

PARKS &
ILLINOIS RECREATION *WEB*

EXTRA!

July/August 2006

An Environmental Toolkit

for

**Park Districts, Forest Preserves, Recreation and
Conservation Agencies**



Developed by
the Illinois Park and Recreation Association Environmental Committee

July 2006





Table of Contents

Overviews	2
Purchasing	14
Environmental Education and Interpretation	22
Wise Use and Protection of Air, Water, Soil, and Wildlife	28
Open Space Planning and Preservation	36
Reduction and Handling of Waste	43
Wise Use of Energy Resources	47
Index	51
Authors	51
Endnotes	52

Vision and Criteria for Recommendations

The recommendations in the following chapters were considered and evaluated to meet the following criteria:

1. **Endurance-** Improvements made will provide long-term benefits for the agency.
2. **Feasibility-** Improvements are realistic and fit within the scope of local government agency responsibilities, resources and funding.
3. **Collaborative possibilities-** Improvements made will support local and regional collaborations saving agency time and money and supporting grant possibilities.
4. **Cost-effectiveness-** Improvements made will provide long-term cost-savings
5. **Time-effectiveness-** Improvements made provide long-term agency efficiency



Purchasing Overview

The production, use and disposal of many office, recreation and maintenance products contributes significantly to the pollution of the air, water and soil and the destruction of natural communities of plants and animals. Making environmentally responsible choices when buying for the workplace and at home can mean the difference between an environment safe for all living things, including people, and a planet contaminated with toxic pollutants. Being a “green” consumer certainly does not mean giving up convenience or functionality of products. It simply means having awareness in regards to how our purchases impact the planet and our local environments as well. As parks and recreation agencies, we can make a statement about our dedication to the current and future health of the earth and its life.

Strategies to Purchase Responsibly

- 1. Purchase products with recycled content wherever possible.** By purchasing recycled content products, energy and resource use are reduced. Buying recycled content products diverts items from landfills and reduces waste. Buying recycled benefits the economy and ensures a demand for recyclables.
- 2. Encourage the conservative use of paper and wood in place of virgin plastics and other non-biodegradable and non-renewable products.** Try to purchase plastic alternatives. If after research, plastic seems to be the “best” overall choice for a product, be sure that the plastic item is recycled/recyclable.
- 3. Eliminate the use of polystyrene products.**
Avoiding polystyrene products will protect public health and wildlife, locally and abroad as well as reduce solid waste disposal and protect air quality.
- 4. Make use of electronic resources such as phone or computer systems in place of paper.**
Using less paper can actually increase office productivity and save resources. When using paper is necessary, use both sides of the paper and avoid chlorine-bleached paper products that increase pollution to the air, water and soil.
- 5. Avoid using products harvested from rainforests or other endangered natural communities.**
- 6. Consider packaging when purchasing a product.** Buy in bulk, choose products with less packaging. Keep in mind the packaging used to transport purchases.
- 7. Develop an agency environmental policy statement for use in bidding documents.**
Refuse products and services that do not meet the environmental specifications established. Let vendors know what specific expectations exist.
- 8. Investigate environmentally sensitive alternatives to hazardous materials such as paints, cleaning solutions and other frequently used products.**



List of Resources

The Department of Commerce and Economic Opportunity:

A recycled content product guide
www.commerce.state.il.us

Worldwise:

Environmentally responsible consumer products
www.worldwise.com

EPA:

Further information
www.epa.gov/opptintr/epp/

Conservatree:

Information on tree free papers
www.conservatree.org

Rainforest Action Network:

Facts and figures about rainforest destruction
www.ran.org

Rainforest Alliance:

A resource for selecting wood and wood products
www.epa.gov/owow/wetlands/watersheds

Non-toxic, Natural and Earthwise

By Debra Lynn Dadd
New York: St. Martin's Press, 1990

The Green Consumer

By John Elkington, Julia Hailes, and Joel Makower
New York: Penguin Books, 1990

www.americannatural.com

All natural products for gardening and lawn care.

www.ecomall.com

Lists environmentally friendly companies and products, news and resources relating to the environment, information about activism, and more.

www.epa.gov/wastewise/pubs/wwupda8.pdf

Provides tips for buying products with recycled content, discusses government recycled product purchasing issues, and includes a list of buying recycled resources.

www.forestethics.org

Strives to provide ecologically sound alternatives to protect forests.

www.greenseal.org

Purchase and production of green products and services.

www.kentcountypw.com/green_products.htm

Steps for creating green purchasing.

www.moea.state.mn.us/p2week/bizcleaners.cfm

Offers tips on selecting cleaning products.

www.newdream.org

Suggests ways to buy wisely that create change.

www.carbohydrateeconomy.org

Information on product selection

www.plasticresource.com

Recycled plastic products directory

www.paperretriever.com

Paper recycling program



Environmental Education and Interpretation Overview

Parks and public outdoor spaces provide recreation opportunities that benefit the community through open space. Educating the citizens who use these lands helps them further appreciate the different ways these spaces contribute to the community. There is a need to educate the public about how to appreciate and care for that open space. Environmentally literate citizens take better care of open space and support district environmental goals and initiatives.

Strategies to Provide Environmental Education and Interpretation

1. **Provide environmental education programs:** Interactive, hands-on activities are the most effective type of program for delivering a district's environmental or conservation message. Work with local recreational groups, provide environmental themed classes for kids through adult, set up restoration workdays, provide tours, start a youth conservation club with local residents or schools.
2. **Support outdoor appreciation/conservation community groups:** Provide meeting space, list group activities in brochures or website.
3. **Educate public/staff through written communication:** Install permanent vandal resistant interpretive signs in high-traffic places, work with local schools to create exhibits, create signs and flyers about environmental issues.
4. **Create demonstration areas:** Create demonstration native gardens and landscaping, outfit one building with energy efficient equipment and supplies (lighting, toilets, insulation, and paper) and compare costs with other facilities in the district, provide solar panel and windmill demonstration exhibits, turn an area of a park into a natural area and compare maintenance costs.



List of Resources

Environmental Education

Programs/Recreation Groups:

Audubon- www.illinoisaudubon.org

University of Illinois Cooperative Extension-
www.extension.uiuc.edu/mg/

Fishing clubs- www.barlowstackle.com/fishing-clubs.html

YMCA- [/www.ywca.org](http://www.ywca.org)

Garden Clubs

www.gardenglories.org

Boy Scouts

www.scouting.org/nav/enter.jsp?s=xx&c=lc

Girl Scouts

www.girlscouts.org/councilfinder/results.asp?STATE=ILcooperative_groups

Conservation Community Groups:

Master Gardeners- www.extension.uiuc.edu/mg/Wildlife_Care-

www.wildlifecare.org/listillinois.html

Northern Illinois

http://www.foxvalleywildlife.org/PDFs/IDNR_permit_list_2005.pdf

Botanic Gardens Conservation International:

www.bgci.org.uk/education/signsolutionsroots7.html

County Land Foundation:

Speakers, information

www.lta.org/findlandtrust/IL2.htm

County Soil and Water Conservation District:

Speakers, information, grants

www.nacdnet.org/resources/IL.htm

Ducks Unlimited:

www.ducks.org/dupages/pageframe.asp?tab=0&sid=14

Field Museum:

Information, speakers, curriculum, traveling exhibits

www.fnmh.org

Grant Opportunities:

www.dnr.state.il.us/orep/c2000/grants/default.asp

Illinois Audubon Society:

Classes, speakers, program participants, donors, volunteers

www.illinoisaudubon.org

Illinois Department of Natural Resources:

Speakers, information, grants

www.dnr.state.il.us

Illinois Environmental Education Association:

List of vendors, staff training

www.eeai.net

Illinois Nature Preserve Commission:

Speakers, information, cooperative grants

www.dnr.state.il.us/INPC

Illinois Wild Turkey Federation:

www.nwtf.org/in_your_state/wito.php

Interpretive Signs:

www.bgci.org.uk/education/signsolutionsroots7.html

<http://www.interpnet.com/greenpages/exhibits.htm>

Museum of Science and Industry:

Information, speakers, curriculum, traveling exhibits

www.msichicago.org

National Association of Interpretation:

Lists of vendors, staff training

www.interpnet.com

Peggy Notebaert Nature Museum:

Information, speakers, curriculum, traveling exhibits

www.chias.org

Pheasants Forever:

www.pheasantsforever.org/

Volunteer labor

Regional Special Recreation Association:

www.illinoisparksandrecreation.com/links/

Volunteer Stewardship Network:

Volunteers, program participants

www.nature.org/wherewework/northamerica/sates/illinois/volunteer

Wildlife Rehabilitation:

www.wildlifecare.org/listillinois.html

Youth Volunteers:

[http://www.nonprofitrisk.org/ws/c6/youth.](http://www.nonprofitrisk.org/ws/c6/youth)

Regional Special Education District:

Volunteer labor

www.isbe.state.il.us/funding/pdf/sped_admin_directory.pdf



Wise Use & Protection of Air, Water, Soil, and Wildlife Overview

All life on earth, including people, are dependent upon clean and reliable sources of air, water and soil. When these basic life-support systems are impaired or damaged by toxins or contaminants, human health and well being as well as the diversity of plants and animals that make up healthy natural environments suffers. Nearly all parks and recreational areas exist in the midst of human-dominated landscapes (whether urban or agricultural). They therefore, serve an especially important role in mitigating the negative environmental impacts of modern transportation systems, commercial and industrial areas, industrial agricultural activities, and concentrated human populations. At the very least, parks and the operations that maintain them should not result in adverse impacts to the environment.

Strategies to Wisely Use and Protect Natural Resources

1. **Reduce the environmental impacts of motorized vehicle fleets.** Regular engine tune-ups and tire maintenance, Properly recycle or dispose of all vehicle fluids and engine parts, Curtail vehicle use during summertime ozone action days.
2. **Identify sources of “indoor air pollution” and safeguard their use.** Proper use, storage, or disposal of cleaning products, training for staff handling hazardous materials, insure that proper ventilation exists.
3. **Establish an integrated pest management program for park grounds.** Be knowledgeable in the identification of insect pests and plant diseases, since early recognition of problems is crucial.
4. **Reduce the use of fertilizers and pesticides in parks.** Implement alternative landscaping designs and practices. Utilize drought and disease-resistant native plant species, eliminate mowing in some areas.
5. **Explore certification of golf courses.**
6. Use the Audubon Cooperative Sanctuary program as an incentive to reduce the use of chemical pesticides and conserve resources as part of golf course maintenance operations.
7. **Use alternative snowmelt products.**
8. **Ensure that underground storage tanks (USTs) do not leak and are registered.** Remove or replace any defective equipment.
9. **Practice soil management and appropriate landscaping, including the control of exotic species, to prevent erosion.**
10. **Incorporate environmental impact considerations in the design process of facilities and parks.** Consider “green building” design features when designing new facilities.



List of Resources

Trust for Public Lands:

Information on Public Sprawl

www.tpl.org

National Resources Defense Council:

Information on Public Sprawl

www.nrdc.org/cities/smartGrowth/nsolve.asp

U.S. Environmental Protection Agency:

Information on vehicle emissions

www.epa.gov/air/aqtrnd95/longterm.html

Information on ozone levels

www.epa.gov/region5/air/naaqs/o3info.htm

Green Fleet program

www.illinoisgreenfleets.org

“Sick-Building” Problems

www.epa.gov/iaq/iaqinfo.html

www.epa.gov/iedweb00/pubs/ventilat.html

Natural landscaping

www.epa.gov/glnpo/greenacres/toolkit/

Removal of underground storage tanks

www.epa.gov/swerust1

Illinois EPA:

Household Hazardous Waste Collection Days

www.epa.state.il.us/land/waste-mgmt/haz-waste.html

U.S. Department of Energy:

Clean air program

www.ccities.doe.gov

U.S.G.A:

Audubon Cooperative Sanctuary System

www.usga.org/green/environment/audubon_program.html

U.S. Fish & Wildlife Service:

Information on invasive species

<http://invasives.fws.gov/Index7.html>

Whole Building Design Group:

Green buildings

www.wbdg.org/index.php



Open Space Planning & Preservation Overview

Clean and attractive parks, green spaces, and natural areas are essential to the health and happiness of all human beings. They provide spaces for children to play and imagine with one another, to play tag and make snow angels. Parents benefit by using this time to connect with their children, with other adults, and meet neighbors they might not have otherwise met. Green spaces draw us out of our homes for fresh air and exercise. They provide us with opportunities to notice things outside ourselves; hear wind, birds, and other natural sounds not associated with human activity; celebrate the change of seasons; and break from the sameness of most human-dominated environments such as our homes, schools, and workplaces.

Helping to nurture and beautify nature in your community makes it a desirable place to live and work. Agencies that help their communities by aiding and protecting open land improve their image and can significantly reduce their long-term maintenance costs for those areas.

Strategies to Provide Open Space Planning and Preservation

1. **Restore natural areas.** Identify native plants on agency owned land, re-establish/preserve any prairie, wetland or wooded areas. Declare them conservation areas and set up maintenance plans for them.
2. **Protect areas that provide habitats and necessary movement of wildlife.** Help acquire, establish and protect streams and rivers, insure that floodplains are protected with natural vegetation to prevent erosion, convert areas such as unused railways into recreational trails, and help make roads crossable for wildlife through reduced speed zones, underpasses or wildlife crossing signs.
3. **Make the restored areas useable to the public for recreation.** Increase public awareness by providing appropriate recreational access to the areas, through educational brochures, trails, and wildlife observation platforms. Invite the public to dedications of newly protected or restored areas, and involve the community in the restoration process as volunteers.
4. **Maintain relationships with organizations and private landowners to insure community supported protection of open spaces.** Participate with local public agencies to insure protection of space on community borders and work with regional conservation coalitions and land trusts to secure protection for land in neighboring communities.
5. **Use native species when landscaping parks and areas of commercially owned property.** Use native shrubs, trees and grasses whenever possible for space adjacent to buildings or in parking lot islands, create prairie gardens in sunny spaces, choose wetland wildflowers to develop 'rain gardens' for areas where building downspouts discharge ample water, plant wetland vegetation around ponds and rivers to reduce erosion and deter Canada geese from nesting on the banks.



