RESCAPE LANDSCAPE GUIDELINES

Regenerative Practices for the Landscape Professional
ReScape California is a non-profit organization that educates about and advocates for a whole-systems approach to landscaping that works in harmony with the natural world and addresses the changing environment. ReScape’s landscaping practices are based on 8 regenerative principles which foster soil health, sequester carbon, conserve water and protect habitat and valuable resources while reducing waste and preventing pollution in our communities and watersheds.”

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Introduction

About the Guidelines

The ReScape Landscape Guidelines are written for the professional landscape industry. The Guidelines provide an integrated approach to healthy, environmentally sound landscape design, construction and management.

The Guidelines are organized around eight principles for protecting the environment. By viewing the landscape through the lens of these eight principles, we can see more clearly how the choices we make for a specific landscape project can have a ripple effect on the broader community and natural environment. Plant selection, for example, has an impact on how much waste winds up in landfills, how much water is consumed for irrigation, and how much food and habitat is available for pollinators and wildlife.

Within the framework of the ReScape’s 8 Principles for Regenerative Landscapes, the Guidelines present more environmentally sound landscape practices. Some practices are repeated under multiple principles because they protect the environment in more than one way. Using mulch, for example, reduces waste, nurtures the soil, conserves water, and creates wildlife habitat.

The ReScape principles, practices, and specific applications included in these Guidelines were selected with guidance from landscape architects, designers, contractors and maintenance professionals; researchers; government agency staff; and other professionals.

The ReScape Landscape Guidelines were originally developed as the Bay-Friendly Landscaping Guidelines under the direction of StopWaste, a public agency whose mission is to reduce waste in Alameda County. EcoLandscape California, with the guidance of Sacramento Stormwater Quality Partnership, adapted the guidelines as River-Friendly Landscaping for use in the Sacramento Region. This edition of the Guidelines integrates the Bay-Friendly Landscaping and River-Friendly Landscaping Guidelines and is managed and published by ReScape California for use across California.

The Guidelines are intended to be used in tandem with ReScape Qualified Trainings and workshops where more in-depth information about locally relevant practices and ordinances is provided. The Guidelines also serve as a complementary tool for use with the ReScape Maintenance Manual. For more information about ReScape’s programs, publications and other resources, visit www.rescapeca.org.

Disclaimer:

The information in these Guidelines is provided for consideration by landscape professionals in the course of designing, constructing and maintaining landscapes. The practices in these Guidelines are strictly for use on a voluntary basis. They are not a substitute for the exercise of sound judgment in particular circumstances and are not intended as recommendations for particular products or services.
About ReScape California

ReScape California is a non-profit organization that educates about and advocates for a whole-systems approach to landscaping that works in harmony with the natural world and addresses the changing environment. ReScape’s landscaping practices are based on 8 regenerative principles which foster soil health, sequester carbon, conserve water and protect habitat and valuable resources while reducing waste and preventing pollution in our communities and watersheds.

ReScape California initially began as the Bay-Friendly Landscaping & Gardening Coalition in 2009. The Coalition evolved to become ReScape California in 2015, and grew further when EcoLandscape California merged with ReScape in 2017.

What We Do

- **Train** landscape professionals in ReScape’s 8 principles
- **Educate** communities with hands-on workshops
- **Connect** clients with the ReScape Qualified Professional Directory
- **Facilitate** adoption of model landscape ordinances
- **Create** partnerships to advocate for regenerative landscape practices
- **Recognize** civic and commercial landscapes in our ReScape Rated Landscape Program

How We Do It

- Qualified Professional Trainings & Directory
- Advanced Professional Seminars
- Community Education
- Rated Landscapes
- Partners, Members & Sponsors

A Few of the Challenges and Climate Change Effects ReScape Addresses:

- California’s water supply is limited and under increasing pressure. Up to 30% of urban water use goes to landscaping. Climate change will continue to stress our water supply.
- Landfill space is scarce and there are significant economic and environmental costs to transporting and landfiling plant debris. In Alameda County alone, 110,000 tons of plant debris goes to the landfill each year.
- Short-lived landfill emissions are responsible for approximately 20% of current global temperature rise, and are 84 times more potent than CO2 over a 20 year period. Air quality is also affected.
- Local creeks and the bay are impacted by inappropriate use of pesticides, affecting human health, food supply, habitat and wildlife populations.
- Conventional landscape construction and maintenance practices contribute to greenhouse gas emissions and air pollution.
- Biodiversity, ecosystem services, and aesthetic values of California natural resources are at risk.
- Increased temperatures and more frequent longer heat waves can affect changes in land cover and land use.
- Longer and more severe wildfire seasons are devastating, with costs to human life and health, property damage, and state and federal resources.
CHAPTER 1: INTRODUCTION TO RESCAPE LANDSCAPING

Basic Principles of Natural Systems

1. Natural systems are inherently beautiful.
2. Nothing goes to waste.
3. Inputs are limited and are primarily defined by the natural resources on site.
4. The more diverse they are, the more stable they are.

ReScape Landscaping

...is a whole systems approach to the design, construction and maintenance of the landscape in order to support the integrity of our watersheds. The ReScape landscape professional can create and maintain healthy, beautiful and vibrant landscapes by:

• Landscaping in harmony with the natural conditions of our watersheds
• Reducing waste and recycling materials
• Nurturing healthy soils while reducing fertilizer use
• Conserving water, energy and topsoil
• Using integrated pest management to minimize chemical use
• Reducing stormwater runoff and air pollution
• Protecting and enhancing wildlife habitat and diversity

For public spaces, ReScape landscapes embody community values for health and safety, wildlife and the environment. For private property, ReScape landscaping addresses issues that people care about, such as lowering water or garbage bills, and protecting the environment. A well-designed and maintained ReScape landscape can cost less to maintain in the long run, as well as lead to increased customer satisfaction and referrals to new clients.

As a landscape professional you can be proactive. You can be part of the environmental solution rather than waiting for more severe water conservation and pollution controls that are increasingly likely with our growing population and changing climate.

Conventional Landscaping

Commercial, public and residential landscapes can benefit the owner and the community through their beauty, the recreation they offer, and their positive environmental effects. Trees, for example, can provide shade and reduce energy consumption, absorb greenhouse gases, reduce stormwater runoff and add to property values.

On the other hand, landscaping can cause damage to the environment, consuming fossil fuels, contributing to pollution of the soil, air and...
water, and burdening landfill space.

Conventional landscaping often relies on large lawns, non-native plants, abundant irrigation, and heavy use of fertilizers and pesticides. It frequently requires significant mowing, blowing, trimming and removal of plant debris. Removing all plant debris from the site is one example of an especially damaging practice. It removes food and habitat for birds, insects and beneficial soil organisms. It mines our local soils of nutrients and degrades soil health. Often, the result is an increased dependency on fertilizers and irrigation, as well as greater stormwater runoff, erosion, pollution of our watersheds and global warming.

The Link Between ReScape Landscaping and Landfills

Over the last two decades, there has been a positive trend to practice backyard composting and residential recycling programs that reduces plant debris sent to the landfill. Leaves and clippings pass through the hands of professional landscapers and are prevalent in our disposal waste systems. Decaying plant debris and other organic waste is responsible for methane emissions from landfills. Methane is a significant greenhouse gas contributing to climate change. Other types of waste, including plastics and hazardous wastes, are also generated by conventional landscaping practices. The horticultural industry in the US throws away billions of pounds of greenhouse film, plastic pots and plastic groundcover each year. ReScape landscaping minimizes the use of plastics and pesticides, and diverts plant debris from the landfill by preventing waste in the first place through careful plant selection, watering and fertilizing or reusing plant material through grasscycling, mulch and compost. Because generating plant debris is linked to a wide range of landscaping practices — such as watering and fertilizing — this integrated solution is essential.

Keeping plant debris on-site can:

- Foster living soils
- Increase the organic matter in the soil
- Improve soil structure and reduce compaction
- Retain and restore topsoil
- Create healthier plants
- Reduce the need for irrigation, fertilizers and pesticides
- Conserve landfill space
- Reduce air pollution and the emission of greenhouse gases from transporting plant debris long distances to be processed or landfilled
- Reduce methane and CO2 emissions caused by anaerobic decomposition of organic material in landfills
- Restore the soil’s ability to absorb and filter water, improving water quality and reducing stormwater runoff into local creeks and our watersheds
- Help address climate change by creating healthy soils and reducing emissions.
The Link Between Wastesheds and Watersheds

Returning organic matter to the soil, in the form of plant debris, is the link between protecting our watershed and conserving landfill space.

In healthy landscapes, water from rain or irrigation percolates through soil that is rich in organic matter and alive with organisms. Living soils absorb and retain much of the water while also filtering out pollutants before the water reaches the aquifer or watershed. For the most part, conventional landscapes no longer provide this cleansing function because...

- Rooftops, asphalt, cement, and other impervious surfaces prevent much of the water from ever reaching the soil.
- Urban soils that have been mined of organic matter, compacted, eroded, and treated with chemicals are often lifeless and no longer able to function naturally — they have lost their ability to absorb much water or to filter pollutants out of the water.
- Runoff from irrigation and rainfall washes pesticides, fertilizers, plant debris, pet waste, heavy metals, spilled motor oil and other contaminants from lawns, gardens, roads and parking lots into gutters and
- Polluted runoff from stormdrains flows directly into creeks and rivers, which are themselves important resources for supporting the diverse and complex array of our natural ecosystems.
- Creeks and rivers flow into our watersheds where the contaminated water again harms fish and other wildlife and can cause illness in humans.

The Link Between ReScape Landscaping and Climate Change

We are experiencing global warming with climate change and there is now “unprecedented certainty” that this is due to greenhouse gases that are emitted into the atmosphere when we burn fossil fuels. Average temperatures are increasing, rain patterns are changing and extreme weather events, including heavy downpours and floods, heat waves and drought, are becoming more frequent.

If you professionally design, install and manage landscapes, the climate changes due to global warming have created new challenges to the way you do business, and the expertise your clients will need from you.

Conventional landscaping practices that contribute to global warming, by relying on coal, oil and natural gas for powering equipment, transporting landscape materials and waste over long distances, manufacturing pesticides and fertilizers, pumping and using water in the landscape may become increasingly subject to local, state and federal regulations, and less attractive to your clients.

Additionally, the consequences of global warming and climate change clearly impact the landscaping expertise needed to differentiate your business in the marketplace. You may be
required to deal with the problems associated with:

- Planting and hardiness zones that are changing
- Plants that are leafing out and blooming earlier
- Birds and butterflies that are breeding and migrating earlier
- Wildlife species that are shifting their ranges

Studies indicate, for example, that increasing temperatures could make aphids capable of producing more than 1 million offspring in 2 months — up from the 300,000 that they can currently produce. Drought-stressed plants are more attractive to aphids and susceptible to disease. Tough, invasive pest plants are expected to be able to exploit new conditions and expand their spread. Native plant species may find the conditions to which they have adapted changing dramatically. It may become more difficult to help your clients provide habitat and food for wildlife, as butterfly caterpillars emerge before the leaves of their host plants, or bees arrive too early or late to feed on the flowers that provide them with food.

**Put on Your Garden Gloves and Fight Climate Change**

You can distinguish yourself in the marketplace by preparing to deal with landscape problems associated with climate change and by becoming part of the solution. The practices detailed in these ReScape Landscape Guidelines are effective steps toward a solution to the problem of global warming. Direct and immediate ways to reduce the impact of the landscapes you design, install or maintain, include:

- Keeping yard waste out of landfills where it decomposes anaerobically, releasing methane
- Decreasing the burning of fossil fuels by:
  - Keeping plant debris on site by grasscycling, mulching and composting
  - Using hand-powered tools or commercial grade battery-electric equipment
  - Carpooling and careful planning of routes
  - Irrigating efficiently
  - Reducing lawn size
  - Selecting low maintenance and drought-tolerant California native plants
- Nurturing the soil to maintain its ability to store carbon, by:
  - Efficiently using natural fertilizers as a source of nitrogen
  - Building the organic matter content of the soil
  - Minimizing site and soil disturbance
  - Protecting the soil from compaction
- Planting and protecting trees

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**How ReScape Landscaping Reduces Greenhouse Gases**

<table>
<thead>
<tr>
<th>Practice</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less organic matter transported</td>
<td>= less CO2</td>
</tr>
<tr>
<td>Less organic debris in the landfill</td>
<td>= less CH4</td>
</tr>
<tr>
<td>Reduced mowing &amp; trimming</td>
<td>= less CO2</td>
</tr>
<tr>
<td>Fewer fertilizers &amp; pesticides</td>
<td>= less N20 &amp; CO2</td>
</tr>
<tr>
<td>Reduced water consumption</td>
<td>= less CO2</td>
</tr>
<tr>
<td>Increased soil organic matter</td>
<td>= less CO2</td>
</tr>
</tbody>
</table>
Returning Organic Matter to the Soil

Just as managing plant debris as if it is a resource and not a waste product can be the link between protecting our watersheds and conserving our resources, so too is this approach critical to reducing the emission of greenhouse gases that contribute to global warming. Consider the practices listed previously that are related to the management of landscape trimmings and grass clippings. You can provide your clients with the most advanced, comprehensive approach to fighting global warming by using sound, effective soil-building strategies.

