forests or prairie communities, and water traps could be turned into wetlands that would be useful to wildlife. Harvester ant colonies and sandy areas should be maintained to keep horned lizard colonies as a unique attribute of Oklahoma's parks. Birdhouse trails could be established if volunteers were available to maintain them. Park managers could experiment

with incorporating chimney swift towers into playground equipment to see if the birds will tolerate the disturbance associated with such an arrangement. If successful, this arrangement would provide some relief for this migratory bird, as more people cap their chimneys and make them unavailable for nesting.

Nature parks featuring interpretive trails through natural habitats provide opportunities for residents to escape from the rigors of urban life. These parks often feature a variety of habitats and provide a refuge for many species in an otherwise unsuitable area. The trails allow visitors to explore natural communities and observe species that normally would require a drive into a rural area. Nature parks are especially valuable for field trips to introduce students to natural habitats.

Subdivision greenbelts featuring natural communities could serve as miniature nature parks, allowing residents to enjoy regular contact with the environment. Interpretive trails similar to those in the larger nature parks would allow them to be used for exercise and education. Designing greenbelts in this manner would greatly enhance their value for biodiversity and add to the enjoyment of subdivision residents.

Habitat Banking

In some cases, development cannot occur without negatively impacting biodiversity. In circumstances in which federal funding or permits are involved, the developer is required to mitigate unacceptable impacts in wetlands. Traditionally, the most common method of mitigation is to purchase and manage a specified amount of land away from the development site. This mitigation site usually contains natural communities similar to those that are impacted.

Nature parks provide opportunities for urban residents to observe nature first-hand.

Because small tracts of land usually have limited potential for enhancing biodiversity, "habitat banking" with proper guidelines may have greater potential for meaningful mitigation when suitable alternatives cannot be found. A habitat bank is a large tract of land managed specifically for biodiversity, usually by a governmental agency, to which developers can make mitigation payments. Developers within a limited radius of the habitat bank can "buy" credits in the bank to mitigate for specific unavoidable impacts. Once the specified number of credits attributed to that particular habitat bank are used up, a new habitat bank must be established or the present one must be improved or expanded to offset additional habitat losses. Although this concept currently is used primarily for wetlands impacted by transportation projects, it could be expanded to other community types. Private landowners or companies also might be able to operate a habitat bank by managing their property for biodiversity.

Although this concept holds promise by creating some large areas managed for biodiversity, caution must be used while detailing the way these habitat banks will operate to ensure that biodiversity is not ultimately compromised. This is not an attempt to allow developers to become careless or ignore habitat concerns while planning a project, but to create a workable solution for both parties when negative impacts of development cannot be avoided.

Control Exotic Species

Because heavy-use areas such as urban areas and roadsides are highly altered from their natural conditions, exotic species often are able to out-compete native species and become the most dominant species present. People living in urban areas also plant or release exotic species with little regard for their potential to spread. Indiscriminate release of unwanted pets, such as cats and rodents, and planting of invasive plants, such as Japanese honeysuckle and tree-of-heaven, often cause significant impacts to biodiversity. Many of these introduced species become major pest species in the urban environment. Examples include house mice (the dominant pest rodent in cities), pigeons, European starlings, house sparrows and dandelions.

Exotic species should be tested to determine whether they are likely to establish self-sufficient populations in Oklahoma's environments before they are marketed to the public. Those species having a significant ability to spread should be restricted to prevent their escape.

In cases where introduced species invade sensitive areas, landowners should be encouraged to control them. There is some evidence that certain mowing intervals help control Johnson grass and goats may be used to control Japanese honeysuckle. In some cases herbicides may be required to reduce the levels of a problem species. Large concentrations of European starlings, house sparrows and pigeons provide opportunities for removing high numbers of these species with relatively little effort. All birdhouses should be monitored and any nests of house sparrows and starlings should be removed. Chronic nesting areas of these species may be altered to prevent their continued reproduction.

Control efforts should be preceded with public education to explain the reasons behind the effort and build public support for the activity.

