Designing Eco-Friendly Landscapes & Water-Wise Irrigation Systems

Lori D. Palmquist, CID, CIC, CLIA, CLWM
&
Cheryl Buckwalter, CLIA, QWEL, RFL Green Gardener Instructor, A.Sc. Horticulture, Landscape Designer

Developed by Cheryl Buckwalter Landscape Liaisons
Presentations & Handouts at www.ecolandscape.org
What’s different between there & here?
And... We’re Not in the Desert
An Eco-Friendly Landscape is…

• Functional
  – Serves intended purpose
  – Uses resources wisely
  – Supports garden “life”

• Sustainable
  – Low maintenance
  – Limited inputs & waste

• Beautiful
  – Shapes, forms
  – Year-round interest
  & color
What is a Watershed?

- Area of land where all water under it or on it drains into a water body
- Small- to large-scale watersheds
  - Sub-watersheds - One flows to another & another until ultimately flowing into the ocean
  - Exception: Endorheic drainage basins (watersheds)
A *watershed approach* to landscaping works with nature to reduce water use, reduce waste, prevent pollution, & support the health of our waterways.
Principles of Watershed Approach to Landscaping

1. Create & Maintain Healthy Living Soil
2. Capture & Use Rainwater as a Resource
3. Use Climate-Appropriate Plants
4. Use Highly Efficient Irrigation
## Multiple Benefits

### Your Landscape vs. a River Friendly Landscape

<table>
<thead>
<tr>
<th></th>
<th>Your Landscape</th>
<th>River Friendly Landscape</th>
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</thead>
<tbody>
<tr>
<td>Water gallons/day</td>
<td>260</td>
<td>73</td>
</tr>
<tr>
<td>Labor hours/year</td>
<td>81</td>
<td>32</td>
</tr>
<tr>
<td>Waste pounds/year</td>
<td>840</td>
<td>460</td>
</tr>
<tr>
<td>Emissions pounds CO₂ per year</td>
<td>170</td>
<td>55</td>
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</tbody>
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Benefits Calculator at riverfriendly.org
Where to Begin?

Create a Master Plan – Why?

- Installation - Phases or all at once
  - Assemble your “team”
  - Fit your schedule & budget
  - Progressively work to achieve goals
  - Implement over time
  - Allow time for proper installation

- Thoughtful planning
  - Select trees, plants, and materials appropriate for your specific site & you

- Protect Your Investment
  - Avoid costly mistakes
  - Maintain / increase curb appeal
Stages to Creating Your “Master Plan”

1. Base Plan / Plot Plan
2. Site & Family Assessment
3. Functional / Bubble Plan
4. Final Conceptual Plan
Stage 1
Base Plan / Plot Plan

- Existing site plan or as-built plan if available
- Draw rough sketch of property
- Measure*
  - Property lines, footprint of house (exterior walls), any existing features (fences, sidewalks, driveways, fences), trees
  - Existing irrigation & utilities
  - Location of downspouts, hose bibs, outlets
- Take photos before, during, and after

*Refer to “Measuring” handout
Stage 1
Details to Note on Base Plan

- Use graph paper to lay out measurements
  - “Bird’s-eye” or Plan View of property
- Scale
  - 1/8” scale = 1/8” inch on ruler / 1 “box” on grid paper = 1 foot
  - ¼” scale = ¼” inch on ruler / 1 “box” on grid paper = 1 foot
- “North Arrow” direction on the plan (orientation)
- Make copies of Base Plan for use in other phases of design development
Stage 1
Base / Plot Plan
Stage 2
Site & Family Assessment

Landscape Design Questionnaire

This questionnaire will help you understand your current landscape, determine your needs, think about your “like to have’s” and “must have’s”, and recognize issues that may need to be resolved.

Name: ___________________________ Date: ___________________________
Address: __________________________ ____________ __________________________

Would you like to focus on your front or back yard? _____ Front yard _____ Back yard

How many members are in your family? _____ Adults _____ Children

Do you have pets? _____ Yes _____ No If yes, what kind and how many? __________

Who will install the landscape? _____ Owner _____ Contractor _____ Both

Who will maintain the landscape? _____ Owner _____ Contractor _____ Both

What level of maintenance do you want to perform? _____ Minimum _____ Moderate _____ High

What style of landscape do you prefer?