List of Resources

Department of Environmental Protection Study:

Findings that state parks and forests enhance property values and increase jobs.

www.state.nj.us/dep/parksandforests

The Illinois Nature Preserves Commission:

Find biologists who can assist in assessing the natural quality of land.

www.dnr.state.il.us/INPC/protection.htm

Natural Landscaping toolkit and sourcebook:

Information of how and where natural landscaping can reduce land maintenance costs.

www.epa.gov/glnpo/greenacres/toolkit/chap1.htm

1

Nature Conservancy:

Information on acquiring lands for natural area preservation.

www.openlands.org

www.conservationfoundation.org

www.tpl.org

www.nature.org

Illinois Greenways and Trails Council:

Help with the planning and establishment of greenways.

dnr.state.il.us/orep/planning/techasst.htm

Environmental Protection Agency:

A good source for wetland and floodplain protection facts.

www.epa.gov/owow/wetlands/watersheds

Wetland mitigation land banking:

Information on making wetland or floodplain acreage on public lands:

www.el.erdc.usace.army.mil/elpubs/pdf/v5n3/brum.html

The Rails to Trails Conservancy:

Assists efforts to preserve unused utility right-of-ways for public trail use.

www.railtrails.org/whatwedo/information/default.asp



Reduction & Handling of Waste Overview

By recycling and using recycled materials, organizations can protect wildlife habitat and biodiversity which helps avoid destruction of forests, wetlands, rivers and other places essential to wildlife; lower the use of toxic chemicals; help curb global warming by cutting down on the energy used in the manufacturing process; help stem the flow of water pollution in the manufacturing process; and it can reduce the need for landfills. Aside from just reusing materials for the same purpose, more innovative recycling is becoming commonplace: shredded tires are used in asphalt, soda bottles are becoming fleece jackets and surgical gloves are being utilized as an ingredient in shoe soles.

Strategies to Reduce and Handle Waste

1. **Reduce, reuse and recycle materials.** Development of programs to recycle paper, cardboard, aluminum, scrap metal, plastics and other materials, developing programs for recycling Christmas trees and chipping cut trees, composting.
2. **Use products that do not create adverse environmental impacts.** Consider environmentally friendly solvent tanks, purchasing products made from recycled pulp or plastic, recycling toner cartridges, donating computers.
3. **Investigate source reduction of waste.** Buy in bulk, minimize packaging and reduce excess use of paper, reduce disposable products, encourage electronic mail.
4. **Explore ways to reduce waste production by minimizing the creation of waste, particularly hazardous.** Create a central collection point for all small batteries to avoid improper disposal and consider the use of rechargeable batteries for maximum efficiency. Examine all concession facilities, kitchens, and park programs serving food for possible recycling of aluminum, tin cans, glass, plastic and paper. Paper makes up about 41% of all trash.
5. **Investigate ways to reuse office, recreation program, maintenance and construction materials.** Donate unused maintenance or construction materials; recycle building materials during remodeling or rebuilding projects. Locate salvage yard for recycling of materials.
6. **Offer educational programs and supportive printed materials demonstrating to the public, specifically children, the importance of such programs to our environment.** Promote proper methods of reducing, reusing and recycling in all children's programs and through the local media.



List of Resources

Sustainable Stillwater:

www.stillwater.org/~recycles/sstw/recycle.htm

List of Recyclable Products:

www.obviously.com/recycle/guides/shortest.html

Global Recycling Network:

Recycling terms

<http://grn.com/library/gloss.htm>

Aluminum Recycling Trends:

<http://greenyes.grn.org/2002/04/msg00210.html>

The Green Initiative:

www.eco-action.net/id87_m.htm

Batteries:

General Information

www.data.energizer.com/datasheets/

Disposal of

www.duracell.com/care_disposal/disposal.asp

<http://data.energizer.com/Static.aspx?Name=BatteryDisp>

List of Disposal Sites:

Fluorescent Tube Disposal

<http://sunnyvale.ca.gov/NR/rdonlyres/043F71C3-1002-4C87-94EF-15C07D685AD7/0/FluorescentTubeDisposal.pdf>

Automotive Maintenance Shops:

Pollution Prevention Tips

<http://es.epa.gov/techinfo/facts/alaska/ak-18.html>

Youth Build Illinois:

www.youthbuildillinois.org/

Great Lakes Net:

<http://www.great-lakes.net/lists/p2tech/1997-02/msg00258.html>

Waterhome:

<http://waterhome.brc.tamus.edu/texasyst/hazardous.html>



Wise Use of Energy Resources Overview

We are rapidly exhausting our sources of extractable coal, oil, nature gas and uranium. As a result of industrial development, combined with population growth, there has been an enormous increase in the demand for energy since the middle of the last century. World population grew more than 3 times between 1850 and 1970, per capita use of industrial energy increased about twenty-fold, and total world use of industrial and traditional energy forms combined increased more than twelve-fold.

It is estimated that fossil fuels provide around 66% of the world's electrical power, and 95% of the world's total energy demands (including heating, transport, electricity generation and other uses). Coal provides around 28% of energy, oil provides 40% and natural gases provide about 20%. Coal, Oil and Gas are called "fossil fuels" because they have been formed from the fossilized remains of prehistoric plants and animals. Our consumption of fossil fuels has nearly doubled every 20 years since 1900. These fuels are NOT replaceable.

Using these resources wisely will save money, lessen the environmental impacts of these fossil fuels and provide more time for the development of alternative energy sources.

Strategies to Use Energy Resources Wisely

- 1. Conserve Energy.** Development programs to limit energy waste through vehicle and gas conservation, water conservation and electricity conservation.
- 2. Redesign existing facility, purchasing and conservation plans to include new energy conservation technology and trends.** Energy conservation practices should be regularly updated to apply reasonable energy conservation appliances, techniques and materials. The savings in the long-term greatly outweigh the initial investment in many new technologies.
- 3. Consider future energy sources and energy conservation techniques.** Planning for future use of alternative fuels allows organizations to take advantage of financial incentives, install infrastructure for future developments and develop policy to support “green” energy practices.



Purchasing

Goal: To purchase products for use in facility and park operations that minimize negative environmental impacts, and take into consideration the effects of product production, use, safety, storage, disposal and cost.

Rationale:

The production, use and disposal of many office, recreation and maintenance products contribute significantly to the pollution of the air, water and soil and the destruction of natural communities of plants and animals. Educated product selection in the workplace and at home can mean the difference between an environment safe for all living things, including people, and a planet contaminated with toxic pollutants.

Background:

As parks and recreation agencies we serve as environmental ambassadors in our communities. By purchasing products with the well-being of the environment in mind, we are demonstrating our commitment to the health of the planet and our own communities.

Evaluating products in terms of their impact is a complex process. The entire life span of a product from creation to disposal should be analyzed before purchasing. As businesses and individuals increase expectations and demands for products that are safe for the earth and its life, companies will be challenged with meeting these needs. A couple of key considerations can be addressed when purchasing products.

First, it is important for us to **understand the environmental impact** of obtaining the raw materials a product is made from, the impact of manufacturing this product, potential toxic exposure while using it and what happens to the product when it is done being used. Energy usage during the entire life cycle of a product is important to consider as well.

Next, **packaging should influence purchasing decisions.** Sometimes, an environmentally friendly product may be packaged in a non-friendly manner and vice-versa. The ideal product selection would be an environmentally friendly product in environmentally friendly packaging.

The **U.S. EPA** operates the **Environmentally Preferable Products (EPP) Program** that assists businesses in purchasing environmentally preferred products and services. The five guiding principals below serve as a guideline for purchasing.

1. **Environment + Price + Performance = EPP**
Include environmental considerations as part of the normal purchasing process.
2. **Pollution Prevention**
Emphasize pollution prevention as part of the purchasing process.
3. **Life Cycle Perspective/Multiple Attributes**
Examine multiple environmental attributes throughout the product and service's life cycle.
4. **Comparison of Environmental Impacts**
Compare environmental impacts when selecting products and services.
5. **Environmental Performance Information**
Collect accurate and meaningful environmental information about environmental performance of products and services.¹

Being a “green” consumer certainly does not mean giving up convenience or functionality of products. It simply means having awareness in regards to how our purchases impact the planet and our local environments as well. As Parks and Recreation agencies, we can make a statement about our dedication to the current and future health of the earth and its life.

Strategies:

A. Purchase products with recycled content whenever possible for use in recreation programs, offices, park maintenance and development projects. Recycled content products have been found to match up with the specifications of virgin materials. Because the demand for recycled products is increasing, the cost for these products is competitive.

1. **Benefits** of this strategy:

- a) **By purchasing recycled content products, energy and resource use are reduced.** Producing a ton of paper from discarded waste paper requires **64% less energy** and **58% less water** and results in **74% less air pollution** and **35% less water pollution** than producing a ton of virgin paper.²
- b) Buying recycled content products **diverts items from landfills** and **reduces waste.** Buying recycled **benefits the economy by creating jobs.**
- c) Buying recycled ensures a demand for the recyclables generated by our agencies. Recycled paper **lies flatter**, has **more strength**, shrinks and **stretches less** and **resists moisture** and **curling** when compared to virgin paper.³

2. **Other considerations:**

- a) **Recycling materials** instead of sending them to landfills is really just **half the job.** **Buying recycled closes the loop.**
- b) Recycled products may have a percentage of **post-consumer recycled content.** The higher the percentage the better. Post consumer content refers

to materials that have already been used by consumers that might otherwise end up in landfills.

c) The **Illinois Department of Commerce and Economic Opportunity** is a great resource for buying recycled in the State of Illinois.⁴

B. Encourage the conservative use of paper and wood in place of virgin plastics and other non-biodegradable and non-renewable products. Unlike paper, glass and aluminum, plastic is usually recycled just one time and it is made into other products with limited lifetimes. Some plastic production produces toxic chemicals and hazardous waste. Examples of products that might require a choice of materials are playground equipment, office products like clipboards and binders and signage.

1. **Benefits** of this strategy:

a) By **purchasing plastic alternatives**, issues related to plastic production and disposal can be reduced.

b) When **purchasing products** made of **renewable** and/or **biodegradable** materials, the entire life cycle **cost** (manufacturing, operating, maintaining and disposing of a product) is **reduced**.

2. Other **considerations**:

a) If after research, **plastic** seems to be the **“best” overall choice** for a product, be sure that the plastic item is recycled/recyclable. This will help reduce the amount of garbage produced and resources needed to make new plastic.⁵

b) **Recycled plastic lumber** does have **advantages over wood**. Some of these include resistance to graffiti, durability and being virtually maintenance free.

C. Eliminate the use of polystyrene products by staff, concessionaires and park/facility users. Polystyrene is a derivative of two by-products of the production of gas and oil, **non-renewable resources**. Although CFCs have been eliminated from the manufacturing process, other agents used to blow gas into **polystyrene cause environmental impacts**, and contribute to **ozone depletion, smog and global warming**. The trouble with polystyrene extends far beyond its production though. After use, **polystyrene can rarely be recycled** and ends up being incinerated or dumped in landfills. As a matter of fact, there are only two companies in the State of Illinois that recycle polystyrene. Especially internally, disposable products can be eliminated almost entirely (see E.).

1. **Benefits** of this strategy:

a) **Avoiding polystyrene** products will **protect public health and wildlife**, locally and abroad. **Styrene** can actually **leach into food and drink** and enter the human body. Because polystyrene is so lightweight, it is carried by wind and water and **ends up in rivers, streams and lakes**. **Animals often mistake the polystyrene for food** and end up dying of starvation because the foam clogs their digestive tracks.

b) **Elimination of polystyrene use will reduce solid waste disposal and protect air quality.**

c) **Effective substitutes** exist for polystyrene products like insulation, packing materials and disposable food service items. **Starch based plastics** are being used to manufacture cups, bowls, plates, utensils, take-out containers and packing peanuts for example. These products are **biodegradable** and are **just as sturdy** as their polystyrene counterparts.⁶

2. **Other considerations:**

a) **If products are shipped to your agency packaged in polystyrene**, be sure to either **reuse the packaging** internally or **deliver** it to a local shipping store **for re-use**.

b) A strong argument exists in favor of the **benefits of polystyrene**. It is often **less expensive** and more **convenient** than its alternatives **but does have a greater environmental impact**.

D. Minimize the use of petroleum-based products such as inks, stains and plastics. When products are made from fossil fuels, there are **environmental impacts caused from the extraction and processing of fossil fuels** and the use and disposal of the end products. Petroleum is a limited resource and the extraction and refining **processes produce pollution**. Consider using products made from plant-derived chemicals. **Vegetable oils, fiber and grain crops, trees, nuts and fruits can be utilized to make a wide variety of products**. These products include adhesives, auto fluid and fuels, cleaners, solvents, lubricants, paints and varnishes, plastics and printing inks.⁷

1. **Benefits** of this strategy:

a) **Products made from plant matter are safer** for workers, patrons and the environment.

b) Plant-derived chemicals are **biodegradable** and can usually be **disposed of safely** and **inexpensively**. Therefore, they are **more economical** because of the elimination of regulation and disposal fees.

c) The purchase of plant-derived alternatives can **aid in rural economic development**.

E. Reduce the use of disposable products by staff, concessionaires and park/facility users. The average American office worker goes through about 500 disposable cups every year.⁸ Disposable products can easily be reduced or even eliminated. Even if disposable products are recyclable, the reality is that an unbelievable amount of these products end up in landfills. **Once in a landfill, almost nothing degrades**. The longer the lifespan of a product the less impact it will have on the environment. Agencies can provide mandatory operation specifications to concessionaires and work cooperatively with park/facility users to encourage reuse.

1. **Benefits** of this strategy:
 - a) Over time, **utilizing re-usable products** can **save money** and the cost involved with managing solid waste is reduced as well.
 - b) In addition to money, **reuse saves energy**, resources and landfill space.
2. Other **considerations**:
 - a) If your agency does not plan to re-use a particular item, check with your local solid waste agency for a **waste reduction service directory**. There are organizations that accept anything from cell phones to construction building materials for reuse.
 - b) Be sure to **maintain** and **repair durable products** as opposed to replacing them.
 - c) Consult the U.S. **EPA's Consumer Handbook for Reducing Solid Waste** for specific suggestions regarding reuse.⁹

F. Make use of electronic resources such as phone or computer systems in place of paper. The average American consumes 681 pounds of paper each year.¹⁰ There are many simple things that can be done to reduce the use of paper. In addition to the use of paper, it is also important to recognize how equipment can help reduce the use of paper and save energy.

