UNIVERSITY OF FLORIDA
EXTENSION
Institute of Food and Agricultural Sciences

SP191

# A Guide to Environmentally Friendly Landscaping: Florida Yards and Neighborhoods Handbook[1]

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## Florida Yards and Neighborhoods: The First Line of Defense

It may surprise you to know that your yard is the first line of defense for Florida's fragile environment. The health of Florida's estuaries, rivers, lakes and aquifers depends in part on how you landscape and maintain your yard. And you don't even have to live on the water to make a difference.

Storm-water runoff is the reason. Rain falls on yards, roads and parking lots, then washes into tributaries and the lagoon, carrying pollutants like fertilizers, pesticides, soil and petroleum products. Scientists have discovered that fertilizers and pesticides from residential areas are serious threats to the health of Florida's waters. When runoff contains nitrogen from fertilizers, algae can become so abundant that sea grasses are smothered, oxygen is depleted and fish kills may result. In some freshwater environments phosphorus is often the nutrient responsible for algae blooms. Toxic substances, such as common landscape and household pesticides, can damage reproduction in marine life.

But all is not gloom and doom. A new ethic is emerging among concerned Florida homeowners who seek to redefine the image of home and landscape. The idea is to cooperate with local, natural conditions, rather than to battle the elements.

**Figure 1.**

**Figure 2.**

1. This document is SP 191, a series of the Environmental Horticulture Department, Florida Cooperative Extension Service, Institute of Agriculture Sciences, University of Florida. Publication date: May 2001. Please visit the EDIS Web site at http://edis.ifas.ufl.edu.

2.

More people are conserving water and energy inside and outside the home. Interest is growing in landscaping with native and other beneficial trees, shrubs and ground covers. Homeowners are choosing plants that blend beauty and environmental benefits. People are selecting safer alternatives to chemicals used indoors and out. Best of all, many of these benefits to the environment also save time and money while enhancing our special Florida lifestyle.

This handbook on the Florida Yards & Neighborhoods Program provides helpful concepts, tools and techniques for creating your own Florida Yard. You'll learn the basics of designing a landscape featuring carefully selected plants suited to our climate, natural conditions and wildlife. Tips on cost-saving, environmentally friendly landscape maintenance also are included to help you reduce water, fertilizer and pesticide use. A helpful section for waterfront homeowners addresses shoreline management. This handbook also provides tips for working with your neighbors to share costs and work. Handy reference lists are located in the back of the handbook.

Whether starting from scratch with a new landscape or considering changes in an existing one, the information provided here will help you get started on your Florida Yard. For more assistance, contact the Cooperative Extension Service in your county and ask about the Florida Yards & Neighborhoods Program.

## Creating Your Florida Yard

### More About Soil

In much of Florida, soil and sand are almost synonymous terms. Typical soils allow rapid, downward movement of water and many nutrients. Thus, they dry out quickly and are not compatible with plants having high water and nutritional requirements. Sandy soils are more likely to allow leaching of chemicals into groundwater and waterways.

The simplest way to avoid these problems in the landscape is to use only plants that are compatible with the site. If you want a vegetable or rose garden, be prepared to modify, or amend, the soil. In that case, frequently add organic matter, such as compost, to the planting bed. This will retain moisture, provide nutrients and attract beneficial organisms like earthworms.

**Figure 3.**

It is helpful to have your soil's pH (acidity/alkalinity) tested. Sandy coastal areas are usually alkaline (high pH), and inland areas are usually acidic (low pH). However, many lots contain fill dirt from other areas, so site-specific pH testing is a good idea. Knowing your soil's pH will help you make better use of plant reference guides, which often provide this information along with other requirements of the plants listed. Many plants will tolerate a wide pH range, but will do best when planted in the right soil.

Modifying the soil's pH is not recommended. Alkaline soils will not stay acidic if chemically altered. In general, slightly acidic soils need not be modified as most landscape plants will tolerate these conditions. Contact the Cooperative Extension Service for information on soil testing services in your area.

**Figure 4.**

When planning your landscape be aware that different areas on the same property may have vastly different soils because of imported fill. Another variable factor in your soils may be the presence of a sub-layer of hardpan, rock or shell. This is one reason to examine your soil to a depth of about 18 inches before making final plant selections.

### More About Plant Selection

Plant selection is undoubtedly the fun part of landscaping. Florida's climate supports countless varieties of plants, and many are grown by local plant nurseries. If you follow the design checklist provided earlier in this section, you'll be well prepared to make the best plant choices.

**Figure 5.**

The plants you select determine the wildlife value of your yard, the level of maintenance required, how much money you'll be spending on water or electricity to run a pump, and how much fertilizer or pesticide may be required. Plant selection also will determine how long your landscape will last. For example, fast-growing plants often have a shorter life-span than slower-growing species.

Here are some guidelines for selecting your Florida Yard plants:

- Plants already on your property, particularly native plants, may be well-suited to the site and should be retained. Avoid disturbing the root zone (at least to the drip line) of these plants or driving over them with heavy vehicles. Saving existing plants reduces costs and leaves valuable wildlife habitat undisturbed. For those building a new home, retaining existing plants also limits erosion by reducing the amount of clearing required.

- Select from a plant palette that includes suitable native plants. Once native plants are established in the right location, most require little, if any, supplemental water, fertilizers or pesticides.

- If you don't want to continue irrigating after plants become established, select drought-resistant plants that are right for your soil.

- Consider wildlife. Providing native flowering and fruiting plants can bring birds and butterflies into your yard and your view. Florida is a stopover for many migrating and wintering butterflies and birds.

- Limit the number of showy plants that require high water and maintenance, and place them where they'll have the most visual impact.

- Don't plant noxious, invasive species. The State of Florida prohibits planting of Brazilian pepper, Australian pine and melaleuca (cajeput or punk tree). These plants should be removed from your yard, if possible. They crowd out native plants and are seriously threatening Florida's ecosystems and wildlife. Several other plants commonly used in landscaping are starting to take over here and in other parts of Florida. A few examples are wedelia (a ground cover), carrotwood tree, Java plum and Chinese tallow. For a list of plants you may want to avoid,

contact the Exotic Pest Plant Council. Also, contact your local government planning department to find out which plants are restricted by landscaping codes.

- Aim for diversity. Strive to create a mosaic of trees, shrubs, ground covers, native grasses and wildflowers. Monocultures, which are large expanses of the same species of plant, are prone to disease and insect infestation and do not provide the same benefits to wildlife as a diverse plant community.

