

Chapter 6: Conservation and Recreation Activities Can Enhance Biodiversity

Conservation

High levels of biodiversity are very important to members of Oklahoma's conservation and recreation organizations. Most of these organizations, such as the Oklahoma Chapter of The Nature Conservancy, the Oklahoma Native Plant Society and the Oklahoma Ornithological Society, were formed expressly to conserve biodiversity. Other groups, such as the Audubon Society, the Sierra Club and the Safari Club are composed of people who enjoy many aspects of outdoor recreation, ranging from viewing panoramas to birdwatching to hunting and fishing. Members of these groups spend large amounts of time directly observing portions of the state's biodiversity.

Two professional societies in the state, The Wildlife Society and American Fisheries Society, are composed of professionals involved in the research or management of Oklahoma's biodiversity. Because of Oklahoma's variety of natural communities, members of these organizations have many choices and opportunities to enjoy their recreational activities under a range of settings. They are able to become familiar with the biodiversity that occurs across a wide gradient of natural communities. Oklahoma's biodiversity is the very foundation for the existence of these groups and their activities.

The variety of natural communities occurring in Oklahoma provides the ecological foundation for the state's wide range of outdoor recreational opportunities. Birdwatchers can develop an extensive life list of species seen without ever leaving the state's boundaries. Hunters enjoy the opportunity to pursue many game animals that occur in different ecoregions.

Tourists can select from a collection of sceneries and environments to visit. By conserving Oklahoma's biodiversity, we will maintain our variety of recreational opportunities and the elements that make Oklahoma unique.

The assortment of natural communities and species that occur in Oklahoma provides direct links to Oklahoma's past. Relict examples of communities or species populations isolated from the rest of their range show how Oklahoma's topography and climate have changed. By studying the distribution of these communities, we are able to revisit our past and speculate about what Oklahoma was like during the time period when these communities were more widespread.

A very important impetus for conserving our wealth of biodiversity is to maintain the opportunity for any future uses that might be discovered. The search for uses of plants, animals and communities is far from complete and conserving these ensures that they will be available when uses are discovered.

Most of the interactions that result in the natural communities that occur in Oklahoma are not completely understood. By ensuring that a variety of species and interactions exist in these communities, we do not risk interrupting some important link in the community's functions. Oklahoma's biodiversity has been very influential in the state's development, and will affect the course the state will take in the future.

Ways Conservation and Recreation Groups Benefit Biodiversity Conservation

Protection of Natural Areas

Conservation and recreation organizations are actively protecting sensitive natural areas. Some natural communities or species are especially sensitive and require special management or protection from incompatible uses. Whether these are on public or private land, groups are attempting to identify and conserve them. Surveys are being conducted to assess the plant and animal populations of each site so that rare species may be conserved. When new areas are identified, efforts are made to inform the landowner about the special resource and assist them in its conservation.

Because some natural communities, such as bat caves, wetlands and areas with rare species, may be easily degraded, protection is important to maintain the biodiversity they support. Conservation groups often concentrate their efforts on these sensitive areas because they are rare or easily lost and can be very difficult to restore.

In some cases, the sensitive area is purchased by a conservation agency or organization. In others, the landowner may wish to sign a voluntary agreement, easement or lease that protects the resource or area of concern. In cooperation with the Oklahoma Department of Tourism and Recreation, The Nature Conservancy operates the Oklahoma Natural Areas Registry Program that works directly with landowners to voluntarily protect sensitive resources.

In other cases, various organizations form cooperative agreements to protect or manage a particular site in a specified manner to enhance the sensitive resource. These agreements often are between governmental agencies and private groups for publicly owned land.

Sensitive natural areas protected by conservation and recreation groups include a variety of natural communities and are scattered among Oklahoma's ecoregions. Individual members of conservation and recreation groups often keep abreast of development plans and attempt to work with responsible parties to minimize impacts of development. For example,

Oklahoma Native Plant Society members relocate rare or beneficial plants in areas to be cleared or paved for road construction or other developments.