- _____ Formal _____ Informal _____ Straight lines
- _____ Curves _____ Circles _____ Don’t know

SOIL PROPERTIES/DRAINAGE

What type of soil do you have? _____ Clay _____ Sand _____ Loam _____ Don’t know

Is there a slope? _____ Yes _____ No

Do you have drainage issues on your property? _____ Yes _____ No

IRRIGATION

Do you have or plan to use an irrigation controller/timer? _____ Yes _____ No

Would you like to convert any overhead spray systems to a drip irrigation system? _____ Yes _____ No

Would you like to replace existing sprinkler heads with high-efficiency rotator heads? _____ Yes _____ No

Would you like to use low-volume, drip irrigation for plants? _____ Yes _____ No

Will additional irrigation be required to support your plant material? _____ Yes _____ No

WALKWAYS/PATHS

Would you like to incorporate a new walkway or path? _____ Yes _____ No

Are you interested in using pervious materials to reduce runoff? _____ Yes _____ No

If yes, what type of material would you like to use? _____ Concrete _____ Pavers _____ Mulch

Do existing walkways/paths provide proper access to your property? _____ Yes _____ No

Would you want existing walkways/paths moved? _____ Yes _____ No

Are you interested in reusing / repurposing existing materials? _____ Yes _____ No
Function, Use, & Needs

- Budget – How much do you want to spend?
- Temporary or permanent home
- Life stages & lifestyle

What do I need & want:

- Shade
- Screening, privacy
- Noise reduction
- Storage
- On-site water catchment
- Areas for activities
- Habitats & edibles
Who Will Design, Install, & Maintain?

- Yourself or should/could you hire qualified, licensed professionals
- APLD – Association of Professional Landscape Designers, apldca.org
- EcoLandscapers™, ecolandscape.org
- Landscape Architects, asla.org
- California Landscape Contractors Association, clca.org
- Ask friends, family, co-workers for referrals
Form
What Shapes Do You Like?

Rectilinear
Curvilinear
Style
What Style & Feel Do You Want?

Formal

Informal
What’s Existing on Your Site & Conditions?

On one copy of the plan, note

• Locate large trees, shrubs, lawn, significant vegetation
• Outline canopy of plants & plant names
• Structures, walls, fences, other plants can affect amount of sun & shade
• Mark areas that receive sun all day, part day, & shaded areas
• Predominant wind direction
What Existing Materials Can Be Kept?

- Reduce, Reuse, Recycle, & Repurpose!!!
How Does Water Move on Your Site?

On another copy of plan, note
• Where does rain fall? Where does it flow?
• Where water flows into garden?
• How it moves through it?
• Where it stays?
• How it leaves?
• What type of soil?

Stage 3
Functional / Bubble Plan

• “Broad strokes”
• Generally define areas & uses
• Consider function & purpose of space
• Approximate size & shape of features
• Challenges (e.g., noise, drainage, slopes)
• Traffic flow & access
Flow & Access

- Elevation
- Function
- Movement
Stage 4
Final Conceptual Plan

- Convert bubbles into specific elements
- Add sizes & shapes to
  - Structures, paths, patios, walls
  - Trees, planting beds
  - Earthworks (swales, rain garden)
- Consider scale & balance
  - House, other structures & elements
- Select materials
  - Many choices
Stage 4 - Hardscape, Water Management, & Features

Hardscape = Non-water-consuming materials
Water Management Begins with Healthy Soil

- Living soils have balance of oxygen, water, & soil organisms
- Avoid compaction!
- Healthy soils function like sponges, absorbing & releasing water
Pervious Materials Allow Water to Soak into Soil

Pervious concrete

Pavers without mortar in driveway
Rainwater Catchment, Swales, & Berms

- Shallow depressions & contours that capture rain from roofs, pavement, irrigation (overspray)
- Benefits:
  - Allows water to slowly soak into soil instead of running off into drainage system
  - Creates added interest by shaping the soil, rather than flat or sloped
  - Provides habitat for birds, butterflies, beneficial insects
Rainwater Catchment
Rain Gardens

