



# BENEFICIAL LANDSCAPING GUIDANCE

U. S. Coast Guard Environmental Management Division (G-SEC-3)



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## I. Introduction

This document has been prepared as part of the Coast Guard's commitment to protecting and restoring natural resources within Coast Guard facilities and commitment to the Greening of the Government as required in the Executive Order (E. O.) 13148, Greening the Government through Leadership in Environmental Management. This document is directed to facility managers and environmental coordinators in Coast Guard Stations and facilities.

### A. What is Beneficial Landscaping?

Landscaping can either be a major frustration, or it can benefit your unit and the environment. "Beneficial Landscaping" is the term commonly used to describe an approach to landscaping that employs native plants and reduced mowing to achieve the goals of reduced maintenance cost, reduced harmful runoff, and increased wildlife habitat. The term also refers to an array of landscaping techniques that help retain the natural landscape features and native vegetation of undeveloped land (including wetlands, woodlands, and natural drainage features); reduce the need for pesticides and fertilizers; reduce the heating and cooling needs of buildings (e.g., shading, windbreaks); and reduce the need for internal combustion engine-driven landscape maintenance equipment. Beneficial landscaping also refers to sites designed to incorporate natural drainage approaches, such as swales and vegetated "filter strips," in contrast to storm sewers and artificial drainage channels. The method of using more vegetation and less concrete and asphalt and other impervious materials is usually attributed to beneficial landscaping. Another meaning of beneficial landscaping is that it considers the make-up of the native ecosystem where landscaping is done and strives to protect it. It is designed to minimize the effects that the landscaping will have on the surrounding environment by giving preference to regionally native plant species. It also emphasizes the use of water-conserving techniques such as efficient irrigation

systems and drought-resistant (beneficial) plants and the reduced use of chemical fertilizers, pesticides, and herbicides.

The Fish and Wildlife Service (FWS) and the Environmental Protection Agency (EPA) define beneficial plants in this way:

Beneficial plants are plants that require minimal maintenance – such as trimming, watering, and fertilizer or pesticide applications – because they are well adapted to local climate and soil types. Beneficial plants begin with native, or indigenous species. Native plants are plants (trees, shrubs, grasses and ground covers) that have evolved over thousands of years in a particular region, have adapted to the geography, hydrology, and climate of the region. Many horticultural varieties and imported plants are also deemed beneficial if they have few maintenance requirements and are not invasive. Although experts, including botanists, disagree on a formal definition of a native plant, for our purposes, we shall define it as a tree, plant, shrub, vine or ground cover that would have been present when Christopher Columbus "arrived in" America.

Beneficial landscaping is also described as a suite of landscaping practices that yield environmental, economic, and aesthetic benefits. These practices include:

- using native plants and appropriate non-natives for landscaping;
- minimizing and clearing construction's adverse effects on natural habitat;
- implementing water-efficient practices and plantings;
- using shade trees, wind breaks, natural hedgerows, buffers and screens; and
- preventing pollution of air, water, and land by decreasing or

eliminating use of chemicals and power lawn maintenance equipment, reducing runoff, and recycling green wastes.

Beneficial landscaping benefits people, wildlife, and the local environment. In this publication you will learn about beneficial landscaping, about some units that are trying beneficial landscaping, and how you can implement it at your unit.

## **B. Benefits of Beneficial Landscaping**

Beneficial landscaping can have many different positive effects on a Coast Guard unit. Some of these effects are economic, while others are environmental. Still other benefits include positive public relations and improved working environment for unit personnel. Many projects lead to benefits in many of these areas.

Beneficial landscaping is good for the Coast Guard and the environment. It promotes the principles of sustainable development and natural resource protection. It also provides Coast Guard units with an opportunity for cost savings by integrating these principles into its core operations.

Cost Reduction – One important benefit of beneficial landscaping is long-term cost reduction through reduced mowing, watering, fertilization, herbicide and fungicide applications, replanting annual flowers, labor, and energy use.

Reduced mowing reduces the cost in personnel hours spent to mow an open area. It also reduces the need for mowing equipment, which over time, breaks down due to wear and tear. If you're not completely comfortable with totally stopping mowing, you can simply increase grass height in certain areas. Increasing grass height can help to reduce opportunity sites for weeds and reduce your herbicide use.

Beneficial landscaping also reduces costs, because it requires less water, fertilizer, and pesticides than conventional

landscaping. Native trees and plants have evolved to thrive in local conditions; they don't need as much "help" as non-natives.

Landscaping has a great effect on water consumption and conservation. By using native plants that can easily survive on a region's normal rainfall rates, outdoor watering needs can be substantially reduced. Plus, if they are left undisturbed on site, native plants are free to flourish.

Energy Reduction – Planting trees near buildings and parking lots can reduce the cost of cooling and heating a building. The shade provided by the trees will help provide natural air conditioning for buildings and parking lots.

One of the significant rewards of environmentally beneficial landscaping is the monetary payback realized when summer heat is controlled and winter heat is conserved.

Pollution Prevention – Another big reason to use beneficial landscaping is pollution prevention.

*Improves Air Quality* – One example is air pollution prevention. Beneficial landscaping practices can help improve air quality on a local, regional and global level. Locally, smog (i.e., ground level ozone) and air toxics can be drastically reduced by elimination of the need for lawn maintenance equipment, e.g., lawn mowers, weed edgers, leaf blowers, etc., all fueled by gasoline, electricity or batteries. Gasoline-powered lawn and garden equipment, on average, produces 5% of ozone-forming volatile organic compounds (VOCs) in areas with smog problems. Regionally, the nitrous oxides (N<sub>2</sub>O) and sulfur dioxide (SO<sub>2</sub>) released from lawn maintenance equipment react with water in the atmosphere to form acid rain. Globally, beneficial landscaping practices help to combat global warming. Plants are efficient absorbers of carbon dioxide, a contributor to global climate change. Minimizing the use of lawn maintenance equipment which emit

carbon monoxide and dioxide (CO and CO<sub>2</sub>) also results in the reduction of the associated CO<sub>2</sub> emissions. Less mowing means less air pollution. According to the U.S. Environmental Protection Agency's (USEPA) "Landscaping with Native Plants," gas-powered garden tools emit 5% of the nation's air pollution and that one gas-powered lawnmower emits 11 times the air pollution of a new car for each hour of operation. From the "Redesign the American Lawn" by F. Herbert Bormann, et al, a lawnmower pollutes as much in one hour as does driving an automobile for 350 miles. (<http://www.epa.gov/glnpo/greenacres/wildones/wo08.htm>) In addition, the driver of such equipment is typically positioned where exposure to such carbon monoxide and toxic emissions is greatest. Further, small gasoline spills evaporate and pollute the air as well. USEPA estimates that every summer, the few ounces spilled during each refueling of lawn and garden equipment adds up to 17 million gallons of gasoline nationwide. USEPA estimates that gasoline lawn and power equipment, on average, produce 5 percent of smog forming hydrocarbons (VOCs) in non-attainment areas. For many Coast Guard units in urban areas with substantial smog ("non-attainment areas"), planting native trees and growing native plants in these units can significantly help reduce the need for fossil fueled lawn and garden equipment and the associated air pollution and health risks. In addition, native plants themselves can help to improve air quality by reducing particulates and gaseous air pollutants and eventually help promote compliance with air pollution laws.

(<http://www.epa.gov/glnpo/greenacres/nativeplants/index.html>)

*Prevents Water Pollution* – Beneficial landscaping also prevents water pollution. When it rains, soil, fertilizers, herbicides, and pesticides run off vegetated areas and into local bodies of water. By planting native trees or flowers, which require fewer pesticides and fertilizers

and help to hold soil in place, you reduce runoff that might harm waterways.

Stormwater runoff can also come from impervious surfaces: roads, roofs, sidewalks, and parking lots. When it rains, water runs off these surfaces, taking oils and chemicals with it. By planting trees, shrubs, and native grasses below parking lots, you help to reduce run-off pollution. Trees and shrubs act as filtering systems and help to clean stormwater run-off. They also serve as barriers, stopping the chemicals from getting into wildlife areas, such as wetlands, or from getting into water supplies.

*Reduces Noise Pollution* – Lawn maintenance equipment (e.g. lawn mower, leaf blower, edgers, etc.) are heavy air polluters and are noisy. Beneficial landscaping requires little or no mowing.

Wildlife Habitat Enhancement – Beneficial landscaping increases habitat for wildlife by providing diverse habitats and food sources thus attracting a variety of birds, butterflies, and other wildlife. Converting some of the turf landscape in your base or unit into natural landscape would result in the increase in available food, water, and areas that can support and protect animals. Increasing habitat is important, because as the human population increases, habitat that is suitable for animals and plants decreases. Wildlife diversity ensures that our ecosystem remains healthy, natural resources (such as fisheries and medicinal plants) remain plentiful, our units/bases are more beautiful, and the environment continues to educate generations to come.

Improved Work Environment – Beneficial landscaping improves the working environment for Coast Guard personnel. Tree-lined parking lots and buildings are much cooler than parking lots and buildings with no shade trees. Coast Guard units that do not have to rely heavily on pesticides to maintain green lawns are healthier for both humans and

the environment. And well-landscaped work environments are aesthetically much more pleasant than areas containing only grass or asphalt.

Aesthetic Benefits – The appearance of a facility and the perception the human mind makes of the visual appearance of landscaping contributes significantly to the value of a facility or work area. Many current studies in architecture are now focusing on the combination of structural elements, color, and their integration into the natural environment. Such studies are now providing quantifiable environmental benefits of the value added due to landscaping. These values should be part of the economic analysis of landscape project. Beneficial landscaping also provide recreational opportunities such as bird watching and photography. Our native flora is naturally beautiful and pleasing to the senses, and our native wildlife species are adapted to and dependent upon it for food, cover, and shelter. This means that through beneficial landscaping, we enjoy more wildlife near our workplaces and homes.

Erosion Control – Planting trees and native plants in slopes, loose or infertile soil or areas with soil problems, stream banks, drainage ways, and shorelines can help control erosion and loss of soil. The proper choice and use of various native plant species could result in eventual enrichment and stabilization of soil fertility.

*In summary*, a big reason to use beneficial landscaping is the environmental benefits that result from it. Beneficial landscaping can prevent pollution in many direct and indirect ways, including the following:

- Reduced or eliminated use of pesticides and fertilizers protects nearby groundwater and surface water from leaching and chemical runoff.
- Reduced fertilizer use and resulting slowed plant growth, which means

less time and energy spent mowing, pruning, and generally cleaning up.

