

The Watershed Approach To Landscaping

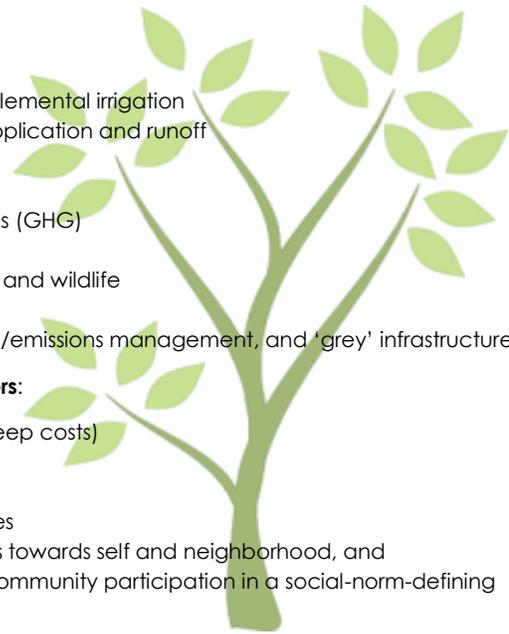
Introduction

The watershed approach is a natural approach to integrated and site-specific landscape design, construction, and maintenance that transcends water-use efficiency to address the related benefits of rainwater capture and use; reduction of pollution, green house gases, and green waste; energy and cost savings; and human and wildlife habitat improvements.

California's landscapes provide essential functions throughout our urban environment. They are where we recreate; capture and clean rainwater; recharge groundwater; shade and cool our buildings; enhance property values; provide wildlife habitat; create space to grow food locally; provide a sense of place and much more. The optimal design, installation, and management of these spaces is critical to enhancing California's quality of life while protecting our limited natural resources, capitalizing on associated economic benefits, and complying with existing and pending regulation.

The transition to the watershed approach will be a system-wide upgrade to the urban environment. In addition to reducing outdoor irrigation in these **critical drought times**, the transformation promotes multiple **environmental and economic benefits for municipalities**:

- Increased rainwater capture, storage, and use
- Decreased use of potable water for landscaping
- Decreased stormwater runoff, flooding, and stream erosion
- Increased opportunities for graywater as sparingly-used supplemental irrigation
- Significantly reduced or eliminated pesticide and fertilizer application and runoff
- Reduced "green waste" production
- Increased soil health and water retention capacity
- Reduced energy consumption and greenhouse gas emissions (GHG)
- Increased GHG capture and improved air quality
- Increased food production and habitat for beneficial insects and wildlife
- Restored native flora and fauna biodiversity
- Reduced public expenditures on water supply/quality, waste/emissions management, and 'grey' infrastructure



The transformation also promotes **benefits for individual property owners**:

- Increased cost savings (lower water bills and landscape upkeep costs)
- Reduced landscaping maintenance
- Healthier neighborhoods and communities
- Increased sense of place and appreciation for local resources
- Improved stewardship ethics and associated positive feelings towards self and neighborhood, and
- Increased shared values between neighbors via increased community participation in a social-norm-defining transformation.

Central Watershed Approach Components

The following list offers a cursory glance at three key facets of the watershed approach:

1) Living Soils

- *Compost integration* – improves soil health, productivity, water retention capacity, and carbon sequestration value
- *Mulch top-layer* – limits water lost to evaporation
- *Fertilizer/pesticide reduction or elimination* – allows critical soil microbes to reproduce and thrive, limits human and animal exposure to harmful chemicals entering landscapes, cuts landscape input costs
- *Soil de-compaction* – allows subsurface air and water flow, plant growth, and water storage

2) Water Conservation & Supply Augmentation

- *Landscape permeability* – cleans and absorbs water, recharges groundwater, limits need for supplemental irrigation
- *Rainwater capture and retention* – limits need for supplemental irrigation
- *Graywater use* – limits need for supplemental irrigation, reduces wastewater flow
- *Minimized, efficient, and climate-sensitive supplemental irrigation* – augments natural supply only when needed

3) Proper Plant Selection

- *Right Plant, Right Place, Right Time* – non-invasive, native/climate-appropriate plants selected for a specific climate and geography, spaced for mature size, and planted in the appropriate season help build soils, conserve water, and provide habitat