Position minimum of 10’ from foundation of home
Visit Riverfriendly.org for sizing & more information

Designer: Soleil Tranquilli
TranquillGardens.com

1” of rain from a 1,000 sq. ft. roof yields 623 gallons of fresh water
Source: U.S. Geological Survey
Swales, Contours, Berms
Reduce Impermeable Areas
Disconnect & Direct Downspouts

“Disconnect” contiguous hardscape
Creek Beds

• Rainwater retention areas created with shallow basins & swales
• Use plants that can tolerate the increased moisture & dry conditions
• May need to include low-volume drip irrigation
Slopes

• Terraces

• Low water-use groundcovers on inaccessible slopes
• Lower water-use plants at top/higher water-use at bottom
Softscape = Living, water-consuming materials
Spacing & Placing Plants on Plan

- **Foundation Plants**
  - Larger plants
  - Close to house
  - Provide backdrop for layers of other plants

- **Layering Plants**
  - Gives illusion of space beyond
  - Density & multi-level interest
  - Habitat

Regional Water Authority Water-Smart Garden Makeover Contest
Mature Size & Placement

Planting Distances From Distribution Lines

- Tall Zone: Tree heights taller than 40 feet
- Medium Zone: Tree heights less than 40 feet
- Small Zone: Tree heights 25 feet or less

Root Damage Zone

Underground Utilities

Pacific Gas & Electric www.pge.com
Planting Day, After 7 Months & 1-1/2 Years

Regional Water Authority
Ultimate Water-Smart Garden Makeover
Select Plants

Based on

• Water & sun (exposure) requirements
• Soil type/texture (mixture of sand, silt, & clay)
• Native or adapted to local climate
• Fire-resistance

www.fire.ca.gov
Invasive species

- Do select
- Do not purchase
- Do not plant
- Remove and replace with appropriate plant

Stipa tenuissima
Mexican Feather Grass

www.cal-ipc.org
www.plantright.org

Cortaderia selloana
Pampas Grass
Select Plants for Mediterranean-type Climates

Cool, wet winters & warm, dry summers

Plant Characteristics & Color

- Texture – Course, fine, rough, smooth, thick, thin (bark, leaves)
- Height, width, canopy - Must consider when selecting, placing, and spacing
- Deciduous, evergreen, perennial (lives more than two years)
- Color – Flower, fruit color, bark, leaves
- Scent – Sweet, odiferous
Plant Characteristics
Hydrozones

Group plants with similar water (and sun) requirements to

- Water where and when plants need it
- Reduce plant stress, non-beneficial growth, pest & disease problems
Water-Use
Categories & Definitions

High
Moderate
Low
Very Low
None
Drought Tolerant = **Once established** – Plants can survive (not necessarily thrive) on:

- Seasonal rainfall
- Infrequent watering, or
- Repeated periods of dry conditions and recover from repeated wilting

**Low Water-Use Plants:**

- A **constant classification**
- Plants that always require low amounts of water
Characteristics of Drought-Tolerant & Many Low-Water Use Plants

Stachys byzantina
Lamb’s Ear

Rosmarinus officinalis
Rosemary

Salvia apiana
California White Sage

Leaves - Retain moisture, color reduces sun exposure, “hairs”, waxy surface, leathery, tiny, thick, leaf orientation

Roots – Deep taproot, fibrous
High (Regular) Water-Use Plants

- Prefer regular moisture throughout the year
- Require frequent watering, generally two to three times a week, sometimes more often during hot & dry temperatures
  - Examples include: Lawns, water-loving plants, & container plants
  - Soil moisture to remain consistently moist
Moderate Water-Use Plants

• Supplemental irrigation required depending on season, location, rainfall, & adaptability of plant
• *Generally* water when top three inches of soil is dry to the touch
• Use soil probe to examine moisture in root zone
Low Water-Use Plants

- Adapted to Mediterranean-type climates & area-specific CA natives
  - Growing cycles late fall through early spring
  - Periodically requires additional summer water
  - May or may not be drought tolerant
  - Require 70 - 90% less water than high water-use plants!
• Also adapted to Mediterranean-type climates
• Some established California natives
• Rely on seasonal rainfall
• No additional summer water (except prolonged periods of winter drought)…