Other groups concentrate on conserving resources with traditional or cultural uses. For example, the Cherokee Nation works with landowners to conserve and maintain availability of a variety of plant species that are used in medicinal or other cultural practices. The conservation of these plant species depends upon maintenance of the health of the natural communities in which they occur.

Management and Stewardship Activities

In most cases, mere protection is not sufficient to maintain the health of natural communities. Most of Oklahoma's natural communities require some kind of management. Because many of the disturbances or functions that historically shaped Oklahoma's landscapes, such as floods, fire and bison grazing, have been disrupted or eliminated by settlement, active management is now necessary when conserving biodiversity. Most often these activities are designed to alter the vegetative cover in ways similar to historic disturbances.

Some areas, such as portions of some state parks, wildlife management areas and federal wildlife refuges, are managed, either permanently or during critical periods (e.g., nesting, migration or wintering), as refuges. Access into these areas is limited, restricted or prohibited, which allows species to be undisturbed during parts of their life cycle when they are most vulnerable.

Examples of areas where natural communities are managed to promote native plant and animal species are the Tallgrass Prairie Preserve, which is owned and managed by The Nature Conservancy, and state and federal wildlife management areas and refuges. Both federal and state wildlife agencies also are actively involved with managing certain species, such as shorebirds and endangered species, and in restoration of wetland communities and improvement of other important habitats.

In addition to management for native species, specific measures are sometimes used to control or eliminate exotic species such as zebra mussels, kudzu, Johnson grass and Bermuda grass. Exotic species often pose serious threats to areas managed for

Oklahoma's native species. Mechanisms to prevent their invasion and eliminate existing populations are very important in managing biodiversity.

Some agencies and private organizations manage sizeable tracts of land for maximum overall community diversity. This may result in an associated increase in biodiversity when the natural communities managed are native to the region. Some sites are managed for specific goals—such as moist-soils units, greentree reservoirs or bottomland hardwood areas, riparian areas, forests and grasslands—and provide biodiversity value by enhancing the health of the target community.

Most public entities charged with land management, when feasible or compatible with primary management objectives, encourage multiple use of appropriate portions of their lands. Examples of alternate uses include seasonal horseback or bicycle riding, hiking, camping, photography, wildlife viewing, hunting, fishing, trapping, boating and picnicking. Careful management of access and types of visitation can reduce impacts of the multiple uses. Encouraging the public to have direct contact with natural communities and their species increases public awareness about Oklahoma's biodiversity and factors that influence it. It also builds a broader base of citizens who might become involved in biodiversity management on their property, and increases public support for efforts of governmental agencies.

Members of a variety of organizations volunteer their time to help manage or monitor species populations on both publicly- and privately-owned natural areas across the state. Whether these activities are assistance for a specific management goal, such as trash cleanup, vegetation control, or burning, or supplying the area manager with information about trends in species populations, volunteers provide services that would otherwise be unavailable due to budget and personnel constraints.

A good example of volunteer management is the Canadian River Least Tern Preserve in Norman. The Natural Areas Registry Program has worked with a number of landowners along the Canadian River to protect colonies of endangered least terns. The Cleveland County Audubon Society sets up signs around the colonies alerting people to the presence of least terns, decreasing disturbance of the protected

nesting area. Volunteers monitor tern nesting progress and success with some funding from the Oklahoma Nongame Program.

Research

Most conservation and recreation organizations in Oklahoma do not directly fund or conduct research on biodiversity; however, activities of many organizations indirectly contribute greatly to our information bases on the distribution and abundance of species.

The Oklahoma Native Plant Society is an organization that conducts several annual field trips. Information from these trips and from other activities are sometimes incorporated into state floral lists and specimens are deposited into state herbaria.

The Oklahoma Ornithological Society contributes both indirectly and directly to biodiversity research and participates each year in the Breeding Bird Survey and Nest Card Program. It also maintains a database on noteworthy bird sightings through the Oklahoma Bird Records Committee, publishes the *OOS Date Guide to the Occurrences of Birds in Oklahoma* and supports research on Oklahoma birds. Information gathered from these surveys is used for state and national biodiversity research projects such as the National Biological Service's Gap Analysis Project.