1. **Benefits** of this strategy:
 - a) **Using less paper** can actually **increase office productivity**.
 - b) Using **less paper saves resources**. In order to produce one ton of virgin paper it takes 17 trees, 4,102 kWh of energy and 7000 gallons of water.¹¹
2. Other **considerations**:
 - a) **Use both sides** of a piece of paper. Duplex machines can copy on two sides of the paper.
 - b) **Electronic communication** can be used for forms, directories, bulletins, manuals etc.
 - c) When purchasing new **copiers**, select one with a **power saving feature**. This type of copier can save substantial amounts of energy and money.
 - d) When paper use is necessary, be sure to **use recycled content, chlorine-free paper or tree free paper**. Tree free paper is considered to be an environmentally preferable product because it uses less energy to produce, saves resources and is processed chlorine-free.¹²
 - e) If an agency receives **multiple copies** of catalogs from vendors, be sure to **reduce the number received** and circulate a single copy as needed.

G. Avoid the use of chlorine-bleached paper products. When chlorine is used in the bleaching process, toxic substances called dioxins are released. **Dioxins are resistant to chemical and physical breakdown**. These toxic substances do not only end up in the paper pulp that has been bleached; fish downstream from pulp and paper mills have been found with high levels of dioxins in them. Also, when dioxin-contaminated water is used to

irrigate crops, they too, can become contaminated. Dioxins have been found in bleached products themselves and can cause human health issues through use of these products.

1. **Benefits** of this strategy:
 - a) **Using non-chlorine bleached products reduces air, water and soil pollution.**
 - b) **Unbleached** or non-chlorine bleached products **are safer for humans and wildlife.**
2. **Other considerations:**
 - a) **Purchase paper** products made with **alternative bleaching agents** such as hydrogen peroxide or sodium hydroxide.
 - b) **Purchase paper products** that are **non-bleached**. Several companies exist that sell unbleached coffee filters, paper towels, toilet paper, office paper and other products.¹³
 - c) **Recycled content products** that are bleached are not known to produce the dioxins that virgin products do. Therefore, the purchase of recycled paper products is a partial solution to dioxin contamination.
 - d) TCF (**totally chlorine free**) **paper** products are the **most desirable** because they are made from a paper pulp bleached without any type of chlorine or no bleach at all. ECF (elementally chlorine free) products are made from a pulp bleached with a chlorine derivative. PCF (processed chlorine free) products are produced using no chlorine or derivatives in the recycling process. Original paper however, was bleached using chlorine or derivatives.

H. Avoid using products harvested from the rainforests or other endangered natural communities. The destruction of forests has a resounding impact on natural communities. As trees disappear, so do thousands of other species of living things. Rainforests contain incredible plant and animal diversity. However, these ecosystems are being destroyed at a rate of 78 million acres per year.¹⁴

1. **Benefits** of this strategy:
 - a) The **preservation of rainforests** and other endangered natural communities **protects ecosystems** and the **people** and **wildlife** that depend on them.
 - b) Several organizations certify products to guarantee that wood and wood products have been responsibly harvested and processed.¹⁵ By **selecting certified products**, agencies can help reduce clearcuts and other harmful logging procedures.
2. **Other considerations:**
 - a) Some examples of **woods that are harvested from sustainable communities** are ash, beech, birch, cherry, elm, hickory, oak, poplar, and black walnut. Consider purchasing wood and wood products made from this

list of trees. When woods like mahogany and teak (tropical hardwoods) are logged, as much as 2/3 of a forest is destroyed.

b) There are some **sustainable and renewable rainforest resources** such as nuts, fruits, oils and medicinal plants than can be harvested without rainforest destruction.

I. Consider packaging when purchasing a product. Packaging **increases the cost of a product** and has a cost to the earth too, especially in its disposal. Up to one dollar of every 10 spent pays for packaging and packaging accounts for fifty percent of the trash produced nationwide.¹⁶ A substantial amount of the trash produced by businesses and individuals is packaging. **Precycling, reducing waste before buying, should be a consideration when purchasing.**

1. **Benefits** of this strategy:

- a) **Reduction** in the amount of **garbage** in the waste stream.
- b) **Minimal packaging saves money and resources.**
- c) **Manufacturers** will/should respond to pressures to **reduce packaging** based on purchasing trends.

2. Other **considerations**:

- a) **Buy in bulk** whenever possible and **reduce excess containers.**
- b) Seek out products that are in **refillable containers.**
- c) When possible, **select a product with less packaging.**
- d) **Glass, paper, cardboard and aluminum** are **preferable** over plastic because these materials can be recycled indefinitely.
- e) **Focus on the product** not the package.
- f) Bring along re-usable cloth shopping bags whenever possible.

J. Develop an agency environmental policy statement for use in bidding documents. It is important that **vendors know what specific expectations exist.** If an agency's environmental purchasing policy is clearly communicated, vendors can continually strive to meet the needs of an agency. Vendors should be prepared to answer specific questions about products as needed. Specifications and RFPs (requests for proposal) should favor environmentally preferable products.

1. **Benefits** of this strategy:

- a) Agencies can **become more educated** about the entire life cycle of a product by asking questions of vendors.
- b) By **defining a specific policy statement**, agencies can **clearly communicate a commitment to the earth.**

2. Other **considerations**:

- a) **Agencies have the ability to refuse** products and services that do not meet the environmental specifications established.

b) Some green products cost more up front while others save money. Decide what initial additional costs might be feasible. Environmental purchasing should save money over the long term though.

K. Investigate environmentally sensitive alternatives to hazardous materials such as paints, cleaning solutions and other frequently used products. Commercial cleaners, for example, produce tons of toxic waste in use, manufacturing and disposal. Items such as these serve as indoor air pollutants and can be harmful to the earth as well.¹⁷

1. **Benefits** of this strategy:

a) **Selecting products that are less toxic** can create a **safer work environment** for employees and are healthier for the earth. **Patrons can be protected** as well, through using environmentally sensitive alternatives.

2. **Other considerations:**

a) When possible utilize multiple use products and **save money and space**.
b) Although most alternative products produce similar if not the same results as commercial products, the **alternatives should be tested for effectiveness**. Research should be conducted agency-wide to evaluate new products. When new products are introduced, staff members may be resistant to change and will need to be “sold” on the benefits of using the new products through an education campaign.

c) It is important to search for **products that disclose** all of their **ingredients**. Sometimes a **product may appear “green” but actually still contain toxic components**.¹⁸

d) In addition to store bought eco-friendly cleaners, **common items** such as baking soda and vinegar **can be used**. A plethora of recipes are available on-line.

Potential Resources/Funding Sources:

- www.americannatural.com - All natural products for gardening and lawn care.
- www.ecomall.com - Lists environmentally friendly companies and products, environmental news and resources information about activism, and more.
- www.epa.gov/wastewise/pubs/wwupda8.pdf - Provides tips for buying products with recycled content, discusses government recycled product purchasing issues, and includes a list of buying recycled resources.
- www.forestethics.org - Ecologically sound alternatives to protect forests.
- www.greenseal.org - Encourages the purchase and production of environmentally responsible products and services.
- www.kentcountypw.com/green_products.htm - Green purchasing program.
- www.moea.state.mn.us/p2week/bizcleaners.cfm - Cleaning products.
- www.newdream.org - Suggests ways to buy wisely that create change.

For more information on specific topics or research that supports the above conclusions, see endnotes at the end of the toolkit.



Environmental Education and Interpretation

Goal: Provide education and interpretation opportunities for staff and the public that increase appreciation for the natural world and promote environmentally conscious lifestyles, emphasizing selective consumption and low-impact resource use.

Rationale:

The field of parks and recreation not only provides recreation opportunities through open space but also needs to educate the public about how to appreciate and care for that open space. **Environmentally literate citizens take better care of open space** and are more likely to support district environmental goals and initiatives.

Background:

Environmental education and interpretation are **proactive approaches** to protecting natural resources and park property, including natural areas. Park districts can use this approach to gain community support for conservation issues such as protecting and caring for parks, protecting and caring for open spaces and native landscapes and protecting and conserving resources like water, electricity and air.

Although commonly interchanged, **environmental interpretation** and **environmental education are different methodologies**. Environmental interpretation is when a person learns about nature information or the environment or the natural resources they are in, in a quick entertaining manner. Interpretation can excite people, get people thinking and broaden their horizons. **Environmental education** takes time, well thought out messages and well thought out communication. Environmental education provides in-depth information about a specific topic in a sequential manner over an extended period of time. Environmental interpretation acts as a springboard whereas environmental education acts as the swimming pool. Although different, both methods can help the community develop understanding, appreciation and care for the natural environment.

Providing effective environmental education and interpretation to the park staff and community residents will not only **help protect natural resources** and open space but also **save park districts money** by affecting politicians, policy makers, and citizens attitudes about fertilizer, water use and mowing in open/play spaces, tolerance of “nuisances” such as insects, geese etc., and the understanding of their own role in maintaining parks and open spaces.¹⁹ **Effective environmental education** includes face-to-face interpretation, articles and news reports and well-written signage delivered regularly and often. Signage and activities that give hands-on experiences are most effective.

Strategies:

A. Provide Environmental Education Programs- Experiential (hands-on and/or mind engaged) activities are the most effective type of program for delivering a district's environmental or conservation message. Hands-on or interactive active programs help audiences understand and remember the information and message.²⁰

1. Efforts to provide environmental education programs can take the following forms:

- a) **Provide cooperative programs** with local recreation groups.
 - (i) Audubon- www.illinoisaudubon.org
 - (ii) University of Illinois Cooperative Extension- <http://www.extension.uiuc.edu/mg/>
 - (iii) Fishing clubs- www.barlowstackle.com/fishing
 - (iv) Boy scouts- <http://www.scouting.org/nav/enter.jsp?s=xx&c=lc>
 - (v) Girl scouts <http://www.girlscouts.org/councilfinder/results.asp?STATE=IL> cooperative groups
- b) Provide **environmental themed** craft, art and other **classes** along with existing recreation classes
- c) Provide year round youth and adult **programming of nature topics.**²¹
- d) **Provide yearly tours of parks** about specific environmental messages.
- e) Schedule and promote regular **restoration workdays.**²²
 - (i) Volunteer stewardship network www.nature.org/wherewework/northamerica/states/illinois/volunteer
 - (ii) Regional Special Education District- www.isbe.state.il.us/funding/pdf/sped_admin_directory.pdf
 - (iii) Regional Special Recreation Association <http://www.illinoisparksandrecreation.com/links/>
- f) Encourage **staff to help** with environmental classes and events.
- g) Provide **native landscaping, recycling** and other environmentally friendly lifestyle programs.
 - (i) Native landscaping- <http://www.il.nrcs.usda.gov/technical/plants/npg/NPG-toc.html>
 - (ii) Recycling- <http://www.earth911.org/>
- h) Start a **youth conservation club** with local residents or schools.
 - (i) How to start: <http://www.kcc.org.nz/howcanihelp/greengroup.asp>

2. **Benefits** of this strategy:

- a) Environmental Education is **effective** with youth, adults and senior citizens.
- b) **Positive environmental actions** in youth and senior citizens.
- c) **Positive environmental attitudes** in youth.²³

- d) Change in **participant/community environmental attitudes** i.e. support of natural area projects.
- e) **More community environmental responsibility** i.e. lower organization energy bills, natural area vandalism, more community recycling in parks.
- f) **Support** of environmentally conscious **land use policies**- i.e. support of open space referendums.
- g) **Volunteer** restoration work/person power.
- h) **Participant appreciation** for organization efforts.
- i) Stronger **cooperative ties** with other organizations.
- j) **Grant opportunities.**
 - (i) Illinois Department of Natural Resources
<http://www.dnr.state.il.us/orep/c2000/grants/default.asp>
 - (ii) North American Association of Environmental Education
<http://eelink.net/grants-eespecificresources.html>

3. Other **considerations:**

- a) **Knowledgeable** program **instructors**
- b) **Supervisory staff** for workdays
- c) **Cost of restoration tools** (rakes, loppers, saws etc.)
- d) Cost of **marketing/communication**
- e) Cost of **program supplies**
- f) Cost of plants, seeds, craft material, restoration **supplies**

B. Support outdoor appreciation/conservation community groups.

1. Efforts to **support cooperative groups** can take the following forms:

- a) **Provide meeting space** for groups in exchange for volunteer labor or goods
- b) **List group activities** and meetings in brochure, newsletters and website
- c) **Partner** on appropriate **grants**
- d) Keep **phone numbers** on hand of **nature experts** to answer questions
 - (i) Master Gardeners- <http://www.extension.uiuc.edu/mg/>
 - (ii) Wildlife Care-
<http://www.wildlifecare.org/listillinois.html>
- e) **Offer joint activities, programs** and/or **field trips**
- f) **Sell group items** in gift shop or main office
- g) Offer a **staff** person to **speak at a meeting**

2. **Benefits** of this strategy:

- a) Money **saved** in staffing **costs**
- b) **Stronger grant applications** (through partnerships)
- c) **More grant eligibility** with diverse partnerships
- d) Money **saved** in marketing staff and supply **costs**
- e) **Increased facility usage/attendance**

- f) More and wider variety of **community recreation/environmental opportunities**
- g) **Great public relations**
- h) **More/Better communication with the public**
- i) Research shows that community driven environmental articles, news reports and investigative reporting **positively affects decisions** made by politicians and other policy makers.²⁴

3. Other **considerations**:

- a) Staffing costs
- b) Building **usage costs**
- c) **Insurance** costs
- d) **Child Labor Laws** (only apply if you tangibly compensate youth volunteers
 - (i) National Network for Childcare-
http://www.nncc.org/SACC/sac21_volunteer.act.html
 - (ii) Nonprofit Risk Management Center-
<http://www.nonprofitrisk.org/ws/c6/youth.htm>
- e) Communication difficulties
- f) **Appropriate partner access** to the facility, tools and supplies

C. Educate public/staff through non-verbal communication. Effective environmental education includes **face-to-face interpretation, news reports** and **well-written signage** delivered on a regular basis. Other forms such as poorly written signage, negative signage, pamphlets and advertisements are less effective and therefore less cost effective.²⁵

1. Efforts to educate through written communication can take the following forms:

- a) Install permanent **vandal resistant interpretive signs** in effective places (high traffic, demonstration areas, natural areas)
 - (i) Botanic Gardens Conservation International
<http://www.bgci.org.uk/education/signsolutionsroots7.html>
- b) **Provide environmental information** to staff so they can answer questions
- c) Place **temporary signs** around natural areas explaining natural resource work being done
- d) Include information regarding local **environmental issues in brochures**, newsletters and board packets
- e) **Work with local schools** to create exhibits
- f) **Create signs** and flyers about **environmental issues**

2. **Benefits** of this strategy:

- a) **Better**, more frequent **environmental communication** through signs
- b) **More public support** and donations from educating about organization environmental needs

- c) **Lower energy and maintenance costs** caused by energy informed citizens
- d) Passive **recreation opportunities** through interpretive signs
- e) **Healthier communities** through better informed community choices

3. Other **considerations**:

- a) **Cost of Signs**- development and manufacturing
 - (i) National Association of Interpretation
<http://www.interpnet.com/greenpages/exhibits.html>
- b) **Staff Time**- Development of signs, installation of signs, writing of articles
- c) **Vandalism/Sign Replacement**
- d) **Effectiveness** of signs

D. Create demonstration areas reflecting your district’s conservation messages and initiatives. Many people need concrete messages and examples in order to understand and support them. Physical demonstrations of your message allow people to see and experience the benefits and drawbacks of projects and changes your district is asking them to support.