- Reduced mowing and pruning with gasoline-powered implements, which means less air pollution.
- Reduced use of air conditioners and furnaces by controlling building temperatures with energy-saving landscaping techniques.
- Reduced energy consumption to operate climate control systems, which in turn reduces the production of air pollutants emitted from central power generation plants.
- Reduced use of power landscape equipment. Shrinking the size of the lawn and planting appropriate native species in less formal arrangements will reduce the need for extensive use of power equipment.

### **C. Beneficial Landscaping and Weed Laws**

Weed Laws – Weed laws are statutes, regulations or ordinances passed by federal, state, county or local government which declares untended, rank, and unmanaged growth of vegetation on any property within the city which is visible from any public way, street, sidewalk or alley as public nuisance. Some municipalities have “weed laws” to prevent unsightly or poorly maintained property. Communities enacted “Weed Laws” aiming to protect the public from neglectful landowners whose littered yards could attract rats, mosquitoes, or present a fire hazard.

The beneficial or natural landscaping “movement” which has a common goal of harmonizing gardening and landscaping practices with Nature has, in some areas, faced challenges from municipal inspectors, city legislators and officials who cling to environmentally hostile “weed laws” and prosecute natural landscapers. As a result of the misunderstanding of some charged with

enforcing weed laws and poor draftsmanship, these laws are often wrongfully enforced against natural landscapers. The fact that natural landscapers are prosecuted while the governments that prosecute them plant natural landscapes in public properties and parks demonstrates the tug-of-war between these two groups. Some in government recognize natural landscaping while others, like those who prosecute natural landscapers, do not. Lately, the view of the former is taking hold as shown by the actions of national, state, and local governments which demonstrate that natural landscaping and the goal of harmonizing our yard with Nature and attracting backyard wildlife has officially taken hold. Natural landscaping is even termed "fashionable." In 1990, Congress mandated that 25% of all funds spent on highway landscaping projects be used to plant native wildflowers along the easements and rights-of-way of the Nation's highways. Nevertheless, beneficial landscape practitioners must be aware that there are local "Weed Laws" to consider when planning beneficial landscaping and it is always good to involve the public and the local community at the early stages of planning in order to avoid problems later on.

Beneficial or natural landscaping does not pose the hazards that the weed laws are intended to address (e.g., problems with vermin). Local plant societies like the Audobon Society took comprehensive

approach to convince local governments to modify their weed laws. Fortunately, many municipalities are responding to the current trend toward beneficial and natural landscaping. Some communities have modified weed laws to allow natural and beneficial landscaping, but require a "setback" or buffer strip to make the landscape appear like it has been planned. A few municipalities actively promote natural landscaping because of the environmental and economic benefits.

Check with your municipal officials regarding weed laws in your area. Determine if your facility is subject to any local ordinances that may require permits or certain amount of grounds maintenance, such as setbacks of trees from the street. Consider security measures when designing the plan (e.g., ensure that no tall shrubs are planted near buildings). Some local Audobon Societies have promulgated model beneficial and natural landscaping ordinances which establish the right to landscape naturally provided the natural heritage or ornamental garden does not encroach upon property ownership lines or public rights-of-way, and the property is not in a state of neglect, nor presents a hazard to the public health or safety, or to the agricultural environment.

For additional information on weed laws, check:  
<http://www.epa.gov/glnpo/greenacres/weedlaws/JMLR.html>.



## II. Beneficial Landscaping Methods

There are numerous ways to try beneficial landscaping at your unit. Some approaches cost your unit nothing, while others require some initial funds. All approaches, though, should lead to long-term savings. Your first stop in developing a beneficial landscaping plan should be COMDTINST M5090.3, Natural Resources Management, A Policy Guidance for Natural Resource Management. This COMDTINST contains a helpful template for managing natural resources at your unit. Examples of beneficial landscaping include reduced mowing, planting native trees and shrubs, and implementing integrated pest management, water conservation and xeriscaping.

### A. No or Reduced Mowing

One of the easiest ways to implement beneficial landscaping is through reduced mowing by either totally reducing mowing at your unit or simply increasing grass height. Reduced mowing may seem counter-intuitive to many personnel who are used to large, mowed lawns of short "putting green" grass. While some lawns are necessary around station buildings, near airfields, on parade grounds, and near fences, many lawns are a waste of space, time, and money. In unused areas, consider leaving the area unmowed. A field that is only mowed one time per year (ideally in the Fall, after nesting season for ground-nesting birds) will eventually turn into an area of native grasses and flowers. Annual mowing will prevent woody growth. If you do not like the look of very long grass, try just increasing your lawn height to help prevent weeds and reduce the need for water, or try planting wildflowers that will reseed the area each year (check with a local nursery to get the appropriate species). One example of a successful "no mow" project is Station Taylors Island in Maryland. The unit ceased mowing at its undeveloped 18-acre site. Grasses were permitted to grow throughout the summer and mowed in the Fall – total savings for the unit were several hundred

dollars per year, a substantial savings for a small unit.



Unused 18 acres owned by USCG Station Taylors Island.

Long grasses are not known to harbor mosquitoes unless there are standing water in the area. If ticks are an issue at your unit, reduced mowing may not be a good option for you.

Many installations are undergoing severe budget cuts to their Grounds-Maintenance contracts. It is no longer affordable to keep all available land mowed and in an "improved grounds" condition. Many installations are transitioning these unused/unseen grounds into "unimproved" (unmowed) grounds. Mowing frequency in these areas is only once or twice a year. These are vast areas on many installations where a more natural approach to landscaping maintenance can be applied to the benefit of the environment and budgets. This transition will not only prevent erosion and evapotranspiration problems and over-application of chemicals/fertilizers, but can also reduce Grounds-Maintenance budgets by millions of dollars annually.

### B. Wooded Areas

What if your unit has wooded areas? Should you pick up fallen branches or trees? The answer is, of course, "yes" if they present any type of safety or fire hazard. If such hazards are not present, just leave the branches and trees. These "snags" provide valuable habitat for invertebrates, reptiles, and small mammals. They also return nutrients to the soil, so future plant growth is possible.



### **C. Native Plants**

Another easy way to landscape naturally or beneficially is to plant native trees and shrubs. First, you have to decide on your need such as shade, beautification, erosion control, etc. Second, you need to look at the area that is to be planted and determine the planting conditions. For example: what type of soil is present? is the soil usually wet or dry? are there any underground utilities in the area to be planted? After answering these questions, you need to determine what species of plants are best suited for that area. By using the species that are better adapted to your local climate, you increase the possibility of a successful planting. To determine what type of habitat you have or what species of plants you need, talk to your local Department of Agriculture extension agent or a reputable local nursery. Be sure to emphasize that you want local natives, not non-native ornamentals. Site design and implementation, together with plant selection, should incorporate the plants' characteristics such as their biological needs, minimal care and need for fertilizers and pesticides, and low water usage.

The benefit of growing native plants is that they are more likely to thrive under the local conditions while being less likely to invade new habitats. Native plants are well adapted to local environmental conditions, maintain or improve soil fertility, reduce erosion and flooding, and often require less fertilizer and pesticides than many alien plants. These characteristics save time and money and reduce the amount of harmful run-off threatening the aquatic resources of our streams, rivers, and estuaries. In addition, functionally healthy and established natural communities are better able to resist invasions by alien plant species. With the large variety of grasses, ferns, wildflowers, shrubs and trees from which to choose, native plants can fulfill any landscaping need from simple container gardens to showy

perennial borders to expansive public lawns and gardens.

Native plants provide familiar sources of food and shelter for wildlife. As natural habitats are replaced by urban and suburban development, the use of native plants in landscaping can provide essential shelter for displaced wildlife. Land managers can use native plants to maintain and restore wildlife habitat. On a broader ecological scale, planting native species contributes to the overall health of natural communities. In addition to ecological and land management benefits, the native flora of each State offers a surprising variety of color, form, and texture to gardeners and landscape designers. Designing with native plants allows the creation of distinctive natural landscapes including woodlands, meadows, and wetlands with unique regional character. Furthermore, native plants attract a greater variety of butterflies, hummingbirds, songbirds and other wildlife than traditional lawns. Wildlife species are adapted to using native plants for food cover, and nesting or rearing offspring. In fact, the greater the variety of native species included in a landscape, the more likely uncommon or rare species will be attracted to an area.

### **D. Integrated Pest Management**

Another beneficial landscaping tool is integrated pest management (IPM). IPM encourages use of pest management practices other than blanket pesticide applications on a schedule; it focuses on "as-needed" pest management. Since IPM combines physical, cultural, biological, and chemical control techniques to manage pests and natural resources, including insects, weeds and rodents, it is considered the best method for controlling pests. The native plants and grasses function much like a natural system, with diverse plants providing food and shelter for a host of birds, butterflies and beneficial insects. Using IPM principles, you can plant shrubs and bushes that provide habitat for insects like spiders, lady beetles, and preying

mantis. These insects are beneficial to shore unit landscaping because they eat other insects that are not generally desirable and control their own populations. If insects are not desirable, there are other species that control insect populations, including birds, bats, frogs, and lizards. Another example of IPM is to introduce plantings that naturally discourage or repel rodents from designated areas.

In IPM, pesticides are applied only on an "as-needed" basis – applications are specific to the pest problem. With this method, plants and trees are treated only when pests are present. Also, when treatment is needed, chemicals with low toxicity are used to reduce harmful effects to human health and beneficial pests. By using fewer and low toxicity pesticides, you save money, decrease pollution, and decrease human exposure to pesticides, thus reducing health risks associated with using such chemicals.

Another form of IPM that promotes the reduction of pesticide use is the practice of organic gardening. Compost and mulch on site to eliminate solid waste, control weeds, restore nutrients and organic matter to your soil and reduce or eliminate the need for fertilizer and herbicide applications. Cooperative extension agents can help with natural alternatives to pesticides.

In summary, implementation of IPM programs can reduce chemical usage and costs significantly. The use of chemicals to maintain grounds contributes to environmental, health, and safety problems. Healthy lawns and landscape plants have few pests and disease problems and are more tolerant to environmental stresses (heat, cold, drought). Reduced use of chemicals lowers the possibility of contaminated run-off into rivers and ground water. Chemical reductions can assist agencies in achieving compliance with the pollution prevention mandated by E. O. 13148 which calls for a 50 percent reduction in

use of toxic substance by federal agencies.