- Turf areas should be functional and designed for easy maintenance. If the grass dies or you aren't using a turf area for play or other activities, consider replacing it. Good alternatives are ground covers or landscaped beds including the mosaic of plants described above. Ground covers can be especially useful in shady areas where turf may not thrive. Fertilizing, watering, mowing and pesticide use will be reduced.

- Don't be fooled by the quick-fix appeal of fast-growing plants. Such plants require more pruning, resulting in more yard waste. Lush, green shoots also attract pests. Slower-growing plants may take longer to fill in your landscape picture, but they'll last longer and create less work.

### Matching Plants to Your Yard

Determine site characteristics.

- **Remember that these may vary throughout your yard:**

SOIL

Sand

Loam

Clay

Alkaline pH

Acidic pH

**Figure 6.**

**Figure 7.**

Compacted

Well-drained

Poorly drained

DRAINAGE

Well-drained

Poorly drained

LIGHT

Full sun

Partial sun

Shade

TEMPERATURE

Exposed to freezes

Exposed to extreme heat

STRUCTURAL LIMITATIONS

Power lines

Underground utilities

Septic tank

Roof overhangs

Paved surfaces

OTHER

Exposed to salt spray or salty well water

Exposed to strong wind

Exposed to wet/dry seasonal extremes

- **Consider plant characteristics that reduce maintenance and prevent pollution:**

  Drought-resistant

  Pest-resistant

  Native

  Non-invasive

  Slow-growing

  Wind-resistant

  Thrives without supplemental fertilizing

- **Select plants with wildlife-attracting characteristics:**

  Berries

  Seeds

  Nuts

  Acorns

  Fleshy fruits

  Butterfly plants: nectar and larval food

  Red tubular flowers for hummingbirds

  Also consider the following characteristics:

  Provides shade

  Human food source

  Deciduous

  Evergreen

  Screening for privacy

  Attractive flowers or foliage

- **Consult with these expert sources to develop a plant list for your site:**

  Cooperative Extension Service

  Florida Native Plant Society

  Division of Forestry

Water Management District

Garden Center or Plant Nursery

USDA Natural Resources Conservation Service

Landscape Maintenance Professional

Libraries

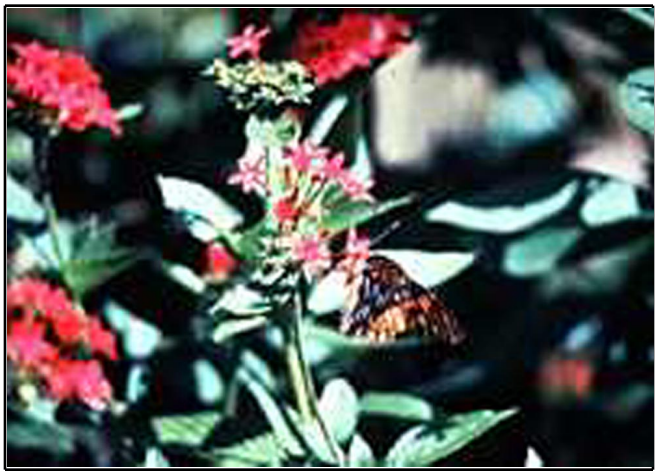

**Figure 8.**

### Searching for Natives

Some Florida native plants may be tough to find at your local garden center, but demand is growing so the supply will follow. In the meantime, here are some tips on finding native plants that may be suited to your yard:

- Visit parks and preserves to view native plants in their natural setting. Undisturbed acreage near your home may serve the same purpose. See what grows well in your area. Take photographs to show to knowledgeable people for later plant identification, or carry a good field guide that includes color photos.
- Visit the library and book stores, particularly those at botanical gardens, to find good reference books on Florida native plants.
- Attend meetings and field trips organized by the Florida Native Plant Society. Members often swap plants and seeds, as well as knowledge on what grows best in your area. Attend meetings and field rips organized by the Florida Native Plant Society or other horticultural organizations.
- When buying your plants, order from a nursery or ask your local garden center to order the native plants you want. Provide a list with scientific names, specifying the size of plant you want. Be sure to request an estimate before placing the order and inspect the plants for vigor and signs of disease or pests before paying.
- If plants you seek are not available through local garden centers, visit plant nurseries that specialize in Florida native plants. For information on locations near you, contact the Association of Florida Native Nurseries.
- Consider hiring a landscape architect or contractor who is knowledgeable about native plants to survey your yard and landscape plan and make suggestions. This may be a wise investment, particularly if you are planning major changes.

**Figure 9.**

### More About Attracting Wildlife

Florida has the third most diverse wildlife population of any state in the nation. But rapid growth of human populations, particularly in coastal communities, is replacing native wildlife habitat with urban development. As our communities expand, we lament the loss of birds and other wildlife, yet our own yards are partly to blame.

A Florida Yard provides habitat for desirable plants and animals that have been displaced by development. As you consider objectives for your new or existing landscape, add a few features for wildlife to bring your yard alive with birds, butterflies and beneficial insects.

Basically, wildlife will be attracted by food, water and cover. Following are some considerations for providing wildlife habitat in your yard:

- Food should be provided in the form of plants that bear seed, fruit, foliage or flowers that you are willing to have eaten by birds, larval butterflies (caterpillars) or adult butterflies. Berries, fleshy fruits, nuts and acorns are treats for wildlife.

- Water sources may include a pond, creek or other body of freshwater if such a feature exists in or near your yard. A bird bath that captures rainwater or that you replenish can suffice. Dump and clean the container every few days and refill it to prevent mosquito breeding and bacterial contamination.

- Birds are attracted to planted areas that include a tree canopy, smaller understory trees and shrubs, and grasses or flowers, particularly those that are allowed to go to seed on occasion. Meadow grasses can be especially attractive to wildlife, as well as adding a graceful and unique feature to your landscape.

- Warning: Pets that are allowed to harass wildlife will frustrate any efforts you make toward attracting wildlife.

- Pesticides used in the landscape will reduce insect populations, an important food source for birds. Some chemicals also may poison birds that feed on affected insects.

- Caterpillars on plants may be the larval form of butterflies. Each species of butterfly lays its eggs on a particular species of plant. For example, the queen butterfly lays its eggs on milkweed. If caterpillars are stripping a plant of leaves, take a sample of the offending insect to the Cooperative Extension Service for identification. If you want to discourage the insect, ask for suggestions on least-toxic controls.