1. Efforts to **create demonstration areas** can take the following forms:

- a) Create demonstration **native gardens and landscaping**
- b) Outfit one building with **energy efficient equipment** and supplies (lighting, toilets, insulation, and paper) and **compare costs with other facilities** in the district.
- c) Provide solar panel and windmill **demonstration exhibits**
- d) Turn an area of a park into a natural area and **compare maintenance costs**

2. **Benefits** of this strategy:

- a) More **public support, donations**
- b) **Lower energy and maintenance costs**
- c) **Better environmental communication**
- d) **Recreation opportunities**
- e) **Healthier communities** through healthier community environmental choices

3. Other **considerations**:

- a) **Cost of signs and demonstration sites**
- b) **Staff time**
- c) **Vandalism/sign replacement**
- d) **Effectiveness** of signs

Potential Resources/Funding Sources:

Boy Scouts- <http://www.scouting.org/nav/enter.jsp?s=xx&c=lc>
http://directory.google.com/Top/Recreation/Scouting/Organizations/Boy_Scouts_of_America/Troops/Illinois
County Land Foundation- www.lta.org/findlandtrust/IL2.htm - speakers, information
County Soil and Water Conservation District- <http://www.nacdnet.org/resources/IL.htm>
County Soil and Water Conservation District- www.aiswcd.org - speakers, grants
Ducks Unlimited- <http://www.ilducks.org/>
Field Museum- www.fmnh.org - information, speakers, curriculum, traveling exhibits
Fishing/Hunting Club- www.barlowstackle.com/fishing-clubs.html classes, speakers, Garden Clubs- www.gardenglories.org - classes, speakers, program participants, donors
Girl Scouts groups and regional office-
<http://www.girlscouts.org/councilfinder/results.asp?STATE=IL> cooperative groups
Grant Opportunities- <http://www.dnr.state.il.us/orep/c2000/grants/default.asp>
Illinois Audubon Society- www.illinoisaudubon.org- classes, speakers
Illinois Department of Natural Resources- www.dnr.state.il.us - speakers, grants
Illinois Environmental Education Association- www.eeai.net - list of vendors, training
Illinois Nature Preserve Commission- www.dnr.state.il.us/INPC - speakers, grants
Illinois Wild Turkey Federation- http://www.nwtf.org/in_your_state/wito.php
Interpretive Signs <http://www.bgci.org.uk/education/signsolutionsroots7.html> &
<http://www.interpnet.com/greenpages/exhibits.html>
Local businesses- nature photographers, folk singers/artists, corporate workdays
Local YMCA- joint activities, grants, cooperative groups- <http://www.ymca.net/> and
<http://www.ywca.org>
Master Gardeners- <http://www.extension.uiuc.edu/mg/> free speakers
Museum of Science and Industry- www.msichicago.org - curriculum, exhibits
National Association of Interpretation- www.interpnet.org -lists of vendors, staff training
Peggy Notebaert Nature Museum- www.chias.org - speakers, curriculum, exhibits
Pheasants Forever- <http://www.pheasantsforever.org/>
Regional Special Education District-
www.isbe.state.il.us/funding/pdf/sped_admin_directory.pdf- volunteer labor
Regional Special Recreation Association- <http://www.illinoisparksandrecreation.com/links/> -
volunteer labor
Volunteer stewardship network
www.nature.org/wherewework/northamerica/states/illinois/volunteer volunteers, participants
Wildlife Rehabilitation- <http://www.wildlifecare.org/listillinois.html>
Youth Volunteers- http://www.nncc.org/SACC/sac21_volunteer.act.html &
<http://www.nonprofitrisk.org/ws/c6/youth.htm>

For more information on specific topics or research that supports the above conclusions, see endnotes at the end of the document.



Wise Use & Protection of Air, Water, Soil & Wildlife

GOAL: Actively seek and implement ways to conserve and protect water and soil, enhance air quality, limit the production and release of damaging pollutants, and protect plant and animal life.

Rationale:

The **parks and recreation** profession plays a **vital role** in **promoting healthy lifestyles** and providing residents with **recreational access** to green spaces, lakes and rivers, clean air, and natural plant and animal communities. Therefore, it is especially important that our operations not adversely impact natural resources within our communities, and that ideally, they result in net improvements to local environmental quality.

Background:

All life on earth, including people, is dependent upon clean and reliable sources of air, water and soil. When these basic life-support systems are impaired or damaged by toxins or contaminants, human health and well being as well as the diversity of plants and animals that make up healthy natural environments suffers. Nearly all parks and recreational areas exist in the midst of human-dominated landscapes (whether urban or agricultural). They therefore, serve an especially important role in mitigating the negative environmental impacts of modern transportation systems, commercial and industrial areas, industrial agricultural activities, and concentrated human populations. At the very least, parks and the operations that maintain them should not result in adverse impacts to the environment.

While **air and water pollution** might seem to be **more common in urban areas**, **pollution** of the air and water **from agricultural sources is a growing problem.** Also, many of **Illinois' native plants and animals have been eliminated or are threatened** by human activities.²⁶ Modification of the landscape for human uses, particularly urban sprawl near Illinois' cities, remains one of the primary threats to environmental quality and the plant and animal resources of Illinois.²⁷ Development of open space generally, but not always, includes an increase in paved surfaces and lawns, both of which shed precipitation along with contaminants into local waterways. Increased automobile traffic, in spite of improvements in overall air quality due to emissions-reduction technologies, results in a net increase in emissions of particulate matter, carbon monoxide and other pollutants in the immediate area.²⁸

The parks and recreation profession relies increasingly on the products and services produced by modern technology and industry, and the production, use, and disposal of these products involve a wide range of potential chemical toxins. While we enjoy a level of environmental protection and oversight in this country (and particularly in Illinois)

unknown in much of the world, a large amount of environmental contamination continues to occur. Much of this is due to the inappropriate use and disposal of cleaning products, pesticides, chemical fertilizers, paints, solvents, and petroleum products. It is the responsibility of everyone, but particularly parks and recreation professionals, to see that potentially hazardous products are used and disposed of in an environmentally safe and sound manner.

Strategies:

A. Reduce the environmental impacts of motorized vehicle fleets. Motorized vehicles and equipment represent one of the greatest impacts on local air quality in any urban area. In addition, the maintenance of motorized vehicles (or lack thereof) can potentially introduce pollutants into waterways and contaminate soil.

1. Efforts to **decrease vehicle emissions** can take the following forms:
 - a) Regular engine **tune-ups** and **tire maintenance** to **improve** fuel mileage and reduce emissions.
 - b) **Properly recycle** or **dispose** of all **vehicle fluids** and **engine parts** as a part of routine maintenance.
 - c) **Curtail vehicle use** and restrict fueling of vehicles to **early morning hours** or **evening during summertime ozone action days**.²⁹
 - d) **Replace older vehicles** with alternative fuel (AFV) and/or hybrid vehicles to reduce emissions.³⁰
2. **Benefits** of these strategies:
 - a) Contribute to **improved local air quality**, resulting in **improved public health** for all citizens, but particularly those with respiratory conditions.
 - b) **Improve public image** by promoting agency's voluntary adoption of "green" practices and technologies.
 - c) **Lower operational costs** due to improved fuel economy.
 - d) **Extended vehicle life** and resulting **lower capital costs**.
3. Other **considerations**:
 - a) Higher **initial costs** for AFVs (still higher than traditional gasoline and diesel vehicles).
 - b) Cost and availability of **alternative fuels** (see endnote 5)
 - c) **Additional training** is required of vehicle maintenance staff.

B. Identify toxic substances used within facilities and sources of "indoor air pollution" and implement a program to safeguard their use and/or replace these substances with less toxic alternatives. Cleaning products, paints, pool chemicals, molds, radon, pesticides, and even "off-gassing" from office furniture and new carpeting can **all potentially affect air quality** and **public health** in facilities. Problems often result from improper use, storage, or disposal of these products and/or from inadequate ventilation within buildings. Ironically, efforts to make buildings more energy-efficient

during the past few decades have resulted in better insulated structures that hold contaminants in, rather than allowing them to escape through walls, doors, and windows. State and local health laws as well as OSHA regulations usually insure that “sick-building” problems are given a high priority, since they can potentially affect the health of both employees and patrons.³¹

1. Efforts to **reduce the impact** of toxic substances can take the following forms:

- a) **Comply with all safety standards** associated with hazardous materials data sheets
- b) See that all **staff handling hazardous materials** receives **proper training** on their use
- c) Maintain an **active safety-training program** and **promote awareness** of environmental hazards among all staff.
- d) **Consider the impact** of cleaners, solvents and other products on air quality and local water resources and investigate environmentally appropriate alternatives.³²
- e) Insure that unused or old toxic cleaners, solvents, etc. are **properly disposed** of. The **Illinois E.P.A.** and often, local city health departments, can provide information on appropriate disposal.³³
- f) Insure that **proper ventilation** exists in any area **where toxic chemicals** are used.
- g) Insure that **proper ventilation** exists in buildings whenever **new carpet and office furnishings are installed**.³⁴
- h) Consider using **low-emitting exterior-grade plywood** in building construction and renovation.³⁵

2. **Benefits** of these strategies:

- a) **Improved air quality** and **public health** for both employees and patrons.
- b) **Reduces workplace safety concerns** when hazardous materials are used, stored, and disposed of properly.
- c) **Improved public image** due to promotion of agency efforts to proactively address air and water quality issues.

3. **Other considerations:**

- a) Some **additional training** of employees, particularly building maintenance staff, is likely.
- b) Some cleaning products touted as “less toxic” and “environment-friendly” may be less effective and more costly—best to **shop around**, talk to others who have used them, and experiment.
- c) The use of low toxin-emitting exterior grade plywood for indoor construction can add **costs to building construction** (see endnote 10).

C. Establish an integrated pest management program for park grounds, including selection of disease-resistant plant species, preventative maintenance, early detection of problems, natural control methods, and minimized use of chemical pesticides.

Integrated pest management (IPM) has as its goal the reduction in the quantity of chemical pesticides applied to outdoor landscapes and indoor facilities. IPM usually results in a graduated response to any potential problem, with natural control methods being employed first and chemical pesticides used only as a last resort. In the park setting, IPM has become **standard practice** for many public agencies, which must consider the health of patrons, including young children and people with chemical sensitivities, who use their parks. To be effective, it requires that someone on staff (or a contracted service) **be knowledgeable in the identification of insect pests and plant diseases**, since **early recognition** of problems is **crucial**. This allows treatments to be small scale and localized. Waiting for a problem to become an infestation requires a more extensive response (i.e. larger quantities of and often more potent pesticides). Natural control methods (companion plantings, soil treatments, natural predators) are normally utilized to maintain a more natural balance of pests and predators, which means that the presence of some pests must be tolerated.

1. **Benefits** of this strategy:

- a) **Protects patrons** from possible exposure to pesticides and herbicides.
- b) **Reduces workplace safety concerns** when reduced quantities of toxic materials are used for maintenance.
- c) Can **reduce operational expenses** since necessary pesticide applications will be reduced and smaller in scale.
- d) **Protects** both surface and ground **water** from potential contamination.
- e) **Protects wildlife**, particularly aquatic creatures, and the habitat they live in from contamination.
- f) Can **improve** the agency's **public image** due to promotion of the voluntary adoption of efforts to reduce pesticide use in the community.

2. Other **considerations**:

- a) IPM requires more highly trained staff (or **additional training**) and more staff time to monitor pests and plant diseases.
- b) **Education** may be necessary for patrons who see any insect as a pest and are unfamiliar with the benefits of IPM.

D. Reduce the use of fertilizers and pesticides in parks through alternative landscaping designs and practices.

1. Efforts to reduce fertilizer and pesticide use can take the following forms:

- a) Utilize drought and disease-resistant **native plant species** for landscaping.³⁶
- b) **Dedicate** open space as natural areas to reduce or eliminate mowing.³⁷

2. **Benefits** of this strategy:

- a) **Reduces operational costs** due to conservation of fuel, equipment, water and other resources. Costs for man-hours are also reduced, and staff resources can be devoted to higher priority maintenance needs.
- b) **Reduces fuel use** and accompanying **emissions** from mowers and other maintenance vehicles.
- c) Reduced use of fertilizers and pesticides **improves the quality** of both surface and **groundwater**.
- d) **Native insects** (butterflies and bees in particular) and **birds benefit** from the presence of native plants.
- e) **Protects surface water** and ground water **from contamination** since naturally landscaped areas, especially wetlands, both absorb and filter runoff more effectively than mowed turf, preventing erosion of stream banks, sedimentation in ponds and lakes, and non-point source contamination from roads, parking lots, and residences.
- f) **Promotes improved air quality** since dense vegetation absorbs sunlight, helps to filter some particulate matter, and cools the air through evapotranspiration (process whereby plants evaporate water into the air, cooling the air around them).
- g) **Enhances both community aesthetics and public image** (promoting increased property values and tax base).
- h) **Native wetland plantings** along the borders of ponds are **effective at reducing** numbers of **Canada geese** in these areas.