Before using IPM, beneficial landscapers in the Coast Guard unit should consult with the Installation Pest Management Coordinator before using pesticides, submitting service order requests for pest control, or contracting for pest control services. For additional information on IPM, consult PRO-ACT's "Integrated Pest Management" Fact Sheet, available at: <http://www.afcee.brooks.af.mil/pro-act/fact/jun00a.asp>.

## **E. Water Conservation and Xeriscapes**

*Conservation of Water:* Water used to irrigate lawns and landscapes can account for significant proportions of total water use during peak watering season. The selection of native plants that are adapted to the particular climate can reduce water demand by requiring less irrigated water. Grasses and trees should be selected in part based on how much water they consume. Species that are particularly thirsty should NOT be used in arid area where normal rainfall does not meet most of the plant's water needs. Reduced water use conserves the fresh water supply for both the natural environmental systems and the human population. Overwatering results in additional water costs, as well as, unnecessary use of energy.

*Xeriscapes:* It is a method of gardening that emphasizes "Water Conservation Through Creative Landscaping." It is a landscape method that uses plants that have low water requirements, making them able to withstand extended periods of drought. Xeric landscapes are a conscious attempt to develop plantings that are compatible with the environment and require little or no water in addition to rainfall.

Xeriscape, described as water-efficient landscaping, involves the strategic selection, placement, and maintenance of plants/soil/irrigation techniques and equipment that minimize water use.

Xeriscapes consist of drought resistant plantings that are often native to a particular region. It also includes the grouping of plants that have similar water requirements together for productive growth with less watering. Once established, these plants are able to survive on normal levels of rainfall and soil moisture, thereby conserving water. Xeriscape landscaping incorporates seven basic principles which lead to saving water:

- Planning and design
- Soil analysis
- Practical turf areas
- Appropriate plant selection
- Efficient irrigation
- Mulching
- Appropriate maintenance.

A well-planned xeriscape will require far less water than a traditional lawn or garden. Landscape architects can help with the design of xeriscapes and choose appropriate plants.

Xeriscapes require low levels of maintenance. A well-designed xeriscape reduces mowing, requires less fertilization, eliminates weak unadapted plants (which are unattractive and often have disease and pest problems), and uses more efficient watering techniques.

Effective and efficient irrigation involves watering plants deeply, infrequently, and slowly. This ensures root zones are thoroughly moistened, does not over-water the plants, and eliminates runoff.

*Mulching:* Another form of water conservation method is mulching. The placement of decomposed organic matter, or mulch, over a plant's root zone conserves water by reducing moisture evaporation from the soil and reducing weed populations. Mulches can be organic materials such as shredded bark, compost, wood chips, or inorganic materials, such as lava rock, limestone, and woven plastic.

Practice soil and water conservation by stabilizing slopes with natural plantings, mulching around plants, and installing drought-tolerant species. If irrigation is used, use drip irrigation or other water conserving techniques, and water plants in the early morning or evening hours. Another key to water conservation-landscape is to apply water as infrequently as possible, yet thoroughly.

For additional information on xeriscape, see the following websites:

<http://www.xeriscape.org/xeriscape.html>

<http://www.csu.org/environment/conservation/xeriscape>

<http://www.water-keep.com/xeriscape-water-crystal-xeriscaping.html>

<http://www.ces.uga.edu/pubcd/B1073.htm>

<http://www.greenbuilder.com/sourcebook/xeriscape.html>

## **F. Reduction of Greenhouse Effect Method**

Another method of beneficial landscaping is accomplished by increasing the amount of permeable surfaces namely: reducing street widths, reducing setbacks between buildings and streets, designing smaller parking lots that include island vegetation, and clustering development on part of a site. Unused paved areas can be "unpaved" and beneficial landscaping installed.

## **G. Erosion Control and Flooding Prevention Method**

Native plants are particularly effective on steep slopes, stream banks, and areas where moving water are present. The roots of native plants are dense, fine, and deep (in some cases 5 to 10 feet in mature plants), and hold soil well. Vegetation provides effective soil

stabilization along streambanks and shorelines by absorbing some of the erosive energy of flowing water and waves.

## H. Energy Reduction Method

One of the significant rewards of environmentally beneficial landscaping is the monetary payback realized when summer heat is controlled and winter heat is conserved. Summer cooling and winter heating costs can be significantly reduced using specialized landscaping techniques including shading, ground cover, and wind channeling. The use of these techniques will depend upon the regional climate and the latitude (distance from the equator) of the building and grounds. Some techniques conserve energy year-round such as planting trees that provide shade in summer and allow light to pass through in winter when the leaves are off the trees.

### *Controlling Summer Heat:*

*Shading* – Trees are the most effective landscaping tools for passively increasing the interior comfort of a building. Trees, shrubs, and tall grasses can help control summer solar heat by blocking sunlight and shading roofs, sidewalks, windows, and ground surfaces near a building. The solar heat is reflected or absorbed by the vegetation instead of being absorbed by the building and nearby ground surfaces. In addition, air conditioning compressor/condenser units shaded from direct sunlight will use less energy. It is important to evaluate existing plants and trees for usefulness before clearing a construction site. Established trees and plants will remain healthier and require less maintenance than new plantings.

*Channeling Wind* – Trees, in addition to being providers of shade, also modify air movement. For non-air conditioned buildings, trees may be situated so that breezes are channeled toward open windows. In contrast, air movement on hot days around air-conditioned buildings can cause hot air to infiltrate through windows and door cracks, other small

openings, and open crawl spaces. Trees and shrubs planted on the side from which the hot wind blows can divert or “ramp” the hot air over the building.

Buildings lose significantly more heat when buffeted by cold winter winds than when the same cold air is still. The heat is lost via conduction through ceilings and walls. Plantings that serve as windbreakers around buildings and along foundations can substantially reduce the heat-robbing effects of winter winds.

*Ground Covers* – Ground covers are low-growing plants that can be used to landscape areas near buildings. Taller and leafier ground covers provide more cooling benefit than shorter ground covers like mowed grass, although grass lawns are more durable under foot traffic. All plants can modify their immediate environment through evaporative cooling. The resulting lowered air temperatures around a building can reduce overall cooling costs.

*Conserving Winter Heat:* During cold winter months, beneficial landscaping techniques can result in significant reductions in heating costs. The following techniques are designed to maximize the amount of solar energy striking a building and minimizing the movement of cold air around a building.

*Shading* – Plantings can be located to maximize the amount of solar radiation received by a building during winter months. Deciduous trees that lose their leaves in winter can serve as shade trees in summer and allow increased sunlight infiltration during winter.

*Foundation Plantings* – Evergreens, due to their dense nature, can create insulating dead-air space around building foundations, especially along northern exposures. Deciduous trees planted appropriately along the south sides of buildings can reduce air conditioning costs by up to 20% in summer. Trees planted to shade paved areas reduce the summer

heat-island effect that makes parking lots unbearable.

## **I. Rain Garden Method**

The term "rain garden" refers to a constructed depressed area that is used as a landscape tool to improve water quality. It is a landscaped area planted with wild flowers and other native vegetation to replace areas of lawn. Native grasses, trees, and flowers known to thrive in moist soils are planted and nourished by the stormwater runoff. The rain garden concept is patterned after the bioretention system derived from the hydrologic and ecological functions in a forest. Bioretention is a water quality practice in which plants and soils remove pollutants from stormwater naturally. The forest produces a spongy litter layer that soaks up water and allows it to penetrate the soil layer slowly. There is a nutrient removal process that takes place as the water comes in contact with the soil and the roots of the trees, shrubs, or other vegetation. This process accounts for the improved water quality.

The Environmental Protection Agency (EPA) has determined that up to 70% of the pollution in our surface waters comes from stormwater, although we tend to think that it is caused by large industrial polluters.

Holding back the runoff helps prevent pollutants such as fertilizers, pesticides and other pollutants from washing off the lawn into storm sewers and eventually into nearby streams and lakes. By reducing the amount of runoff water that enters the local drain systems, a rain garden can provide valuable wildlife habitat and reduce the chances for local flooding, erosion of streambanks and lakeshore, and the need for costly storm water management/treatment structures. Aside from providing a natural and cost-effective method of protecting local water quality, a rain garden provides other environmental benefits such as shade,

wind breaks, and absorption of noise. Also, it requires little maintenance, no pesticides or mowing so you save time and money. In addition, it provides a pleasing and beautifully landscaped area.

To attain most of the environmental benefits a rain garden offers, it must be sited strategically to intercept water runoff. It should be located such that the first flush of rain water which usually contains the highest concentration of materials washed off impervious surfaces such as roofs, roads, driveways, parking lots and lawns, will drain into the depressed area of the rain garden.

A rain garden is a special landscape for low-lying areas, areas with standing water, and/or erosion. It is also usually located between the downspout and the sidewalk and about 10 feet away from the foundation of a building. While a healthy lawn could probably absorb most of the water if it was well distributed, in most cases, water from the downspout tends to follow a fairly narrow path to the sidewalk, then the storm sewer and finally the nearest lake. With a rain garden, the stormwater from the roof is directed to a place where it is absorbed and stays for a few days nourishing the garden's grasses, trees and flowers. The rain garden fills with a few inches of water and allows the water to slowly filter into the ground rather than running off to storm drains. Thus, you are essentially enhancing the infiltration that is already occurring by providing a place where the water has to stop and then go down.

A rain garden contains three planting zones. The lowest will have periods of standing water and extended soil saturation. Plants for the lowest zone are selected for their tolerance to wet conditions. The middle zone will have periodic soil saturation, and the upper edge will be dry. Plants in the lower and middle zones must also tolerate fluctuating moisture. Plants in all zones will be subject to drought spells as well. A diversity of trees and shrubs native to local wetlands and streambanks are most

suitable for the lower and middle zones. The upper rim of the garden can be planted with perennials.

A Coast Guard unit can retrofit a rain garden into the existing landscape simply by capturing runoff from parking areas, driveways, walkways, decks or roofs. Downspouts can be directed to discharge into a rain garden. A section of the curb may be cut, allowing water to flow into a rain garden instead of out into the roadway.

To build a rain garden, you need the following:

*Sand Bed:* This is the bottom layer of the rain garden and it provides drainage for the planting soil, acts as a filter for the stormwater, and spreads the water throughout the garden.