### Soil Strategies for Reducing Greenhouse Gas Emissions

#### Carbon Dioxide

- Minimize soil erosion
  - Maintain cover and minimize disturbance
- Build soil organic matter
  - Add compost and maintain vegetation

#### Methane

- Maintain aerobic conditions
  - Limit compaction
  - Maintain subsurface drainage
  - Build organic matter with compost and healthy vegetation

#### Nitrous Oxide

- Verify need for nitrogen fertilizers by testing soils
- Use nitrogen fertilizers efficiently
  - Apply during times of active uptake
  - Don’t leave fertilizer at the soil surface
  - Apply nitrogen during cool weather
  - Do not apply nitrogen to saturated soil or if rain is expected

You can be the first line of defense.

Whether a site is next to a creek or miles away, your landscaping activities impact the quality of your watershed and the global climate.

The landscape you design, construct or maintain can conserve valuable resources, prevent waste and pollution, protect wildlife habitat, and reconnect your clients and the public to the beauty and value of your ecosystem.

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CHAPTER 2: REscape Menu of Best Practices

Act Local
- Select and evaluate the site carefully
- Assess the soil and test drainage
- Survey and protect flora and fauna
- Consider the potential for fire
- Use local, natural plant communities as models

Reduce Waste
- Select appropriate plants
- Keep plant debris on-site
- Prune selectively and properly
- Water and fertilize judiciously
- Use goats for controlling weeds and creating firebreaks
- Use salvaged items and recycled content materials
- Reduce and recycle waste
- Separate plant debris for clean green discounts

Nurture Soil
- Remove and store topsoil before grading
- Protect soil from compaction
- Defend against erosion
- Amend the soil with compost before planting
- Grasscycle
- Mulch regularly
- Aerate compacted soils
- Feed soils naturally
- Avoid synthetic, quick release fertilizers
- Minimize the use of chemical pesticides

Sequester Carbon
- Apply compost and feed the soil food web
- Add organic mulch to bare soil
- Limit soil compaction and minimize disturbance
- Reduce synthetic fertilizers, pesticides and herbicides
- Protect mature trees and plant large stature trees
Save Water

- Create drought resistant soils with compost and mulch
- Grow drought tolerant California native or Mediterranean plants
- Minimize the lawn
- Implement hydrozoning — group plants by water needs
- Design for on-site rainwater collection, recycled water and/or graywater use
- Design and install high efficiency irrigation systems
- Install a dedicated meter to monitor landscape water use
- Manage irrigation according to need
- Maintain the irrigation system so every drop counts
- Request an irrigation audit

Conservs Energy

- Shade buildings to moderate temperatures
- Reduce the heat island effect
- Shade air conditioners
- Design lighting carefully
- Choose and maintain equipment for fuel conservation
- Specify low embodied energy materials

Protect Water & Air

- Use Integrated Pest Management
- Eliminate high input decorative lawns
- Minimize site disturbance
- Choose and maintain your materials, equipment and vehicles carefully
- Keep soil and organic matter where it belongs
- Minimize impervious surfaces
- Plant and protect trees
- Maintain and manage the irrigation system carefully
- Design a system to capture and treat water

Create Habitat

- Diversify
- Choose California natives first
- Provide water and shelter
- Use organic pest management
- Conserve or restore natural areas and wildlife corridors
CHAPTER 3: RESCAPE LANDSCAPING PRINCIPLES AND PRACTICES

1. Act Local

ReScape landscaping recognizes that our landscapes, whether they are commercial, institutional, residential or open space, are part of a larger ecosystem. It does not mean that the landscape must be wild and uncontrolled, but rather on the whole, it respects the natural attributes of our region and contributes to the health, diversity and sustainability of each ecosystem. In return, many of the natural processes of a well-functioning ecosystem, like nutrient cycling, can then benefit the landscape you design, construct or maintain. You will re-connect your clients to nature through their landscapes.

Select and Evaluate the Site Carefully

Careful selection and evaluation will reveal both the opportunities and the limits of the site. Consider the unique features of smaller zones within the site, which could mean the difference between life and death for some plants.

Applications

Determine if the site is an urban growth boundary, a brownfield or near a sensitive ecosystem

Visit the site and among other features, identify on a site map the:

- Sunny, shady and partly shady areas
- Hot spots along south facing walls and fences
- Wet or dry spots
- Windy or exposed areas and the direction of prevailing winds

Benefits

This knowledge is critical to all other ReScape landscaping practices — particularly being able to select plant materials that match the site. It places the landscape in the context of its watershed. In the long run, it allows you to collaborate with nature, saving you time and money.

Assess the Soil and Test Drainage

Know the soil: its organic matter, fertility, texture, and structure. Identify problems such as compaction layers, poor drainage,
or contamination with heavy metals, salts or toxic compounds. This knowledge will help you determine the soil quality, the types of plants it can best support and any need for supplements.

Applications
Locate the landscape site on a soil survey map
Review site grading specifications.
Visit the site and take handfuls of the soil to determine the texture by feel.
Check for compaction zones with probes, augers or shovels. Test drainage in several spots.
Sample the soil from different zones in the landscape - and remember that different plants have different nutrient requirements. Send soil samples for an analysis of the soil pH, organic matter, nutrients and potential contaminants.

Identify soil characteristics on a site map.
Do an initial soil analysis, and then annually during the transition to a ReScape landscape, and also:
• When planning a renovation
• When experiencing ongoing problems

Watch the weeds. Clover, in turf, for example suggests a need for nitrogen.

Benefits
Understanding the soil is also critical to landscaping in an environmentally friendly manner. Plants are more likely to be placed appropriately and fertilizers used only as needed.

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### TIPS FOR SUCCESS: Soil Texture by Feel

Take a 1 or 2-tablespoon sample of soil into your hand. Slowly add water and knead the sample until moist. Try to form the sample into a ball. Squeeze it to see if you can make a cast (an impression of your fingers). Gently stretch the soil out between your thumb and forefinger and try and make a ribbon. Note the feel of the soil as you are working it and use the table to determine its texture:

<table>
<thead>
<tr>
<th>Characteristics of Soil Sample</th>
<th>Soil Texture</th>
</tr>
</thead>
<tbody>
<tr>
<td>Soil will not stay in a ball. Loose and single-grained with a gritty feeling when moistened.</td>
<td>Sand</td>
</tr>
<tr>
<td>A cast will form but it can’t be handled without breaking and will not form into a ribbon. Soil feels slightly gritty.</td>
<td>Loamy sand</td>
</tr>
<tr>
<td>A short ribbon can be formed but breaks when about 1/2 inch long.</td>
<td>Loam</td>
</tr>
<tr>
<td>A ribbon can be formed. The ribbon is moderately strong until it breaks at about 3/4 inch length. Soil feels slightly sticky.</td>
<td>Clay loam</td>
</tr>
<tr>
<td>The soil can easily be formed into a ribbon 1 inch or longer. Soil feels very sticky.</td>
<td>Clay</td>
</tr>
</tbody>
</table>

Survey and Protect Flora & Fauna

Existing flora and fauna provide insight into the ecosystem health and the landscape possibilities. Native vegetation, wildlife habitat & sensitive areas such as wetlands may need protection. Invasive species will need active control.

Applications

Identify plant species and communities, especially California natives, invasive or endangered species and wetlands.

Learn what wildlife inhabit or move through the site or have historically inhabited the site. Consider what they used for food and shelter. Plan for restoration.

Ask your clients to identify plants that are of value to them.

Become familiar with local tree ordinances and wetland or endangered species regulations.

Develop a plan for preserving existing trees and shrubs or engage the services of a certified arborist to help you create the plan.

Benefits

Conserving or restoring local flora, fauna and habitat provides your clients with a sense of place. Native plants can make the job easier for the landscape professional.

Consider the Potential for Fire

There is no doubt that the potential for fire in California can be great and that landscaping is a critical factor. Understanding the topography, fuel loads and local weather are critical to designing and maintaining a landscape that reduces the potential for loss to fire. Plant selection is also very important to reducing the fuel load and avoiding fire ladders. Some species—“pyrophites”—ignite readily and burn intensely. Dense vegetation in hedges, screens or espaliers can be a fire hazard because the competition for limited water, nutrients and space results in a large amount of dry twiggy material.

Applications

For sites adjacent to fire-sensitive slopes, open space or wildland: Create a Fire Mitigation Plan that identifies adjacent fire-sensitive wildland or open space or developments, exposure to prevailing winds during the dry season, steep slopes (especially south and west facing that can increase wind speed and convey heat), and vegetation type (particularly species that burn readily). Specify mitigations to these fire vectors, including the establishment of a “defensible zone” immediately surrounding the structure, that use one or more strategies for firescaping, such as:

• Emphasize plants with low fuel volume and/or high moisture content in planting plans
• Avoid plants with high oil content or that tend to accumulate excessive dead wood or debris (pyrophites)
• Assure that trees are well-spaced and pruned to 6 feet minimum above ground, and that dense shrub plantings are separate from trees, to minimize fuel ladders
• Plant trees and tall shrubs where limbs and branches will not reach the building or grow under overhangs as they mature
• Avoid finely shredded bark mulch
• Face and construct decks out of fire-resistant materials

Contact the local fire department for assistance in understanding the fire risk at a particular site and for additional guidance in reducing that risk, particularly for sites at the urbanwildland interface.

Benefits

Landscapes can be designed to reduce the fire hazard, with a clearer understanding of the risks, proper design and choice of plants.
Use Local, Natural Plant Communities as Models

A plant community is a group of plants that recurs with relative consistency, often dominated by a single species. It is important to recognize that species within different plant communities overlap and change over time.

Applications
Learn about local plant communities.
Train yourself and your staff to recognize local plant communities and to evaluate the conditions under which the plants are succeeding.
Use these communities to guide your choice in plant selection.
Plant seeds of annuals to fill in with color and greenery while slower growing perennials get established.

Benefits
Using the local, natural plant communities as a model allows you to work with nature to create spectacular landscapes that can help replace what’s so often been degraded or lost.

Learning from Local Plant Communities

Many local native species are excellent landscape plants. You can imitate natural processes by using the plant community concept to organize plantings. Blending the science of ecology with the practice of horticulture, you can create landscape projects that assume qualities of natural landscapes.

If you choose plants in response to the site conditions, the new planting will probably become established easily. There will be little need for special fertilizing, pest control and heavy irrigation that have been so common in the past. The plants grow easily because they’re adapted to the place. If you visit local wildlands, you will notice that a particular species might be abundant in a given area, only occasionally present in an adjacent space, and completely absent elsewhere. You may also recognize, as you move from south facing to north facing slopes or from exposed ridges to wooded canyons that certain groups of plants tend to grow together. This is because native plants have adapted over many generations to specific environmental conditions.

Using local plant communities as a model allows you to work with nature to create healthy, vibrant landscapes that can also help replace what’s so often been degraded or lost due to development.
2. Reduce Waste

Reducing waste starts with not generating it in the first place. Selecting the right plants for the right place, as well as watering and fertilizing judiciously are important ways to reduce the tons of plant debris that end up in the landfills.

Reusing plant trimmings as mulch, grasscycling, and using compost improves soils, creates healthier landscapes and in addition, keeps materials out of local landfills.

Material use is an important factor in the landscape. Using recycled content, salvaged, durable or local materials conserves resources and can reduce the amount of embodied energy that is consumed by the landscape.

Landscaping with waste reduction in mind will help you create a beautiful, relatively trouble free landscape that yields years of benefits for you, your client and your watershed.

Choose Plants to Match the Microclimate & Soil Conditions

Selecting the right plants is linked to understanding the site-specific conditions of the landscape. Plant selection is the foundation of environmentally sound landscaping and thus an important practice for meeting many of the other principles of ReScape landscaping.

Applications
Select flora that is compatible with the exposure, temperature, moisture, and soil in microsites within each particular landscape site.

Consider appropriate plant communities and how one community may succeed another with time.

Benefits
Plants are more likely to thrive, which reduces their susceptibility to disease and other pests and their need for fertilizers and pesticides. Water can be conserved. Callbacks and plant replacement are often reduced. Debris is not generated in the first place.

Choose Plants That Can Grow to Their Natural Size in the Space Allotted Them
Selecting a plant or plants to grow in too small a space starts a lifelong battle with the plant’s genetics, thereby inviting disease and insects, generating unnecessary waste or increasing the fuel load.

Applications
Consider the mature size and shape of the plants you choose and place them in areas that will allow them to assume their natural form.

Avoid over-planting for instant effect.

Select trees with a mature height of less than 20 feet for planting near power lines.

Benefits
Labor, fuel and waste are likely to be reduced, cutting your costs. Plant health and resistance to disease is fostered.

Replace Sheared Hedges with Plants That Can Grow to Their Natural Shape & Size
Shearing is a horticulturally unsound practice that is labor intensive and that encourages excessive new growth that can lead to unhealthy plants and increased waste. What’s more, sheared hedges and screens have lots of deadwood under the dense green crown because of the lack of light reaching into the
Hedge. This dieback in the center of the plant increases its flammability.

**Applications**

If hedges are desired, select dense species that will be able to grow to their natural shapes and sizes.

Reduce the number of plants in the existing hedges and allow the remaining plants to grow into their natural form, if their size is appropriate to the space.

Recommend to your customers that sheared hedges be removed and replaced with plants that can grow to their natural form.

**Benefits**

Your cost for the labor to regularly shear the hedges is lowered and at the same time, fuel load can be decreased, waste will likely be reduced and your disposal bills lowered.