- Butterflies of different species are attracted to specific flowering nectar plants such as native wildflowers, shrubs and vines. The Cooperative Extension Service and Florida Native Plant Society can provide information on which butterflies are found in your area and which plants they use.

- Snags or dead trees can be left in place if they don't threaten structures or parking areas. Birds use the snags for perches, nesting and sources of insects for food.

- Literature from the Urban Wildlife Program of the Cooperative Extension Service can aid in your plans. The pamphlets list scores of plants and their wildlife-attracting characteristics, plus they describe which birds, butterflies or mammals use various plants. In some counties you can apply for your yard to be certified as a Florida Wildlife Habitat.

**Figure 10.**

## More About Preventing Runoff

Here's a basic concept of a Florida Yard: Rain that falls in your yard should soak into your yard. After all, rainfall is an excellent source of water for your landscape, and reducing runoff will help protect waterways. Retaining rainfall long enough for it to percolate through the soil is particularly challenging in neighborhoods built before the late 1970s, when

storm-water treatment ponds were not required. Please consider a few practical tips for reducing the amount of rainfall that runs off your yard.

**Downspouts**

If the roof of your home has rain gutters, make sure the downspouts are not aimed toward a paved surface. Turn downspouts into areas with plantings that will make better use of rainfall than letting it run down the driveway and into a storm drain. Be sure to choose plants for these areas that can adapt to having more water, and be sure water doesn't pool next to buildings.

**Figure 11.**

**Earth Shaping**

Swales (small dips in the ground) and berms (raised earthen areas) can help divert runoff that is rushing from your yard. A bit of earth shaping can also be an attractive design element in your landscape. A berm-and-swale combination might be especially appropriate if your waterfront yard has a seawall. That, in combination with a maintenance-free zone of native plants, can make your yard more lagoon-friendly. Minor alterations to the lay of the land won't require permits or engineers, but any major earth work should have the professional touch and will require regulatory review. Some cities and counties have natural resource departments that can provide advice on earth shaping. The USDA Natural Resources Conservation Service and local Soil and Water Conservation Districts also may provide assistance.

**Rain Barrels & Cisterns**

These ancient "technologies" are making a comeback as water shortages and environmental ethics lead homeowners to use rain that falls on their property. Large, plastic rain barrels are now available at home and garden stores. The barrel looks much like a garbage can, but has a hole in the top where a roof downspout can fit snugly.

A valve near the bottom allows you to fill a watering can or connect a hose. These barrels are great for hand-watering, and they aren't mosquito-attracters as long as the downspout fits tightly. The barrel is not unsightly, and a four-foot shrub could easily shield it from view.

"Cistern" is really just a fancy word for rain barrel, but it implies a bit more engineering and greater storage capacity. Water is collected from the roof, filtered and stored in a container made of concrete, metal, wood, fiberglass or plastic. Water travels from the cistern upon demand by either gravity feed or pump action.

**Figure 12.**

**Porous Surfaces**

Whenever possible, use bricks, gravel, turf block, mulch, pervious concrete or other porous materials for sidewalks, driveways or patios. These materials

allow rainwater to seep into the ground, helping to filter pollutants and reducing the amount of runoff from your yard. In some cases they may even cost less to install than typical paving materials. Here's a comparison of surfaces for a 15-foot by 30-foot driveway. They are placed in order from most porous to least porous:

- Recycled mulch costs $0.16-0.40 per square foot. It requires occasional replenishing. Cypress mulch not recommended because harvest depletes wetlands.
- Washed shell costs $0.30 per square foot. It eventually compacts and hardens. It needs periodic additions and may alter soil pH.
- Gravel costs $ 1.33 per square foot.
- Pervious concrete costs $ 2.50 per square foot.
- Shell rock (limestone) costs $0.94 per square foot. It hardens. It is prone to erosion. It may alter soil pH.
- DOT-approved shell costs $0.25 per square foot. It may alter soil pH.
- Concrete costs $ 1.50 per square foot.
- Asphalt costs $ 1.17 per square foot.

**Figure 13.**

## Maintaining Your Florida Yard

Caring for our waterways starts with caring for your yard.

The perfect yard is less than ideal if caring for it causes you to pollute tributaries and the lagoon. A good landscape design incorporating the right plants in the right places reduces maintenance requirements and costs. For most yards it will be necessary to perform some maintenance, including:

- Composting
- Fertilizing
- Watering
- Mowing, Pruning, Raking
- Mulching
- Pest Management

**Figure 14.**

From Florida Yards & Neighborhoods, you'll learn some of the basics of nurturing your landscape without damaging the environment. You will find that pollution-free maintenance is easiest when plants are selected with that goal in mind. If your existing landscape is too much work or requires maintenance practices that pollute, you may begin to consider changing some plants in your yard. If so, please review the section on landscape design in this handbook.

### Composting

A common misconception about plant care is that plants require fertilizer for proper nutrition. Plants do need nutrients, but they don't necessarily need fertilizer. Plants use their leaves to make food

from sunlight, water, carbon dioxide and nutrients. Nutrients in the soil are necessary for structure, regulating metabolism, growth and reproduction. Some key nutrients for plants include nitrogen, phosphorus, potassium, calcium, zinc, magnesium, iron and manganese.

If a plant is appropriate for the soil and site where it is located, it may not require additional nutrients from fertilization. Fertilizers are generally used to achieve a specific goal: more or larger blooms, faster growth, greener leaves or more fruit. If one of these is your goal, you basically have three choices: using compost, applying packaged fertilizer or applying a specific mineral, such as iron.

A great way to improve your soil is by adding compost, which can be made from partially decomposed yard or kitchen waste. When added to your soil it can create the perfect medium for sustained plant health. Adding compost will:

- Improve soil structure, texture and aeration and increase the soil's capacity to hold water;
- Help loosen compacted soils;
- Promote soil fertility and stimulate root development in plants
- Create a favorable environment for microorganisms and larger creatures, such as earthworms and insects that are nature's "soil builders.

Generous amounts of compost frequently added to the soil surface can replace petroleum-based, nitrogen fertilizers. And unlike fast-release fertilizers, nutrients in compost are released slowly so landscape plants can better use them. Also, composting or mulching with yard wastes helps reduce the amount of waste that must be hauled to over-burdened landfills.

Composting can be as simple as placing leaves, grass clippings and small cuttings behind shrubs or in a hidden corner of the yard and letting nature take its course. Homemade or manufactured compost bins are another option to consider and will allow you to easily incorporate kitchen waste, such as vegetable and fruit scraps, egg shells and coffee grounds. Numerous types of compost bins are commercially available, and many are designed to be aesthetically attractive. Gardening magazines, catalogs and garden centers are good sources for such products.