Once Established
High Water-Use Turf (Lawn) & Low Water-use Alternatives

- Have turf when there’s a use for it (play area, pets, sports activities)
- Reasonable size based on function
- Avoid planting trees in turf

Designer Bernadette Balics, Ecological Landscape Designs
**IF You Need Turf**

- Create **“buffer zone”** (minimum of 2’) between lawn & impervious surfaces (sidewalk, street) to reduce runoff and overspray

- Reduce size of turf
Solar Categories & Definitions
Plants for Hot Sun

- Require direct sun most of day
- Thrive under toughest conditions

Dasylirion wheeleri
Desert Spoon

Leucophyllum frutescens
Cenizo or Texas Ranger
Plants for Sun to Part Shade

- Tolerate sun all day or some shade part day

*Heteromeles arbutifolia*
Toyon, Christmas Berry

*Nepeta x faassenii 'Walker’s Low'*
Hybrid Catmint
Plants for Dry Shade

- Full to dappled shade, some morning sun
- Useful under Oaks

*Carpenteria californica*
‘Elizabeth’
Elizabeth Bush Anemone
Include Mulch in Your Plan
What is mulch & why use it?

• Any material spread evenly over the soil surface to enhance the growth of plants & appearance of the landscape.

• Many benefits!

Use THIS 👍

NOT THIS 👎
Landscape Features for Your Plan

Arbors & overhead structures provide

• Shade
• Area for relaxation
• Color
• Support for plants
Fences

Be aware of codes & setback requirements
Water Features

- Re-circulating pump (requires electricity)
- Solar powered
- Muffles sounds
- Gives cooling effect
Landscape Lighting

- Light for a reason & on target
  - Uplights accent plants
  - Downlights for shadows
- Safety & security
  - Entries
  - Steps/stairs
  - Entertaining areas

Night Pollution – Inappropriate or excessive use of artificial light
- Learn more at darksky.org
Details Reflect Your Personality & Lifestyle
Stage 4 – The Completed Final Conceptual Plan

- Professionally designed plan
- Can be hand drawn
- A simple sketch
Resources
The New California Landscape

Eco-Friendly Landscape Design Plans for The New California Landscape

FREE
Four Complete Landscape & Irrigation Plans
• 75 Plant Profiles
• Irrigation Equipment
• Guided Verbal Tours of Plans
• Interactive Designs: See plants, features, & learn about water-saving irrigation equipment and practices

Visit  Download  Learn

ecolandscape.org
A Homeowner’s Guide to a WaterSmart Landscape
Plant Resources for the Sacramento Region

www.ecolandscape.org

WaterSmart Plants for the Sacramento Region

This Plant List contains some of the most common very low, low and moderate water-use plants found in the Sacramento region.

This list is intended as a tool to participants in rebate and incentive programs for calculating the living plant coverage requirement (oftentimes a minimum of 50% plant coverage) for the converted area.

Refer to specific requirements for the rebate or incentive program for which you are an applicant to determine if you must use plants only from this list or if you can use plants from this list and plants that are not on this list.

Use of drought-tolerant, low-water-use plants, and California plant species native to this region is highly encouraged.

PLANT COVERAGE & SIZE

Plant Coverage Value
The Plant Coverage Value in square feet is for each plant at its mature width; it is the value that will be used by Program Administrators to determine the canopy coverage regardless of the size of the plant at the time of planting and/or inspection. NOTE: Tree canopy will not be used to determine the 50% plant coverage requirement for Placer County Water Agency’s Lawn Replacement Rebate Program.

WATER

Plant Water Requirements
Plant water requirements were obtained from WUCOLS IV, Water Use Classification of Landscape Species, Fourth Edition, CA Department of Water Resources, Regents of the University of California, California Center for Urban Horticulture, 2014, except where noted. Sacramento is in Region 2, the Central Valley.

Cultivars, with some exceptions, may not have been included in WUCOLS because it is presumed that...
Let’s take a break and then…
Designing Water-Wise Irrigation Systems