3. **Other considerations:**

- a) Native plantings can have a slightly higher **initial cost** than plantings with traditional cultivars (although significant savings accrue over the long-term due to reduced maintenance).
- b) If in-house landscape design staff is not familiar with native plants, outside **design assistance** may be necessary (although this can sometimes be obtained at no cost from governmental agencies and private organizations that promote the use of native plants).
- c) **Additional training** of grounds maintenance staff will be required to insure that “low-maintenance” areas receive the appropriate maintenance they do need (occasional mowing, removal of trash and hazards, prescribed fire – if native plants are present or replanted, control of exotic species).

E. Explore certification of golf courses with the Audubon Cooperative Sanctuary Program as an incentive to reduce the use of chemical pesticides and conserve resources as part of golf course maintenance operations. More public and private golf courses are searching for ways to maintain both professional course standards and be kinder to the environment. From converting out of bounds areas to native vegetation, placing nesting boxes to attract songbirds, and adopting integrated pest management (IPM) and water conservation technologies, golf courses can become valuable natural green spaces as well as popular recreational facilities. The Audubon Cooperative

Sanctuary System is designed to assist golf courses with recommended practices and design considerations. The program certifies courses that have achieved certain standards.³⁸

1. **Benefits** of this strategy:

- a) **Reduced contamination** of surface and groundwater due to pesticide run-off and infiltration.
- b) **Improved water quality** in streams and ponds due to reductions in algal blooms caused by fertilizer run-off.
- c) **Conservation of water resources** due to more efficient watering of course turf and elimination of watering for native plantings.
- d) **Improved natural habitat** for wildlife due to more diverse plantings on course and availability of natural foods.
- e) **Improved public image** due to promotion of status as certified member of ACSS.
- f) **Potential reduction in operating expenses** due to less regular use of pesticides, more efficient watering, and reduced mowing of out-of-bounds areas.

2. Other **considerations**:

- a) **Initial costs** of redesigning and replanting out of bounds areas with native plants (costs may be slightly higher than if planted with traditional cultivars). Cost of water saving technology added to irrigation and sprinkler systems.
- b) **Cost and effort** to re-train grounds maintenance staff in integrated pest management techniques and in proper maintenance of native landscapes.
- c) Additional **staff time** required maintaining regular inspections for pest damage with IPM.
- d) **Pro-active public relations** effort required to educate regular course users about changes.

F. Use **alternative snowmelt products and/or modify application rates and equipment, using those that have the least impact upon the surrounding soil, water, and plant life.** The **use of de-icers** during winter on roads, parking lots, and walkways are necessary practices intended to provide safe walking and driving surfaces. These products often have **negative effects on plant life, water quality, soils, and vehicles.** The range and degree of these effects vary, depending on the type of de-icer used, the quantity applied over the course of the winter season, and the proximity to nearby plantings and water bodies. Effects are mostly localized, occurring within 50-100 feet of where the de-icers are applied.³⁹ It should be noted that all de-icing products, even sand, can have potential negative effects, and so the decision as to which product to use must weigh product cost, effectiveness, and the costs of potential damage. A partial list of de-icers and their characteristics is available in the endnotes.⁴⁰

1. **Benefits** of this strategy:
 - a) **Reduced replacement costs** for salt damaged landscaping trees and shrubs.
 - b) **Protection** of water quality, plant, and animal life in sensitive wetland areas.
 - c) Reduced costs from more efficient application of deicers, minimizing waste.

2. Other **considerations**:
 - a) Most alternatives to salt and sand **cost** anywhere from two to ten times more, although some of these products are more effective and can be applied in lower concentrations.

G. Ensure that underground storage tanks (USTs) do not leak and are registered. Remove or replace any defective equipment. While underground storage tanks provide a convenient, space-efficient, and relatively safe way to store hazardous fuels, problems associated with **leaking tanks can result in soil and water contamination**. These problems can often go undetected for years until the contamination has spread into ground water and/or nearby streams, rivers, or lakes. The U.S. EPA is mandated by law to regulate USTs and insure that owners are in compliance with federal regulations and that contamination from leaking tanks is cleaned up. The cost of fines and environmental remediation to remove leaking tanks and contaminated soil makes a regular maintenance and inspection program a best-management practice and a necessary expense.⁴¹ The benefits of following this strategy are obvious and the potential costs of not maintaining and inspecting all storage tanks are much higher than the costs of regular maintenance.

H. Practice soil management and appropriate landscaping, including the control of exotic species, to prevent erosion. Soil erosion may include severe deterioration of stream banks and shorelines as well as the less noticeable erosion of soil from nearby upland areas. Addressing **severe erosion often requires costly structural solutions** and soil replacement, and these projects become a high priority for public officials. Less obvious forms of erosion are often ignored until they become more serious and require costly remedies. In addition to the loss of topsoil and aesthetic damage, all erosion negatively impacts water quality in streams, rivers, and lakes. Many communities now require erosion control measures to be taken during any construction project in which soils are disturbed (excavations and re-grading projects), since sedimentation impacts storm drains and other flood control structures. Unknown to many park managers is the more gradual deterioration of soils due to the proliferation of certain invasive plant species.⁴² Many of these plants shade out and eliminate the ground cover and grassy vegetation that is most effective at preventing erosion. Therefore, a comprehensive erosion-control program should seek to eliminate exotic invasive plants and replace them with plant cover that is more effective at holding soil. Deep-rooted perennial plants are always more effective than shallow-rooted plants at maintaining soil structure. Native grasses in particular possess extremely dense root structures (turf grass is a relatively shallow-rooted grass and not as effective as native grasses at preventing erosion).

1. **Benefits** of this strategy:
 - a) **Reduced costs** associated with the need for engineered erosion control along streams and lakes and on slopes and pathways.
 - b) **Improved water quality** in local waterways, ponds, and lakes, resulting in healthier fish populations and improved aesthetics.
 - c) **Improved soil** structure resulting in better infiltration of rainwater into soils and reduced flooding.
2. Other **considerations**:
 - a) **Initial costs** to mechanically remove exotic plant species and replace with native plants can be high (although these costs are ultimately lower than the cost of engineered remediation).
 - b) **Public education** will likely be necessary to explain the benefits of natural erosion control measures.

I. Incorporate environmental impact considerations in the design process of facilities and parks. Building construction, while **occurring over a limited span of time, has the potential to result in a whole range of negative environmental impacts.** Ultimately, the finished structure is a highly visible reflection of the agency's commitment (or lack thereof) to environmental protection. Since most building construction for parks and recreation agencies is completed by outside contractors, the contractual agreement can be used as a tool to insure that not only do contractors adhere to guidelines designed to protect the immediate environment, but the building itself is built in a way that protects the environment well beyond the construction site.

1. Efforts to implement this strategy include:
 - a) Consider incorporating state-of-the-art **“green building” design** features when planning for the construction of new facilities.⁴³
2. **Benefits** of this strategy:
 - a) **Positive publicity** for agency resulting from the use of “green” technologies in the development of facilities.
 - b) **Reduced heating and cooling costs** when “green building” technologies are incorporated into designs.
 - c) **Reduced negative impacts** on local air and water resources.
3. Other **considerations**:
 - a) “Green” building design will generally have higher **costs** for materials and construction than traditionally designed structures.
4. Requiring contractors to adhere to specific practices to protect the environment will require **additional oversight** by staff to insure that they are adhered to.

For more information on specific topics or research that supports the above conclusions, see endnotes at the back of the toolkit.



Open Space Planning & Preservation

GOAL: Protect and restore indigenous natural communities such as prairies, woodlands, and wetlands, and promote the reclamation, acquisition, preservation, and management of other open space areas, including natural corridors, waterways, greenways, and trails.

Rationale:

Open space preservation is one of the parks and recreation profession's key functions in modern society. **Clean and attractive parks, green spaces, and natural areas are essential to the health and happiness of all human beings.** They provide opportunities for active outdoor recreation, solitude, natural beauty, and places to learn about the world around us. Maintaining ecologically healthy natural areas is also imperative to the survival of many plant and animal species and help to maintain the balance of life on our planet. Preservation of open space also accrues economic benefits to surrounding communities.¹

Background:

Our society has transformed itself in a very short period of time from one that once saw the natural world and open space as merely **economic opportunities** waiting to be exploited and utilized by human enterprise to one that now views them as having intrinsic value and benefits to society. However, before this transformation took place, much of our nation's natural bounty and open land was destroyed and/or altered to serve private or **public economic interests.**² While there is still a tendency to see the preservation of open space as a luxury and as secondary to economic and other human interests, we have largely come to accept that the presence of parks and preserved natural areas is a quality of life issue and a necessary part of healthy communities. The creative thinking of park planners has insured that open space includes such things as **urban natural areas and wildlife sanctuaries, recreational lakes and rivers, recreational trails** and green corridors that connect parks and break up the urban landscape, and even **naturalized landscaping** as an alternative to traditional formal landscaping. More recently, in an effort to expand open space preservation to private land, environmental organizations and land trusts have worked to **encourage private landowners** to place legally binding **conservation easements** on their land, which insure that the land will remain as open space in perpetuity.

Just as traditional parks require **upkeep and maintenance**, the preservation of natural landscapes requires more than simply declaring them public nature areas and leaving them alone. Many communities have wisely decided to preserve and protect natural open space for their residents but have sometimes neglected to plan for the **ongoing management** of these areas. Numerous resources exist within state and county agencies, at local colleges and universities, and among private sector environmental consulting firms to assist park professionals unfamiliar with natural areas management

(some of which are listed under the endnotes included at the end of this document). It is equally important to make the local community aware of natural open spaces and their benefits so that they will both support and assist in their preservation.

Strategies:

A. **Develop and implement long-range management plans** for the reestablishment and/or restoration of native prairie, woodland, and wetland ecosystems.

1. Efforts to **restore** and/or **re-establish native ecosystems** can take the following forms:

a) **Identify** any existing remnants of native prairie, woodland, or wetland on agency properties, **declare** them conservation/natural areas, and develop natural resource management and **maintenance plans** for them.³

b) Identify areas where mowing and other forms of traditional maintenance are difficult and/or un-necessary and **replant** these areas with appropriate native plants (i.e. steep slopes, borders of ponds and wetlands, stream corridors, existing brushy or densely wooded areas)⁴

c) Work with state and local conservation agencies to identify any potential open space natural areas within the community and develop a long-range plan to **acquire** and **develop** the property as **public parkland**.⁵

2. **Benefits** of these strategy:

a) Provides the community with places to engage in both active and passive **recreation**, seek **relief** from the **stresses of urban living**, and experience solitude, quiet, and natural beauty.

b) Contributes to **a healthy environment** (i.e. water quality in local streams and lakes, flood protection, clean air and natural ‘air conditioning’)

c) Over time, the **costs** for maintaining and managing natural areas are much **lower** than for traditional park **maintenance**.

d) **Improves community** aesthetics, image, and potentially, local land values.

e) Has the potential to **promote local tourism**.

f) Improves the **public image** of the agency by promoting the preservation of natural areas for public benefit.

g) Provides **protected homes** for wildlife and rare plants.

h) Natural vegetation adjacent to wetlands, lakes, and rivers will significantly **reduce impacts** from urban Canada geese since the geese will not nest in these areas.

i) **Public acceptance** of preserved, well-managed, and publicly accessible natural areas tends to build a constituency that supports the continued preservation of additional acres as natural open space.

2. Other **considerations**:

- a) Restoration of natural areas has upfront **costs** like any other park development, and these costs can seem excessive to a public or board that is not already sold on the benefits of natural areas.
- b) **Costs** for **ongoing maintenance** and management need to be considered, even though these costs are usually much less than for traditional active-use parkland.
- c) **Educating** the public and board members about the benefits of natural areas can take time and resources.

B. Re-establish and protect river corridors, wetlands, and other open space greenways that facilitate safe movement of wildlife and provide habitat, and support other local efforts to establish greenways.⁶

1. Efforts to **establish** and **protect** open space **greenways** can take the following forms:

- a) **Insure that stream** and **river** corridors and floodplains are **protected** and that natural **vegetation** within the floodplain is maintained in order to **prevent erosion**, promote use by wildlife and **enhance local natural scenery**.⁷
- b) **Acquire wetlands** from developers as passive use **recreational areas**.
- c) Make non-recreational **public open space available** for wetland mitigation banking through the U.S. Army Corps of Engineers.
- d) **Convert floodwater** retention and detention basins into **functional wetlands** through enhancement with **native vegetation**
- e) Work with public utilities and local planning boards to **convert utility right-of-ways** and **unused rail lines to recreational trails** and open space corridors.⁸
- f) Provide means for **wildlife** to **safely cross** or **bypass busy roads** and highways through the establishment of reduced speed zones, wildlife crossing signs, underpasses, and overpasses.

2. **Benefits** of this strategy:

- a) Provides the community with places to engage in both active and passive **recreation**, seek **relief** from the stresses of urban living, and experience solitude, quiet, and natural **beauty**.
- b) Contributes to a **healthy environment** (i.e. improved water quality in local streams and lakes, flood protection, clean air, and natural ‘air conditioning’)
- c) Over time, the **costs** for maintaining and managing natural areas are much **lower** than for traditional park maintenance.
- d) **Improves community** aesthetics, image, and potentially, local land values.
- e) Has the potential to **promote local tourism**.
- f) **Improves the public image** of the agency by promoting the preservation of natural areas for public benefit.

- g) Natural vegetation adjacent to wetlands, lakes, and rivers will significantly reduce impacts from urban Canada geese since the geese will not nest in these areas.
- h) Provides **protected homes** for wildlife and rare plants.
- i) Provides safe corridors for wildlife through urban areas can potentially **reduce** the number of **road-killed animals** and **vehicle damage** due to collisions with deer.
- j) **Public acceptance** of preserved, well-managed, and publicly accessible natural areas tends to build a constituency that supports the continued preservation of additional acres as natural open space.

3. Other **considerations**:

- a) **Restoration** of natural areas has upfront **costs** like any other park development, and these costs can seem excessive to a public or board that is not already sold on the benefits of natural areas.
- b) Costs for **ongoing maintenance** and management need to be considered, even though these costs are usually much less than for traditional active-use parkland.
- c) **Educating** the public and board members about the benefits of natural areas can take time and resources.