*Planting Soil:* This layer, found above the sand, also acts as filter for pollutants and provides the source of water and nutrients for the plants. It is recommended that organic matters in the form of leaf mulch (20%) be blended with a sandy soil (50%) and about 30% top soil. This layer provides a source of water and nutrients for the plants to sustain growth. The clay particles would absorb the metals, hydrocarbons and other pollutants.

*Mulch Layer:* Mulch is the top layer of the garden. It protects the soil from drying and eroding as well as acting as a filter. This medium provides for the decomposition of organic materials. It also plays a very important role in the removal of metals. Shredded hardwood mulch is highly recommended because it allows for a greater surface area for binding and resists flotation or washout.

*Ponding Area:* This area, where the vegetation is found, holds water around the roots of the plants and provides an opportunity for evaporation. This area should accumulate enough water that would last for no more than four days in order to avoid breeding of mosquitoes.

*Grass Buffer:* This sloped area, through which the stormwater will travel to reach the rain garden, acts as a first filter for the water and reduces the water's travel speed. The surface of the grass buffer strip slows water as it enters the rain garden and filters particulates from the runoff.

Designs can vary considerably depending on your lawn size and layout and your water source. One common sense rule is to place your rain garden in line with the basic drainage pattern of the lawn in your facility so that overflow will drain away from the buildings, in accordance with the designed drainage of the area. However you decide to build your rain garden, try to keep the design simple as this would make the garden as affordable as possible and increase the chances of success.

A planting design should include species that tolerate extremes. There will be periods of water inundation and very dry periods. Place the more aquatic plants in the area where standing water is predominant. Most riparian plant species will do well in rain gardens. The choice of species should include plants that mimic forest habitats and have an aesthetic landscape value such as flowers, berries, interesting leaves or bark. Groundcovers, perennials, shrubs and trees should be incorporated into the planting design.

When planting a rain garden, keep in mind that a rain garden is a "garden" so use more flowers than native grasses. Also as the rain garden matures, you will need to thin the population of some plants to allow others to grow. Leave the dead or dormant plants standing over the winter. Many of the plants will provide seeds and shelter for birds. In spring, cut back or mow the stalks to allow new shoots to emerge. Keep in mind also that installation of a rain garden is slightly more work than a comparable area of lawn, but maintenance is low once plants mature.

Rain gardens make the most sense for units who have slopes in their properties,



but even those with flat lands will benefit from tree plantings or mulched garden areas that will hold stormwater runoff and prevent water pollution. Keep in mind that rain gardens are useful even where little space is available.

In either case, the benefit of a rain garden to local and regional water resources is that runoff from your unit does not carry with it the amount of fertilizers, herbicides, salts, and sediments that would otherwise make their way downstream.

For further information on planting a rain garden, check the following websites:

<http://chicagowildernessmag.org/issues/spring2001/raingardens.html>

<http://www.porttowns.com/special/rain.html>

<http://www.channel3000.com/yourmadison/563186/detail.html>

### III. Beneficial Landscaping Case Studies

Several Coast Guard shore units have already switched to beneficial landscaping from more traditional landscaping. Depending on the size of the unit and the ecosystem in which it sits, each unit has developed a plan that best suits its needs. These case studies will help to illustrate the great range of landscaping options open to Coast Guard units and the possible benefits of these various methods.

#### A. United States Coast Guard (USCG) Station Crisfield

POC: (410) 968-0323

USCG Station Crisfield is a small shore unit on the Chesapeake Bay in Crisfield, Maryland. With the help of the Alliance for the Chesapeake Bay, Crisfield personnel transformed their facility grounds, which was a difficult-to-maintain lawn on dredge material, into a scenic, easy-to-maintain landscape. Station personnel started by choosing a design that divides the station into two zones. The first zone contains native species of trees and shrubs planted in "islands" toward the front of the base and to the side of the station building. The second zone is a wildflower garden in front of the station building. This garden includes a variety of native species of flowering plants to attract butterflies and hummingbirds. By investing some up-front time and money (about \$2000 for plants and technical assistance), Station Crisfield personnel hope to reduce mowing, and the fertilizer use and watering currently needed to sustain the grass, thus saving time and money. They also hope to provide shade to the parking lot and station building, which get hot during summers in the Chesapeake Bay area.

Two important factors played into the cost savings associated with this project. First, by partnering with a local non-profit environmental group, Station Crisfield benefited from the expertise provided by the Alliance for the Chesapeake Bay in transforming a difficult-to-maintain area into a scenic beneficial landscape.

Second, by using native plants for landscaping the unit saves both short- and long-term costs. In the short term, native plants are easier and less expensive to acquire. In the long term, native plants require less maintenance time and money than non-natives.

Secondary benefits of this project include the improved wildlife habitat and aesthetic beauty of the facility. The butterfly garden and other tree plantings provide improved habitat for local species of birds and butterflies, while the wildflower garden contains a small walkway, which allows station personnel to enjoy the area year-round.



Station Crisfield personnel prepare for beneficial landscaping. Note the large expanse of unused lawn growing on less-than-ideal fill.

#### B. USCG Telecommunications and Information Systems Command (TISCOM)

POC: (703) 313-5450

On a sunny and unseasonably warm March day in 1998 in Alexandria, Virginia, over 40 volunteers from TISCOM, the USCG Navigation Center, and USCG Headquarters kicked off Earth Day celebrations in a grand style by planting over 450 trees on a five acre field at TISCOM. The unit followed up by planting an additional 250 trees along the fence line on 22 April, 1999.

The project was originally developed in the TISCOM Master Plan. After coordination with neighbors, the unit Facilities Engineer and other TISCOM personnel developed a plan that included reforestation of major sections of the unit. They partnered with a local tree planting volunteer organization, Fairfax RELEAF, and received free trees, tree protectors, and technical expertise; the county provided mulch at low cost. Volunteers included members of CG staff from Headquarters (HQ) and local units, as well as a local Boy Scout troop. These projects covered just two areas, out of about 25 acres scheduled for reforestation in the TISCOM master plan.

Cost of the project included volunteer and unit time to plant trees, plus some equipment and mulch costs (about \$1000), the cost of 50 trees for the second stage of the project (\$3 per tree), and increased watering during the first year. Through this low-cost project TISCOM personnel will reduce staff time (estimated at \$500 per year for one E3 to do the mowing), save money on the fuel and maintenance to operate the lawn machinery, increase habitat quality of the area, reduce erosion along the fenceline, improve community relations along the newly reforested border, and improve local air quality.

Two key elements were vital to the success of this project. First, the unit conducted long-term planning through its Master Plan. With the help of community participants, areas with potential for reforestation were mapped out. Second, personnel at TISCOM developed cost-saving partnerships with a local environmental organization, as well as with other CG units. Both types of partnerships helped to save up-front costs and will help the unit to see cost savings sooner.



Just some of the 400 seedlings planted at TISCOM's first beneficial landscaping project.

### C. USCG Air Station San Diego

POC: San Diego (619) 683-6389

Air Station San Diego personnel have been working with the Point Loma Ecological Reserve to remove the Acacia shrubs found at the Point Loma Lighthouse and housing area. The Acacia is considered a nuisance weed and is not native to the San Diego area. Its rapid growth overtakes the native plants and prevents new growth. During a trip to the San Diego Zoo it was discovered that the Zoo feeds Acacia to the hoof and horn stock, as well as the giraffes. So after a few calls to the Zoo, Air Station San Diego personnel found someone who not only wanted the Acacia, but who is also willing to remove it for free. Since the Air Station had just spent close to \$10,000 trimming the Acacias at the base, this news was a very welcomed treat. The Acacia was removed during the Summer of 1999, retaining only those located within the areas used for erosion control. Expected savings are \$5,000 – \$10,000. This creative type of partnership is a good example of a win-win situation with beneficial landscaping – the CG removes harmful invasive non-natives and saves harmful pruning costs, while the zoo receives a three-month supply of food for its hoof and horn stock.

#### **D. USCG Aviation Training Center Mobile (ATC Mobile)**

POC: (334) 441-6870

The 200-acre ATC Mobile Air Station has landscaping issues that are quite different from those of Air Station San Diego. Unlike San Diego, the Mobile area is one of the wettest areas in the country. To develop a beneficial landscaping plan for the unit, the Facilities Engineer at ATC Mobile called a meeting for various environmental experts to help develop options. These experts included unit and HQ environmental personnel, the local extension agent and master gardener, and a representative from the local U.S. Fish and Wildlife Service. This group established goals for the unit including: reduction of grounds maintenance costs by 25% in the next two years; improved landscaping appearance around the facility; improved water use; and reduced erosion and surface runoff. The group then toured the facility and made specific recommendations on how to achieve these landscaping goals. Expected cost savings over two years equal \$35,000.

The first step of the project occurred in April 1999, when unit personnel planted 1000 seedlings obtained from the National Tree Trust, a non-profit organization. Seedlings included the following:

- 100 Bald Cypress
- 100 Dahoon Holly
- 200 River Birch
- 200 Nuttall Oak
- 200 Live Oak
- 200 Laurel Oak

The Trust also provided a partner handbook for the project. This partnership saved the unit substantial material costs – money that can now be used for future beneficial landscaping projects.

Trees were placed irregularly throughout the planting area, which will be converted to a “natural forest” by not mowing. Pre-

dug holes were installed with a 6-inch diameter mechanical auger. From April 13-16, 1999 twelve Coast Guard personnel planted the trees on a 3-acre tract. Total man-hours expended were 112, at an estimated cost of \$2,200. Equipment costs (e.g., fill soil, PVC irrigation pipe, rubber hoses, sprinklers) were approximately \$2,500. Newly planted trees were watered twice weekly during the first year, and will be watered once weekly the second year, and once a month the third year. After the third year, trees will be watered during dry weather. Water is supplied through a 200-foot deep water well. As of Summer 1999, approximately 95% of the new trees were living.

One of the keys to the ATC Mobile beneficial landscaping project is the use of local expertise. By partnering with local state and federal agency personnel the unit benefits from reduced costs plus personnel who understand the local ecosystem. These personnel can provide valuable information about appropriate native plants and maintenance methods.