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**Do Not Plant Invasive Species**

Invasive plants used in landscaping often escape into our natural areas, where they can spread rapidly and out-compete natives, degrade wildlife habitat and increase the fuel load.

**Applications**

Familiarize yourself with locally important invasive species. Sheet mulch can be very effective for weed control. Do not plant invasive species.

**Benefits**

The cost of later pulling these species out of the landscape, neighboring sites and wild lands is avoided. Waste is reduced and ecosystem diversity is protected.

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**Grasscycle**

Grasscycling means leaving the clippings on the lawn after mowing, so they decompose and release their nutrients into the soil.

**Applications**

Mow often and when the grass is dry for the best results.

**Benefits**

Leaving the clippings on the lawn after mowing saves time — one study showed that grasscycling reduced mowing time by 38%. It also saves money and reduces greenhouse gases that result from hauling the grass clippings to the landfill.

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**Produce Mulch from Plant Debris**

Plant debris left on the soil or chipped and then spread evenly over the surface of the soil nurtures soil organisms, and recycles organic matter and nutrients.

**Applications**

Avoid removing leaves as they drop from the tree — designate areas under the tree & shrub canopy, and away from hard surfaces and stormdrains as a natural leaf repository. Leaves should be picked up if they carry disease that can infect other plants, preventing low growing plants from receiving light, or if they are where they can clog stormdrains.

Regularly chip plant debris and spread evenly over all exposed soil surfaces.

Refer to the section *Nurture Soil*.

**Benefits**

Nutrients are recycled, habitat is created, waste is reduced, and the beneficial soil life that feeds on the organic matter jumpstarts other natural processes.

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**Compost Plant Debris**

Composting is the controlled decomposition of organic material. It turns plant debris into a beneficial soil amendment.
Applications
Enroll yourself or your staff in a composting training program
Encourage your residential clients to purchase a compost bin and offer to manage it for them.
Design a site for composting client plant material.

Benefits
Composting on-site returns valuable nutrients and organic matter to the soil & reduces pollution associated with transporting waste, as well as disposal costs.

Prune Selectively and Properly
Pruning should complement the natural form and strengthen the structural integrity of the plant. It should not be used to dominate plants. The labor for this type of pruning is not a cost well spent; it never ends, weakens the plant and generates unnecessary plant debris.

Applications
Use the standards from the American National Standards Institute for proper tree pruning, including pruning at the appropriate time of year.
Do not top trees but rather remove branches at their point of origin or shorten branches back to a lateral.
Prune when the plant is not under stress or dormant.
Ask your client to consider replacing a tree or shrub that requires frequent pruning because it has grown too large for its space with a species that will require little or no pruning.

Benefits
Trees and shrubs are stronger and more likely to resist pests. Waste is minimized.

Water and Fertilize Judiciously
Watering and fertilizing wisely prevents rampant plant growth that weakens the plants and generates plant debris.

Sample Contract Specifications for Pruning:
Trees and shrubs shall be pruned selectively only as necessary to enhance their natural shape. Topping of trees is prohibited except for safety or liability issues.
Shearing new hedges into formal shapes is prohibited. Plants shall instead be selectively pruned by cutting individual branches or stems to interior lateral branches at appropriate locations, on an as needed basis.
Existing hedges that have been maintained by shearing in the past and that do not have adequate space to grow to mature plant size, can continue to be maintained by shearing, until replacement is possible.
Trimmings generated by pruning shall either be chipped and used as mulch on the site, or separated for plant debris recycling.

Applications
There are many applications. Refer to Nurture Soil and Save Water for more info.

Benefits
Plants are not pushed into growth over-drive. Water damage to fences and hardscapes is minimized. Waste is prevented and disposal bills are decreased. Less maintenance translates into lower labor and fuel costs.
Use Goats for Controlling Weeds and Creating Firebreaks

Goats will eat many weeds that are otherwise very difficult to control — like poison oak, for example. Goats can work in areas that are too steep for human crews. They don’t start fires with sparks, nor require fossil fuels to get the job done, and goats can reduce the fuel load in a short period of time. The costs of renting a herd may be lower than the costs of the labor for weeding and disposing of the plant debris.

Applications

Consider renting a herd of goats. Ask for references of local landscapers who have used goats for controlling weeds or creating firebreaks.

Use them with care as they eat desirable vegetation along with weeds: identify natives and other vegetation that will need to be protected from the goats with temporary fences. Remove them from the area before they have a chance to overgraze.

Benefits

As the goats graze they reduce the fuel load, return nutrients to the soil and eliminate the need to haul off plant debris.

Use Salvaged Items & Recycled Content Materials

Salvaged materials are not remanufactured between uses. Finding and using them takes time and ingenuity but in the long run, salvaging conserves resources, can save money and adds interesting elements to the design. Recycled content materials such as plastic or composite lumber make very durable decks or raised garden beds that do not rot, crack or splinter.

Applications

Get creative and specify that hardscapes and other landscape structures be constructed...
with salvaged items. For example, use broken concrete for very attractive retaining walls and ground glass cullet for beautiful walkways.

Find materials for reuse.

Specify the use of recycled content materials or those made from rapidly renewable resources.

Substitute compost blankets, berms and filter socks for plastic silt fencing.

Purchase biodiesel or biobased lubricants for your equipment.

Use sustainably harvested wood (FSC Certified) if plastic or composite lumber is not appropriate. Use treated wood that does not contain chromium or arsenic for any application that specifies treated lumber.

Specify recycled aggregate (crushed concrete and asphalt) for backfill, road base or other uses.

**Benefits**

Lower maintenance costs can recover the added cost of plastic or composite lumber within a year. Compost provides superior erosion control to silt fencing and doesn’t require disposal. Waste can be reduced, natural resources conserved, and markets for recycled products strengthened.

**Reduce and Recycle Waste**

ReScape landscapes offer many opportunities to reduce and recycle waste, both in the short-term construction of the landscape and in the long term, by designing spaces for collection and storing recyclable materials.

**Applications**

Dedicate an easily accessible area to the collection & storage of materials for recycling.

List the types and estimated quantities of materials that will be generated at the job site.

Contact local recycling facilities and haulers to identify terms and conditions required for recycling materials.

Develop and implement a plan to reduce construction waste including plastic plant containers, land clearing waste and other landscape construction materials.

Specify the recycling or donating of unused materials to reach a goal of reducing waste by at least 50%.

Select suppliers that allow returns of unused items.

Return used containers to nurseries that accept them.

Offer incentives to contractors or employees who reduce waste.

Return wooden pallets to suppliers or take apart non-returnable wood pallets to chip for mulch.

Donate healthy plants to local nonprofits or school gardens.

**Benefits**

Recycling and donating unused items reduces pressure on landfills, saves money by reducing tipping fees and provides raw materials for future projects.

**Separate Plant Debris for Clean Green Discount**

Some local landfills and transfer stations may offer a discount for disposing of plant debris if it is kept separate from other types of waste.

**Applications**

If reusing and recycling on site is not feasible, take the time to separate yard trimmings from other waste. At larger sites, dedicate a bin to plant trimmings.

**Benefits**

Your disposal costs may be trimmed, and in most cases, the material is processed into mulch or compost.
Why Does Soil Life Matter?

Living soil is teeming with bacteria, fungi, protozoa, beneficial nematodes, worms and other beneficial organisms — amazing workhorses that will carry out the following valuable processes.

- Creating soil structure
- Storing and cycling nutrients
- Protecting plants from pests
- Improving water infiltration and storage
- Filtering out urban pollutants

Store Water and Nutrients

Much like a giant sponge, healthy soil acts as a storehouse for water and nutrients. The slow release helps plants absorb the correct amount. As a storage reservoir for both water and nutrients, healthy soil has a greater holding capacity than soils that lack sufficient organisms, organic matter and pore spaces.

Water Flow and Regulation

Living soil helps moderate water percolation and penetration. Water is absorbed and runoff is avoided.

Neutralization of Pollutants

Healthy soil is the site of intensive physical, chemical and biological activity, thus it can prevent water and air pollution. Soil rich in organic matter contains microorganisms that can immobilize or degrade pollutants.

Resists Pests

Living soil has an incredible array of organisms, most of which are beneficial. The beneficial organisms protect plants from disease through predation, parasitization, competition and antibiosis. Bacteria, for example, cover leaf surfaces and block infection. Beneficial nematodes prey on harmful nematodes.

Remove and Store Topsoil

Before Grading

Topsoil is a valuable resource, yet it is typically removed or mixed with subsoil during construction, beginning a cycle of high water and chemical dependency.

Applications

When grading the soil is unavoidable:

- Identify areas that are to be paved as a place to store topsoil during construction.
- Remove the topsoil (at least the top 6 inches if the topsoil is deep) before other grading and store for future use.
- Do not store in piles larger than 6 feet high.
- Protect from erosion.
- Send samples for analysis.
- Amend with 20-35% compost, depending on soil type and analysis, compost quality and plant selection.
- Re-spread after grading and construction.
Benefits
Conserving topsoil can reduce the likelihood of many problems over the long run, including stormwater runoff. It can minimize fertilizer and irrigation requirements and topsoil replacement costs.

Protect Soil from Compaction
Heavy equipment can compact soil as deep as two feet below the surface of the soil. Compacted soils do not have adequate space for air or water.

Application
Before construction begins, specify a limited construction area. Install temporary fences to restrict heavy equipment, including cars. Areas that will be paved or built over are good sites for parking equipment.

Don’t assume you need the biggest, heaviest equipment.

If using heavy equipment, select those with flotation tires or wide tracks to distribute the load.

On a longer-term basis, limit foot traffic, especially during the wet season.

Do not work soil when it is too wet or too dry. Till as little as possible, and only with a clearly identified goal, such as incorporating organic matter. Loosen the soil with a fork instead of turning it over whenever possible.

Benefits
Soil structure and the soil’s ability to support the microbes that cycle nutrients and filter pollutants are protected. The soil is easier to work.

Defend Against Erosion
A sediment and erosion control plan that conforms to local sedimentation and erosion standards or the best management practices in the California Stormwater Quality Association Handbook (whichever is more stringent) should

Why Use Compost for Erosion Control?

• Compost blankets and compost filter berms are less expensive when construction, maintenance, removal and disposal costs are considered.
• Compost blankets and filter berms provide chemical, biological and physical filtration.
• They work better than standard BMP’s like silt fences or straw bales.
• Berms offer more actual filtration than coir rolls, silt fences or straw bales.
• Compost is annually renewable.
• Compost is 100% recycled.
• Compost is all organic and natural.
• It strengthens the market for compost.
• Aquatic wildlife can negotiate berms but not silt fences.
• It avoids the use of petroleum based products like silt fences.
• Construction equipment can run over it and it still works — and it is easy to fix.
• The materials can be re-used in landscaping or seeding after their use for erosion control.

SOURCE: Rod Tyler, Wake up and Smell the Compost! Presented at Innovations in Erosion Control, WA

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have the following objectives:

- Prevent loss of soil during construction by stormwater runoff and/or wind erosion, including protecting topsoil by stockpiling for reuse.
- Prevent longer term sedimentation of streams, stormwater drains and/or air pollution with dust and particulate matter.

**Applications**

Do not remove valuable trees and shrubs, especially near waterways. Protect them with fencing.

Schedule grading for the dry season.

Use compost berms, blankets, or socks. The EPA specifies that, depending on the length and height of a particular slope, a 1/2-inch to 4-inch layer of mature, screened compost, placed directly on top of the soil, controls erosion by enhancing planted or volunteer vegetation growth.

Construct earth dikes or install silt fencing, sediment traps, and sediment basins.

Terrace steep slopes.

Hydroseed or otherwise plant to reduce bare soil, but do not overplant for instant color. Annuals and short-lived perennials can be used to fill in areas while larger trees & shrubs become established. Cover crops provide excellent short-term cover that also adds nitrogen and/or organic matter when it is later tilled into the soil.

Mulch regularly.

Minimize the use of blowers.

**Benefits**

The likelihood of erosion is lessened, thereby conserving topsoil and protecting aquatic habitat.

**Amend the Soil with Compost Before Planting**

Compost is thriving with microorganisms — one teaspoon can have more than one billion beneficial microbes. Adding good quality compost before planting turf, annuals, perennials, trees and shrubs brings life to the soil and feeds existing soil organisms. Compost is effective in improving problem soils — in particular those that are compacted, heavy clay or sandy, poor in nutrients, or lead contaminated. It is one of the most important practices for a healthy, living ReScape landscape.

**Applications**

It is important to first assess the soil for physical and chemical problems. Refer to the section Act Local in these guidelines.

If topsoil has been removed and stored during building construction, mix one cubic yard of compost into 3-5 cubic yards of soil before respreading.

If the topsoil has not been removed then sheet mulching is an efficient means of adding

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**TIPS FOR SUCCESS: Indicators of Quality Compost**

- Dark brown color
- Sweet, earthy smell
- Small, fairly uniform particle size
- No weed sprouts
- Feedstock is no longer recognizable
- The producer can tell you the peak temperatures (and how long the compost stayed at those temperatures)
- A nutrient analysis is available from the producer upon request
- Compost is certified by the US Composting Council’s Seal of Testing Assurance (STA) Program.
compost & other organic matter while controlling weeds.

For turf or groundcover installations: Incorporate 1-2 inches (3 1/3 – 6 2/3 cubic yards) of compost into 1000 square feet. Mix it with the top 5-7 inches of soil.