The Nature Conservancy is an internationally-based organization with state offices that supports biodiversity research on its lands. The Tallgrass Prairie Preserve in northeastern Oklahoma is currently the subject of several research studies, some of which are funded by the Conservancy. These include an ecological analysis of historical information that is being used to develop a restoration and management strategy for the preserve, and a landscape-level analysis of the effects of bison reintroduction on the preserve. State chapters of national professional organizations, such as the American Fisheries Society and The Wildlife Society, typically do not fund biodiversity research; however, they have traditionally supported biodiversity conservation through public service and political-action activities and are becoming increasingly more active in this arena.

These represent just a few examples of research-related activities by some of Oklahoma's conservation and recreation organizations. Research activities will

likely increase in the future with heightened awareness of the need for basic information on the distribution, abundance and value of the state's biological resources.

Education

Educational efforts increase the public's awareness and appreciation of biodiversity. An understanding of the value and importance of biodiversity helps create a willingness and commitment to conserve it. Conservation and recreation organizations play an important role by making sure that these opportunities are available for everyone throughout the state. These organizations, through their meetings, field trips, special programs and exhibits and publications, educate both their members and the general public about Oklahoma's natural diversity.

For instance, the Oklahoma Native Plant Society assists homeowners wanting to use native plants in landscaping. They provide information about how native plants are more desirable in landscaped areas, ranging from biodiversity value to cost-effectiveness through reduced chemical and water requirements and labor.

Many organizations have regular meetings and field trips that expose the public to biodiversity and allow direct contact with nature. The Sierra Club has camping and hiking outings and various chapters of the Audubon Society have frequent birdwatching field trips. Oxley (Tulsa) and Martin Park (Oklahoma City) nature centers and the Sierra Club involve inner-city youth in outdoor activities. The Nature Conservancy's Natural Areas Registry Program, sponsored by the Oklahoma Department of Tourism and Recreation, educates private landowners about rare natural features on their properties. State and federal agencies have additional outreach programs concerning management of natural communities, wildlife management, recycling and other pertinent topics.

Political Action

Because many actions that benefit or degrade biodiversity are influenced through governmental policies, regulations or statutes, political action by conservation and recreation organizations may have significant benefits for biodiversity in Oklahoma.

Some of Oklahoma's conservation and recreation organizations politically express their concerns about issues impacting biodiversity in a variety of ways and in varying degrees. Citizens can express their views by writing or calling their elected officials. Both the Sierra Club and Oklahoma Wildlife Federation have lobbyists to promote their views with the state legislature.

Individual Actions

Many Oklahomans who are not affiliated with a conservation or outdoor recreation group also participate in many of these activities in varying degrees. People develop habitat in their yards or on their property for wildlife. Some state parks and nature centers in the state have volunteer programs to help with management of the area. Many more individuals who are not affiliated with any organization also enjoy, and work toward preserving, Oklahoma's biodiversity simply by recycling, observing antilitter laws and in a myriad of other ways by being good citizens.

Ways to Improve Biodiversity Conservation

Regional Coordination

One important way conservation and recreation organizations can improve biodiversity conservation is to increase networking and cooperation to coordinate their efforts. By coordinating efforts toward common goals, groups can enhance their effectiveness and not duplicate each other's efforts. The combined knowledge and volunteer force of these groups could be a significant benefit in managing biodiversity in their area. For example, very little coordination occurs among the state's chapters of the Audubon Society and other birding organizations. Other groups, devoted to conserving bats, plants and unique habitats share similar goals with organizations devoted to managing habitat for game species, such as Ducks Unlimited. When these groups coordinate on specific projects within the state, they achieve greater success for the resources they value.

Concerned parties, including conservation and recreation groups and landowners, should develop regional goals for the mix of natural communities in each ecoregion of the state. Specific needs could be identified and prioritized to meet these established goals. Organizations could then concentrate their



By cooperating to reach common goals, conservation and recreation groups can increase their effectiveness.

efforts on highest priority needs for an ecoregion to improve biodiversity in their area. Groups could work with landowners, both public and private, to implement practices that would achieve these specified goals.