C. **Provide appropriate recreational access** to and enhance public awareness of restored and protected natural sites through trails, wildlife observation areas, signs, environmental programs, and volunteer restoration efforts.⁹

1. Efforts to **provide recreational access** to and **improve public awareness** of natural areas can take the following forms:

- a) **Develop walking trails**, boardwalks, and bridges within conservation/natural areas to encourage public access and use.
- b) **Develop wildlife observation platforms** or blinds adjacent to wetlands, lakes, rivers, and at raised elevation overlooks.
- c) **Establish park use policies** that are specific to conservation/natural areas and promote both the protection of the site and encourage appropriate public use. Design and install attractive signs that provide information on the site's use guidelines, trails, and natural features.
- d) **Develop a brochure** that specifically promotes the community's natural areas and distribute within park and municipal facilities, local library, schools, etc.
- e) **Conduct public dedications** when sites are named, for new restoration efforts, grant-funded projects, and the installation of trail features with neighbors and local press invited to participate.
- f) **Develop and offer programs** and community **events within** or adjacent to **natural areas** that highlight natural features and promote stewardship by the public.

g) **Provide opportunities** for community members to participate in **volunteer** efforts to maintain and manage natural resources within natural areas.

2. **Benefits** of this strategy:

a) Contributes to the overall agency mission of **improving physical health** and wellness by promoting outdoor activity.

b) **Community** will become both aware of and **supportive** of the agency's efforts.

c) **Community volunteers** can accomplish many of the needed management functions, allowing **staff resources to be focused elsewhere**.

3. **Other considerations:**

a) **Costs** for outdoor amenities (trails, bridges, boardwalks, etc.) as well as for outdoor signage, brochures, etc. can have high up-front costs.

b) Volunteer groups and programs require **staff time** and resources to properly manage and nurture.

D. Maintain relationships with land trusts, private organizations, conservation coalitions, and private landowners in your community in order to insure regional and/or community-wide protection of open space.

1. Efforts to **protect open space** on a regional or community-wide basis can take the following forms:

a) **Establish inter-governmental agreements** with neighboring public agencies to insure that open space on community borders is protected.

b) **Participate with regional conservation coalitions** and planning agencies in the formulation of regional **open space protection plans**.

c) **Work with land trusts** and other groups operating in your region to insure that public conservation efforts are coordinated with efforts to establish conservation easements on private land or in neighboring communities (see endnote 5 for a list of land trusts). Seek to establish cooperative agreements with private landowners in an effort to acquire or otherwise ensure the use of these lands for open space.

2. **Benefits** of this strategy:

a) The community and region **gain valuable preserved open space** at **little or no cost** to the public. (i.e. if a neighboring community owns the land and is conducting management and/or a private landowner is managing a conservation easement).

b) The presence of **nearby open space** and buffers **effectively increases the size of natural areas**, particularly benefiting rare or endangered species of plants and wildlife.

c) The **agency's image can be enhanced** by its role in protecting land from development without taking it off of local tax rolls (in the case of conservation easements on private land).

3. **Other considerations:**

- a) Process of **working cooperatively** with neighboring public agencies and/or private landowners can be time-consuming and tedious.
- b) There are often **legal fees** associated with inter-governmental agreements and conservation easements.

E. **Utilize native species for park landscaping** and seek to develop naturalized plantings wherever they do not interfere with a site's primary function.

1. Efforts to **landscape with native species** can take the following forms:

- a) **Use native trees, shrubs, and grasses** within formal landscape plans **adjacent to facilities**, within parking lot islands, as vegetation screenings, and in other locations where exotic cultivars were traditionally used.
- b) **Develop 'rain gardens'** consisting of diverse plantings of native wetland wildflowers and grasses **where building downspouts and field drains discharge water**, within drainage swales, and anywhere saturated soils are created by drainage conditions.
- c) Develop butterfly gardens using native prairie wildflowers.
- d) **Develop naturalized prairie gardens** in sunny spots adjacent to park entrances, along pathways, and in locations where slopes and/or dry soils make establishment of bluegrass sod difficult.
- e) **Utilize natural wetland vegetation** around ponds, lakes, rivers, etc. as a way to reduce soil erosion and deter Canada geese from nesting and feeding in these areas.

2. **Benefits** of this strategy:

- a) Contributes to a **healthy environment** (i.e. water quality in local streams and lakes, flood protection, clean air and natural 'air conditioning')
- b) Over time, the **costs** for maintaining and managing natural landscaping are **much lower** than for traditional park landscaping
- c) **Improves the public image** of the agency by promoting the preservation of natural areas for public benefit
- d) Provides protected homes for wildlife and rare plants.
- e) **Public acceptance** of preserved, well-managed, and publicly accessible natural areas tends to build a constituency that supports the continued preservation of additional acres as natural open space.

3. Other **considerations**:

a) Installation of natural landscaping has **upfront costs** like any other park development, and these costs can seem excessive to a public or board that is not already sold on the benefits of natural landscaping.

b) Costs for **ongoing maintenance** and management need to be considered, even though these costs are usually much less than for traditional active-use parkland.

c) **Educating** the public and board members about the benefits of natural areas can take time and resources.

Endnotes:

For more information on specific topics or research that supports the above conclusions, see endnotes at the end of the toolkit.



Reduction & Handling of Waste

GOAL: Reduce waste production, reuse and recycle materials from facility and park operations, and handle hazardous and all other wastes according to lawful and safety procedures.

Rationale:

Recycling has many benefits. It **can save trees, protect wildlife habitat**, reduce space needed for landfills and support biodiversity. On a global scale, reducing new product manufacturing from raw materials helps avoid destruction of forests, wetlands, rivers and other places essential to wildlife. New product manufacturing with virgin materials uses toxic chemicals which typically end up in local watersheds.

There can be additional **economic benefit** from recycling when it **creates jobs** and promotes economic development. A recent study by the Texas Natural Resources Conservation Commission found that recycling added about \$18.5 billion in value to the economies of 12 southern states and Puerto Rico in 1995. A recycled newsprint mill in the Bronx, started by NRDC and a local community group, will create 600 permanent jobs and clean up an industrial site abandoned for a quarter of a century. Cities may profit by selling recyclables. **Buying recycled** products contributes to the **demand for more recycled products**. This can, in turn, save even *more* resources, reduce *more* pollution and protect *more* people's health.¹ The **benefits** of not impacting our environment grow daily to those paying attention.

The parks and recreation profession can play a vital leadership role in any community. By demonstrating concern for our environment by reducing, reusing and recycling various materials, a park program can introduce the public to, and ask for community members' assistance in implementation of such programs. Education is the key to reaching more people in more situations.

Background:

America generates more waste every year, growing from 247 million tons of non-hazardous waste in 1990, to 409 million tons in 2001, according to Biocycle magazine, an industry publication.² Much of this so-called trash could be reused, recycled or reduced at the source by first learning what items fit the program.³ Simple steps taken at the agency level to eliminate waste in the work place and reusing materials and recycling discards could result in a net waste reduction. Before you begin, you should understand the terminology (see website).⁴

Strategies

A. Reduce, reuse and recycle materials

1. Efforts to reduce, reuse and recycle materials can take the following forms:

- a) **Develop aluminum can recycling program.**⁵
- b) **Develop a plastic bottle recycling program.**⁶
- c) **Develop a one-sort recycling system** at all facilities.
- d) **Develop a recycling scrap metal** program.
- e) **Develop a paper / cardboard recycling program.**
- f) **Discover a recycling location** or reuses **for styrofoam** (some pack and ship places will accept donations to use as packing materials)
- g) **Develop a composting program-** district, city, county.
- h) **Chip trees** and limbs from trimming for use in mulch in landscaping beds and pathways (or compost piles).
- i) **Compost grass** clippings when possible.
- j) **Develop and implement a Christmas tree recycling program** where trees are mulched and made available to the public at no charge. Trees are also used as habitat in lakes.

2. **Benefits** of this strategy:

- a) **Cleaner, more beautiful parks and facilities**
- b) **Less impact on landfills.**

3. Other **considerations**:

- a) Transport and storage of materials.

B. Use products that do not create adverse environmental impacts

1. Efforts to use environmentally conscious products can take the following forms:

- a) **Replace solvent tanks** with environmentally friendly tanks to reduce hazardous waste generated by maintenance shops.
- b) **Return toner cartridges** to the manufacturer for reuse. Check with local school districts- they may be accumulating cartridges as a fund-raiser.
- c) **Develop water recapture and reuse designs** for future construction projects.
- d) Develop a plan to filter and **reuse the rinse water** in equipment wash areas.
- e) **Donate used computer equipment** or sending to auction to avoid placement in landfill.
- a) **Purchase products** made from **recycled plastic** such as eco-spun t-shirts, plastic picnic tables (when weight is not a factor), etc.

2. Other **considerations**:

- a) Storage and deliverability to recycling locations

C. Investigate source reduction of waste by purchasing in bulk, minimizing packaging and reducing excess use of paper.

1. Efforts to reducing the source reduction of waste can take the following forms:

- a) Investigate **bulk purchasing** to minimize disposal of packaging as well as saving money.
- b) **Minimize packaging** in souvenir stands and concession stands.
- c) **Encourage electronic mail** and voice mail to reduce use of paper products.
- d) **Reduce** the use of **disposable products** by staff, concessionaires and park/facility users.

2. **Benefits** of this strategy:

- a) Small savings
- b) Less in-house garbage or recycling

3. Other **considerations**:

- a) Fuel costs and pollution related to re-distribution

D. Explore ways to reduce waste production by minimizing the creation of waste, especially hazardous waste.

1. Efforts to reducing waste production can take the following forms:

- a) Create a **central collection point** for all small batteries to avoid improper disposal.
- b) Discover proper disposal locations.⁷
- c) Consider the use of **rechargeable batteries** for maximum efficiency (and then recycle or properly dispose of the batteries).⁸
- d) Use vendors who properly dispose of all hazardous waste including used oils, antifreeze, batteries, tires and Freon.
- e) Examine all **concession facilities**, kitchens, and park programs that serve food for possible **recycling** of aluminum, tin cans, glass, plastic and paper. Paper makes up about 41% of all trash.⁹
- f) **Purchase earth friendly fluorescent bulbs** that meet or exceed minimum mercury requirements for landfill disposal and properly dispose of (and recycle) them.¹⁰ (<http://www.mass.gov/dep/files/lamps.htm>)
- g) Consider an **energy audit**.
- h) **Check furnace ducts** for leakage.
- i) Develop and implement a plan for **proper disposal of chemicals** used by in-house print shop.
- j) Use **hazardous waste bags** for proper disposal of chemicals and biohazard material.

- k) Place **special collection boxes** for hazardous waste and/or hazardous waste bags to provide proper disposal.
- l) **Replace solvent tanks** with environmentally friendly solvent tanks to reduce hazardous waste generated by maintenance shops.¹¹
- m) **Purchase an EPA approved waste oil furnace.** Safety is important.¹²
- n) Collect and reuse or **properly dispose of engine oil.**¹³

2. **Benefits** of this strategy:

- a) A safer working environment.

3. **Other considerations:**

- a) **Train** on proper handling methods of various hazardous wastes
- b) Help staff overcome their fears and concerns about handling of hazardous waste

E. Reuse office, recreation program and maintenance/construction materials.

1. Efforts to reuse materials can take the following forms:

- a) **Donate** unused maintenance or **construction materials** to local YouthBuild¹⁴ or Habitat for Humanity organizations.
- b) **Recycle building materials** during remodeling or rebuilding projects.
- c) **Locate salvage yard** for recycling of materials.

2. **Other considerations:**

- a) Transportation of collected materials to disposal sites
- b) **Storage space** of materials before delivery to disposal sites

F. Create and offer educational programs and supportive printed materials that demonstrate to the public (and specifically children) the environmental importance of recycling, waste reduction and appropriate handling of waste.

1. Education about recycling, waste reduction and waste handling can take the following forms:

- a) **Promote proper methods** of reducing, reusing and recycling in all **children's programs.**
- b) Promote your Park District's environmental initiatives through the **local media.**

Potential Resources/Funding Sources:

- www.NAPCOR.com
- www.commerce.state.il.us/com/recycling/success_bus.html

For more information on specific topics or research that supports the above conclusions, see endnotes at the end of the toolkit.



Wise Use of Energy Resources

GOAL: Actively seek and implement ways to conserve energy resources and investigate methods of applying alternative energy technologies.

Rationale:

We are **rapidly exhausting** our sources of **extractable coal, oil, nature gas and uranium**. As a result of industrial development, combined with population growth, there has been an enormous increase in the demand for energy since the middle of the last century. World population grew more than 3 times between 1850 and 1970, per capita use of industrial energy increased about twenty-fold, and total world use of industrial and traditional energy forms combined increased more than twelve-fold.

It is estimated that fossil fuels provide around 66% of the world's electrical power, and 95% of the world's total energy demands (including heating, transport, electricity generation and other uses). Coal provides around 28% of energy, oil provides 40% and natural gases provide about 20%. Coal, oil and gas are called "fossil fuels" because they have been formed from the fossilized remains of prehistoric plants and animals. **Our consumption of fossil fuels has nearly doubled every 20 years since 1900. These fuels are NOT replaceable.** In addition, fossil fuel extraction negatively impacts the environment and becomes more cost prohibitive as the remaining available deposits are more inaccessible to extraction.

"... oil that makes possible where we live, how we live, how we commute to work, how we travel-even where we conduct our courtships. It is the lifeblood of suburban communities. Oil (and natural gas) are the essential components in the fertilizer on which world agriculture depends; oil makes it possible to transport food to the totally not-self-sufficient megacities of the world. Oil also provides the plastics and chemicals that are the bricks and mortar of contemporary civilization, a civilization that would collapse if the world's oil wells suddenly went dry."¹

Background:

There is a **need to conserve** existing sources of energy **through energy efficiency**, as well as to **discovering and utilizing alternative or renewable sources of energy**. Renewable energy is energy that is derived from an inexhaustible (i.e wind, sun, sea, geothermal, biomass) and/or replaceable (waste products, crops) sources. Also known as non-conventional sources of energy, they typically **cause less emission** and are **available locally**. Their use can significantly **reduce chemical, radioactive, and thermal pollution** and they are viable sources of clean and limitless energy. Most of the renewable sources of energy are fairly non-polluting and considered clean.