For preparing planting beds: Spread 2-4 inches of compost over the surface of the soil and incorporate it into the top 12-24 inches of the planting bed.

Consider the conditions under which the plant grows naturally. Some California natives require less fertile soils and compost may not be necessary.

Use compost made from local green and food waste to maximum feasible. Specify compost from a producer that is enrolled in the US Composting Council’s Standard Testing Assurance (STA) program.

**Benefits**

Compost fosters a diverse, fertile, and disease suppressive soil. You and your clients may see both long and short term benefits, including faster plant establishment, decreased fertilizer & pesticide use and lower water usage.

**Grasscycle**

Grass clippings have about 4% nitrogen in them. When they are left on the lawn, they can meet some of the lawn’s nitrogen needs, as well as supply an array of other nutrients.

**Applications**

Leave the clippings on the lawn after mowing, except during the limited time of the year when the grass is too wet or too long.

**Benefits**

Nutrients in the grass clippings are made available to plants. Fertilizer requirements can be reduced by as much as 50%, thereby lowering your costs and protecting water quality.

**Mulch Regularly**

Mulch is any material spread evenly over the surface of the soil. Organic materials, including chipped landscape debris, are preferable over inorganic materials because they supply nutrients over time. Nitrogen ‘drag’ is usually not a problem, even when woody materials are used.

**Applications**

Keep 2-4 inches of an organic mulch over the surface of the soil at all times, or at least

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**TIPS FOR SUCCESS: Properly Amend Planting Holes**

Mixing compost into the backfill of a planting hole for trees and shrubs may not yield significant benefits. Some research indicates that young plants benefit more than mature plants. Some specialists also believe that amending backfill can create such a difference between the soil in the hole and the surrounding soil that the roots don’t grow outwards — it is as if they are growing in a pot.

To prevent this problem, amend the entire bed or create planting holes that are no deeper than the root ball and a minimum of 3 times size of the transplant’s root ball. Rough up the sides of the hole. Mix soil from the hole with compost at a rate of 1 part compost to 3-5 parts soil (by volume) and backfill. Make the hole shallower and create a mound in heavy clay soils.
until plants grow to cover the soil. Typically, larger particle size mulches are better for weed control. Designate less visible areas, away from stormdrains, for leaves to remain as mulch after they fall.

Benefits
Mulch conserves water, enhances the growth of plants and the appearance of the landscape. It can also simplify your operations — thereby lowering your costs — by suppressing annual weed growth and reducing the need for trimming around trees and poles.

Aerate Compacted Soils
It is not always possible to remove topsoil or otherwise protect it during construction. Additionally, soils under turf subject to heavy use become compacted, which can increase the lawn’s susceptibility to weeds, drought, disease and insect damage.

Applications
Specify that soil be mechanically aerated before amending and planting.

Reduce subsoil compaction by ripping or trenching. Deep tap-rooted plants can be seeded to break up compacted soils in nonturf areas. Mow before plants have gone to seed, leaving organic matter on the soil surface as mulch.

Mechanically aerate soil under turf at least once a year: the number of times will depend on use and type. Aerating in the spring is best. Avoid doing so in the summer. Topdress with compost following aeration.

Use power augers or water jets to create holes in compacted soil around trees and shrubs. Fill with compost.

Benefits
Root growth is stimulated and plants are more easily established. Water and fertilizer requirements may be lessened, while disease is resisted.

Feed Soils Naturally
There are important benefits to regularly adding a thin layer of good compost to the surface of...
the soil under turf, perennials, shrubs or trees, or drenching the soil with compost tea.

Applications
Feed turf, especially after aeration, by topdressing with finely screened compost: one-fourth of an inch applied 2-4 times per year will show good results.

Apply compost once or twice each year to the base of the plant or under the dripline. Be sure the compost is free of weed seeds and the plant is also mulched at an optimum thickness. You can scatter the compost over the mulch and it will settle to the surface of the soil.

Benefits
A strong soil foodweb, which makes nutrients available to the plants and protects water quality, is nurtured. Topdressing turf with compost can decrease fertilizer use by as much as 50%.

Avoid Synthetic, Quick Release Fertilizers

Synthetic, quick release fertilizers frequently wash through the soil before they are even taken up by the plants. They can also damage soil microbial populations or cause a flush of tender new plant growth that is very attractive to sucking insects. Furthermore, many well-chosen California native plants thrive without fertilizers. Most other plants do not need the quick release fertilizers that are often applied on a scheduled basis. Plant nutrient requirements can be met with compost, naturally derived fertilizers or slow-release synthetic fertilizers as a last resort.

Applications
Kick the chemical habit: base feedings on a soil analysis or other clear indications of need, not on a calendar.

Use compost to establish beneficial soil organisms and release nutrients over the long term.

Sow nitrogen fixing or deep-rooted cover crops, then till them in before they go to seed.

Use blood and bone meal, fishmeal or kelp, examples of naturally derived fertilizers that release nutrients in a 1-4-month time frame.

Use synthetic fertilizers as a last resort and select fertilizers that contain 30% or more of the nitrogen in slow release form.

Do not use weed and feed formulations.

Do not fertilize within 25 feet of the water’s edge.

Benefits
Slow release fertilizers make nutrients available to the plants when they are needed and are therefore often a better value. Flushes of growth that result in pest infestations or plant waste are less likely. Avoiding synthetic fertilizers can also reduce the likelihood of soil compaction, acidification and thatch build-up in lawns.

Minimize the Use of Chemical Pesticides

Many pesticides are toxic to microbes and other soil dwelling creatures such as earthworms. These toxins can reduce the diversity of soil life, select for resistant organisms or even increase soil pathogen density.

Applications
Learn and offer integrated pest management to your clients. If pesticides are absolutely necessary — choose the least toxic alternative. Refer to the description of Integrated Pest Management in the section Protecting Water and Air Quality and visit the websites: www.ipm.ucdavis.edu or www.birc.org or www.ourwaterourworld.org.

Benefits
Minimizing pesticides reduces water pollution and helps support soil life, which cycles nutrients and promotes resistance to plant disease. Your costs may then be reduced in the long run.
4. Sequester Carbon

Healthy vegetation works together with soil rich in organic matter and beneficial microorganisms to remove carbon dioxide from the air and store it as soil carbon, an important strategy for addressing climate change. As the amount of carbon dioxide in the atmosphere reaches new highs, solutions to the climate change crisis must come from all of us.

Apply Compost and Feed the Soil Food Web

Applications
Add 1 inch of compost annually to seasonal color beds.
Topdress turf areas with a finely screened compost.
Topdress shrub areas.
Integrate the use of compost into soil management plans.
When purchasing imported topsoil, specify that it be amended with compost.

Benefits
Compost improves conditions for the beneficial bacteria, fungi and microorganisms that help to absorb carbon and keep it locked in the soil.
Compost improves plant vigor which leads to greater growth and more carbon storage.
A one-time, half-inch application of compost can increase the amount of carbon stored in the soil by 1 ton per acre per year.

Keep Soil Covered with Mulch and/or Plants

Applications
Apply a 3-inch layer of mulch.
Use local recycled mulch produced from plant debris that is free of diseases and contaminants.
Keep root crowns free of mulch.
Do not use landscape fabric under mulch.

Benefits
A 3-inch layer of mulch helps soil retain moisture, encourages microbial activity and prevents erosion.
Woody perennial plants store large amounts of carbon in their plant material, and their roots provide excellent habitat for beneficial microorganisms.
Every ton of additional carbon sequestered in the soil removes 3.67 tons of carbon dioxide from the atmosphere.

Limit Soil Compaction and Minimize Disturbance

Applications
Avoid tilling.
Sheet mulch instead of tilling when preparing garden beds.
Create clearly marked paths.

Benefits
Protects microorganisms and fungi that bind up carbon in the soil.
Reduce Synthetic Fertilizers, Pesticides and Herbicides

**Applications**
- Adopt an IPM approach.
- Plant a mix of flowering plants to attract beneficial insects that feed on pests.
- Choose organic, non-synthetic products to control pest outbreaks.
- Build healthy soils to feed plants.

**Benefits**
- Avoiding synthetic inputs protects the soil food web.

Protect Mature Trees and Plant Large Stature Trees

**Applications**
- Follow proper planting guidelines to ensure trees establish healthy roots.
- Select trees suited to the local conditions.
- Prune to complement the natural form and strengthen the structural integrity of the tree.

**Benefits**
- Through photosynthesis, trees draw CO2 out of the air. They use some of that carbon for growth and exude some of it through their roots to feed soil organisms.

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**Research Shows:**

A one-time, half-inch application of compost can increase the amount of carbon stored in the soil by **1 ton per acre per year**, and forecasts estimate that this benefit will continue for more than 30 years [1].

If climate smart practices became widely adopted, **5.5 million tons of carbon dioxide** could be stored in California soils, equivalent to taking over 1 million cars off the road [2].

Every ton of additional carbon sequestered in the soil removes **3.67 tons of carbon dioxide** from the atmosphere [3].

If we increase soil carbon content by **.4% a year** it would offset the annual increase in atmospheric carbon dioxide [4].

**Sources:**


5. Save Water

Our Mediterranean climate includes long dry summers and the periodic failure of winter rains — water is a precious and often scarce resource. With projected population growth, it was estimated we will face annual water shortages, even during years of regular rainfall. Yet one-third of all urban water is applied to landscapes. What’s more, much of this water is used in excess or at the wrong time of year: residential properties are regularly over-watered by 30-40%.

Water-wise landscaping is, however, more than efficient irrigation and xeriscapes. It also means augmenting the water holding capacity of the soil to create drought resistant soils. Water-wise landscaping makes use of alternatives to potable water such as recycled water, graywater, or captured rain, and it relies on the latest in irrigation controller technology for the most efficient application of water possible. The landscape professional can offer the following critical expertise in conserving water.

Create Drought Resistant Soils with Compost & Mulch

A robust, living soil, with sufficient organic content, is the foundation of a water conserving landscape: 1 cubic foot of soil holds roughly 1.5 quarts of water for each 1% of organic matter. The amount of irrigation water required for a landscape thus varies significantly with soil quality.

Applications

Know the soil texture.

Incorporate 2-4 inches of compost into the top 6-12 inches of soil to reach a target soil organic matter of 3.5% under turf and 5% in planting beds.

Topdress with compost around shrubs and trees, and on turf.

Regularly apply mulch to all exposed surfaces to encourage living soils and reduce evaporation.

For additional practices see Nurture Soil in these guidelines.

Finally, consider applying high quality mycorrhizal innoculants, available as root dips, mixes, tablets and solutions.

Benefits

Compost can increase permeability and water-holding capacity, thereby reducing the need for irrigation and lowering water bills.

Grow Drought Tolerant Native or Mediterranean Plants

Native plants have evolved with local ecosystems and adapted to our soils, wildlife and climate — including no rain for 6 months of the year. Many natives, as well as many Mediterranean species, tolerate dry summers without watering once they are established.

Applications

Keep in mind that climate and soil can vary significantly, as can native plant species. Not every native is drought tolerant. Select the native species that match the site soil and microclimate and if possible, choose local ecotypes.

Select plants from Mediterranean climates that also thrive with little irrigation.

Plant in fall so the plants can establish their root system during the rainy season and require less water their first dry season.
Water drought tolerant species for their first one or two summers, until they are established.

Minimize high water use ornamentals.

**Benefits**

Appropriately sited native or Mediterranean type plants often require less soil preparation, watering, mowing, fertilizing and spraying, which can reduce your operating costs. CA native species are relatively easy and inexpensive to implement on a trial basis. Using local natives reduces the risk of spreading nonlocal plant species.

**Minimize the Lawn**

Lawns are useful for recreation or places where family members and employees can relax. But turf requires frequent watering to stay green during our long dry season.

**Applications**

Recommend to your clients that they replace decorative lawns with water conserving California native groundcovers or perennial grasses, shrubs and trees.

If lawns are desired, limit turf to no more than 25% of total irrigated areas. For residential clients, suggest the lawn be limited to a small part of the backyard where it is more likely to be used for play and relaxation.

Do not plant turf in strips or medians less than 8 feet wide, irregular shaped areas or on slopes greater than 10%.

Specify a turf alternative such in bioswales.

**Benefits**

Water and energy can be conserved. For example, reducing the size of a 1,000 square foot lawn that gets 1 inch of water per week to 500 square feet can save approximately 10,000 gallons of water per dry season. Your clients’ water bills and your labor for mowing may also be reduced. Chemical use may be decreased and water quality protected.

**Implement Hydrozoning — Group Plants by Water Needs**

Different plants have different water requirements. Dividing the landscape into low, medium and high-water use zones prevents over-watering.

**Applications**

Group plants by water and light needs (dry shade, dry sun, wet sun, wet shade).

Place thirstier plants in relatively small, highly visible areas and if possible, in spots that naturally collect water.

Plant a large perimeter area with drought adapted species.

Plan to discontinue irrigating those California natives that do not tolerate water in the summer after they are established — and be sure to separate them from plants that will need ongoing irrigation.

Create and identify irrigation zones on plans, based on the plants’ water requirements, exposure, and soil water holding capacity. Include a summary table of the square footage of each hydrozone in construction documents.

Separate valves and circuits for individual hydrozones. In particular, put turf on its own valve.