Funding

Stable funding is necessary for conducting a program to adequately address biodiversity needs of the state. This funding is needed to conduct necessary inventories, monitoring and research to provide information on our biodiversity. Funds are needed to implement the Biodiversity Plan and ensure that sound biodiversity management is implemented statewide.

Historically, hunters and anglers have provided the primary funding for wildlife conservation efforts. However, the responsibilities for and benefits derived from biodiversity extend far beyond this portion of the population. A much broader funding base is needed to adequately address biodiversity management in Oklahoma. One suggested mechanism is a surcharge on equipment used for outdoor recreation and wildlife watching, similar to the very successful programs

supported by hunters and anglers.

One important use of these monies could be incentives or cost-share programs to assist landowners in conserving or restoring natural communities. Many landowners cannot afford to restore prairies, for example, because seeds of prairie plants are expensive and require special planting equipment. Providing monetary or other assistance to landowners would encourage them to manage for biodiversity.

Inventory and Monitoring

Many conservation organization members are experienced in sampling populations of a variety of species. These skills could be valuable for surveying large tracts of land or special natural features. For example, members of the Oklahoma Ornithological Society conduct annual Breeding Bird Surveys and Audubon chapters conduct Christmas Bird Counts. Groups should work with interested landowners to survey plants and animals occurring on their land. Many landowners would like to know what species they have but will not allow professional biologists to survey their land for fear of regulation. In such cases, landowners might be more willing to allow members of private organizations to inventory species on their land. Groups could incorporate these surveys into their field trips. If a rare species is found during a survey, the organization could bring it to the landowner's attention and work with them to protect the species.

Another way to utilize member skills is to hold workshops to train landowners and managers to inventory and monitor populations on their land. Managers of areas where rare species have been found should be special targets for these workshops so they could monitor their population of rare species. Other managers also would benefit from the ability to monitor the effects of their activities.

Management

Because many people are accustomed to manicured landscapes, they view unmowed areas as being weedy and unkempt. Neighbors and city ordinances pressure landowners to keep their land "clean" and not allow it to "grow up." This attitude extends to public lands and makes it difficult for managers to leave areas natural because people complain to public officials. This is especially problematic in state parks and along

road rights-of-way. Conservation organizations could assist managers by providing signs explaining why an area is not mowed. Not only would these signs show that the area is being purposefully left unmowed, but they also would educate the public about the value of wildlife habitat. Two programs administered by the Oklahoma Department of Wildlife Conservation (Acres for Wildlife and Oklahoma Wildscapes) include a sign landowners can erect to help raise awareness.

Although urban areas usually are ignored in biodiversity management schemes, residential owners can provide some benefits to biodiversity. Yards can be landscaped to resemble natural communities characteristic of their ecoregion. Homeowners can use native plants to create natural communities, such as prairies, forests and wetlands, in their yards to provide wildlife habitat. Careful research should be given to determine which natural communities are appropriate. For example, homeowners might be cautioned about planting a large number of trees and shrubs—a common recommendation for attracting birds to yards—in ecoregions where prairies dominate. Likewise, yards in eastern forests should feature forest plants to reduce fragmentation of these communities. Creating communities that do not occur in an ecoregion may cause declines in biodiversity by fragmenting existing communities. A major problem in western ecoregions is that prairies are not valued as much as trees and shrubs in landscaped yards. Conservation groups in these areas need to demonstrate the beauty of a well managed prairie yard to show homeowners that these communities can be suitable for home landscapes.

Conservation and recreation groups could offer technical assistance to landowners interested in improving the biodiversity of their properties for biodiversity. Members with knowledge about managing natural communities could help landowners develop management plans to improve biodiversity. Members also could help owners manage existing native communities as well as establish or restore natural communities by providing seed or labor. Members experienced with prescribed burning could provide valuable assistance in conducting burns to improve prairie or savanna communities. These types of volunteer activities would be especially valuable for

public lands.