Strategies:

A. Conserve energy

1. Efforts to conserve energy can take the following forms:

a) Vehicle/Gasoline

- (i) **Remove** leaking or compromised **underground fuel tanks**. Replace or bring into compliance with the use of fuel monitoring systems.
- (ii) **Tune up vehicles** on a regular basis. Check **tire pressures** regularly. Perform all applicable **vehicle maintenance** to reduce emissions.
- (iii) **Replace older vehicles** with more efficient hybrid or alternative vehicles

b) Water

- (i) **Retrofit** all facilities with **water conservation hardware** and develop a **leak detection and correction** program.
- (ii) Develop a water **conservation plan** for **swimming pools, skating rinks and other special facilities**.
- (iii) **Find** comprehensive **water conservation programs** to promote better over-all turf health, reduce maintenance costs, and promote good community relations.
- (iv) **Investigate new irrigation systems** for golf courses.

c) Energy

- (i) **Set the thermostat** in winter to 68 degrees or less for daytime hours. For the summer, set thermostats to 78 degrees or more. For the heating season, leave **shades and blinds** open on sunny days, but close them at night to reduce the amount of heat lost through windows. Close shades and blinds for the summer or when you use or will use the air conditioner later in the day.
- (ii) Purchase **efficient energy-rated electrical appliances** and **low water use toilets and faucets** as replacements.
- (iii) **Plant shade trees** near buildings to reduce energy consumption.
- (iv) **Plant evergreens and shrubs as windbreaks along building** foundations and walls to reduce energy conservation.
- (v) **Daylighting uses natural light** from the sun or sky to **provide illumination in interior environments**. Techniques include: locating furniture to make use of natural light, using task lighting, installing interior windows in the walls between one office and another, painting surfaces in light colors, using mirrors to reflect light and installing a skylight.

- (vi) **Unplug unused chargers** including cell phones, PDA's, digital cameras, cordless tools and other gadgets.
- (vii) **Set Computers** to sleep and hibernate. **Enable the "sleep mode"** feature on your computer, so it uses less power during periods of inactivity. In Windows, the power management settings are found on the control panel. Mac users, look for energy save settings under system preferences in the apple menu. **Configure your computer to "hibernate"** automatically after 30 minutes or so of inactivity. The "hibernate mode" turns the computer off in a way that doesn't require you to reload everything when you switch it back on. This feature saves more energy and time than if you shut down and restarted your computer from scratch.
- (viii) **Turn off the lights.** Turn off or dim the lights in unused conference rooms and when you step out for lunch. **Motion activated lights** may make this job easier. Work by daylight when possible. A typical commercial building uses more energy for lighting than anything else.

2. **Benefits** of this strategy:
 - a) Most people find natural light **more pleasant.**
 - b) **Employees may positively change** their energy use habits **outside the workplace.**
 - c) These strategies demonstrate **community leadership** by your agency.
3. Other **considerations**:
 - a) **Higher initial costs** for equipment may force organizations to selectively purchase replacements in an on-going effort compared to an expensive retrofit of newer technology.
 - b) **When trained, employees** are more likely to embrace the importance of energy savings.

B. Design facilities and energy use and purchase plans for energy efficiency

1. Energy efficient design can take the following forms:
 - a) **Design and build energy efficient buildings**, with consideration to **"green technology"** which includes insulation and energy efficient appliances. Consider the 'whole buildings' design approach which asks the members of the plan, design and construct team to look at the materials, systems and assemblies from many different perspectives. **Evaluate the design for cost, quality-of-life, future flexibility, efficiency, overall environmental impact, productivity, and creativity.** As economy and population expands, designers and builders face a unique challenge to meet demands for new and renovated facilities that are accessible, **secure, healthy, and**

productive and minimize their impact on the environment. Recent answers include an integrated, **synergistic approach**. This "sustainable" approach supports environmental stewardship and conservation, and results in an optimal balance of cost, environmental, societal, and human benefits, while meeting the mission and function of the intended facility or infrastructure. Sustainable design should **avoid resource depletion** of energy, water, and raw materials, prevents environmental degradation from facilities and infrastructure throughout their life cycle, and create built environments that are **livable, comfortable, safe, and productive.**²

b) Develop an **energy savings plan** through **energy audits** at each major facility.

c) **Train staff** to "turn it off/turn it down" to reduce energy expenses. **Properly maintain** refrigerators and air conditioners for efficiency.

d) **Establish** minimum and maximum **thermostat temperature** settings for all facilities.

e) **Purchase diesel versus gasoline-powered machinery** to maximum fuel efficiency and minimize maintenance procedures. Investigate the merit of bio-diesel (or soy-diesel) to reveal savings. More information is available from the National Motorists Association (www.motorists.com).

f) **Upgrade interior lighting** and use **more energy efficient fixtures** to include **replacement of ballasts and lamps**. Replace incandescent lighting with CFL (**Compact Fluorescent Light Bulbs**). (CFLs use 1/3 to 1/4 of the energy of incandescent bulbs.) "*... the potential energy savings from daylighting can be substantial, reducing energy consumption by as much as 20 percent in schools and offices and up to 40 percent in some retail and industrial buildings.*"³

2. **Benefits** of this strategy:

a) When organizations reduce energy consumption, they save money

b) Less energy consumption means less pollution from energy producers and energy devices

C. Consider future energy efficiency

1. **Gather information** in regards to **energy efficient vehicles** (electric, hybrids, or vehicles that run on fuel cells) and their potential use for short distances within the agency. Examine new transportation devices (i.e. Segway).

2. **Examine energy sources** which include (but are not limited to): wind, geothermal and biomass.

3. **Develop/discuss policy** "at what price green" in your district.

4. Choose **renewable energy suppliers** for the agency power needs.

For more information on specific topics or research that supports the above conclusions, see endnotes at the end of the toolkit.



Index

- E**
Energy
 Conservation, 48, 49
- F**
Facilities
 Green, 8, 49, 50
 Health, 7, 8, 29
- G**
Grants, 5, 24, 27
- H**
Hazardous Waste, 8, 12
- I**
Invasive Species, 8
- L**
Land
 Access, 9, 28, 36, 38, 39, 40
 Acquisition, 6, 8, 10, 23, 27, 36, 38
 Landscaping, 8
- Maintenance, 7, 33
 Management, 7, 8, 31, 32, 33, 34
 Protection, 12
- P**
Packaging, 20
Polystyrene, 16
Products, 12, 17, 52
 Cleaning, 3, 21, 29
 Gardening, 3, 5, 21, 27
 Green, 2, 3, 8, 9, 12, 14, 16, 17, 21, 35, 52
 Impact, 2, 7, 14, 15, 17, 18, 19, 22, 28, 30, 33, 35, 44
 Lawn Care, 3, 21
 Rainforest, 3, 52
 Recycled, 3, 52
 Wood, 3, 21, 52
Programming, 22
 General, 5, 6, 7, 8, 23, 24, 26, 27, 32
 Participants, 5, 27
 Speakers, 1, 5, 6, 8, 23, 24, 27, 28
 Volunteers, 4, 5, 6, 12, 23, 25, 27
Purchase, 1, 2, 3, 8, 14, 15, 18, 19, 34, 43, 44, 45, 46, 52
 Green, 3, 8, 9, 12, 21, 35, 52
 Paper, 3, 11, 45, 52
 Plastic, 16
 Recycled, 3, 21, 52
- R**
Recycle, 3, 11, 15, 16, 19, 23, 24, 43, 44, 45, 46, 52
 Batteries, 11, 45
 Fluorescent Tube, 12
Recycling, 3, 52
- S**
Signs, 5, 25, 27
Sprawl, 8
- U**
Underground Storage Tanks, 7, 8, 34
- V**
Vehicle
 Alternative Fuels, 29
 Biodiesel, 50
 Emissions, 8, 12, 15
 Green, 8, 48
- W**
Water
 Conservation, 48

Author Information

Dave Brooks
**Open Space &
Wise Use of Air, Water,
Soil and Wildlife**
Spring Valley Nat. Cent.
Schaumburg Park Dist.
1111 E. Schaumburg Rd
Schaumburg, IL 60134
(847)985-2100

Jan Herbert
**Reduction and
Handling of Waste &
Wise Use of Energy
Resources**
Rockford Park District
(815)969-4499

Rita Hickman
Env. Education
Crystal Lake Park Dist.
Nature Center
Crystal Lake Park Dist.
1 East. Crystal Lake Ave.
Crystal Lake, IL 60014
(815)455-1763

Cheryl Toohey
Purchasing
Emily Oaks Nat. Cent.
Skokie Park District
4650 Brummel Street
Skokie, IL 60076
(847)674-1500



Endnotes

Purchasing

¹ For further details about these five guiding principals, visit the EPA's website at www.epa.gov/opptintr/epp/.

² John Elkington, Julia Hailes, and Joel Makower, *The Green Consumer* (New York: Penguin Books, 1990), 48-49.

³ www.worldwise.com- Worldwise is a leading brand of environmentally responsible consumer products.

⁴ The Department of Commerce and Economic Opportunity has put together a recycled content product guide. The website for DCEO is www.commerce.state.il.us/.

⁵ For a recycled plastic products directory visit www.plasticresource.com.

⁶ Eco-foam (eco-foam.com) and Starch Tech Inc. are companies that manufacture starch-based plastics. One company that manufactures cellulose insulation, 80% recycled paper fiber, is U.S. Green Fiber www.greenstone.com.

⁷ For a regional list of companies that produce biochemically derived products visit <http://www.carbohydrateconomy.org>. This site also provides general information about the benefits of replacing petrochemicals with biochemicals.

⁸ The Earth Works Group, *50 Simple Things Your Business Can Do to Save the Earth* (California: Earthworks Press, Inc., 1990), 12.

⁹ The Consumer Handbook for Reducing Solid Waste can be accessed at <http://www.epa.gov/epaoswer/non-hw/reduce/catbook/reuse.htm>.

¹⁰ Refer to www.emagazine.com/view/?41 for information on tree-free paper.

¹¹ www.paperretriever.com Paper retriever is a paper recycling program run by Abitibi Consolidated Recycling.

¹² www.conservatree.org offers a list of tree free papers according to brand and content.

¹³ For a partial list of these companies see pgs. 112-113 of *The Green Consumer*, John Elkington, Julia Hailes, and Joel Makower.

¹⁴ www.rain-tree.com and www.ran.org (Rainforest Action Network) share facts and figures about rainforest destruction.

¹⁵ Smartwood, a program of the Rainforest Alliance, can be accessed at www.smartwood.org. The Certified Forest Products Council is another resource for selecting wood and wood products at www.certifiedwood.org.

¹⁶ Debra Lynn Dadd, *Non-toxic, Natural and Earthwise* (New York: St. Martin's Press, 1990), 13

¹⁷ Debra Lynn Dadd, *Non-toxic, Natural and Earthwise* (New York: St. Martin's Press, 1990), 140-162

¹⁸ For more information on product selection visit www.carbohydrateconomy.org.

Environmental Education

¹⁹:**Jaus, H.**, 1984 The development and retention of environmental attitudes in elementary school children. *Journal of Environmental Education*, 15(3), 33-36.

Jordan, J., Hungerford, H., & Tomera, A., 1986 Analysis and synthesis of research on responsible environmental behavior: A meta-analysis. *The Journal of Environmental Education*, 18(2), 1-8. Fifteen separate variables were meta-analyzed, of which the following were found to be associated with responsible strategies, locus of control, attitudes, verbal commitment, and an individual's sense of responsibility. Environmental educators may influence several important component areas of strategies, and action skills may be enhanced through educational efforts.

Gill, J. D. & Crosby, L. A., 1986 Ecological concern, attitudes, and social norms in voting behavior. *Public Opinion Quarterly*, 50(4), 537-554.

Protess, D.L., 1987 The impact of investigative reporting on public opinion and policymaking: Targeting toxic waste. *Public Opinion Quarterly*, 51(2), 166-185. In their review of the case studies, they theorized that the way the media portrayed the issues and the frequency of past media attention had the greatest influence on public attitudes. The strongest effects were produced when the presentation was unambiguous and the issue was nonrecurring. Investigative journalism tended to put policy-makers on the defensive, producing some policy impact in each study.

²⁰ **Vander Stoep, Gail A. & James H. Gramann.** The effect of verbal appeals and incentives on depreciative behavior among youthful park visitors. *Journal of Leisure Research*, 19(2), 69-83. Four messages delivered to groups before starting their hike - a. "Awareness of Consequences" treatment - verbal information about the damaging consequences of specific acts (AC Treatment) b. "Awareness of Consequences plus Resource Protector" treatment - AC treatment plus hikers asked to record any damage to resources they noticed while in the park (AC + RP Treatment) c. "Awareness of Consequences plus Resource Protector plus Incentive" treatment - AC + RP plus hikers an incentive of an award given to hikers (AC + RP + I Treatment) d. Control group - hikers met at trailhead and just welcomed. All treatments reduced depreciative behavior relative to the control condition. AC and AC + RP treatments reduced climbing/ hitting activity by 88%. AC + RP + I treatment reduced climbing/ hitting by 87%. Leaning/touching behaviors, although reduced, were not affected as much as were the more serious behaviors (i.e. climbing/ hitting). Under the AC + RP + I treatment leaning/ touching increased slightly, although not significant statistically. The AC + RP and AC + RP + I treatments did not differ significantly from each other in their impact on depreciative behavior.

Wagstaff, M., & Wilson, B. 1988. The evaluation of litter behavior modification in a river environment. *Journal of Environmental Education*, 20(1), 39-44. Results showed significant differences in letter collection behavior among the treatment and control groups. When role modeling and verbal appeals were used with commercial rafting groups, they appeared to improve litter pick up behavior. Planting designated litter in specific locations proved to be an effective and manageable technique.

Hecht, P. R., Durdan, C. A., & Reeder, G. D. 1985 Litter in a university cafeteria demographic data and the use of prompts as an intervention strategy. *Environmental and Behavior*, 17(3), 387-404. There was a significant decline in food-related litter when prompts were in effect. Positively worded prompts were found significantly more effective than negatively worded prompts.

Hayes, S. C., & Cone, J. D. 1981 Reduction of residential consumption of electricity through simple monthly feedback. *Journal of Applied Behavior Analysis*, 14(1), 81-88. The data showed a clear decrease in electricity consumption for the feedback group during the feedback phase. The effect was maintained during a four-month intervention period. Withdrawal of the feedback was associated with a return to higher levels of electricity consumption.