**Benefits**

Water use can be more easily matched to the plant requirements. This fosters resistance to pests as well as conserves water. Plant mortality is reduced, saving time and money.
Design for On-Site Rainwater Collection, Recycled Water and/or Graywater Use

Rainwater can be channeled through gutters and downspouts to a storage unit. During a 1-inch rain, 625 gallons or more of water can be collected from 1,000 square feet of roof. Stored water can then be used for irrigation. Recycled water is wastewater that has been tertiary treated at a wastewater treatment plant to a high quality, suitable for landscape irrigation and other approved uses, but not for human consumption. Recycled water has been used for over 40 years in California and provides a drought-proof supply of water. Graywater is wastewater from bathroom sinks, showers, bathtubs and washing machines that is not contaminated with human waste and is reused on site. Not suitable for drinking, it is a resource that can be used for subsurface irrigation of the roots of trees and shrubs.

Applications

Promote groundwater recharge and conserve water by channeling rainfall from the roof to specially designed planters, swales and other landscaped areas.

Design, install and operate dual distribution systems to allow for the current and future use of recycled water.

Check with local building code for applicable permits and backflow protection for rainwater and graywater systems.

Encourage the building architect, to pre-plumb for graywater to irrigate landscape areas.

Use graywater for subsurface irrigation only. Educate your clients to use biodegradable soaps.

Benefits

The use of potable water to irrigate lawns and gardens can be reduced. Groundwater is recharged and greenhouse gas emissions, produced from pumping water, can be minimized.

Design and Install High Efficiency Irrigation Systems

Drip and bubbler irrigation technologies apply water accurately, to the plant root zones, at the rate that it can infiltrate. Low flow sprinkler heads apply water uniformly and slowly and improve the efficiency of turf and groundcover irrigation. Both minimize overspray and evaporation and reduce runoff. Drip is often more appropriate than overhead in areas that are narrow, odd shaped, densely planted, or in parking lots and medians.

Applications

Be pro-active, not reactive with customers. Provide them with recommendations to improve their irrigation efficiency to achieve 70% or greater distribution uniformity in turf areas and 80% in all other landscaped areas.

Install a weather based, self-adjusting irrigation controller that has certified by the Irrigation Association (www.ia.org), and has, at a minimum, a soil moisture or rain sensor shutoff.

For large commercial or municipal sites, select controllers that can detect and respond to problems like a broken sprinkler head.

Rediscover drip. Several types of drip systems exist: select the right system for the specific job. Using ‘in-line emitters’ or ‘subsurface’ drip improves efficiency.

Irrigate turf areas with subsurface irrigation or equipment that has a precipitation rate of 1 inch or less per hour as specified by the manufacturer and use stream rotator heads instead of standard spray heads.

Use matched precipitation rate nozzles within each control valve and circuit.

Design a system based on a water use budget of no more than 70% of reference ET and have this
budget and your irrigation plans reviewed by a representative of your water supplier or a trained irrigation specialist.

Check with your local water supplier for rebates.

**Install a Dedicated Meter to Monitor Landscape Water Use**

Separate irrigation meters, although they can be expensive, allow for the monitoring and evaluation of water use in the landscape.

**Applications**

Specify the addition of a separate water meter for landscapes larger than 5000 sq. ft.

Combine with a 'smart' or automatic, self-adjusting irrigation controller(s) for a sophisticated understanding of water use.

Read the irrigation meter to check for leaks and maintain a water budget.

Provide detailed feedback to your customers about their water use or conservation achievements.

If a dedicated water meter is not possible, install a submeter to track the irrigation portion of a mixed-use water meter.

**Benefits**

Monitoring the landscape water use more precisely can demonstrate and support water conservation. A separate meter can also reduce your client’s sewage bill since it is based on water use in buildings.

**Manage Irrigation According to Need**

Watering requirements will vary with soil, plant, climate, exposure and season. If the irrigation system is not timed by a weather-based controller, management of the irrigation requires particular attention and expertise.

**Applications**

Base irrigation on:

- The watering needs of the plant material, in inches per week.
- How fast the water is being applied. Sprinklers apply water in inches per hour, drip in gallons per hour.
- The soil types and slope. Apply water slowly or intermittently on slopes or clay soils, so that it can sink into the soil.

If the system does not include a soil moisture sensing device, use a soil probe to check soil moisture before irrigating and watch the plants for signs that they need water.

Avoid watering during the warmest and windiest times of the day.

Water deeply enough to soak the root zone.

If you have installed an irrigation system but will not be managing it, provide the property owner with precipitation rate for each valve zone, maximum runtimes for July 3, location of irrigation supply shut off, maintenance checklist, distribution uniformity and internet address for watering index information.

**Benefits**

Appropriate watering moderates plant growth, promotes plant health and reduces replacement costs, as well as the need for pesticides and pruning. Your costs and your clients’ water bills can be reduced.

**Maintain the Irrigation System so Every Drop Counts**

Every drop of water that is supplied to the landscape by irrigation should be protected from loss due to evaporation, overspraying or runoff. Irrigation systems that do not leak, overspray or gush water are critical to conserving water.
Applications
Mulch to reduce evaporation.
Keep the rain shut off device in working condition.
For overhead spray systems, check and adjust the system regularly for:
- Matched precipitation rate (MPR) nozzles
- Low, buried sprinklers
- Incorrect nozzles
- Overspray
- Head to head coverage
- Improper pressure
- Leaks near unusually tall, green vegetation, muddy or eroding spots

Repair leaks and broken sprinklers immediately. Use originally specified materials or materials of superior quality and efficiency.

Keep in mind that it may take more diligence with drip systems to notice leaks and troubleshoot other problems.

Become IA certified. Contact the Irrigation Association at www.irrigation.org.

Benefits
Properly maintained irrigation systems not only save water but can also avoid unnecessary plant, fencing and asphalt replacement costs and increase property values. They can also decrease the use of energy for pumping and moving water, which in turn reduces greenhouse gas emissions.

Request an Irrigation Audit
FREE water use surveys for landscapes, offered by many local water districts provide your commercial or homeowners association customers with practical information for improving landscape quality and reducing water costs. Utility company staff will demonstrate how to use irrigation equipment efficiently.
6. Conserve Energy

The need to conserve energy is as important to ReScape landscaping as the need to conserve water. Both are increasing concerns as energy shortfalls and droughts continue to occur throughout the West. Energy and water are related — it takes a lot of energy to supply water to our landscapes.

Conventional landscapes also directly consume large amounts of fossil fuels. Nationally, forty million lawnmowers consume 200 million gallons of gasoline per year, representing a huge investment of energy for this one landscape maintenance task. What’s more, the US EPA estimates that the few ounces spilled during each refueling of lawn and other garden equipment — during the summer only — totals 17 million gallons of gasoline nationwide. And energy use means releasing greenhouse gases that are contributing to global warming.

Landscape designers, installers and professional maintenance staff can play an important role in conserving energy. Include ReScape, energy conserving practices in your design or service program.

Shade Buildings to Moderate Temperatures

Trees conserve energy by shading, cooling the air through evapotranspiration and reducing the velocity of wind. Selecting and placing trees to shade adjacent buildings in the summer or protect them from the prevailing winter winds can moderate building temperatures.

Applications

Plant trees to the west of a building for maximum shading benefits. Avoid planting trees that block solar collectors or in front of south facing windows that allow the low winter sun to warm a building, especially in cooler regions.

Large deciduous trees will be of greater value for summer cooling and winter solar gain.

Select evergreen trees for windbreaks.

Select trees that are appropriate for the soil type, water use and exposure. If possible, select trees that have low water requirements.

Plant larger trees at least 20 feet from the foundation. Plant smaller trees a minimum of 10 feet from the foundation.

For more info go to the following websites:

Benefits

When properly placed, mature trees can reduce the interior temperature of a building by as much as 20 degrees, reducing summer cooling costs by 25-40%, and reducing greenhouse gas emissions.

What Large Trees Mean:

More shade = More energy savings
Cleaner air = Better health and fewer hospital visits.
More stormwater management = Lower costs for stormwater controls.
More shaded streets = Longer time between resurfacing

SOURCE: Center for Urban Forest Research, Davis, CA, 2003
TIPS FOR SUCCESS: Shade Effectiveness in Parking Lots

Parking lots are thermal hot spots. Many cities have ordinances that require shading of paved area by trees. Implement the suggestions below to ensure that you maximize shading:

- Become familiar with local ordinances and their recommended tree lists.
- Include only trees that are on the local ordinance’s recommended tree list.
- Be sure crown diameters on parking lot plans are not overstated.
- Do not allow smaller-size substitutions after the plans have been approved.
- Follow-up to ensure trees are actually planted, as well as not removed after planting, especially at sites near store fronts where trees could obstruct signs.


Reduce the Heat Island Effect

Parking lots and streets are significant sources of heat and pollutants (parked cars emit hydrocarbons that contribute to the formation of ground level ozone), as well as often being unattractive. Trees reduce the amount of heat stored in, or reflected from, paved surfaces which can contribute to increased building and car temperatures.

Shade Air Conditioners

Limiting the sun that shines directly on an air conditioner will keep it cooler and running more efficiently.

Applications

Choose a shrub or tree that will match the soil and microclimate.

Or build a freestanding arbor with deciduous vines to provide shade.

Do not obstruct airflow around the unit.

Benefits

The air conditioner runs more efficiently, which will reduce your client’s utility bill.

Design Lighting Carefully

Outdoor lighting consumes a large fraction of the electricity used in the United States. Site lighting can be designed to use less energy and minimize light pollution and trespass.

Applications

Identify lighting goals and determine lowest acceptable levels.

Use only fluorescent, high-intensity discharge (HID), light emitting diode (LED), or low pressure sodium lamps.

Specify Energy Star, photovoltaic or 12-volt for 100% of outdoor building and site fixtures.

For security, use lights with a photocell or motion...
sensor lights instead of all night illumination. Specify that all exterior luminaries emit no light above horizontal OR are Dark Sky certified. Visit www.darksky.org for a list of fixtures approved by the International Dark Sky Association. Prevent light trespass by selecting and placing fixtures that will not spill light onto neighboring properties.

**Benefits**

Power and energy use can be decreased. Lower operating costs can often recover higher initial purchase costs of newer more efficient lamps.

**Choose and Maintain Equipment for Fuel Conservation**

Equipment is most often selected for its speed, cost and ease of use. However, reducing fossil fuel consumption is one of the most important practices the landscape professional can do to protect the environment, while lowering the cost of operating the equipment.

**Applications**

Use hand powered equipment when possible and take pride in the quality of the work. Minimize the use of gas-powered blowers. When using machinery, choose the smallest, most fuel efficient, lowest emission machinery required to get the job done. As you upgrade your equipment & vehicles, select for fuel economy and low emissions. Select vehicles that operate on biodiesel — or convert existing vehicles. Keep every piece of equipment and vehicle tuned. Recycle plant debris on site to minimize fuel consumption for hauling. Require employee carpooling to sites and plan maintenance routes carefully.

Track the gallons of gas your business consumes and set goals to reduce that consumption.

**Benefits**

Manual labor may make the most economic sense for many landscape operations. You can cut the cost of fuel while protecting the health of your staff, and local air and water quality.

**Specify Low Embodied Energy Materials**

Embodied energy is the energy consumed by all the processes associated with the production of an item, from the acquisition of natural resources to the delivery of the final product. The single most important factor in reducing the impact of embodied energy is to design long lived and adaptable landscapes. Transporting items the least distance reduces fuel consumption and air pollution and supports local economies.

**Applications**

Consider the source and embodied energy of all materials in the landscape, including stone, gravel, plants, lumber, furniture, etc. Use local stone, for example, rather than limestone shipped from the Midwest. Select smaller container stock to increase the number of plants per delivery. Smaller plants also transplant better. Use recycled and less highly processed materials, and avoid petroleum-based products, including synthetic fertilizers.

**Benefits**

Buying locally produced and low embodied energy products often reduces the cost of an item, as well as the hidden environmental costs of transporting materials, such as pollution.
7. Protect Water and Air

In an undisturbed landscape, only 15% of the rainwater leaves the system through surface water runoff. More than one-third moves into the soil where living, biologically diverse organisms break down and naturally filter out pollutants, before it reaches groundwater or our waterways.

As land is developed into residential or commercial landscapes, roads and parking lots, major changes occur.

- More water runs off the surfaces — as much as 70% of all rain and irrigation water runs into waterways without moving through soil.
- The soil supports less microbial life and is less able to filter harmful chemicals out of the little water that infiltrates and moves through soil.

What happens next? Flash floods scour creek banks. Erosion of channels is greatly accelerated. As little as 10% impervious surface causes significant degradation of streams.

Pollutant load also increases. An acre of parking lot collects as much as 4 gallons of oil, gasoline and diesel fuel each year. When it rains and water runs off the parking lot, these toxic compounds are discharged into local creeks and watersheds. Other pollutants include trace metals, pesticides, nutrients from fertilizers and pet waste, trash and suspended soil particles from poorly vegetated ground. Stormwater runoff, from both residential and commercial sites, thus becomes a large source of pollution.

At the same time air pollution from power equipment used in conventional landscaping takes an enormous toll on our environment. Gas powered garden tools emit 5 percent of the nation’s air pollution. Plant debris is hauled to the landfill in vehicles that pollute the air, and once there, the materials decompose without oxygen and in the process emit greenhouse gases.