Incorporate Biodiversity Conservation with Recreational Activities

Although outdoor recreation allows citizens to learn about and become concerned for biodiversity, outdoor enthusiasts must practice caution to ensure that their activities do not destroy the resource they are enjoying. Irresponsible practices or ignorance can result in severe negative impacts to an area's biodiversity. Although littering, poaching and irresponsible camp fires are the most publicized, other activities have equally significant, though less visible, results. Attempting to get close to wildlife for observation may disrupt their behavior and increase their risk of being captured by a predator. Picking wildflowers along public trails can result in poor reproduction or even the disappearance of the species. Hiking and camping outside established sites in high-use areas degrades the entire area. This not only reduces the diversity of the site but also lowers its recreational value.

Along with the privilege of enjoying the outdoors comes a responsibility to be good stewards. Visitors should attempt to leave the area in the same condition, or better, that it was before they arrived. Many organizations have produced codes of ethics for recreationists in their field. Persons practicing that type of activity should review the code of ethics and follow it closely to minimize their negative impacts on the natural communities. Persons should focus on enjoying the outdoors rather than narrowly focusing on their particular activity.

One way recreationists can provide positive impacts for the areas they use is to maintain lists of species with which they are familiar and give them to the landowner or manager. Hunters, due to the amounts of time they spend in a hunting area, can increase their enjoyment by recording wildlife they see. Bird watchers commonly fill out checklists of bird species seen during an outing. These could be expanded to include other wildlife and wildflowers. Native plant enthusiasts also could make lists of species they observe during outings. These lists should be copied for the landowners to help them with their inventories of species occurring on their area. This could be especially useful for publicly owned

land. These lists could be reviewed by experts and then used for management and to inform visitors of species they can find on the area.

Education

Outdoor organizations should increase educational outreach efforts. These efforts should include informa-



By recording observations and giving them to the manager, visitors can contribute to the management of public lands.

tion about Oklahoma's biodiversity and proper ways to minimize negative impacts.

Getting the public involved in activities associated with biodiversity is a valuable tool in educating them about this resource. Information should be distributed about the range of activities (such as hunting, fishing, birdwatching and hiking), locations and times of the year to enjoy recreational opportunities. Efforts should be made to publicize the network of Watchable Wildlife Areas (WWAs), which are open to the public for observing wildlife. April is designated as Watchable Wildlife Month and special programs are held at many WWAs. These and other opportunities to observe and enjoy nature should be promoted. Additional areas could be developed to give more opportunities for enjoying Oklahoma's biodiversity.

Volunteers can provide valuable contributions to biodiversity education by presenting programs at various public forums. Programs on biodiversity provide opportunities to excite school children about our rich natural heritage and interest them in becoming involved in various outdoor activities. On-site programs about the biodiversity occurring on a given area (e.g., a state park) provide valuable information to visitors about the types of plants and wildlife they might observe. These programs also give volunteers an opportunity to explain how natural communities function and stress the relationships that occur among species, further increasing appreciation for biodiversity.

The use of native versus exotic species needs to be stressed in as many instances as possible. Interrelationships among species, such as **sympiosis** (two or more species benefiting from one another), and community functions and health should be a major portion of biodiversity education.

Conservation and recreation organizations could conduct workshops in their areas to train school teachers, educators, public employees and landowners about biodiversity conservation. These would be useful in distributing information about certain topics so attendees could relay that information to others or incorporate it into their management practices. Some topics for these workshops might include managing residential areas for biodiversity, overviews of the state or ecoregion's biodiversity, or how to manage a particular community.

Organizations or ecotourism industries could offer tours to allow the public to view Oklahoma's biodiversity. Some of these are currently available, such as the fall foliage tours in eastern Oklahoma. Many organizations also hold regular field trips. These could be expanded to attract more of the public. Tours should not only impress guests but also educate them about the resource or phenomenon they are observing. Providing information about the natural communities or phenomenon being featured by the tour would increase the understanding and appreciation viewers have for the subject matter and their enjoyment of the outing.

Change in Public Perception

Public perceptions result in unnecessary impacts on biodiversity in a number of fields. Natural communities or wildlife habitat may be viewed as unsightly or undesirable. In some cases, these misconceptions cause increased expense and labor for the landowners. Conservation and recreation organizations could help change these perceptions by informing the public about the benefits to be gained by a change in attitude. Targeted perceptions are discussed below.