#### **E. Training Center Cape May (TRACEN Cape May)**

POC: Cape May Facilities Engineering,  
(609) 898-6889  
CEU Cleveland, (216) 902-6258

TRACEN Cape May is another example of a large unit using beneficial landscaping. Personnel at TRACEN Cape May teamed with personnel at CEU Cleveland to develop an extensive beneficial landscaping plan for this 400-acre unit. TRACEN Cape May is a unit with many natural resources including wetlands, threatened and endangered species (such as the Federally-listed piping plover and the State-listed least tern), and coastal zones. The beneficial landscaping plan had to take these diverse ecosystems into account, as well as the realities of land use needs at the CG’s boot camp for new recruits.

The first step was meeting with potential partners. Partners for the project included representatives from the local U.S. Fish and Wildlife Service office, the regional U.S. Department of Agriculture office and its local nursery, the New Jersey Audubon Society, and the New Jersey Division of Fish, Game, and Wildlife. Thanks to an excellent rapport with many of these local agencies, built through other environmental projects, the group worked well together to develop a landscaping plan.

The group divided the facility grounds into six zones, each with a specific landscaping goal:

- Zone 1 – Developed area. Plant native tree, plant islands, and butterfly gardens to the maximum extent possible to minimize grass mowing.
- Zone 2 – Developed area. Maintain mowed grasses in these areas for parade grounds and baseball, football, and soccer fields.
- Zone 3 – No mowing zone. Do not mow in these areas. Develop native tree and shrub islands. Cut fire paths by brush-hog or mowers as needed.
- Zone 4 – Wetland area. Remove phragmites by cutting, burning, and spraying. Replant with native shrubs, grasses, trees, or wetland plants when the soil is suitable.
- Zone 5 – Beach conservation zone. Manage for endangered species. Plant native shrubs, grasses, and trees as needed.
- Zone 6 – Harbor-channel inlet conservation zone. Manage for native shrubs, grasses, and trees. Remove phragmites. Cut fire paths as needed.

The unit began to implement the plan in March 1999. Initially, the unit implemented the plan on approximately 3

acres the cost savings. These 3 acres were being cut 4 times a month for 6 months. As a result of beneficial landscaping, cost savings are \$40 per acre per cut, or \$960 per acre, or \$2880 total per year.

#### **F. ISC Portsmouth**

POC: Facilities Engineering  
(757) 483-8504

In October 1998, ISC Portsmouth undertook a large beneficial landscaping project -- 450 native trees and shrubs on a 4.5 acre piece of lawn. The project was accomplished in cooperation with the Elizabeth River Project who provided the project design and participated in the planting. Following initial design, the ISC facilities engineer had the soil tested and surveyed the facility to see which species of trees were growing well. The ISC bought the plants and got a good deal on compost and mulch from the Southeastern Public Service Authority. Each ISC division took a morning or afternoon during the workweek to go out and plant a portion of the forest. It was a great team-building event! The corpsman and yeoman had fun digging, planting, and watering their oak and pine trees! Many of ISC's 18 tenant commands also took time out to plant a tree, or twenty. On Saturday, October 24, 1998 fifty volunteers arrived to complete the project. They were treated to coffee and donuts donated by local vendors. The volunteers included troubled youths from two different programs, Elizabeth River Project personnel, two school groups, Coast Guard retirees and dependents. They planted all day and were treated to a hot dog lunch cooked by the Morale Committee.

Although the project was very similar to the tree-planting project at TISCOM in Spring 1998, the project differed in a few ways: ISC Portsmouth purchased their trees from a grower who specializes in native trees and shrubs. The trees ranged in size from 4-8 feet. ISC Portsmouth's soil presents a particular challenge to tree growth. The soil is

dredge spoil. It has extremely low organic and oxygen content and is alkaline. Most trees and shrubs prefer an acidic soil. ISC Portsmouth added sulfur to the soil in an attempt to acidify it and added organic compost to raise both the oxygen and organic content. This is a controversial measure because it creates a nice "pot" for the tree to grow in. The tree never wants to send its roots into the poor soil and therefore never develops a strong and far reaching root system. The alternative is to have many trees die early in the project. Even after taking these soil preparation measures, ISC Portsmouth lost more than 100 trees. The nursery replaced half of those lost.

As a follow-up to this project, the Staff at ISC Portsmouth received additional 1000 tree seedlings from the National Tree Trust. Some of the same troubled youths who planted the first forest, potted these seedlings. The seedlings will grow in pots for the next two to five years and be used in future forestation projects. Expected cost savings from these beneficial landscaping projects are not yet known. The long-term benefit to the environment will be significant. Instead of a hot dusty industrial base, ISC Portsmouth will have lots of shades in the future from the planted trees just like RTC Yorktown.



Participants in ISC Portsmouth's tree planting project

## **G. USCG STATION NEAH BAY**

The goal of the Station Neah Bay project, in Neah Bay, Washington, was to reduce mowing to free up personnel time for more valuable uses. Prior to beneficial landscaping, it took three people three days to finish mowing the station

grounds; they had to mow twice per month. When you figure that there are five months in the growing season, the unit was losing approximately 60 personnel-days per year just on mowing! By simply limiting mowing to areas around the station building and helicopter pad (and mowing other areas designated as "wild" areas in the unit SOP, a maximum of once per year in the Fall), station personnel achieved substantial savings with this no-cut option. Future projects included planting low ground cover or native fruit trees. An additional benefit of reduced mowing is increased wildlife habitat. Reduced mowing allows native species of flowers and grasses to naturally take over the area, which increases the habitat for wildlife and allows more species of animals to move in and increase diversity.

Despite all of these good reasons though, the Station Neah Bay project was halted. Community leaders, including one Native American tribe, did not like the new look of the station. Despite efforts to educate the local public, the new look was not accepted and a tribal beautification committee authorized an AmeriCorps work detail to groom the grounds.

It is important to note three aspects of the Station Neah Bay project. First, the unit personnel chose a landscaping method that was appropriate for the goal they had set. Wishing to reduce maintenance time on lawns and limited by the unit maintenance budget, the unit determined that "no-mow" was the option for them. Second, unit personnel developed a reasonable plan allowing mowing near station buildings and helicopter pads, and included this plan in the unit SOP. Finally, this project demonstrates the importance of community involvement. This involvement can be difficult for units that are already strapped for time. But without support from the command and the local community, sometimes beneficial landscaping is an uphill battle. Education of the public, both on and off base, is a key element to beneficial landscaping.



## H. USCG COMMUNICATION STATION MIAMI (CEU MIAMI)

POC: CEU MIAMI (305) 278-6708

Being located on one of the few remaining endangered Rocklands Pine areas in Dade County, Florida brought new challenges to beneficial landscaping. When CEU Miami was relocated to the Communication Station (COMMSTA), excessive mowing was commonplace around buildings. In one project, mowed areas were reduced to minimum fire safety requirements, allowing areas to be naturally replaced with native grasses and plants.



Area allowed to grow naturally then planted with native slash pines.

Exotics, like invasive Australian Pines, were cut and the roots treated with glyphosate, a non-persistent herbicide with low toxicity. As a 2001 Earth Day project, 300 native slash pine seedlings were planted to replace exotics. Despite using only rain for watering, a 90% survival rate was accomplished. The property is also home to two endangered plant species, the deltoid spurge and the tiny polygala, which now thrive in the new naturalized areas, along with the endangered Indigo Snake and threatened Florida Red Fox. Even a Bobcat has been spotted occasionally.

Hurricane Andrew killed many of the old slash pines on the property. While removing many of these dead trees,

snags (which provide homes to a variety of birds) were left at the rate of approximately one per acre.



Rocklands Pine area with snags

Natural landscaping does have its downside. Dead leaves, pine needles and fallen trees create a fire hazard in the heavy growth areas of the Rockland Pines that constitute about 20% of the property. An occasional controlled burn is needed to remove the dead materials. Plants and wildlife are enhanced and will benefit from an occasional controlled burn. A controlled burn was coordinated with the fire department in 1998 so the two endangered plant species were not affected. The COMMSTA is waiting on the wet season to coordinate another controlled burn.



Dead organic material requiring a controlled burn

## IV. How to Develop a Beneficial Landscaping Plan at Your Unit

### A. Initial Inventory

Start planning your beneficial landscaping project with an inventory. Tour your facility to spot areas that need some landscaping changes. A few things to look for:

- Large expanses of lawn that are not needed as parade grounds, ball fields, etc.
- Creeping vines, such as trumpet creeper or kudzu, and other invasive plants, such as phragmites or multiflower rose, that seem to be taking over an area of the facility
- Areas of eroding soil
- Areas where grass will not grow, such as areas that facility maintenance personnel must constantly fertilize and water or those they find very difficult to mow due to tree roots, parking lots, or other obstructions
- Areas that are extremely hot due to lack of shade such as parking lots, new buildings

A good start is to make a simple sketch of or footprint of the facility indicating the location of buildings, sidewalks, parking lots, stormwater basins, trees, shrubs, and lawns. A simple footprint will be useful as an indicator of trouble spots and places to preserve and/or restore.

See Appendix A for a sample beneficial landscaping inventory checklist.

### B. Set Goals

The next thing you need to do when planning a beneficial landscaping project is set your goals. Goals for beneficial landscaping projects vary from place to place, but some options might be:

- Reduce maintenance time and money – often this time is used for maintenance of lawns around the facility
- Reduce erosion
- Conserve water
- Reduce pesticide use
- Reduce fertilizer use
- Reduce stormwater runoff
- Increase shade such as around parking lots and/or buildings
- Increase wildlife habitat which is often a secondary goal
- Stop the spread of non-native, invasive plants like kudzu which is often a problem for units with wetlands and phragmites

See Appendix B for a table with sample beneficial landscaping goals.

Although the overall goals of beneficial landscaping are to minimize negative impacts on the environment and to minimize maintenance costs, facility managers may consider setting site-specific goals such as beautifying the facility, installing a native landscape, reducing stormwater runoff, reducing maintenance costs. When considering changes to existing grounds maintenance practices, site layout, and facility plans, you should determine the following:

- **Who** – is responsible for the current grounds maintenance practices and who will be responsible for any new beneficial landscaping methods like planting groundcover or cleaning storm drains
- **What** – beneficial landscaping methods will be implemented. The result of a site assessment checklist, costs projections and financial resources will help determine your goals.