ReScape landscaping can help protect our air from pollution by:

- Reducing fossil fuel consumption
- Recycling plant debris on site
- Planting trees to remove CO2 and absorb air pollutants

Make the connection between ReScape Qualification and reducing the emissions that cause global warming — and distinguish yourself in the marketplace.

Integrated Pest Management

IPM is a holistic approach to controlling insects, plant diseases, weeds, and other pests. IPM programs integrate the use of many environmentally-sound strategies for managing, but not necessarily eliminating, pests. First and foremost, IPM seeks to prevent pests by fostering a healthy environment in which plants have the strength to resist disease and insect infestations and to out-compete weeds. An IPM approach requires an understanding of the life cycles of pests and beneficial organisms and regular monitoring of their populations. If a pest problem is identified, IPM then considers all viable solutions and uses a variety of techniques to control pests, rather than turning only to
pesticides. The least toxic pesticides are used as a last resort only.

**Prevent Pest Problems**

Preventing pests before they become a problem is the first step in an IPM approach. Applying the best landscape design, construction and management practices to prevent pests is always preferable to trying to control them after they become established.

**Applications**

Design to prevent pests by:

- Choosing a diversity of species that are well suited to the site.
- Selecting resistant varieties and local native species, including species that attract beneficial insects.
- Placing plants at proper distances from buildings, giving them space for adequate air circulation and room to reach their natural size and shape.
- Avoiding over-planting for instant color.
- Including compost in the soil specifications.

Prevent pests during landscape construction and maintenance by:

- Selecting plant material that is free from disease and insects.
- Planting at the right depth.
- Watering thoroughly but not overwatering.
- Sheetmulch
- Keeping mulch on the surface of the soil at all times. Using slow release fertilizers if soil tests indicate their need, and not overfertilizing.
- Pruning judiciously — severe pruning stimulates new growth, stresses plants and encourages pests and disease.
- Eliminating noxious weeds before they go to seed or spread uncontrollably. Cleaning equipment after use.

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**IPM for Weed Control**

**Prevent weeds first:**

- Purchase only weed free plants and compost.
- Use drip irrigation to apply water only to desired plants.
- Use mulch to suppress weeds. Sheet mulching is an effective strategy that layers cardboard, compost and then coarse mulch.

**Monitor weeds:**

- Create a map that locates the species and density of weeds.

**Try cultural, mechanical & physical controls before reaching for the herbicides:**

- Flame weeders use a targeted flame to kill weeds and are very effective for controlling weeds in sidewalks and other hardscapes.
- Boiling water, hot foam and high pressure steam both work to kill weeds and are a better option in areas where an open flame may be hazardous.

**Select herbicides as a last resort & use the least toxic:**

- Corn gluten meal is a pre-emergent herbicide that also acts as a fertilizer. The timing of the application is important, if it is used after weeds have started growing, they will actually benefit from its fertilizing properties.
- Horticultural vinegar, or acetic acid, is also effective at killing certain weeds. Use with caution since acetic acid greater than 5% can cause skin irritation or eye damage.
- Herbicidal soaps are highly refined soaps that can penetrate the waxy coating on plant leaves, causing them to dry out. Some of these products also contain essential oils that enhance their herbicidal properties.
- Inspecting and removing invasive plant parts or seeds from your clothing, tools and vehicle before leaving an infested site.
- Cleaning up wood, fruit and other plant material that is infected with disease — compost the debris only if you have the experience to get the compost pile to temperatures over 135 F for an extended period.

Benefits
A healthy, diverse landscape that prevents pests in the first place is critical to eliminating the need for pesticides, thereby reducing pollution and protecting the health of our watersheds.

Train Your Staff to Identify and Monitor Pest and Beneficial Populations
A critical part of an Integrated Pest Management program is “watchful waiting”-- observing the site at regular intervals in order to understand whether populations are increasing or decreasing and what harm pests are doing. It is likely that most organisms in the landscape are actually beneficial. Living soils, for example, can support billions of beneficial organisms, which suppress the fewer disease causing organisms. Many insects naturally feed on other pest insects — some even feed on weeds. Insects provide food for birds, reptiles and amphibians. Raptors and snakes eat rodents. Immediately pulling out the big guns in the form of pesticides will kill the beneficial organisms along with the pests, which can lead to more problems as the balance between the two is disrupted.

Applications
Provide your staff with the time and resources to learn to identify both pest and beneficial organisms.
Check plants often for vigor and signs of pests.

Train your residential clients to monitor and record pest populations.
Clarify which problems are the result of pests and not other factors, such as overwatering.
Evaluate the results of any treatments.

Benefits
Your staff enjoys greater job satisfaction as they learn additional, valuable skills. Beneficial organisms are given the opportunity to control pests. If a problem does develop, you can catch it just as it is reaching a level that needs control.

Control Pest Problems with Physical and Mechanical Controls
When pests are identified as the source of unacceptable levels of damage, physical barriers or mechanical techniques for excluding or removing pests should be implemented as a first line of control.

Applications
Learn about and specify sheet mulching to prepare the soil and control weeds.
Weeds can also be controlled by using drip irrigation and a minimum 2-inch layer of coarse mulch.
Flame seedlings.
Hoe or pull established weeds.
Spray aphids with a strong jet of water.
Use sticky traps around tree trunks to keep ants and other insects away.
Hand-pick large adult insect pests and larvae as they appear.
Remove dead or diseased plants or plant parts — hot composting the debris will kill disease-causing organisms.
Benefits
Pests can be kept at acceptable levels thereby reducing the need for pesticides. Pollutants are kept out of stormwater in the first place.

Control Pest Problems with the Least Toxic Pesticide as a Last Resort
Used as a last resort in the IPM hierarchy, choose least toxic and least persistent pesticides when monitoring indicates that preventative and nonchemical methods are not keeping pests below acceptable levels. The goal is to reduce the population of the pest organisms with the least toxic pesticide that will control the pest but not harm the organisms or the environment.

Applications
Do not use pesticides on a prescheduled basis.
Learn the life cycle of the pest to maximize pesticide efficiency.
Consider naturally occurring pesticides before synthetic. For example, soaps and oils can be used for control of aphids and other insect species. Sulfur controls fungal diseases. Corn gluten is available as a pre-emergent weed control. Acetic acid based sprays are becoming available for use on weed seedlings.
If synthetic pesticides are identified as the last resort: choose the least toxic and the least persistent.
Do not assume a high percentage of inert ingredients means the product is not hazardous.
Do not use broad-spectrum, synthetic chemical pesticides.
Spot spray weeds or use an ultra low volume sprayer to apply the absolute minimum amount.
Keep pesticides out of gutters, stormdrains, and off sidewalks, driveways and other hard surfaces, and dispose of leftover product properly.

Benefits
Using the least amount of the least toxic pesticide helps to protect water quality and demonstrates your commitment to the health of your clients and staff, the community and the Bay.

Educate Your Clients
Many clients have unrealistic standards of absolute pest control and will require education. Landscapes can tolerate certain levels of pests without causing significant or even noticeable damage. Small populations of pest organisms are necessary to establish healthy populations of predators.

Why calendar-based spraying doesn’t work:
Over 2/3 of plant problems are not caused by any living pathogen. More often than not, the problem is from improper soil conditions, watering or fertilizing practices and other cultural problems.
If a pathogen or other pest is present, it must be treated at the correct point in its life cycle. Pest organisms do not grow on a regular calendar basis. It is likely the timing of spraying based on the calendar would be too early or too late to be effective.
Timed sprays endanger the beneficial organisms. Healthy landscapes with a diversity of birds, insects, microbes and other organisms can often keep pest populations under threshold levels, making chemical treatment unnecessary.
Adapted From: ProIPM Fact Sheet, Green Gardening Program, Seattle, WA.
Applications
Educate your clients about the role of beneficial organisms and ask them to consider some damage as a sign of a balanced, thriving ecosystem. Encourage them to raise their threshold of acceptable damage.

Ask yourself and your clients if treatment is even necessary before developing a strategy for managing a pest problem.

In the case of ongoing pests, advise your clients that removing a particular problem plant may be the best solution.

Benefits
Insects and other pests can be accepted as an integral component of any ecosystem, in which case they are not controlled until they cause an unacceptable level of damage. The need for pesticides may be reduced or eliminated.

Eliminate High Input Decorative Lawns
Installing large turf areas solely for their looks is resource inefficient. One study estimated that over a 20 year period, the cumulative cost of maintaining a prairie or a wetland totals $3,000 per acre versus $20,000 per acre for non-native turf grasses.

Applications
Plant groundcovers, shrubs, or trees, instead of turf.

Replace lawns, especially those on steep slopes, in shady areas or near creeks and wetlands with native plant meadows or grassy swales that treat stormwater and resemble native grasslands.

Benefits
The need for irrigation, synthetic fertilizers and pesticides can be reduced or eliminated, thus protecting water quality.

Minimize Site Disturbance
In general, soil should have 100% plant or mulch cover, since exposed soil surfaces are highly susceptible to runoff and erosion, especially along slopes and waterways. Often, natural hydrological features are destroyed by grading and with the exception of a few large trees, native vegetation is typically removed from a site before building or landscaping. Doing so exposes the soil to erosion, and the resulting loss of topsoil depletes the soil of its organic, living component and clogs waterways. It turns nature on its head by turning a valuable resource into a pollutant.

Applications
Design and implement a plan to defend against erosion, as described in Nurture Soil.

Retain natural topographic features that slow and store storm flows and/or do not increase steep continuous slopes.

Limit overall cut and fill through efficient road design and lot layout.

Limit clearing to road, utility building pad, landscape areas and the minimum area needed to maneuver.

Use mulch regularly. Place it in a way that keeps it out of stormwater.

Benefits
Vegetation, topography and hydrology is undisturbed and erosion is prevented. Sediment does not clog waterways.

Choose and Maintain your Materials, Equipment and Vehicles Carefully
Lawn mowers, chain saws and leaf blowers emit significant amounts of pollutants. According to the US EPA, a gas-powered lawn mower emits 11 times the air pollution of a new car, per
hour of use. In addition, operators are typically positioned where exposure to toxic emissions is greatest.

**Applications**
Upgrade to low emission equipment.
Inspect and maintain all equipment to keep it performing optimally. Repair oil leaks immediately.
Don’t repair equipment on site.
Dispose of spent oil properly
Refuel carefully. Do not refuel near a creek or drainage area.
Consider your routes and always carpool to sites.
Specify low or zero VOC paints, sealants, solvents and adhesives.
Use sustainably harvested wood (FSC Certified) if plastic or composite lumber is not appropriate. Use treated wood that does not contain chromium or arsenic for any application that specifies treated lumber.

**Benefits**
Fuel consumption is minimized. Air, water and noise pollution can often be reduced. Worker and community health will be protected.

**Keep Soil & Organic Matter Where it Belongs**
Organic matter, added to the landscape in the form of mulch or compost, supports soil microbial life, which filter out pollutants. But it can become a pollutant when it enters the stormdrain.

**Applications**
Amend soil with compost as described in the section Nurture Soil. But be sure to keep organic matter from being washed or blown into the gutter or stormdrain where it could become a pollutant by:

Using compost filter socks around stockpiled organic matter.
Storing it away from creeks and stormdrains.
Sweeping every day during construction.
Minimizing the use of blowers and using them carefully so you are not removing topsoil.
Switching to gravel or cobblestone mulch in areas of high surface water flow.
Keeping fallen leaves, grassclippings, and other plant materials away from storm drains, creek banks, and the shoreline.

**Benefits**
Organic matter does not become a pollutant but rather, increases the soil’s ability to remove pollutants, thereby protecting our watershed. It also increases the soil’s pool of sequestered carbon dioxide.

**Minimize Impervious Surfaces**
Watershed quality decreases rapidly when the total impervious area exceeds 10%. Yet typical single-family housing projects have 25-50% impervious surfaces. Asphalt and concrete for parking lots and driveways can be formulated to be porous. Crushed rock and mulch add a striking element to the design while allowing water infiltration. Pervious pavers which can include low growing groundcovers or gravel also facilitate water infiltration into the soil.

**Applications**
Keep impervious surfaces to a minimum: Use porous surfaces, including permeable paving, and maximize landscaped area to encourage infiltration.
Avoid contiguous impervious surfaces. Do not directly connect impervious areas to the stormdrain.
Decrease parking lot sizes by narrowing the aisles between rows and increasing the ratio of compact to full size spaces.
Remove all unnecessary impervious paving. Check with your local hauler for more information on where to recycle asphalt & concrete.

Benefits
Increasing porous surfaces decreases runoff, protects the biology of the San Francisco watershed and contributes to the restoration of our local streams, creeks and wetlands.

Plant and Protect Trees
Trees clean, cool the air and intercept significant amounts of rainfall each year and thus help control stormwater runoff. The Center for Urban Forest Research estimates that the continuous tree canopy in Oakland intercepts 4 inches of rain over one acre in a typical year — about 108,000 gallons. Their root growth also increases the ability of soil to take in rainfall.

Applications
Select trees that match the microclimate and soil characteristics.
Select California natives or other low water use species.
Specify large stature trees in as many appropriate places as possible.
Plant in groves and hydrozones.
Provide adequate soil volume, amended as per a soil analysis.
Inspect tree health regularly.
Maintain and prune appropriately.
Design the landscape to protect 80% or more of existing, mature, healthy trees and include penalties for destruction of protected trees in the construction contract.