Minimize Illegal Dumping

Dumping trash in inappropriate areas causes unsightly conditions and, especially when pollutants or hazardous materials are involved, can damage natural communities. Many communities are addressing the dumping problem attempting to aprehend individuals using areas having chronic dumping problems.

In rural areas, waste disposal is difficult since there are few locations to properly dispose of trash. Some states have addressed this problem by placing dumpsters in rural areas for use by residents. However, funding must be available to empty the dumpsters so the sites do not become overcrowded with trash. Containers for recyclable materials also could be provided to encourage recycling in rural areas.

Outreach

Education is vital to the success of achieving implementation of this chapter's recommendations. Individuals who will be involved with and affected by

these recommendations should be informed about their importance and benefits. A variety of techniques is necessary to disseminate information to the varied audiences represented in heavily used areas. Each audience should be informed about the concept of biodiversity and its importance to Oklahoma. Recommendations included in educational materials should be tailored to each audience.

Seminars, workshops or presentations at meetings should be designed to inform appropriate public employees, businesses and chambers of commerce about these recommendations. Information about resources, expertise, grants and cost-share programs should be included in these seminars. Some workshops could be made available as continuing-education credits for the targeted groups to encourage them to attend.

Municipal, county and state employees involved with planning and management of public areas should receive information about managing for biodiversity in parks, roadsides, public building yards and other areas under their responsibility. Nursery specialists and developers should be educated about landscaping for biodiversity and about native plants that are useful in a landscaped setting. Potential ecotourism or other biodiversity-related economic interests should be discussed with and promoted by local chambers of commerce.

University programs for community developers, economic developers and other related professions should include recommendations about managing biodiversity in their coursework and continuing education programs. New ideas could be generated and tested to improve biodiversity options in these areas.

A program should be created to certify municipal parks, developments and greenbelts that incorporate biodiversity concerns into their construction and management activities. This program could be linked to the Nongame Wildlife Program's "Wildscapes Program" for homeowners. Developers, homeowner associations and municipal park managers could complete applications and submit them for certification. Sites that meet criteria outlined in the application would receive a sign and certificate recognizing the site as having special value for biodiversity. This would provide public recognition of the efforts of these groups to enhance biodiversity.

Several products should be developed to inform homeowners about ways they can enhance biodiversity in their yards. A card with general facts about developing backyard habitats should be developed and offered to realtors and chambers of commerce to be given to customers or included in welcome packets. These could be printed by the realtor or chamber. More detailed information with recommendations specific to the local ecoregion could be distributed by nurseries to aid customers in landscaping for biodiversity. Videos about backyard habitats and biodiversity management in urban areas would be an effective tool for reaching large numbers of individuals.

Information should be distributed through mass-media outlets to generate interest and prompt people to investigate ways they can enhance biodiversity. Television and radio shows and newspaper sections on gardening would be good outlets for backyard habitat information. Business sections of newspapers would be valuable in gaining the attention of developers and other professionals who could incorporate biodiversity into their activities. A home page on the Internet including biodiversity recommendations and information would be a valuable outreach tool. All of these and other sources should be explored and included in outreach efforts.

Summary

Although urban and other heavy-use areas have relatively little potential for providing direct benefits for biodiversity, they can enhance biodiversity by mimicking natural communities and educating the public to build support for conservation efforts. Encouraging homeowners to develop backyard habitats not only improves the biodiversity in their yards, but also educates them about conservation issues. A larger focus should be placed on developing a market for native plant species in landscaping to allow these areas to resemble natural communities to the greatest extent possible. Noxious or invasive exotic species should be controlled, especially in problem areas, and new introduced species should be tested before being placed on the market. Nature parks, greenbelt habitats, outdoor classrooms and other facilities could be provided so residents will have opportunities for observing biodiversity. Subdivision developers should be informed on the benefits of weaving biodiversity concerns into project plans. In all cases, these recommendations are attempts to allow biodiversity to complement these heavily used areas and support economic growth.