The compost pile needs adequate moisture, oxygen and nitrogen/carbon sources to generate the right conditions for decomposition. The more closely these factors are monitored and manipulated, the faster decomposition can occur, and the sooner you'll have rich compost for fertilizing plants and amending soil. Your landscape maintenance professional will be grateful for an opportunity to avoid costly tipping fees at the landfill, too.

**Figure 15.**

Here are some tips on composting:

- Bins aren't necessary but they help keep piles neat, retain heat and moisture, and prevent complaints from neighbors. The minimum recommended size is one cubic yard (three feet square by three feet high).
- Composting can take as little as four-six weeks or as long as one-two years, depending on the size and type of material in the pile and the amount of attention you give it.
- Proper moisture is necessary for microorganisms to compost the material. Covering the pile helps retain moisture and prevents the pile from getting too soggy when it rains. You should not be able to squeeze water from the material produced at the bottom of the pile.

- Heat is important in composting, so a sunny location is better than a shady one.
- Combining different materials, such as grass clippings and leaves, in the pile can help achieve the right proportions of carbon and nitrogen for effective composting. Always bury kitchen waste in the pile to discourage pests and to prevent odor from rotting fruit and vegetables.
- Generally, for fastest composting, the pile should be turned with a pitchfork or stirred on a weekly basis in warm weather. Stabbing the pile with a length of pipe or rake handle can help with aeration and mixing.
- Never place meat, animal fat or dairy products in the compost pile.

### Fertilizing

If compost is not available or if you need to fertilize, a basic fertilizer that contains slow-release, water-insoluble nitrogen and other essential nutrients is the most environmentally safe and cost-effective alternative. At least 30 percent of the nitrogen in the fertilizer should be listed as water insoluble. Water-insoluble nitrogen fertilizers usually cost more, but fewer applications will be required. Besides, a few dollars can make a big difference in protecting tributaries and the lagoon.

When shopping for fertilizer, you will usually see three numbers (6-6-6, 15-0-15, 16-4-8, and the like) on the front of the bag. The first number refers to the percent of nitrogen content, the second number refers to phosphorus and the third refers to potassium. You'll need to read the label more closely to find out if other important nutrients are included.

If possible, the first and third numbers (nitrogen and potassium) should be the same. In many parts of Florida, natural phosphorus-rich soils mean you don't need to spend money on phosphorus in your fertilizer. The middle number should be no more than half the value of the first and third numbers. Recommended blends include 10-5-10, 16-4-8 and 15-0-15. And remember, try to select a fertilizer containing at least 30 percent slow-release, water-insoluble nitrogen. If your garden center does not stock what you are seeking, ask the manager to order it. As demand for appropriate products increases, they'll be easier to find.

Avoid using fertilizers that contain weed killer or insecticide. Such chemicals should be used only as a last resort when other more environmentally-friendly pest control options fail, and they should be used only on affected areas.

Fertilizer is most often required for turf areas that tend to have higher nutritional needs. If the lawn just won't green up, even after a good rain, first try applying chelated iron or iron sulfate instead of a complete fertilizer. An iron deficiency may be causing that less robust color.

Three common types of lawn grasses in Florida are Bahia, St. Augustine and Bermuda grass. Bahia requires the least amount of maintenance, but it is not salt-tolerant. Bahia also is prone to damage by mole crickets. St. Augustine is often used in coastal areas because it is very salt-tolerant, but it requires more fertilizer and water. It also can be prone to pests, such as chinch bugs. Bermuda, which is used on golf-course greens, requires the most fertilizer, pesticides and water, plus careful mowing. Because it requires intensive maintenance, it is not recommended for home landscapes.

When applying fertilizer use a maximum of one pound of nitrogen per 1,000 square feet no more than twice per year (March and September). However, you may be able to use half that amount and achieve excellent results. You can also reduce the risk of nitrate leaching into ground or surface waters by applying one-half pound of nitrogen per 1,000 square feet four times per year (March, May, September and early November).

### Watering

Homeowners in coastal areas of Florida are becoming accustomed to restrictions that limit irrigation to certain days and times. Still, most of us are watering too much. Overwatering depletes our water supply, often makes plants pest prone, and adds to storm-water runoff which pollutes our lagoon.

A sure way to reduce the need for watering is to choose drought-resistant plants, especially those native to your part of Florida, and plant them in the right spots. If you group plants according to their water (and light) needs, your irrigation methods and systems can be simplified. For example, turf irrigation zones should be separate from tree-and-shrub zones.

By choosing and operating a watering system correctly, you can reduce water bills, fungal diseases and maintenance requirements. Remember, the more you water the faster your lawn grows and the more it needs to be mowed. Here are some tips on irrigation that may help protect your plants, your pocketbook and our precious natural resources:

If you have an automatic sprinkler system, install a rain shut-off device or sensor that will override the system when adequate rainfall has occurred. Your water management districts, Cooperative Extension Service, USDA Natural Resources Conservation Service or an irrigation professional can provide technical assistance.

For best results, water in the early morning (4-7 a.m.). This is the most efficient time because temperature and wind speeds are at their lowest and evaporation is reduced. Also, grasses will be less susceptible to fungus if water is applied at the time dew normally forms.

Here's a simple watering schedule for grass: Apply 1/2-inch to 3/4-inch of water when the grass shows signs of distress (bluish-gray color, folded leaf blades). Don't apply more water until symptoms reappear.

Experiment with gradual reductions in irrigation to see if plants can tolerate less water. Some people use no irrigation, yet have healthy plants.

Water less in cooler months (November-March), and turn off automatic systems in the summer if rainfall is consistent.

### Sprinkling

You're probably familiar with sprinklers -- the kind that are part of an automated system. In some landscape situations, such as a lawn or bed of flowering annuals, that's the best method for applying water. Today, there are systems that allow you to conserve water by using micro-irrigation equipment, such as micro-spray jets, bubblers or drip tubes. If you are in the market for a new irrigation system, find a reputable irrigation contractor who has experience with these systems.

Be aware that drip or micro-spray fittings may clog and require filtration of the source water, regular inspection and possibly cleaning. Drip tape or tubing can be damaged by insects and rodents. Practical advice on state-of-the-art irrigation systems is available from the Cooperative Extension Service and USDA Natural Resources Conservation Service.