Benefits
Appropriately planting more trees decreases runoff and protects water quality. Trees also absorb air pollutants, thus protecting air quality. Dollar for dollar, larger trees deliver 8 times the benefits of smaller trees.

Manage and Maintain the Irrigation System Carefully
A poorly maintained irrigation system wastes water, adds to surface runoff, and damages property.

Applications
Match watering schedule to plant needs, soil type, slope and season.
Eliminate leaks and spraying onto sidewalks immediately.
Install rain shut-off devices.
Upgrade to new technology irrigation controllers.

TIPS FOR SUCCESS: Pervious Concrete
Pervious concrete is a high cement content mix manufactured with a low water-cement ratio and without fine aggregate that:
• Meets NPDES regulations
• Provides for groundwater recharge
• Has the same structural integrity as conventional concrete

When compared to a conventional asphalt parking lot requiring stormwater system tie-in and first flush pollution measures, pervious concrete parking lots are by far the lower initial cost solution.

that adjust watering schedules to reflect weather conditions or soil moisture and include a rain shut-off device.

**Design a System to Capture and Treat Water**

Catching, slowing and retaining water will promote infiltration and removal of pollutants, as well as minimize stormwater runoff. It can also add beauty and value to the landscape. Studies indicate that home values and leases of commercial buildings are higher if the building overlooks, or the home is within 300 feet of a water element.

**Applications**

Limit grading to protect existing patterns of drainage and retain natural topographic features that slow and store storm flows.

Incorporate design measures and treatment controls, such as landscape beds, detention basins, ponds, stormwater wetlands and/or vegetated swales, that are sized to treat at least 85% of average annual runoff.

Divert rain water from all down spouts to planters, swales or landscaped areas. Capture and filter runoff from parking lots into islands or planter strips or other treatment controls.

Design bioswales with flat bottoms of at least 18 inches across, and/or rock cobble at points of concentrated flow.

Specify turf alternatives for bioswales.

Plant a 24 inch buffer zone between areas receiving spray irrigation and impervious surfaces to keep overspray and runoff out of stormdrains.

**Benefits**

Stormwater runoff is reduced while water recycled on site fosters the removal of pollutants and encourages biodiversity. Downstream engineering costs are decreased. Property values can be increased.

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**TIPS FOR SUCCESS: Green Stormwater Infrastructure**

Green Stormwater Infrastructure (GSI) is a resilient approach to managing and preventing stormwater runoff. GSI control measures mimic nature, and use plants, soils, and/or pervious surfaces to collect stormwater, allowing it to soak into the ground, and be filtered by soil. This reduces the quantity of water and pollutants flowing into local waterways.

**Green Infrastructure:**

- Reduces and treats stormwater at its source
- Offers environmental, social, and economic benefits
- Includes control measures such as green streets, bioretention planters, pervious surfaces, and tree filters that slow and reduce runoff

**Grey Infrastructure:**

- Conventional piped drainage and water treatment systems
- Designed to move stormwater away from the built environment
- Includes impervious surfaces (roofs, roads, large areas of pavement, and asphalt parking lots) that increase the speed and volume of runoff
8. Create Habitat

Plant and animal diversity is one of the many factors that make the San Francisco Bay Watershed unique and beautiful. More than 1,500 local plant species bloom throughout the year, supporting hundreds of native pollinators, beneficial insects and other organisms that can reduce the need for pesticides. Birds & butterflies are attracted, bringing with them beauty, song and interest to a landscape.

Biodiversity is crucial to the health and resiliency of the local landscape, the Bay area ecosystem and its inhabitants. Yet the loss of habitat is threatening local biodiversity. The population of the Bay Area is growing and expected to continue to do so. With increased populations comes development, which is too often done without regard for wildlife habitat. And although we tend to rely on parks and open space for preserving wildlife habitat, both residential and commercial landscapes can also play an important role.

Developed landscapes can provide food, water, shelter and nesting sites for birds, butterflies, beneficial insects and other creatures, thus helping to conserve valuable wildlife resources and restore damaged ecosystems. Small spaces or corridors, patched together over the entire Bay Area, add up to a great opportunity for encouraging and protecting wildlife. Offer your skill and expertise to your customers through the following practices for creating wildlife habitat.

Diversify

A diverse landscape includes annuals, biennials and perennials of many different sizes, shapes, colors and textures. It includes evergreens and deciduous plants, species that bloom at different times of the year and those that bear fruit or berries. And it includes plants that occupy different canopy levels and root zones.

Applications

Educate your customers and encourage them to embrace diversity.

Start with a trial zone, then plan for increasing diversity throughout the landscape over time.

Recommend to your clients that they convert a lawn that no one uses, or that they replace part of it with a diverse border.

Select a rich array of plant species that includes many, if not all, California natives.

Specify layers of groundcovers, shrubs and trees that provide a variety of nesting sites or flower and bear fruit at different times of the year.

Do not plant invasive species as they often damage or destroy habitat.

Benefits

Biodiversity is fostered. A diverse landscape may resist disease and insect pests better than those with little variety, while providing a higher habitat value. A single insect or disease infestation is less likely to be devastating.

Choose Natives First

Native plant species are critical to creating wildlife habitat because local fauna are adapted to them. Research indicates, for example, that indigenous bees prefer native plants over exotic species. The best natives for landscapes are local and they are especially important to consider for sites that interface with wild lands. Native plants that match the microclimate can also be good choices.

Applications

Select a variety of appropriate California native species that match the microsites of the landscape.

Group flowering species in dense stands of at least 16 square feet, rather than plant in isolated single plants, to attract native pollinators.

Let some plants go to seed for food for wildlife.
— don’t immediately deadhead everything in the garden.

Consider grouping native plants in communities.

**Benefits**
Many natives flourish in California, often with less water, fertilizers and maintenance. Local wildlife is fostered.

**Provide Water & Shelter**

Providing nesting sites, shelter and clean, fresh water is also essential for encouraging wildlife. But care must be taken not to create breeding sites for mosquitoes.

**Applications**
Place a birdbath in the garden. Remind your customers to change the water every few days to keep mosquitoes from breeding.

Select groundcovers, shrubs, and trees that provide a variety of nesting sites.

Specify rockwalls and boulders as design elements that also provide habitat.

Install bird and bat houses in locations that are secure and away from a lot of activity.

Snags are dead trees left in place. Consider leaving wood materials or downed trees if they don’t threaten structures or parking areas or create a fire hazard.

**Benefits**
Water and shelter support wildlife and add interesting elements to the landscape.

**Use Organic Pest Management**

Pesticides do not kill only the target pest species. Birds, bees, butterflies and other creatures are also vulnerable — in many cases they are more sensitive to the toxins than the pests. Eliminating or at least using them only as a last resort is one of the most important practices for nurturing wildlife.

**Applications**
Refer to the integrated pest management practices in the section *Protect Water & Air Quality*.

Read the label on every pesticide (including naturally derived pesticides) that you use for toxicity to non-target organisms.

**Benefits**
Beneficial organisms, which can keep pests under control, are not harmed. The soil’s ability to filter out pollutants and suppress disease is fostered.

**Conserve or Restore Natural Areas and Wildlife Corridors**

Careful site planning, especially for new development along the urban-wild interface is important for protecting biodiversity. Natural areas and corridors increase habitat and range, supporting a diversity of organisms and allowing them to travel safely between sites.

**Applications**
Become familiar with local open space requirements.

Limit earthwork and clearing of vegetation.

Place impervious surfaces outside of tree drip lines.

Specify, in the construction contract, penalties for destruction of protected soil, trees and other vegetation.

On previously developed sites, restore open space by planting native vegetation.

Build in wildlife corridors adjacent to open spaces, wild lands, and creeks.

Consider corridors when designing roads and fencing.

Protect or create a diverse buffer of dense low maintenance vegetation along monocultures, creeks and the bay.

**Benefits**
ReScape Landscaping protects plant and wildlife diversity. Runoff is slowed, streams are cooled and bank erosion is prevented.
ReScape Rated Landscapes are certified using a rating system that recognizes excellence in sustainable landscape design, construction and maintenance practices. Civic, commercial, institutional, residential and multifamily landscapes are eligible to become ReScape Rated. The Rated Scorecard provides property owners and landscape professionals with a flexible, systematic framework for creating healthy, drought-tolerant and environmentally sound landscapes.

The Rated Scorecard is based on ReScape’s 8 Principles and records individual practices according to those principles. Trained Raters use the Scorecard to evaluate eligible landscapes. Each practice earns a specified number of points, as listed in the Scorecard, and principles associated with specific practices are marked with an “X”. To qualify as ReScape Rated, a landscape must earn a total of 60 points or more AND complete the 14 required practices marked with “R” in the “Possible Points” column.
## A. Site Planning

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### Chapter 4: Scorecard

## B. Stormwater & Site Drainage

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## C. Earthwork & Soil Health

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<td>C.8 Protect all Planting Areas with 3” Mulch</td>
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## D. Materials

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## E. Planting

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<td>E.14 Plant a Diverse Palette</td>
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<td>E.15 Plant California Natives</td>
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### F. Irrigation

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<tr>
<td>F.1 Plumb Irrigation for Recycled Water</td>
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<td>F.2 Use Rainwater/Graywater</td>
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<td>F.3 Install a SMART Controller</td>
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<td>F.4 Low Volume Irrigation Where Required</td>
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<td>F.5 Limit Precipitation Rates</td>
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<tr>
<td>F.6 Climate Adapted Plants Meet Water Budget</td>
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<td>F.7 Install Dedicated Water Meters</td>
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<td>F.8 Conduct an Irrigation Audit</td>
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<td>F.9 Meet Your Local CA WELO</td>
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### G. Maintenance

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<td>G.2 Site Analysis in Maintenance Manual</td>
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<td>G.3 Grasscycle</td>
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<td>G.4 Produce Mulch Onsite</td>
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<td>G.5 Produce Compost Onsite</td>
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<td>G.6 No Plant Trimmings to Landfill</td>
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<td>G.7 Do Not Shear Hedges</td>
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# G. Maintenance

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<td>G.11 Reapply Mulch Regularly</td>
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<td>G.12 Read Dedicated Meter</td>
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<td>G.13 Check Irrigation Equipment</td>
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<td>G.14 Use IPM During Maintenance</td>
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<td>G.15 Use Organic Pest Management</td>
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# H. Innovation

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<tr>
<td>H.1 Include Rating Info in Bid Documents</td>
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<td>H.2 ReScape Professional on Design Team</td>
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<td>H.3 Install Educational Signage</td>
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<td>H.4 Employ a Holistic Approach</td>
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<td>H.5 Implement Your Own Innovation</td>
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Residents, business owners and policy makers are already thinking about the connection between their landscapes and the environment and they want to make a difference. Yet ReScape landscaping practices require skill and expertise. Communicate your expertise to earn new clients, educate the community, and strengthen your existing customer loyalty, then expand to include more practices, marketing yourself as a ReScape Qualified landscaper.

**STEP 1:** Start with the ReScape Practices That You Already Do and Explain the Benefits to Your Clients

The best strategy for offering ReScape landscaping to your clients is to start by identifying those practices that you already do. Then: train yourself and your staff on the benefits. Learn how these practices can protect your client’s health or that of the environment, save landfill space, provide wildlife habitat or increase the value of their property.

Communicate your skills and the benefits of ReScape landscaping to your customers or potential new customers. Feel free to share the information in these guidelines with them. Let them know you can help them landscape in an environmentally friendly manner with these ReScape services. Emphasize that many of these services can save them money. Detail your skill in providing these benefits in periodic quality control reports mailed to your clients. Be sure to include the benefits to your customer such as lower water bills and increased property value.

Include the practices and their benefits in your contracts. You may even want to request that your clients sign an agreement on the goals of their ReScape Landscape program.

**STEP 2:** Plan to Offer More ReScape Landscaping Practices

The ideal ReScape landscape is designed, constructed and maintained with most, if not all, the practices listed in this guide. It is a holistic, integrated approach that yields the most benefits to your clients, your business, the environment and our community. It is more likely, though, that you will need to evolve towards that goal rather than instantly switch over.
Sit down with your staff and ask yourselves:

- Do we currently offer more practices from one principle than others? Why?
- What other ReScape practices from the Menu of Best Practices (pages 10-11) might our clients also value?
- What additional practices would be relatively easy to learn about and implement in the near future?

Consider how to adopt more of the practices over time:

Under the principle(s) at which your company is already strong, (such as Save Water) what would it take to offer all or most of the practices?

What additional practices can you offer in the next fiscal year, or the next 2 years? What training do you need to offer more ReScape services?

Design professionals: ask that the landscapes you design be maintained in accordance with the ReScape Landscape Guidelines by firms with ReScape Qualified Landscape Maintenance Professionals on staff. You can find these qualified professionals at: www.rescapeca.org/directory.

STEP 3: Market ReScape Landscaping Packages

Another important question to ask yourself as you expand your ReScape services is how to market them to your clients. Here are some suggestions for ReScape Landscaping Packages that could be developed to both respond to and encourage customer demand:

ReScape Lawn Care Program

Lawns continue to be a part of our culture. But maybe it is time to rethink what we mean by a lawn. ReScape landscaping emphasizes that high input lawns are not included solely for their looks. Small functional lawns — those that are used for play and relaxation - can be managed to minimize environmental impacts and provide your clients with a safer lawn by including:

- Grasscycling
- Aerating, then topdressing with compost
- Phasing out the scheduled application of synthetic fertilizers and pesticides
- Feeding with compost or other natural or slow release fertilizers after analysis or demonstrated need
- Integrated pest management that includes:
  - Hand pulling weeds
  - Use of natural herbicides

TIPS FOR SUCCESS: Guide your Clients through a Transition Period

Transitioning a landscape that has been managed with few chemical inputs and some additions of organic amendments to a ReScape landscaping maintenance program can be a relatively simple and short process. Landscapes that have been intensively treated with pesticides, over-watered and over-fertilized will require greater skill and time to transition.