- **When** – to develop an implementation and activity schedule. Remember that timing will be based on many elements, e.g., availability of financial resources and time of the year when the planting is done.
- **Where** – Based on the site inventory analysis, determine where the beneficial landscaping will be implemented. Make provisions for future plans that may affect the site such as expansion of the parking lot or the building footprint and avoid planting trees in these areas as well as areas that may be paved in the future.
- **Security** – Consider security measures of the Coast Guard unit when designing the beneficial landscape plan (e.g., ensure that tall shrubs are not planted near buildings).
- **Local Ordinances** – Check if the Coast Guard unit is subject to any local ordinances (e.g., weed laws) that may require permits or setbacks of trees from the street and other grounds maintenance specifications.
- **Determining Costs** – Assessing the costs of a planned beneficial landscaping also helps in setting goals. Keep in mind that implementing beneficial landscaping does not necessarily mean increased costs. For example, letting a mowed lawn return to its natural condition or reducing the mowing frequency by increasing lawn heights cuts down on the cost of ground maintenance.

Site planning for beneficial landscaping should strive to preserve existing wildlife habitats. It is desirable that an inventory of plant and animal species currently using the site and their habitats be taken. Where desirable species are already using the site for nesting, the Unit should consider phasing in a project by keeping enough habitat to protect those species before

forging ahead with replanting the entire site.

For more information on site planning, see the following website.

<http://www.epa.gov/glnpo/greenacres/toolkit/>

### C. Creating a Beneficial Landscaping Team

Once you have set and prioritized goals, it is time to get some help. Plan a meeting with the facility manager and maintenance personnel from your servicing MLC unit (or G-SEC-3 for HQ units), and other local experts in beneficial landscaping (e.g., landscape designers, agronomists, arborists, local nurseries, garden clubs, and other qualified landscape professionals). Good sources of expertise are your local Department of Agriculture extension agent (or master gardener, if your state has the master gardener program), the local Environmental Protection Agency, U. S. Fish and Wildlife Service, and a local Department of Defense facility. Members of the local community and local government agencies could also be included (do not forget the Neah Bay experience and how important public opinion can be) like landscape architects, botanists, agronomists, arborists, and other landscape professionals. Although developing and implementing beneficial landscaping is the responsibility of the facility manager, it is important to involve maintenance personnel from the beginning. It is best to try to bring as many of these people together as possible. Often, the different agency backgrounds provide different perspectives on possible projects.

Also, be sure that all representatives understand the basic goals of beneficial landscaping (e.g., use of native plants, cost savings, and pollution prevention). After introducing everyone and discussing your goals, take your group on a tour of the facility, so they can make

recommendations for meeting your beneficial landscaping goals. As the group tours the facility, take notes regarding recommendations and be sure to take pictures at each location. Your notes should refer back to photos and goals.

#### **D. Developing a Plan**

Once the meeting is complete, it is time to begin planning. Among factors that would influence the landscape design are the following:

**Timeline** – First, you need to set a timeline. Is your unit small and needs relatively simple changes? Is this a small-scale project with very limited budget and limited access to technical services? Perhaps you only need one growing season to make changes; your plan will span one year. Is your unit large and have many different areas needing different types of projects? Is it a large, well-funded project intended to accomplish complex results? Perhaps you would like to control erosion on the south side of the property, while transitioning four (4) large lawns into alternate landscapes. Large projects may require more time to complete; your plan may span four or five years.

Designing, installing and managing beneficial landscaping projects will vary in complexity and approach depending upon the nature of the site and the project goals. Planning, even if informal, is a fundamental ingredient for a successful beneficial landscaping project. You also need to know local weed ordinances before proceeding. Being a good neighbor is important, so a consideration of adjacent land uses is critical.

As you prepare your plan, be sure to check other unit planning documents such as the unit's Master Plan or perhaps a previous landscaping plan. Another source of information could be the unit's optional Integrated Natural Resources Management Plan.

Your plan should include information on types of projects, timing, plant material to be used, and funding. List the types of projects to be completed under your beneficial landscaping plan, which are probably the projects suggested by your team of experts. Include information on expected primary and secondary benefits of each project. Specify timing for each project. If your entire plan is to reduce mowing, simply explain the procedure and add it to your unit's SOP. If you plan to start with the erosion project on the south side of the property and then move on to lawn project #1, be sure to specify the seasons and years during which you will begin.

**Plant Materials to be Used** – For planting projects, you will need to specify the type of plant material to be used. You will probably need some expert advice, either from members of your planning team or from a landscape architect. Be sure your expert understands that you will only use native plants and that one of your goals is long-term cost savings. Using native plants helps preserve the balance of natural ecosystems. Native plants can provide year-round color and require less pruning and maintenance compared to invasive or non-native plants. Remember, a plant is not native just because someone saw it in the woods. For our purposes, we define "native" as a plant that was present when Columbus arrived in North America. Native plants are very specific for each geographic area. For example, a plant that is native in Virginia may be non-native and therefore, inappropriate in Oregon. Thus we will not provide a listing of native plants in this document. Some information regarding plants is available on the Internet or in landscaping books, but an experienced landscape architect is your best bet. If you do not have a landscape architect, your next alternative is the local agricultural department extension, arboretum, local Audubon Society, local and regional nurseries or consultants. Staff at local nurseries can be an invaluable source of information

about the plants they grow. Talk to them!

Many garden centers have special sections devoted to native plants. But before you buy native plants, make sure that the grower or dealer is reputable. Never buy wild-collected plants, thoughtless or unethical collectors can (and have) devastated wild plant communities. Also, beware of the term "nursery grown," which may simply refer to a plant which was illegally collected in the wild, potted up, and grown for a season at the nursery. Buy only plants that were propagated at the nursery from legally collected seeds, divisions, or cuttings.

**Plant Arrangement** – Design the site in such a way that plants are arranged in aggregate groups, rather than planted individually, and plants that have the same water requirement are grouped together. Plants needing less water should be separated from those needing more to enable more efficient watering system. You can also loosely group plants of the same species and interspersed them with other species for variety.

**Watering Frequency** – The mantra on watering frequency is water as needed. Frequent watering should be concentrated to lawns and areas of high visibility while well-established trees, shrubs and plants, especially those native to the area, should be watered minimally. For newly planted trees, shrubs, and perennials, they should be monitored and watered as needed. Usually, shrubs and groundcover should be watered when the leaves begin to droop or wilt while lawns are watered when the soil is dry. Watering the plants in the morning is preferable and encouraged not only because the air is cool and moist but also because loss of water to evaporation is reduced. Also, watering the plants, shrubs and perennials in the evening may encourage mildew and disease. Lastly, avoid excessive watering after chemicals and fertilizers have just been applied to

reduce runoffs that usually carry pollutants to streams and drainage ways.

**Watering Methods** – There are several ways of watering the landscape. Sprinklers are the most commonly used way to irrigate wide expanse of landscape but this method may result in waste of water due to evaporation and runoff. Hand watering is another method, however, when too much water is applied too quickly, it results in runoff. Instead, soaker hoses, trickle system or drip irrigation – systems that place water directly at the plants' roots with virtually no loss to evaporation – are recommended. These types of watering systems are ideal for irregularly shaped areas because they can be adjusted to follow the contour of the areas. They also are effective in reducing weeds since the water is concentrated into the plants and do not spill into unwanted areas. Each year inspect the heads, hoses and connectors and make sure that the washers at all hose connections and sprinkler valves are tight fitting, otherwise the leaks can waste up to 50% or more of the water flowing into the hose, sprinklers or watering device.

Another option is to redirect water coming from gutters and downspouts to areas that need to be irrigated. To avoid excessive runoff from the gutter and/or downspout which may ultimately destroy plants and lawns, perforated downspouts or rolled pipe attachments are recommended.

**Soil Erosion** – Soil erosion occurs when wind and rain carries away soil particles including fertilizers and other pollutants to other parts of the area and eventually to rivers, watersheds, etc. Some signs of erosion are bare spots, exposed tree roots, rills and gullies on slopes, soil splashes on the windows and walls of a building, or sediment collected on paved areas.

Erosion is usually caused by excess water so to help prevent it you can divert the water with the use of logs and berms.

For slight diversions, immediately mulching, sodding or planting the area after the water has been diverted is strongly encouraged. For strong runoff coming from gutters or downspouts, placing a concrete splashblock underneath the downspouts could help control the erosion. Also, you can direct the runoff toward grassy or planted areas, a stream, or street gutter. Another option is to place a drum or direct the runoff to a drum or storage area for future use but make sure that the container will not serve as a breeding area for mosquitoes, etc.

Another way of preventing erosion is planting groundcover (e.g., perennials such as pachysandra) especially on slopes.

Additionally, terracing a steep slope and filling the terraces with native flowering shrubs or groundcover may help prevent erosion. If the slope or erosion proves to be a bigger problem, it may be time to bring in a professional landscape architect.

**Groundcover** – Aside from serving as an element for soil erosion control, groundcover could be used as a means to reduce the area that requires mowing, weeding and maintenance costs. Groundcovers also could add color and screen unattractive spots. When selecting groundcovers, choose different varieties of native plants of varied colors, preferably perennial shrubs. Groundcover of this type would be attractive, long lasting and interesting all year round. Also, there are some native evergreen perennial groundcovers such as junipers.

Spring is the best time to plant groundcovers and other plants, however when planted in summer or fall, they would need frequent watering. Before planting, know the amount of sunlight and shade available at each site and compare with plant requirements. Many plants will grow in full shade. Always check the plant's tag as it specifies the requirements of each plant type.

**Natural Fields and Wildflower Meadows** – Natural fields and wildflower meadows also reduce mowed acreage and create a new habitat. Meadows can be located in areas where constant mowing is not required as long as they will not interfere with the facility's operations. Some beneficial locations include along mowed edges, particularly adjacent to tree lines and forested buffers; adjacent to storm ditches and drainage ways; in open areas; and adjacent waterways.

For newly seeded meadows, they should be mowed throughout the first growing season, preferably every 6-8 weeks, to a height of 6-8 inches. This will prevent reseeding of annual weeds while allowing perennials to develop strong roots and ensure a good diversity of plants in the meadow in subsequent growing seasons.

For any existing grasses and flowers in a meadow these can be supplemented with perennial wildflowers and native meadow grasses to increase the aesthetic appeal, or can be left to develop on their own. You only need to mow these areas once a year, preferably in March, early spring or before nesting season to ensure that birds nesting in the area are not disturbed and seeds and cover are available all winter.

### **Questions to Ask When Buying Native Plants:**

- Are the native plants locally grown or shipped in? Native plants which are locally grown are best suited to the regional climatic conditions. Always remember to select the best species for each location and situation.
- Have the seeds been propagated in a nursery or collected from the wild? Seeds from the wild need to be protected so that we do not deplete our natural areas.
- Will the native plants grow best in sun or shade? Survey your plot carefully.