Free inspection of irrigation system efficiency is available in some areas through the Natural Resources Conservation Service.

If you already have an irrigation system your options for retrofitting may be limited. Sometimes low-pressure emitters, such as bubblers, can be adapted to existing sprinkler heads. This may require an attachment at the source to reduce water pressure. If you are changing areas of your landscape from turf to trees or planted beds, consult with the Cooperative Extension Service or Natural Resources Conservation Service on irrigation options. The St. Johns River and South Florida water management districts, and Florida Irrigation Society also provide information on irrigation system selection, maintenance and appropriate watering practices.

### Mowing, Pruning and Raking

Trimming some plants can help enhance the beauty of your Florida Yard. This is also an area of maintenance where you can reduce the workload by doing things the environmentally friendly way.

For example, if you've selected slow-growing plants, the amount of pruning will be reduced. Also, less pruning is required if plants are placed so that when they mature, they don't grow over walkways, driveways or against buildings. If your yard isn't turf intensive, less mowing is an obvious work and time saver. In addition, a beautiful landscape need not have a clipped, formal look. Soft, flowing, natural lines can be attractive and easy to maintain.

If there are turf areas to be mowed, keep in mind that most St. Augustine and Bahia turf grass should be kept at a minimum height of three to four inches and longer in the shade. If cut shorter the plants may be stressed. Each mowing should remove no more than one-third of the leaf blade, and those cuttings should remain on the lawn to decompose.

For procrastinators who don't mow regularly, mulching mowers will cut grass into smaller pieces, speeding decomposition. If the grass has gotten too long, spread cuttings behind shrubs or add them to a compost pile.

Grass clippings can also be mixed with leaves and twigs to create a useful mulch that provides nutrients to your plants.

Many new Floridians avoid having deciduous trees in their yards because fallen leaves require raking. But deciduous trees help reduce energy costs by shading the house in summer and allowing sunshine to heat the house in winter when their leaves fall.

Where turf isn't a concern, you don't have to rake under trees because the self-mulching is good for the plant. If aesthetics are an issue, plant shrubs under the trees to avoid raking. They benefit from the mulch and help hold leaves in place so they won't clutter the landscape.

Collecting leaves and pine needles by raking or blowing provides a source of mulch that is a real asset in the landscape, and it's virtually free. If your yard generates more leaf mulch than you can use, compost the material or share some with a neighbor. When pruning trees and shrubs, toss small cuttings into a compost pile or behind a shrub. Hauling huge piles of brush to the landfill is not necessary--and you'll avoid tipping fees charged at the landfill that add to the cost of maintenance.

### Mulching

Applying a layer of mulch around trees, shrubs, planted beds and on any exposed soil area will reduce water loss, control weeds and prevent runoff.

Here are a few simple facts to remember about mulch:

- 2- to 3-inch layer (after settling) of mulch around most plants reduces evaporation from the soil's surface, moderates soil temperatures and suppresses weeds.
- Mulches can replace turf or ground covers in areas that are difficult to mow, irrigate or otherwise maintain. Mulches also can be used in shady areas where plants may not grow readily.
- Mulch requires practically no maintenance, except for occasional additions and weeding.
- Use mulch that originates in your own landscape by using leaves, pine needles, grass and shrub clippings. Several sources of recycled mulch are available in the region. Start with your local government solid waste department or recycling coordinator. Avoid using cypress mulch because its harvest depletes cypress wetlands.
- Shell, crushed stone or pebbles can be used as mulch but will not contribute to the organic content of your soil. Also, be aware that shell mulch will raise the soil's pH as the shell material dissolves and will reflect heat, increasing water needs of plants.
- Mulch can provide a design element in your landscape, adding a contrast of color and texture that complements plantings.
- Reduce the chances of rot by avoiding piles of mulch against plant stems or trunks. Citrus trees are particularly prone to rot from such practice.

### Pest Management

Concerns about health, the environment and the increasing resistance of pests to chemicals have forced people to reconsider practices they once took for granted. The regular preventive application of traditional pesticides is one example. Most people don't realize that, in general, nature takes pretty good care of itself. Healthy plants can usually fend off pest attacks, while predatory insects and birds may keep undesirable insects under control. Thus, the preventive use of pesticides is unnecessary. Also, many insects are beneficial with less than 1 percent of all insects being harmful to plants.

There is a lagoon-friendly approach to pest control, called Integrated Pest Management (IPM). IPM emphasizes using pest-resistant plants, proper landscape management, natural enemies of pests and applying the least-toxic alternative if pesticides are required. Plants are carefully monitored for harmful pests, and only the safest materials are used to control them. Pesticides are used only on affected plants, not as blanket applications.

Non-chemical controls are not yet available for all pest and disease problems. This handbook attempts to highlight several common pests and the least-toxic methods that may control them.

**Avoiding Pest Problems**

Think before you plant. It takes considerable amounts of pesticides to protect plants weakened by unfavorable growing conditions. Know which plants can tolerate the conditions in your yard and plant them. Concentrate on pest-resistant varieties.

Go easy on water and fertilizer. Over watering and over fertilizing cause excessive growth, making them vulnerable to insects and disease. Encourage healthy growth and maintain the quality of your landscape by applying fertilizer and water only when needed and in moderate amounts.

Mowing grass too short and severely shearing trees and shrubs weakens them, inviting pests. Mow to the proper height and prune selectively. Remember, leaves are necessary to produce food for the plant.

## Identifying Pest Problems

Scout the yard for pests. Inspecting plants for pests helps identify problems early, before they get out of hand. Common plant pests in this area include aphids, mealybugs, scales, whiteflies, thrips, spider mites and caterpillars. Detecting small insects and mites can be difficult; life cycles as short as one week add to the problem.

To detect small pests, strike the leaves of small branches against a sheet of white paper and use a ten-power (10X) magnifying glass. Scales and whitefly larvae attach to the plant. Look for them on branches and the undersides of leaves.

Sooty mold on foliage is a good indicator of infestation by insect pests that pierce the plant and suck sap. These insects often secrete a sugary product known as honeydew. This substance encourages the growth of black fungi which appear as sooty mold.

Ants are another good indicator of the presence of pest insects as they feed on honeydew and care for insects that produce it.

Extensive plant damage with few pests may signal the decline of a pest population. Beneficial insects may already be doing the job for you. These may include lady beetles (commonly called lady bugs), lacewings and parasitic wasps.