Horsley, A. 1988 The unintended effects of a posted sign on littering attitudes and stated intentions. *The Journal of Environmental Education*, 19(3), 10-14.

Ford & Cloninger 1982-83 Multi-phasic mood changes in a five-day residential outdoor education experience. *The Journal of Environmental Education*, 14(2), 29-31.

²¹ <http://www.sharingnature.com/NatureActivities.html>

²² <http://www.dnr.state.wi.us/org/water/fhp/wetlands/resman.shtml> (wetlands)

²³ **Jaus, H, 1984; Jordan, J. Hungerford, H., & Tomera, A.,** 1986

²⁴ **Protess, D.L.,** 1987 The impact of investigative reporting on public opinion and policymaking: Targeting toxic waste. *Public Opinion Quarterly*, 51(2), 166-185. In their review of the case studies, they theorized that the way the media portrayed the issues and the frequency

of past media attention had the greatest influence on public attitudes. The strongest effects were produced when the presentation was unambiguous and the issue was nonrecurring. Investigative journalism tended to put policy-makers on the defensive, producing some policy impact in each study.

²⁵ **Vander Stoep, Gail A. & James H. Gramann., Wagstaff, M., & Wilson, B.** 1988., Hecht, P. R., Durdan, C. A., & Reeder, G. D. 1985, Hayes, S. C., & Cone, J. D. 1981, Horsley, A. 1988, Ford & Cloninger 1982-83

Wise Use of Air, Water, Soil and Wildlife

²⁶ Approximately 150 animal species are currently listed as threatened or endangered in Illinois, and 335 plant species are listed. Source: Illinois Endangered Species Protection Board, <http://dnr.state.il.us/espb/dataset.htm>

²⁷ Further information on the environmental and economic effects of urban sprawl can be found at the following organization websites: *Trust for Public Lands*, www.tpl.org and *National Resources Defense Council*, www.nrdc.org/cities/smartGrowth/nsolve.asp

²⁸ While trends documented by the U.S. Environmental Protection Agency between 1970 and 1995 indicate that clean air laws and new emission technologies have resulted in declines in the percentage of pollutants in both auto and industrial emissions, the overall quantity of pollutants released into our atmosphere continues to rise due to increased vehicle miles, number of vehicles in use, and industrial activity. For further information, visit www.epa.gov/air/aqtrnd95/longterm.html

²⁹ Many urban areas experience high ozone levels during hot summer weather when high air pressure holds pollution close to the ground. Sunlight reacts with pollutants to create ozone, a colorless gas that is harmful to people and wildlife. Ozone occurs naturally in the upper atmosphere and protects all life on earth from ultraviolet radiation. When high levels of nitrous oxides and hydrocarbons (both pollutants) are held close to the ground by weather conditions on hot sunny days, they react chemically to form ozone. Ozone close to the ground, where we can breathe it, is harmful. While many of the pollutants come from industrial sources, over 50% result from the use of autos, lawnmower, recreational vehicles, etc. For additional info on ozone and ozone action days, visit www.epa.gov/region5/air/naaqs/o3info.htm

³⁰ Replacement of traditional gasoline and diesel engine vehicles with hybrid and alternative fuel vehicles (AFV) represents the greatest (and most costly) commitment to improving local air quality. AFV technology has improved greatly during the past decade and continues to do so – both in terms of vehicle performance, availability, and affordability. Hybrid vehicles combine a traditional gasoline engine with an alternative power source, often batteries, to reduce fuel use. Alternative fuels include low emission combustibles such as bio-diesel, propane, and hydrogen. Many public policy experts predict that the use of low emission alternative fuels will be mandated for government agencies in the not-too-distant future, since air quality is a public health issue and the development of new petroleum resources promises to be both controversial and increasingly costly. Many forward-looking municipal agencies and private businesses have already begun to convert their fleets to AFVs, spreading capital costs for replacing traditional vehicles with AFVs over several years rather than waiting for government mandates to require more rapid replacement. A variety of government grant, rebate, and incentive programs have been developed to encourage fleet managers to convert to AFVs. Additional incentives exist to invest in alternative fuel storage systems and/or to set up cooperative agreements with other local municipalities to establish local refueling stations. Visit the following websites for additional info: U.S. Department of Energy's Clean Cities Program, www.ccities.doe.gov and the Illinois Department of Environmental Protection Agency's Green Fleet program, www.illinoisgreenfleets.org

³¹ For more information on “sick-building” problems and indoor air quality, visit the following EPA websites: www.epa.gov/iaq/iaqinfo.html and www.epa.gov/iedweb00/pubs/ventilat.html

³² Due to environmental concerns and efforts by people with sensitivities to many modern chemicals, an entire industry in “green” products has sprung up in the past 10-20 years. Many of these products are nothing new (baking soda and vinegar are two very effective cleansers that have been used for generations), while others use new combinations of low-toxicity substances and natural aromatics to clean and deodorize.

³³ The Illinois E.P.A. sponsors Household Hazardous Waste Collection Days throughout the state, however only household waste is accepted. Municipalities must usually arrange to have hazardous wastes disposed of by contracted and licensed private companies. For more information, refer to the IEPA’s website.

³⁴ Newly furnished and/or remodeled facilities often experience high indoor levels of toxic formaldehyde, which is released from most particle board, new carpeting, and from adhesives. This can be alleviated and/or reduced in a variety of ways to minimize the effects on staff and patrons.

³⁵ The use of exterior grade plywood for indoor construction has been shown to emit lower levels of formaldehyde, since the resins used are more stable. Also, maintaining low indoor humidity and insuring areas are well ventilated whenever new carpeting or furnishings are installed will reduce exposure. For more information, refer to www.epa.gov/iaq/formalde.html

³⁶ Native plants and their cultivars are better adapted to local climates and soils than exotic cultivars and most are perennial plants (living for many years). Also, their maintenance requirements are considerably less than for exotic plants (cost analyses have shown the combined costs of installation and maintenance of native plantings over a ten year span are often one-fifth the combined costs for traditional turf grass). They are also more naturally disease-resistant and drought-resistant. When used in traditional perennial bed designs, borders, foundation plantings around buildings, or in re-created natural areas, they thrive and can rival the beauty of the exotic plants most people are accustomed to. It is helpful when first introducing these plants, to have the assistance of a landscape designer who is familiar with their growth patterns and bloom times. The U.S. EPA’s Greenacres program promotes natural landscaping and native plants among municipalities. *A Sourcebook on Natural Landscaping* is an excellent resource and provides a summary of benefits, costs, rationales, and associated resources to help one get started with planning a native landscaping project. View this resource at www.epa.gov/glnpo/greenacres/toolkit/. It should be noted that the use of native plants is not limited to prairie wildflowers. Native bunch grasses, ferns, trees, shrubs, and vines can all be used effectively in park landscapes, either formally or more randomly.

³⁷ Areas that may be considered include: pond and wetland borders, areas with steep grades that make them difficult to mow, depressions that stay wet for a portion of the year, wooded areas, or any large field not dedicated to active recreation. It should be noted that most open fields, if never mowed, would gradually fill in with dense brush and small trees. If a more “prairie-like” appearance is desired, periodic mowing (at least once per year) is recommended.

³⁸ This program is a cooperative effort between the U.S.G.A. and Audubon International. For further information on the Audubon Cooperative Sanctuary System, refer to the U.S.G.A. website at Audubon International’s website at www.audubonintl.org/programs/acss/

³⁹ The executive summary of a research report on the environmental effects of various deicers can be found at www.michigan.gov/documents/summary_51450_7.pdf

⁴⁰ Types of de-icers available and some of their characteristics include:

- Sand – inexpensive but does not melt ice and can clog sewers and abrade vehicle finishes.
- Sodium Chloride (NaCl) – effective at 15-20 degrees and above; inexpensive but impacts soils, plant growth, and corrodes concrete, vehicles, and bridges.

-
- Potassium Chloride or Urea (KCl) – effective at 20-25 degrees and above; 2-3 times as expensive as salt; non-corrosive to vehicles and concrete but must be used in heavier concentrations, so can ‘burn’ plants. Also can cause algal blooms in ponds and wetlands.
 - Calcium or Magnesium Chloride (CaCl) – effective at –25 degrees and above; 2-3 times as expensive as salt; causes same problems as salt.
 - Calcium magnesium acetate (CMA) – variable effectiveness at low temperatures; 10 times as expensive as salt; is biodegradable and does not damage plants. Does not melt ice but turns it into slush so not appropriate for sidewalks or driveways.

⁴¹ Visit the U.S. EPA website for up to date information on maintenance and removal of underground storage tanks at www.epa.gov/swerust1

⁴² There are many sources of information on the problems associated with invasive exotic species. The U.S. Fish & Wildlife Service website contains a concise summary of the problems associated with invasive species, including soil erosion, at <http://invasives.fws.gov/Index7.html>

⁴³ “Green buildings” that are designed to blend in with the landscape, contain energy-saving features such as passive solar, make use of recycled materials, or incorporate sustainably harvested woods represent the state of the art in new building technology that is environmentally sensitive. Green building design criteria are currently being formulated by a working group of government and construction industry professionals. An excellent source of updated information on this emerging technology is the Whole Building Design Group, whose website is located at www.wbdg.org/index.php

Open Space Planning and Preservation

¹The state of New Jersey’s Department of Environmental Protection released a study entitled *The Economic Value of New Jersey State Parks and Forests*, which found that state-owned parks and forests enhanced property values, created nearly 14,000 jobs, and annually contributed \$1.2 billion to the state’s economy, including \$140 million worth of ecosystem services such as watershed and groundwater protection, flood control, and biodiversity protection, as well as \$812 million in benefits from recreation and tourism. For details on this report, visit <http://www.state.nj.us/dep/parksandforests>.

² In Illinois, less than 1% of the state’s acreage is basically unchanged from its condition (original soils and plant communities intact) prior to the arrival of Europeans. The only state with a smaller percentage of land in its original condition is Iowa. Source: the Illinois Nature Preserves Commission.

³ The Illinois Nature Preserves Commission, administered by the IDNR, maintains a staff of biologists statewide that can assist landowners in assessing the natural quality of land and determining what degree of protection may be warranted. More information is available at <http://dnr.state.il.us/INPC/protection.htm>. On a local level, many county forest preserve districts and conservation districts have staff biologists and ecologists who can assist with assessing the ecological quality of land.

⁴ The U.S. EPA provides a toolkit called *Greenacres*, which is a sourcebook on natural landscaping for local government officials and staffs. It provides information on how, where, and why natural landscaping can not only improve the local environment but reduce landscape maintenance costs as well. The sourcebook can be accessed at www.epa.gov/glnpo/greenacres/toolkit/chap1.html.

⁵ In addition to the federal OSLAD and LAWCON grants available to park and conservation districts for the purchase and development of public park resources, local and national land trusts are in the business of assisting public agencies with the acquisition of land. In northern Illinois, Open Lands Project and the Conservation Foundation can be consulted for assistance. Nationally, the Trust for Public Lands and the Nature Conservancy can assist with the timely

acquisition of land for natural area preservation. Check these websites for more info: www.openlands.org, www.conservationfoundation.org, www.tpl.org, www.nature.org.

⁶ Numerous resources exist to assist parks planners and local officials with the establishment of greenways in their communities. In Illinois, the Department of Natural Resources provides technical and financial assistance via the Illinois Greenways and Trails Council. Information can be accessed at <http://dnr.state.il.us/orep/planning/tehasst.htm>. Additional background information on trails and greenways can be found at www.urban.uiuc.edu/faculty/budic/W-IRFI-2.html.

⁷ A fact sheet on wetlands and floodplain protection, including best-practices information can be obtained from the U.S. EPA's website at www.epa.gov/owow/wetlands/watersheds.

⁸ Wetland mitigation land banking involves making wetland or floodplain acreage on public lands available for enhancement with local developers when they seek permits to build within wetlands in other locations. In most cases, funds are transferred to the public agency, which are then used to enhance the wetland functions and natural character of the public land and improve public accessibility. More information can be obtained at <http://el.erdc.usace.army.mil/elpubs/pdf/v5n3/brum.html>.

⁹ The Rails to Trails Conservancy is a private organization that will assist public agencies with efforts to preserve unused utility right-of-ways for public trail use. More information is available by contacting them or visiting their website at www.railtrails.org/whatwedo/information/default.asp.

Recycling and Handling of Waste

¹ Material selected from a document prepared by Sustainable Stillwater. Visit at <http://www.stillwater.org/~recycles/sstw/recycle.htm>

² Magazine description, <http://www.jgpress.com/biocycle.htm>

³ List of products to be recycled. <http://www.obviously.com/recycle/guides/shortest.html>

⁴ Glossary of recycling terms from the reference desk of the Global Recycling Network , <http://grn.com/library/gloss.htm>

⁵ Trends indicate that recycling of aluminum cans has hit a peak and is now declining. Visit <http://greenyes.grn.org/2002/04/msg00210.html>.

⁶ Statistics on various aspects of recycling accumulated by ECO-Action, The Green Initiative, www.eco-action.net/id87_m.htm

⁷ Easy tips on batteries and their proper disposal. http://www.duracell.com/care_disposal/disposal.asp

⁸ General information on batteries. <http://data.energizer.com/>

Advisory documents regarding rechargeable batteries. <http://www.rbrc.org/index.html>

⁹ Statistics ECO-Action, The Green Initiative

¹⁰ List of disposal sites. <http://sunnyvale.ca.gov/NR/rdonlyres/043F71C3-1002-4C87-94EF-15C07D685AD7/0/FluorescentTubeDisposal.pdf>

¹¹ Automotive Maintenance Shops Pollution Prevention Tips, <http://es.epa.gov/techinfo/facts/alaska/ak-fs18.html>

¹² <http://waterhome.brc.tamus.edu/texasyst/hazardous.html>

¹³ <http://www.great-lakes.net/lists/p2tech/1997-02/msg00258.html>

¹⁴ Locate nearest chapter of YouthBuild at www.youthbuildillinois.org/

Wise Use of Energy Resources

¹ <http://www.theglobalist.com/DBWeb/AuthorBiography.aspx?AuthorId=372>

² <http://www.wbdg.org/design/index.php?cn=3.8&cx=0>

³ Information from ASHRAE Journal