- What soil type is required? Is it sandy or loamy, wet or dry?
- Which native plants grow well together? Call your local nature center or Heritage Program Office to find out about plant communities.

**Planting Methods** – The best approach to reduce lawn area and to reduce watering and maintenance cost is to plant trees and shrubs in a concentrated area rather than in isolation. When designing plant and shrub location, it is recommended that a two-foot wide mulch be placed around the building and other facilities to reduce potential water and plant damage to foundations and to enable access for maintenance of the structure(s). This method also would limit access areas for ants and other pests to enter the buildings.

When designing the beneficial landscaping project and considering the type of trees to plant, remember that dense deciduous trees and evergreen trees provide a desirable dead-air zone next to the outside walls of a facility as well as act as buffer for winter winds; evergreens are best located near the north or northwest sides of the building; and, deciduous trees should be planted on the southern and western sides of the building to provide shade during summertime. Avoid planting trees near or around septic systems, if any, because their long roots can clog or break the pipes.

When selecting plants and trees consider their size when fully grown and choose the ones that will still fit in a space when they reach their maximum size. Pruning is essential for healthy and attractive trees and shrubs so remember that native plants do not require as much pruning as non-natives.

**Plant Care and Maintenance** – Once trees and shrubs are planted, they should be monitored for signs of disease, pest infestation, dieback, the need for water or fertilizer, or any other change in status.

Maintenance equipment and activities that could result in damage to trees and shrubs are string trimmers, overmulching, driving of vehicles over root systems, pruning, or storage of equipment under the trees.

One of the best ways to maintain the health and beauty of trees and shrubs is to prune them periodically. Pruning helps shape trees and shrubs, remove dead, dying, or diseased branches, which could be entry points for insects and diseases that spread throughout the plants. The best time to prune is late winter or early spring. For flowering trees and shrubs, pruning should be done after the flowers have bloomed; for those that bloom in summer or fall, pruning should be exercised in winter. Do not prune after buds have opened or in the late summer.

Another way of cultivating the trees and shrubs is through mulching which promotes reduction in weeds, prevents erosion, helps maintain soil temperature and moisture, and acts as fertilizer. Shredded bark, peat moss, straw, and wood chips are commonly used as mulch. Also, mulch can be obtained free by contacting the local government. Mulching should be applied as needed and mulch depth should never exceed three inches because excessive mulching may furnish rodents abode. Feeder roots also have a tendency to grow into the mulch when there is too much of it thus making the roots susceptible to drought and freezing. Existing mulch should be replaced occasionally by removing the top 1/2 inch and cultivating the rest into the soil before applying new mulch. Remove weeds while mulching.

**Soil Conditions** – A basic element for any beneficial landscaping project would be an understanding of current soil conditions. This knowledge will assist you with your decision about what plants are appropriate where, since soil conditions can vary dramatically across a site. A soil scientist, such as your local expert from the U.S. Department of Agriculture, Natural Resources Conservations Service

can tell you the type of soil that you have and the kind of material from which it was derived.

In most cases, units implement their beneficial landscape project in phases due to limited resources. The project may be implemented in phases e.g., converting the lawn area or part of it to natural condition or meadow as the first phase, increasing the lawn height to reduce frequency of mowing as the second phase, creating new landscapes of native plants as the third, then initiating an integrated pest management program as the next phase, and lastly the maintenance phase. More often than not, the initial phases require more effort and expense than the maintenance phases.

Other sources of information are:

Department of Parks and Recreation

Lady Bird Johnson Wildflower Center:  
<http://www.wildflower.org>

National Wildlife Federation Backyard  
Wildlife Habitat Program:  
<http://www.nwf.org/habitats/index.html>

During this phase of the project, you should also initiate public outreach. You should educate the public about the unit's efforts to reduce and prevent pollution in the local community through beneficial landscape. You can inform the public through brochures, press releases and signs outside the facility indicating what the beneficial landscape project is all about.

## E. Approval and funding

Your final step in the beneficial landscaping planning process is acquiring command approval and funding. Present an organized plan that outlines your landscaping program and cost savings to your CO or OIC. Remember – command support is the only way to ensure a successful program. In your plan, you will need to determine how to fund your beneficial landscaping plan. Some plans will be very easy to fund, such as reduced mowing, because start-up costs

are low. Some plans require more up-front costs for purchasing plants, landscaping expertise, or soil amendments. You can build these costs into the unit's budget for maintenance, always keeping in mind that long-term savings are a goal of beneficial landscaping. You might also be able to include beneficial landscaping into ongoing projects. If a construction or restoration project is underway at your unit, check to see if native plants are being used for re-landscaping. If a lawn must be dug up, see if it can be replaced by a lower cost wildflower garden.

**Self Help Programs:** Consider "Self-Help Programs" being offered by the Coast Guard and other Federal, state and local agencies and organizations. Also, native plant installation costs can often be reduced where the project sponsor or co-sponsor is a public or private entity with plant propagating capabilities. Volunteers are often willing to assist in the installation and maintenance of native landscapes free of charge, which further reduces costs.

Once you have written your plan, you are ready to begin. Be sure to document progress and keep track of landscaping costs before and after the project so that you can demonstrate cost savings over the long-term.

### Helpful Hints:

- Draw your landscaping plan on paper.
- Start out small, only do a little at a time. Consider converting infrequently used areas of your lawn to native plants.
- Talk to your neighboring communities about what you are doing. Relaying the benefits of beneficial or natural landscaping may inspire others to try it.
- Consider putting up a sign (e.g., "Wildflower Garden"), or putting a border around your native garden to better define it. This will help onlookers feel more comfortable with a different approach to landscaping.

- Talk with local officials about applicable landscaping ordinances (e.g., weed laws, restrictions on vegetation height).

## **F. Evaluation and Report on Progress**

Evaluate the beneficial landscape project and report on its progress. Compare the expenses of maintaining the landscape before and after installation of beneficial landscaping. The evaluation should reflect reduction of maintenance costs. For example, letting all or a partial section of the landscape revert to a natural state will result in a reduction of mowed area and mowing costs. Newly planted native plants would initially require more watering and fertilizer but less in the succeeding years. The facility manager should modify grounds maintenance contracts to reflect new levels and types of maintenance necessary for the new landscape. The contract should reflect changes and be re-evaluated after the first growing season.

Managing the project includes control of noxious weeds via mowing or pruning during the first few years. If certain

noxious weeds need additional control, limited use of approved herbicides may be appropriate in the areas where needed. Some replanting may also be necessary. You must remember that a stable beneficial landscape may take three to five years to achieve.

Usually, the benefits of beneficial landscaping are not realized about 3 years. However, the initial investments are offset by the long-term reduced maintenance costs resulting from the reduced areas to be mowed and the reduced frequency of mowing, reduced use of fertilizers and pesticides, and the number of plants to be replaced.

Remember that implementing a beneficial landscaping program does not have to be done overnight, rather, it can be implemented over time. Make sure arrangements are made to familiarize facility maintenance staff with the new grounds maintenance practices. Native plants are accidentally destroyed as often times they are mistaken for weeds. Replacing them would entail additional cost in terms of money and time.

## V. SOURCES OF HELP

If you would like to learn more about beneficial landscaping or want to try it at your unit, check out these sources.

- Presidential Memorandum on Landscaping – On 26 April 1994, President Clinton issued a memorandum, Environmentally and Economically Beneficial Landscape Practices on Federal Landscaped Grounds. (See Appendix C.) Guidance from the White House followed on 10 August 1995. The goal of this Federal guidance is to promote sustainable landscape design that minimizes impact on the environment while maximizing cost effectiveness. The guidance does not advocate replacement of existing landscapes, unless it is cost-effective to do so. A summary of the memorandum can be found in the COMDTINST M5090.3 – Natural Resources Management.
- Executive Order 13148, Greening the Government through Leadership in Environmental Management was issued by President Clinton on 22 April 2000. The E.O. promotes sustainable management of Federal facility lands through the implementation of environmentally sound landscaping practices and programs.
- Executive Order 13112, Invasive Species was issued on 3 February 1999. This E.O. instructs Federal agencies to prevent and control invasive species in an environmentally sound manner, and to restore native species and habitats.
- COMDTINST 5090.3 – Natural Resources Management, A Policy and Guidance Document for Natural Resources Management – This document presents Coast Guard's natural resources policy

regarding compliance with the natural resources management requirements of Federal and state statutes such as the Clean Water Act, the Endangered Species Act, the Marine Mammal Protection Act, the Coastal Zone Management Act, and the National Environmental Policy Act. It also provides guidance for CG shore unit personnel in the implementation of that policy through coordination with the servicing MLC for the optional preparation of Natural Resources Management Plans.

For additional technical guidance, check the following:

U.S. Air Force Landscape Design Guide (highly recommended):  
<http://www.afcee.brooks.af.mil/DC/dcd/land/ldg/index.html>

<http://www.epa.gov/glnpo/greenacres>

<http://www.eren.doe.gov/femp/techassist/greening.html>

<http://www.epa.gov/glnpo/ecopage>

<http://www.epa.gov/glnpo/greenacres/nativeplants/index.html>

The following agencies are good sources of information and guidelines:

The Nature Conservancy (State Chapter)

Department of Horticulture (State University)