Tolerate some insect damage and leaf disease on plants. No one can maintain an insect- and disease-free landscape, and a little damage won't hurt your plants. Remember, to have the "good guys" there must be some "bad guys" as a food source.

If a pest problem persists, take a sample of the offending insect to the Cooperative Extension Service for identification and IPM treatment suggestions.

## Controlling Pest Problems

Handpicking, pruning or spraying with water are effective controls of some insect pests if you catch the damage early. Many insect problems can be reduced or eliminated by removing a few affected leaves or plant parts.

Protect the beneficial insects in your landscape by avoiding blanket applications of pesticides. Treat for specific pests and only treat the affected plant. Avoid using broad-spectrum pesticides. Remember, broad-spectrum pesticides are not selective; they also kill beneficial insects.

Safer alternatives to traditional, chemical pesticides include insecticidal soaps, horticultural oils and products containing a bacterium called *Bacillus thuringiensis*.

## Common Plant Pests and Least-Toxic Controls

**Aphids:**

- Winged or wingless; pear-shaped body; usually green; may be yellow, black or other color; typically congregate at twig tips; leaves may be twisted or distorted; ants or sooty mold may be present.
- Natural controls: Lady beetle adults and larvae, lacewing larvae, syrphid fly larvae, parasitic wasps.
- Other controls: Flush from branch tips with water from hose, apply insecticidal soaps.

**Mealybugs:**

- 1/16- to 1/8-inch long; soft bodies; well-developed legs; bodies covered by powdery white coating that may also surround egg masses; attack leaves, twigs, roots; lots of ants; white, mealy wax deposits; sooty mold.
- Natural controls: Lady beetles, lacewing larvae.
- Other controls: Spray with horticultural oil. If oil spray fails, systemic pesticide may be applied to root system, affecting only pests that feed on plant sap.

**Scales:**

- About 1/16-inch in diameter; various size, shape and color; some produce honeydew (sugary secretion); body hidden under waxy scale covering; mature scales are stationary and feed on leaves, twigs, stems, fruit; yellow spots on top of leaves with scale underneath; ants; sooty mold
- Natural controls: Lady beetles, parasitic wasps.
- Other controls: See methods for mealybugs.

**Whiteflies:**

- Adults appear as white specks on plants; deposit eggs on underside of leaves; stationary larvae are oval, flat, transparent-to-greenish color when alive and dull white when dead; ants; sooty mold; adult flies around or on plant; larvae under leaves.
- Natural controls: Fungi (white, orange or tan; most effective in humid weather), parasitic wasps, lady beetles.
- Other controls: Spray with insecticidal soap. Follow with horticultural oils if necessary.

**Caterpillars:**

- Larvae of butterflies and moths, chew on foliage causing skeletonized leaves and notches, greenish fecal pellets on foliage, caterpillars observed.
- Natural controls: Birds, predatory stinkbugs, big-eyed bugs, lizards.
- Other controls: Spray or dust with *Bacillus thurigiensis.* Most effective when caterpillars are small.

**Thrips:**

- Tiny (1/32-inch); wings; scar leaves and drink sap from wounds; plant may be dull, grayish; curling, distorted leaves.
- Natural controls: None identified.
- Other controls: Apply horticultural oils

**Spider mites:**

- Tiny (1/32-inch); oval bodies; red, yellow or greenish; may have spots; adults spin loose webs on foliage; reproduce rapidly in hot weather; injuries to plants look like light color dots, giving leaves dull, gray green, stippled appearance. Fine, loose spider webs; ashy looking residues.
- Natural controls: Lady beetles, predatory mites.
- Other controls: Flush with water, then alternate with soap and oils if necessary.

**Mole crickets:**

- Up to 1/2-inch long, velvety brown, front legs flattened and adapted for burrowing; affects Bahia and Bermuda grass, turf may be spongy and thinning, 3/4-inch round holes with signs of

tunneling, infestation likely to occur in same area each year. Test for infestation by flushing area with soapy water, crickets will surface if present.

- Natural controls: Red-eyed fly, beneficial nematode, ibis.
- Other controls: For chronic infestation consider replacing turf with trees, shrubs or ground covers. May spot-treat infestations in June with materials labeled for mole cricket control. Use bait later if necessary.

**Chinch bugs:**

- Adults 1/5-inch long, black and white patches on wings, young nymphs smaller and reddish, attacks St. Augustine grass, yellowing turf grass, often in stressed areas in full sun or near paved areas.
- Natural controls: Big-eyed bug, earwigs.
- Other controls: Avoid high fertilizer rates. Maintain St. Augustine at height of 3 inches in sun and 4 inches in shade. Use chinch bug-resistant grass varieties (Floratam, Floralawn, FX-10). Spot-treat infestations with materials labeled for chinch bugs.

**Fleas:**

- Small, dark colored, 1/8-inch long, can hop some distance, obvious effects on pets and people, prevalent in areas where pets bed down or dig holes.
- Natural controls: None identified.
- Other controls: Spot-treat pet bed/outdoor resting areas with soap solution. Other least-toxic products are boric acid and those containing fenoxycarb (an insect growth regulator) that may be effective in shade. Beneficial nematode products are the newest outdoor control.

**Ants:**

- Three body segments; sizes range from 1/16-1/2 inch, depending on species; most species not harmful; mounds, ants in trails and on plants; controls not recommended in landscape unless fire ants are a problem.
- Natural predators: None identified.
- Other controls: Safest chemicals for fire ants include those with avermectin. Be sure material is dry/fresh and apply in morning or evening around edges of mound. Do not disturb mound.

### When You Don't Do the Work Yourself

There are thousands of companies in the region offering landscape maintenance services. With all of those folks vying for business, take care to select one that will use sound maintenance practices to produce a Florida Yard that's beautiful and friendly to the environment. This handbook will help the do-it-yourselfers, but what about those lacking the time, desire or ability to do the work?

Here's a checklist to review with a prospective maintenance provider. Your landscape maintenance service should agree to:

- Monitor for pests rather than apply sprays routinely and provide evidence of a significant problem before you allow and pay for treatment.
- Use least-toxic methods of controlling pest problems as described in this handbook.
- Use chemical pesticides only when less-toxic methods fail and post a sign to alert neighbors that chemicals have been applied.
- Apply slow-release fertilizer, and only if fertilizer is needed.
- Avoid fertilizers containing weed killer or insecticide unless applied with your permission.
- Leave grass clippings on the lawn and use other yard waste as mulch or compost.