(1) **Intensively manicured lawns.** Highly manicured lawns provide very little benefit to most wildlife, while the fertilizers and pesticides used there contribute to pollution problems in streams and lakes. City ordinances, in some cases, restrict the landowners' abilities to provide habitat in the form of prairie or wildflower plots. Yards left in a more natural state not only attract wildlife, which add color and interest to the yard, but also lower maintenance costs.

(2) **Demand for manicured roadways, parks, farms, etc.** This lawn image extends to other lands as well. A common belief is that land managers are neglecting their duties if grasslands are not neatly mowed and woodlands do not look like city parks. This even extends to roadsides through rural parts of the state. "Clean farming" involves the management of a farm with an appearance of a manicured lawn. "Weedy" corners are mowed or sprayed to maintain a "clean" appearance. Many farmers mow areas regularly simply to prevent them from "growing up" and for weed control. All of these actions reduce bio-

diversity.

(4) **Managing areas to be weed or pest free.** Managing areas to be completely free of native "weeds" or "pests" requires intensive efforts, expense and chemicals. In most cases, there is little need for complete removal of unwanted species. Management should focus on maintaining these species at levels at which their impacts are minimal or tolerable.

(5) **Fire in the ecosystem.** Misconceptions about the role of fire in the management of natural communities range from fear and total suppression to pyromania. The public needs to be aware that fire plays a vital role in Oklahoma's natural communities. However, they also need to realize that fires must be carefully planned and conducted.

(6) **Management or conservation versus preservation.** To many people, the best way to conserve biodiversity and unique resources is to remove human influences from the area and protect it from any outside forces. Although this type of protection or preservation may be necessary in some special cases, pure hands-off preservation often results in degradation of the natural communities present because it interrupts natural processes. The public needs to understand that our communities often require management if their diversity is to be maintained.

(7) **Food plots.** Many people equate good wildlife management with planting food plots of cultivated or exotic crops. Emphasis should be shifted to providing food and cover for wildlife through managing natural communities. Because food is not necessarily the limiting factor for most species, managing the communities will provide all of the needs for the targeted species. If certain areas are planted as feeding areas, favored native food plants should be used.

(8) **Misconceptions about species.** Beliefs that a species is harmful to humans have resulted in the purposeful destruction of many wildlife populations. Snakes and bats probably are the most maligned groups in Oklahoma. Myths and fears about these animals cause people to kill them when they are found. These myths should be dispelled, and the benefits that can be gained from these species should be promoted.

(9) **Need to restrict human access to some areas.** In some cases, it may be necessary to restrict human access to some publicly owned areas during a critical period, such as the nesting season or hibernation period for a particular sensitive species. Whenever this action is needed, the public needs to be informed of the reasons access must be limited.

(10) **Inappropriate plantings.** Many people seem to believe that one of the best things to do for wildlife is to plant trees. Planting exotic species contributes to biodiversity losses. Rather than simply planting trees or shrubs to attract wildlife, the public should be encouraged to restore natural communities characteristic of their ecoregion.

(11) **Value of key species in the community.** Although the functions of every species within natural communities are not clearly understood, Oklahoma has several species that play key roles for the survival of a number of other species. The public needs to understand that these are not “worthless varmints” but are important to the functioning of the whole community. Some examples of species considered as pests that are vital to other species include prairie dogs, woodpeckers, harvester ants and native mice and other rodents.

(12) **Building residences in scenic areas.** Building residences in remote or scenic areas often

creates problems for wildlife or biodiversity other than the impact of construction. Living in remote areas brings people into intimate contact with wildlife species and may cause conflicts. This often is true when the landowner moved to the area simply because of its aesthetic appeal. Other construction often is



Hands-off preservation often causes loss of diversity; most of Oklahoma's habitats require management.

conducted in the area and, ultimately, the initial beauty is destroyed.