Department of Agriculture and Consumer Services

Department of Forestry

Department of Game and Inland Fisheries

**APPENDIX A: Sample Beneficial Landscaping Inventory Checklist**

Adapted from the U.S. Fish and Wildlife BayScapes Action Guide

SITE CHARACTERISTIC	SITE USES
<p><u>Wind Direction:</u> Affects sun exposure</p> <ul style="list-style-type: none"> <li>• Summer winds: N S E W</li> <li>• Winter winds: N S E W (circle one)</li> </ul>	<p><u>Buildings</u> ( _____ %)</p> <ul style="list-style-type: none"> <li>• Residence</li> <li>• Utility</li> <li>• Garage</li> </ul>
<p><u>Sunny Areas</u></p> <ul style="list-style-type: none"> <li>• % in summer _____</li> <li>• % in winter _____</li> </ul>	<p><u>Lawn Areas</u> ( _____ %)</p> <ul style="list-style-type: none"> <li>• Parade grounds</li> <li>• Ball fields</li> <li>• Other lawns</li> </ul>
<p><u>Shady Areas:</u> Existing shade areas can be 20% cooler than sunny spots.</p> <ul style="list-style-type: none"> <li>• % morning shade _____</li> <li>• % afternoon _____</li> </ul>	<p><u>Paths/Roads</u> ( _____ %)</p>
<p><u>Water Drainage:</u></p> <ul style="list-style-type: none"> <li>• % overall well-drained areas _____</li> <li>• % overall poorly-drained areas _____</li> </ul>	<p><u>Service Areas</u> ( _____ %)</p> <ul style="list-style-type: none"> <li>• Trash cans</li> <li>• Fuel delivery tanks</li> <li>• Outside storage</li> <li>• Inside storage</li> </ul>
<p><u>Grading</u></p> <ul style="list-style-type: none"> <li>• Sloped Areas</li> <li>• Eroding areas</li> <li>• Embankments</li> <li>• Walls</li> </ul>	<p><u>Vehicle Parking</u> ( _____ %)</p> <ul style="list-style-type: none"> <li>• Garage</li> <li>• Paved Surface</li> </ul>
<p><u>Soils:</u> Soil quality determines which plants will thrive in the facility's landscape design.</p> <ul style="list-style-type: none"> <li>• Type of dominant soils</li> <li>• % of soil compacted _____</li> <li>• % of soil exposed _____</li> <li>• Soil test for pH: A soil test will indicate an inventory of minerals and the pH in the soil affecting plant growth. The results will indicate whether additional organic matter or nutrients should be added. A local Department of Agriculture extension agent can help analyze soil and suggests ways for improving its ability to support plants and retain water if needed.</li> </ul>	<p><u>Utilities</u> ( _____ %) CALL Miss Utility for the location of utility lines.</p> <ul style="list-style-type: none"> <li>• Poles</li> <li>• Lights</li> <li>• Pipes</li> <li>• Buried cable</li> </ul>
<p><u>Plants:</u> Existing foliage adds value to the site and reduces landscaping costs.</p> <ul style="list-style-type: none"> <li>• Ground cover</li> <li>• Shade trees</li> <li>• Accent trees</li> <li>• Foundation shrubs</li> <li>• Accent shrubs</li> <li>• Non-natives (non-vine)</li> <li>• Vines</li> </ul>	<p><u>Other</u> ( _____ %)</p>

**APPENDIX B – Beneficial Landscaping Opportunity Guide**

Adapted from the U.S. Fish and Wildlife Service BayScapes Action Guide

<b>LANDSCAPE/MANAGEMENT FEATURE</b>	<b>CONSERVATION SUGGESTION</b>
<p><u>Fertilization</u></p> <ul style="list-style-type: none"> <li>• How often and when do you fertilize?</li> <li>• How long does this take and at what cost?</li> <li>• What type of fertilizer do you generally purchase?</li> </ul>	<ul style="list-style-type: none"> <li>• Fertilize cool season grasses in Fall</li> <li>• Fertilize warm-season grasses in Spring</li> <li>• Use fertilizers with at least 10% WIN (Water Insoluble Nitrogen)</li> </ul>
<p><u>Pesticides</u></p> <ul style="list-style-type: none"> <li>• Do you use a herbicide to reduce weeds?</li> <li>• Do you have a use for all of the pesticides in your storage locker?</li> </ul>	<ul style="list-style-type: none"> <li>• Raise lawn cutting height to reduce opportunity sites for weeds</li> <li>• Practice IPM</li> <li>• Plant beneficial species that require less pesticide</li> </ul>
<p><u>Watering</u></p> <ul style="list-style-type: none"> <li>• What time of day do you water?</li> <li>• What kind of sprinkler do you use (if any)?</li> <li>• How long do you let your hose/sprinkler run?</li> </ul>	<ul style="list-style-type: none"> <li>• Water infrequently and thoroughly</li> <li>• Water only in the cool of the day (preferably mornings)</li> <li>• Use water timers to save water</li> <li>• Water lawn only when visible signs indicate it needs it.</li> <li>• Mulch all exposed soil</li> </ul>
<p><u>Trimming and Pruning</u></p> <ul style="list-style-type: none"> <li>• How many hedges and shrubs do you trim regularly?</li> <li>• How often do you prune dead or diseased wood on shrubs?</li> <li>• What do you do with fallen branches in wooded areas?</li> </ul>	<ul style="list-style-type: none"> <li>• Select plants for their growth habit</li> <li>• Replace high-maintenance species with beneficial species</li> <li>• Leave snags in wooded areas, if there is no fire risk</li> </ul>
<p><u>Wildlife</u></p> <ul style="list-style-type: none"> <li>• Does your yard contain a variety of cover types?</li> <li>• Are a wide variety of foods appealing to different wildlife species available throughout the year?</li> <li>• Are there any existing structures that provide a place for some wildlife species to nest/raise young?</li> <li>• Are wetlands conserved on your property?</li> </ul>	<ul style="list-style-type: none"> <li>• Plant berry-producing shrubs</li> <li>• Plant nectar/nut/seed-producing plants</li> <li>• Plant evergreens for year-round cover</li> <li>• Plant tall grasses or wildflower meadows for butterflies and ground-nesting birds (only mow in the Fall)</li> <li>• Hang commercial nest boxes for birds or bats (very helpful in reducing insect populations)</li> </ul>
<p><u>Pests</u></p> <ul style="list-style-type: none"> <li>• Does your facility have a large mosquito population?</li> <li>• Does your facility have a large chigger population?</li> <li>• Does your facility have a large tick/flea population?</li> <li>• Does your facility have diseased plants?</li> </ul>	<ul style="list-style-type: none"> <li>• For mosquitoes, remove sources of standing water and hang bat boxes</li> <li>• For chiggers, regularly mow grassy areas</li> <li>• For ticks, treat host animals and their sleeping quarters, rather than the entire landscape</li> <li>• General tips for plant diseases: hand pick infected leaves and prune affected branches; plant resistant species; maintain proper drainage; sanitize all pruning equipment (1 part bleach to 9 parts water)</li> </ul>



APPENDIX C – Presidential Memorandum on Environmentally and Economically  
Beneficial Practices on Federal Landscape Grounds

THE WHITE HOUSE

WASHINGTON

April 26, 1994

MEMORANDUM FOR THE HEADS OF EXECUTIVE DEPARTMENTS AND AGENCIES

SUBJECT: Environmentally and Economically Beneficial  
Practices on Federal Landscaped Grounds

The Report of the National Performance Review contains recommendations for a series of environmental actions, including one to increase environmentally and economically beneficial landscaping practices at Federal facilities and federally funded projects. Environmentally beneficial landscaping entails utilizing techniques that complement and enhance the local environment and seek to minimize the adverse effects that the landscaping will have on it. In particular, this means using regionally native plants and employing landscaping practices and technologies that conserve water and prevent pollution.

These landscaping practices should benefit the environment, as well as generate long-term cost savings for the Federal Government. For example, the use of native plants not only protects our natural heritage and provides wildlife habitat, but also can reduce fertilizer, pesticide, and irrigation demands and their associated costs because native plants are suited to the local environment and climate.

Because the Federal Government owns and landscapes large areas of land, our stewardship presents a unique opportunity to provide leadership in this area and to develop practical and cost-effective methods to preserve and protect that which has been entrusted to us. Therefore, for Federal grounds, Federal projects, and federally funded projects, I direct that agencies shall, where cost-effective and to the extent practicable:

- (a) use regionally native plants for landscaping;
- (b) design, use, or promote construction practices that minimize adverse effects on the natural habitat;
- (c) seek to prevent pollution by, among other things, reducing fertilizer and pesticide use, using integrated pest management techniques, recycling green waste, and minimizing runoff. Landscaping practices that reduce the use of toxic chemicals provide one approach for agencies to reach reduction goals established in Executive Order No. 12856, "Federal Compliance with Right-To-Know Laws and Pollution Prevention Requirements;"



(d) implement water-efficient practices, such as the use of mulches, efficient irrigation systems, audits to determine exact landscaping water-use needs, and recycled or reclaimed water and the selecting and siting of plants in a manner that conserves water and controls soil erosion. Landscaping practices, such as planting regionally native shade trees around buildings to reduce air conditioning demands, can also provide innovative measures to meet the energy consumption reduction goal established in Executive Order No. 12902, "Energy Efficiency and Water Conservation at Federal Facilities;" and

(e) create outdoor demonstrations incorporating native plants, as well as pollution prevention and water conservation techniques, to promote awareness of the environmental and economic benefits of implementing this directive. Agencies are encouraged to develop other methods for sharing information on landscaping advances with interested nonfederal parties.

In order to assist agencies in implementing this directive, the Federal Environmental Executive shall:

(a) establish an interagency working group to develop recommendations for guidance, including compliance with the requirements of the National Environmental Policy Act, 42 U.S.C. 4321, 4331-4335, and 4341-4347, and training needs to implement this directive. The recommendations are to be developed by November 1994; and

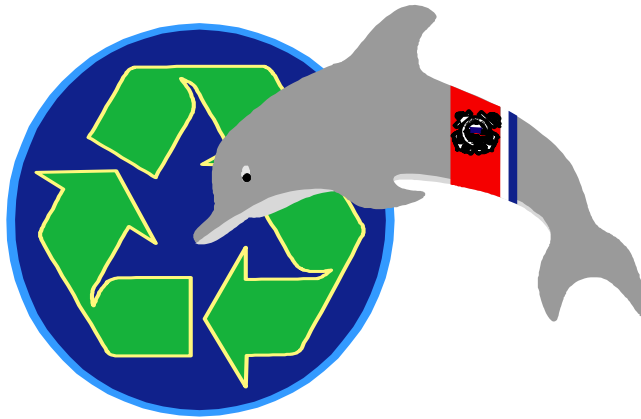
(b) issue the guidance by April 1995. To the extent practicable, agencies shall incorporate this guidance into their landscaping programs and practices by February 1996.

In addition, the Federal Environmental Executive shall establish annual awards to recognize outstanding landscaping efforts of agencies and individual employees. Agencies are encouraged to recognize exceptional performance in the implementation of this directive through their awards programs.

Agencies shall advise the Federal Environmental Executive by April 1996 on their progress in implementing this directive.

To enhance landscaping options and awareness, the Department of Agriculture shall conduct research on the suitability, propagation, and use of native plants for landscaping. The Department shall make available to agencies and the public the results of this research.

William P. Clinton



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