### On the Waterfront

Waterfront Florida Yards present special challenges and responsibilities. Waterfront property owners have firsthand knowledge of the special

contributions that the lagoon, rivers, streams and lakes add to our quality of life. But a special responsibility goes along with the benefit of being a next-door neighbor to these natural resource treasures.

Landscapes bordering our surface-water resources need to be designed with special sensitivity to the environment. Those landscapes also present some unique management challenges for the environmentally conscious homeowner. Some of those considerations are highlighted here.

**Lagoon Shore Considerations**

If you have a naturally sloping, vegetated shoreline, count yourself among the lucky few. Approximately 40-50 percent of the natural shorelines around the Indian River Lagoon have been altered by shore protection structures like seawalls or rock revetments.

Naturally sloping lagoon shorelines, particularly when buffered by a fringe of mangroves and/or marsh grass, help smooth out waves and reduce turbidity (cloudiness) in the water. Mangroves and other shoreline plants contribute to the lagoon's food web, attract wildlife, such as wading birds, and help prevent erosion of the shoreline.

The area in which these shoreline plants grow is known as the littoral zone, the boundary or interface between land and water. Unfortunately, seawalls have traditionally been placed directly in this intertidal zone. While returning to a naturally vegetated shoreline is ecologically desirable, removing a shore protection structure is likely to be a complex decision.

If a shore protection structure has replaced the littoral zone along your property, your options are limited by the depth of your lot, the distance from the waterline to upland structures, the wave impact against your shore, your budget and the shoreline condition of neighboring properties. Shoreline protection alternatives are very site-specific considerations, and expert advice is essential. The Florida Sea Grant marine extension agent in your county, natural resources employees of local governments and the Florida Department of Environmental Protection are good places to start. Keep in mind that submerged land waterward of the Mean High Water line (see definition in this section) may not be your property, but may belong to the state.

One of the following scenarios may relate to your property and may provide ideas on how you can be part of restoring natural shorelines to our lagoon:

- **No existing shore protection structure and no need for erosion control.** Seek advice from one of the agencies listed above on how to enhance and protect your natural shoreline. If Brazilian pepper or Australian pine are present, remove them and replant with marsh grass to reduce erosion. You can help protect the shoreline and the lagoon at the same time by installing a maintenance-free zone of landscaping along the waterfront edge of your yard. This buffer zone protects the lagoon from areas that are mowed, fertilized or treated with pesticides. Plant selection for the buffer can maintain ecological diversity, further protect your shoreline from erosion and enhance the aesthetic value of your waterfront.

- **No existing shore protection structure but apparent need for erosion control.** If the waterline is moving landward and causing the loss of shoreline vegetation, the degree of erosion risk should be assessed by agency staff. They can recommend options to control erosion but may find that structural protection is not necessary. If structural protection is recommended, it should be placed landward of the Mean High Water line. This leaves the littoral zone undisturbed and allows natural vegetation to be maintained or placed waterward of the shore protection structure, thus providing habi tat value and shoreline protection. The structural protection could be large boulders; a planted, timber terrace effect; or a seawall. The latter is usually the most costly to construct and maintain.

- **Existing shore protection structure is in excellent condition.** If your seawall or revetment preempts the littoral zone and you don't want to move it landward, a perched planter for aquatic plants or an artificial reef habitat for fish could be considered. If your

seawall or revetment is landward of the littoral zone, consider suggestions in No. 1 above for enhancing and protecting the littoral zone.

- **Existing shore protection structure needs minor repairs.** Weigh the cost of repairs and eventual replacement with the cost of removal and reestablishing a planted, sloping shoreline. If you opt to repair the existing seawall, see No. 3 above.

- **Existing shore protection structure needs replacement.** It is often less expensive to remove a seawall, regrade the shoreline and replant with appropriate vegetation than to replace the wall. If structural protection is required, see No. 2 above. Replacing a seawall located within the littoral zone is a last resort, but may be necessary in your case.

**Lakes, Rivers, Lagoons and Streams**

Lakes, rivers, lagoons and streams -- even most storm-water retention ponds -- also have littoral zones where the land and water meet. Many of the same considerations apply in these freshwater systems as in the lagoon.

Definitely do not mow the littoral zones along these water bodies, and protect them from fertilizer and pesticide runoff. Erosion problems are typical along water bodies where vegetation has been disturbed by construction activities. Enhancing natural vegetation with additional plantings and removing non-native, invasive plants can improve both the function and aesthetics of your shoreline.

**What is the Mean High Water?**

This is an important point for waterfront property owners because their property typically ends at the Mean High Water (MHW) line. Mean High Water is not the wrack line where sea-grass debris is piled in a storm, nor is it the extent of wave impact.

The exact elevation of MHW above sea level may vary somewhat around the state of Florida. For those of us who are not land surveyors, that translates to slightly above the line where barnacles grow on pilings or seawalls.

Remember that anything you wish to do that affects submerged lands waterward of MHW requires the state's permission. For information on permitting requirements, contact the Florida Department of Environmental Protection and your local natural resources department.

### Those Marvelous Mangroves

The beauty, wildlife value, erosion protection, importance in the lagoon's ecology and declining numbers make mangrove trees an asset to a Florida Yard.

If you have mangroves, contact the following organizations for information on properly managing these fascinating plants: Florida Sea Grant Extension Program, Florida Department of Environmental Protection (FDEP) and your local government's natural resources department. Remember that some mangrove pruning requires a permit and the rules are periodically revised. Here's a quick primer to help you identify the mangrove species found in Florida:

- Red mangroves usually live closest to open water. They have arching prop roots and their seeds, or propagules, look something like green cigars. Their leaves are large and bright green.

- Black mangroves usually are found growing landward of red mangroves. Their leaves are dull green with silver undersides. Black mangroves "sweat" salt from their leaves and send up from their roots twiggy projections called pneumatophores, which provide oxygen to the tree's roots.

- White mangroves usually grow landward of or interspersed with black mangroves. Their leaves are more rounded than those of other species and have a small notch at the tip, and are lighter in color. On each leaf stem at the base of the leaf is a pair of small bumps.

- Green buttonwood is not considered a true mangrove by some scientists. It grows in the most landward locations of the littoral zone, behind the other mangrove species. It generally has small, elongated leaves and bears round buttons that turn brown. Once established, the green buttonwood is quite drought-resistant. It

can also withstand flooding, which makes it an ideal landscape plant for coastal areas. The silver buttonwood, its cousin, is prized in coastal landscapes for its distinctive silver-gray foliage. Pruning of buttonwoods doesn't require a permit.