Let your customers know that it may take two years or more to make the change, that it will require skill, frequent monitoring and increased communication, and that their expenses could be greater during that period.

Agree upon an acceptable period and include this in your contract.

Start by assessing the soil and testing drainage.
Amending the soil with compost may be one of your easiest selling points

Compost pays for itself over the long term as you and your clients benefit from:

- Bringing life to the soil
  - Reduces the need for fertilizers
  - Improves plant resistance to disease
  - Reduces need for pesticides
  - Degrades pollutants
- Healthier plants with an improved appearance
  - Increased customer satisfaction
- Faster planting in amended soils
  - Reducing plant loss
  - Fewer callbacks
  - Improved profits
- Increasing water holding capacity
  - Irrigation costs are cut by as much as 50%
  - Reduced water bills for customer
  - Decreased stormwater runoff
- Paying back the cost of amending soil in 5-7 years
- Protecting the environment and the health of their families
- Contributing to decrease in greenhouse gas emissions

ReScape Wildlife Gardening
Specializing in designing, constructing or maintaining wildlife gardens is another opportunity for your business to grow and flourish. Develop expertise in the following practices and offer them to new and existing clients:

- Survey flora and fauna
- Learn about local, natural plant communities and use them as models
- Conserve or restore natural areas
- Diversify and include many California native plant species
- Provide water and shelter
- Eliminate the use of pesticides

ReScape Soil Health Care Program
Soil is the foundation of a healthy, beautiful landscape. Offer the following practices:

- Assessing the soil and testing drainage
- Removing and storing topsoil during construction
- Protecting soil from compaction and erosion
- Amending the soil with compost
- Mulching regularly
- Feeding soils naturally with compost or compost tea
- Avoiding synthetic fertilizers
- Minimizing chemicals with a goal of eliminating them altogether

- Use of beneficial nematodes
- Use of compost tea for disease management and nutrient cycling
- State of the art irrigation management to prevent over watering
TIPS FOR SUCCESS: Bringing ReScape Landscaping to Public Sector Projects

There are some important differences in the way public landscapes are designed, constructed, and maintained. A good first step for successfully implementing ReScape landscaping in public projects is starting with the coordinated involvement of city planners, landscape architects, landscape contractors, and landscape maintenance professionals. If there is a building also being planned, bring a team together to discuss ReScape goals at the conceptual design phase for the building — including the professionals responsible for both designing and maintaining the landscape.

Here are some additional tips for making the transition to ReScape in public landscaping projects more successful:

- Identify the key people, again involved in the project, initially and for the long term — and organize a ReScape landscape team that includes the city planner, arborist, landscape architect or designer, landscape contractor, and the landscape maintenance staff.
- Have the key people, again including maintenance staff, complete an initial ReScape Scorecard for Commercial and Civic Landscapes no later than the design and development phase, to define the ReScape landscape goals for the project.
- Include language in the RFP & RFQ that clearly states that the landscape will be designed to ReScape landscape standards as per the ReScape Scorecard.
- Include language in the construction bid documents that clearly states that the landscape will be built as per the final ReScape Scorecard.
- Create a ReScape landscape maintenance task list or use the ReScape Landscaping Model Maintenance Specifications as a reference document to the maintenance contract.
- Provide educational signage describing the ReScape features of the landscape and their benefit to the public.
Step 4: Integrate ReScape Landscaping with Green Building

Buildings, like landscapes, impact the health and wellbeing of people, the community and the environment. Green building focuses on many of the same considerations during the design, construction and operations of buildings as ReScape does in landscapes—energy use, water use, environmental quality, material selection, and the site.

GreenPoint Rated is a residential rating program for new and existing single and multifamily homes in California. It is a third-party rating system administered by Build It Green and designed to provide a credible yet accessible entry point into green building. It acts as an independent seal of approval that reassures homeowners that a home is healthier, more durable, and resource-efficient. A home’s landscape is considered in the rating process, specifically regarding water conservation, plant selection, and the use of compost and mulch—practices that are in alignment with ReScape Landscaping.

Nationally, the US Green Building Council has developed a rating system that specifies ‘green’ standards for commercial, multifamily and civic buildings. The Leadership in Energy and Environmental Design (LEED) is a voluntary program for rating the environmental impacts of both new and existing building projects. LEED rating and certification provides credits for landscape practices such as habitat restoration and biodiversity, erosion prevention during construction, and stormwater control measures like rain gardens and pervious pavement.

A ReScape Rated Landscape complements green building practices and associated third-party certifications.
Acknowledgements


Bay-Friendly Development Team

Bay-Friendly Landscaping was originally developed by StopWaste, which is the Alameda County Waste Management Authority and Recycling Board acting as one public agency. Its mission is to plan and implement the most environmentally sound waste management program for the residents, businesses and institutions of Alameda County.

Special thanks go to the following organizations and individuals for contributing to the initial development or subsequent editions of the Bay-Friendly Landscape Guidelines:

Alameda Countywide Clean Water Program: Jim Scanlon
Aquatic Outreach Institute/The Watershed Project: Sharon Farrell, Tamara Shulman
Baefsky & Associates: Michael Baefsky
Bio-Integral Resource Center: Tanya Drlik
Cagwin & Dorward: Manuel Gonzales
California Invasive Plant Council: Doug Johnson
Cal Poly, Pomona: Bob Perry, Professor Emeritus
City of Berkeley: Jerry Koch David
Gilmore Graphic Design: David Gilmore
Design Works: Rebecca Coffman
East Bay Municipal Utility District: Christine Finch, Susan Handjian, David Langridge
Four Dimensions Landscape Co.: Michael Thilgen

Glen Schneider Landscape: Glen Schneider
Jensen Corporation Landscape Contractors: Jake Cacciato
Katrine Benninger Landscape Design: Katrine Benninger
New Growth Landscape: Nate Silin
Office of Cheryl Barton: Burt Tanoue
Pacheco Brothers Gardening: George Pacheco
Presidio Trust: Michael Boland
Sentient Landscape, Inc.: Geoff Hall
StopWaste.Org: Teresa Eade, Cynthia Havstad, Kelly Schoonmaker
UC Cooperative Extension, Alameda County: Shauna Cozad, Karen Wikler
UC Berkeley: Greg Harrington
Wildheart Gardens: Chris Shein
Acknowledgements (cont.)

River-Friendly Development Team

The Sacramento Stormwater Quality Partnership (SSQP) worked with EcoLandscape California to develop River-Friendly Landscaping with the goal of reducing pollution to local waterways. SSQP educates and informs the public about urban runoff pollution and works with industries and businesses to encourage pollution prevention and reduce erosion. It is a partnership among Sacramento area public agencies, including the County of Sacramento and the Cities of Citrus Heights, Elk Grove, Folsom, Galt, Rancho Cordova and Sacramento.

Special thanks go to the following organizations and individuals for contributing to the initial development or subsequent editions of the River-Friendly Landscape Guidelines:

Ecological Landscape Design: Bernadette Balics
SiteOne Landscape Supply: Barney Baty
Pomegranate Design: Gregory Berger
CalRecycle: Ken Decio
Sacramento County: Doug Eubanks & Pat Quinn
UC Statewide IPM Program:
Dr. Mary Louise Flint
California Water Efficiency Partnership:
Sara Foley
City of Roseville: Tara L. Gee
UC Davis Arboretum: Emily Griswold & Ellen Zagory
Luciole Design: Annete & Mike Haecox
City of Sacramento: Jessical Hess, Connie Perkins & Tyler Stratton
UCCE - Sacramento County: Chuck Ingels & Judy McClure

CA Native Plant Society: Chris Lewis & Mary Mare
Regional Water Authority: Lisa Maddaus
City of Sacramento: Daisy Mah
Formerly of City of Folsom: Ken Menzer
Writer, Researcher, Photographer: Cindy Nelson
Roberts Landscape: Dave Roberts
Red Studio Design: Lynn Scholl
City of Folsom: Don Smith
Cunningham Engineering Corp.:
Cheryl H. Sullivan
County of Sacramento: Dave Tamayo
Roberta Walker Landscape Design:
Roberta Walker
Living Resources Company: Steven Zien
ReScape California is a non-profit organization that educates about and advocates for a whole-systems approach to landscaping that works in harmony with the natural world and addresses the changing environment. ReScape’s landscaping practices are based on 8 regenerative principles which foster soil health, sequester carbon, conserve water and protect habitat and valuable resources while reducing waste and preventing pollution in our communities and watersheds.

### SAN FRANCISCO BAY DELTA WATERSHED

A watershed is all the land in a region from which rain collects and drains into a common creek, river, lake or bay. The water in a watershed moves across the land and through the storm drain system both underground and on the surface. Water that flows onto streets and into gutters is called urban runoff. On the way to the creeks and rivers, urban runoff picks up pollutants that eventually end up, untreated, in our waterways.

The San Francisco Bay Delta Watershed includes the largest estuary in western North America and encompasses over 60,000 square miles, extending from the Sierras to the Golden Gate. It includes the Sacramento and San Joaquin Rivers and their tributaries as well as the Delta, Suisun Bay, San Pablo Bay, San Francisco Bay and the Golden Gate Strait where the entire watershed drains into the Pacific Ocean. Fresh water is diverted to supply drinking water for 25 million Californians and irrigation for millions of acres of farmland. Endangered and threatened species also rely on the watershed for habitat while two-thirds of California’s salmon pass through these waters. At least half of the water birds whose migration follows the Pacific Flyway count on the region’s remaining wetlands (more than 90% of California’s wetlands have been lost).

Whether your landscape is next to a creek or miles away, your activities impact the quality of water in the watershed. In healthy landscapes, water from rain or irrigation percolates through soil that is rich in organic matter and alive with organisms. Living soils absorb and retain much of the water while also filtering out pollutants before the water reaches the aquifer or watershed. Incorporating ReScape’s 8 Principles into your landscaping practices will ensure that you are helping to protect the watershed and minimize pollutants that reach the waterways where we live, work and play.
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SACRAMENTO RIVER WATERSHED

A watershed is all the land in a region from which rain collects and drains into a common creek, river, lake or bay. The water in a watershed moves across the land and through the storm drain system both underground and on the surface. Water that flows onto streets and into gutters is called urban runoff. On the way to the creeks and rivers, urban runoff picks up pollutants that eventually end up, untreated, in our waterways.

The 27,000 square-mile Sacramento River Watershed drains the Sacramento Valley, the Modoc Plateau, and parts of the Cascade Range and Sierra Nevada Range. This watershed is one of the largest in the United States and covers most of northern California. The Sacramento River carries 31% of the state’s total surface water runoff. The mouth of the Sacramento River is at Suisun Bay near Antioch where it combines with the San Joaquin River, flows into the San Francisco Bay and ultimately meets the Pacific Ocean under the Golden Gate Bridge.

Whether your landscape is next to a creek or miles away, your activities impact the quality of water in the Sacramento River Basin. In healthy landscapes, water from rain or irrigation percolates through soil that is rich in organic matter and alive with organisms. Living soils absorb and retain much of the water while also filtering out pollutants before the water reaches the aquifer or watershed. Incorporating ReScape’s 8 Principles into your landscaping practices will ensure that you are helping to protect the watershed and minimize pollutants that reach the waterways where we live, work and play.
1. **Act Local**
   Built landscapes are a part of the larger ecosystem of the San Francisco Bay Delta Watershed and they can contribute to its health if designed and maintained using sustainable practices.

2. **Reduce Waste**
   Reduce waste by choosing the right plants, avoiding invasive plant species, using recycled and salvaged products in the landscape, and by composting, mulching and grasscycling plant debris.

3. **Nurture the Soil**
   Soils are living ecosystems and when landscape practices allow the soil food web to thrive it can filter pollution, store water, provide plant nutrients and help plants resist pests naturally.

4. **Sequester Carbon**
   Healthy vegetation works together with soil rich in organic matter and beneficial microorganisms to remove carbon dioxide from the air and store it as soil carbon, an important strategy for addressing climate change.

5. **Save Water**
   Use a holistic approach of creating drought resistant soils with compost and mulch, select plants naturally adapted to summer-dry climates, use stormwater, greywater and recycled water in the landscape as much as possible, and use efficient irrigation systems that include self-adjusting, weather-based controllers.

6. **Conserve Energy**
   Reduce the need for mowing and shearing, shade buildings and paved areas, use efficient outdoor lighting, and buy local landscape products.

7. **Protect Water and Air Quality**
   Maximize permeable surfaces and minimize stormwater runoff, use integrated pest management, minimize the use of synthetic pesticides and avoid overuse of fertilizers, reduce fossil fuel consumption, and plant trees to remove CO2 and absorb air pollutants.

8. **Create Wildlife Habitat**
   Biodiversity is crucial to the health of natural ecosystems and by using native plants and increasing the diversity of plant palettes, our built landscape can provide food, water and shelter for birds, butterflies, beneficial insects and other welcome creatures.