(13) **Scenic is not equivalent to high biodiversity.** Although areas having high levels of biodiversity are aesthetically attractive, some situations that appear to be very scenic may have very poor biodiversity. This often is the case with exotic species or areas such as reservoirs or rivers where natural processes have been interrupted, causing major changes in the community. For example, many large rivers in the western half of the state supported very few trees or riparian forests. Flood-control measures have allowed cottonwoods, willows and saltcedars to form riparian forests along the river banks. Although these woodlands are scenic, they have significant negative effects on species that once occurred along these river corridors.

(14) **Humans must conquer nature.** The belief that humans must fight or conquer natural forces has

become deeply ingrained in our culture. We have begun to believe that humans can and must be in control of every aspect of our environment. This results in many activities that create direct conflicts between humans and processes needed to maintain our biodiversity. We should focus on positioning our activities so natural forces complement or do not conflict with our actions. Massive efforts directed at flood control to protect housing and businesses built in floodplains are a good example. These flood control measures, such as building reservoirs, often encourage further development and compound the problem. Then, when the truly large flood event occurs, damage can be significantly greater than if the original flood control structures were never built.

Outreach

Information about biodiversity conservation should be a regular portion of conservation and recreational organization activities. Most organizations hold periodic meetings, often on a monthly basis. These meetings would be an excellent forum to feature speakers knowledgeable about biodiversity and discuss things the group could do to enhance biodiversity conservation. Newsletters should include articles on biodiversity and ways members can benefit it. Other materials produced by these groups could incorporate biodiversity concepts whenever they are relevant.

Conservation and recreational organizations should work with other interests, such as agricultural organizations, to further biodiversity conservation in the state. All interests would benefit from the others' expertise and experience.

Informational efforts should begin by focusing on groups that already participate in forms of outdoor recreation, such as hunting, fishing and hiking. These people already have a general interest in biodiversity. Learning more about the resource they enjoy would enhance the quality of their experience and build support for its conservation. By broadening the focus of their activities, they would be able to make even greater contributions to biodiversity conservation.

Standardized data sheets should be developed and distributed to groups so they can record observations

they make during their field trips in a manner that would allow the information to be useful to land managers. Although they should be reasonably simple to be of value, these forms should identify the types of information needed for each observation. The Oklahoma Gap Analysis project or other geographic information system-based efforts might be able to use some of these data if they included the appropriate information. A standardized form would ensure that all of the necessary information is included and would be simple for the observer once they became familiar with the form. Some training might need to be offered to some groups to inform them of specialized techniques if required.

Educational materials, such as brochures or fact sheets, about biodiversity should be developed and distributed by the organizations, to members and non-members.

Field trips and other group activities could be used to attract nonmembers and inform them about biodiversity. Special activities such as field trips or youth hunts should be advertised and biodiversity information should be a part of the activity. Serving refreshments or giving door prizes during regularly scheduled meetings often is effective in increasing audience numbers.

Conservation and recreation organizations should find ways to encourage landowners to conserve biodiversity. Public recognition of landowners that have made significant contributions to biodiversity can be used as a reward. Even simple verbal or written

appreciation to a landowner or company for a particular action would be valuable for developing a relationship. Paying field trip fees to the manager or helping them design other ecotourism opportunities would help the landowner realize the importance of the resources on their property. All of these actions could be carried out as a group or on an individual basis.

Summary

Each group that uses natural areas should be encouraged to actively participate in the conservation of existing protected sites and seek out new ones. Group members must be instructed to utilize such places without harming them and instruct the public by setting examples. They should work with individuals or groups with different interests, even though they disagree on some issues, because biodiversity conservation requires the efforts of everyone. Not every individual or group needs to practice every recommendation because even small changes on large amounts of land may result in significant improvements. Groups should take advantage of opportunities to enhance biodiversity or educate an audience as they present themselves and not wait for what is perceived to be the ideal situation. All age levels and interests should be included in educational efforts. Conservation groups must show consideration for the needs of landowners and companies that demonstrate a willingness to work with those who are interested. Finally, they must stress that the sooner actions are taken, the fewer species will be lost and the more effective restoration efforts will be.