### Septic Systems

In some communities wastewater produced in the home is treated in a septic system located in the yard. Scientists have documented that even properly operating septic systems now in use in many Florida soils do not protect coastal waters from the nitrogen that is a component of human waste. When septic systems are located near streams, the lagoon or other surface waters, groundwater carries nitrogen from the septic system drain field to these surface waters. Too much nitrogen in the lagoon causes algae to overgrow, smothering sea grasses and sometimes causing fish kills.

Additionally, water that is treated by septic systems cannot be retrieved for irrigating farms, golf courses or yards. This is now a common conservation practice with many centralized wastewater treatment systems.

In many areas centralized sewer service may become available, providing homeowners with an environmentally responsible option for wastewater treatment. Testing is also under way to determine whether new septic systems that remove nitrogen are appropriate for Florida. Meanwhile, homeowners with septic systems in their yards are responsible for properly maintaining the systems to reduce health and pollution hazards.

The Florida Septic Tank Association has the following recommendations for homeowners using septic systems:

- A septic tank should be opened and inspected every two to three years by a septic tank contractor, who will determine whether it needs to be pumped out.
- Do not plant trees or shrubbery over a septic tank or drain field. Roots can choke the drain field, reduce the tank's capacity or block the tank's inlet or outlet.
- Do not place grease or fibrous products, such as fruit peelings, in the garbage disposal.
- Replacement is the only remedy for a clogged drain field. It cannot be repaired by cleaning or the infusion of enzymes.
- Do not add yeast or bacteria to your septic tank.
- Avoid overtaxing your septic system by spacing laundry loads throughout the week rather than several loads on just one or two days.

**Warning Signs of Septic System Trouble**

- Plumbing backups or sluggish flushing in the toilet.
- Gurgling sounds in the plumbing.
- Grass in the yard growing faster and greener in one particular area.
- Ground mushy underfoot.
- Offensive odors indoors or outdoors.
- Low spots beginning to appear in the yard, regardless of other symptoms.

For more information on septic system operation and maintenance, contact:

Florida Septic Tank Association
PO Box 1025
Lakeland FL 33802

### Ponds in the Florida Landscape

A backyard pond is a very appealing feature, and an increasingly common one, in Florida yards. Ponds provide landscape charm, water retention and treatment, wildlife habitat, recreation and gardening opportunities. But they are not without their own, unique costs and considerations.

Whether they are natural or part of site development, they must be considered when making choices about house design, lawn care or general yard use. If planned right, ponds can represent the best--or if not, the worst--about the site.

**Ponds in the Landscape**

Water adds a magical element to most all landscapes. The change of texture, variety of lighting conditions, sounds, smells, all add to our increased interest in the landscape. Selecting a good pond site is a decision involving many site factors, such as correct slope, soil types and water table, but also practical matters, such as septic tank and house foundation setbacks, utility easements and soil types. When planning, try to strike a balance between what your permit allows and what the landscape calls for.

Natural Florida ponds most always are located in the lowest points of a landscape. There may be some advantage to constructing a pond at midway of the drainage but consider downstream flooding and drainage effects. Florida ponds must all have a high edge-to-depth ratio; that is, they are wide and shallow. This ratio increases the amount of littoral shelf area in the pond--the area of maximum sunlight penetration and subsequent rooted plant production and pond life activity. Florida ponds less than 4 feet often carry a complete plant cover. It takes 6- to 10-foot depths to maintain open water.

If deeper depths are required (typically for production of construction fill material), aerator pumps can help maintain proper aeration conditions. Local county excavation regulations, federal wetland regulations and other required local permitting must be considered when designing these ponds.

**Storm-Water Control**

As part of a mandated storm-water management system, frequently required by local water district permitting, the small pond can serve as a final collection point for runoff after a series of swales and channels. Pollutants are filtered by vegetation, filter traps and the settling action in the pond itself. This can have a significant effect, improving water quality draining into estuarine bodies. These systems also have the advantage of extending the "soak time" of storm water, or increasing the amount of water allowed to percolate, recharging the groundwater table directly.

Unlike ponds in natural systems, ornamental and storm-water ponds have a specific job to do and, like other artifacts, will need a maintenance-minded attitude toward their management. If you find yourself managing / living with one of these systems, here are some guidelines, several DOs and DON'Ts, to assure they continue to function properly:

- DO plant appropriate aquatic, emergent and upland vegetation properly, according to hydroperiod needs and habitat qualities (they will greatly enhance stabilization)
- DO use pond water for non-potable, local irrigation needs.
- DO set growth goals for surrounding plantings and fertilize the least amount possible with slow release fertilizer.
- DO use organic composting in lieu of fertilizer.
- DO use mulch around plants to retain moisture.
- DO keep pet and feral waterfowl wastes out of water bodies.
- DON'T allow livestock to graze pond banksides.
- DON'T swim or eat fish caught in storm-water ponds.
- DON'T allow invasive plants to clog waterways.
- DON'T direct grass clippings into storm-water ponds

**Wildlife Habitat**

Whether the pond surface can be measured in square feet or acres, ponds will provide a significant contribution to the wildlife of the area. A common pond type, and perhaps the easiest to imitate as a yard feature, are shallow "seasonal" ponds, typically 2-5 feet deep and 25-150 feet across, found across much of the Florida peninsular flatwoods.

The wet/dry variation in seasonal rainfall causes great changes in shallow pond water levels, appearances and functions. Standing water recedes in the Florida winter, often drying down completely, depending on the pond's water depth, soil type and

the local water table. Even in this "dry-down" condition, these sites provide moisture sources, the "damp habitats" required by many amphibians, reptiles, birds and small mammals.

If you wish to construct a pond to replicate these important habitats, choose an area where:

- Their wide-and-shallow profiles can be accommodated
- Present plant life and soil types are suitable
- Wildlife can get to the pond without disturbance

**Recreational Fishing**

Many ponds are constructed with recreational fishing in mind. Sport fish species, especially the complex chain able to support bass and other large species, need a permanent hydroperiod for habitat stability. Ponds of at least one-half acre surface area, a minimum 60-foot-wide bottom and depths of at least 6-8 feet have a better chance of offering stable conditions for successful sport-fish management.

**Pond Gardening**

Aquascaping -- landscape gardening with aquatic plants in wetland habitats -- is a satisfying form of gardening in a cross-section representing elevation contours (and therefore hydroperiod), and the sequence of plants along this slope is essential to a successful planting.