Transitioning to the watershed approach requires collaboration between government, non-profit, and private actors. The following are three example strategies that will help shape a state-wide landscaping transformation:

- 1) **Messaging & Branding** – unified, state-wide messaging campaign
- 2) **Regulations** – standards for turf replacement rebate programs that integrate the watershed approach
- 3) **Education & Training** – decision-maker education and landscape workforce development

Alignment with California Legislation

The watershed approach aligns closely with an array of state agency mandates to augment water supply, improve water quality/reduce runoff, reduce green waste, and sequester carbon. Specifically, the watershed approach appeals to the following legislative and policy mandates:

1. Water Conservation – Lead Agencies: State Water Resources Control Board, Department of Water Resources

Legislative Mandate – SB X7-7 20% urban water use reduction by 2020:

http://www.swrcb.ca.gov/water_issues/hot_topics/20x2020/docs/20x2020plan.pdf

Executive Order – 25% average urban water use reduction from 2013: <http://gov.ca.gov/home.php>

Over 50% of California urban water is used outdoors. The following four watershed approach landscaping principals can help the state achieve its water conservation goals: 1) enhanced soil water holding capacity; 2) on-site rainwater and graywater collection; 3) limited, efficient, supplemental irrigation; and 4) climate appropriate, water-conserving plants.

For example, soil scientists report that for every additional 1% of organic matter per acre of soil (introduced by way of compost), soil capacity to hold plant-available water increases by 16,500 gallons. The increased water holding capacity reduces irrigation requirements, as does the removal of inefficient, ineffective, and degraded irrigation systems. Similarly, climate appropriate plants, central to the watershed approach, require 50-80% less water than turf grass, limiting supplemental irrigation needs.

2. Water Quality Improvement – Lead Agencies: State Water Resources Control Board, Dept. of Pesticide Regulation

Legislative Mandate – Clean Water Act; attain and comply with MS4 Permits:

http://www.waterboards.ca.gov/water_issues/programs/stormwater/municipal.shtml

Urban runoff is the number one source of ocean pollution. Water running off our properties picks up pollutants like fertilizers, pesticides, animal waste, and fine sediment, as well as oil, brake pad dust and exhaust from cars. Runoff also contributes to flooding and degradation of stream banks. Watershed approach landscaping principles minimize and clean would-be runoff by 1) maximizing on-site water retention and percolation through landscape topography and materials; and 2) eliminating excess supplemental irrigation. Decentralized yet prevalent reductions in urban landscape runoff can help municipalities remain in compliance with their MS4 permits and save significant money on costly stormwater management measures and processing facilities.

3. Green Waste Reduction – Lead Agency: CalRecycle

Legislative Mandate – AB 341 75% solid waste to be source reduced, recycled, or composted by 2020:

<http://www.calrecycle.ca.gov/75Percent/>

Of the projected 43 million tons of waste that will be produced in California in 2020, green waste, lumber, food, and organics comprise 44% of disposal activity. Components of each of these disposal sectors can be re-purposed into landscaping materials that support living soils by reducing surface compaction, increasing water absorption and retention, and by supplying soil nutrients. Thus, central pillars of the watershed approach (e.g., mulch and compost) can help the state re-direct conventional waste streams to capture multiple landscape benefits while achieving legislative goals.

4. Carbon Sequestration – Lead Agency: Air Resources Control Board

Legislative mandate – AB 32 reduce GHG emissions to 1990 levels by 2020: <http://www.arb.ca.gov/cc/ab32/ab32.htm>

Healthy, living urban landscapes serve as a Green House Gas (GHG) mitigation strategy. Plants and trees sequester (remove) carbon from the atmosphere as they grow, reducing atmospheric carbon dioxide and slowing the buildup of GHGs. Plants also store atmospheric carbon in soils by releasing carbon compounds in the form of simple sugars that feed soil microbes. The soil microbes use those simple sugars to grow and to set up a symbiotic relationships with other inhabitants of the soil. Each time those sugars are traded, they become more complex, with more carbon atoms bonded together. More complex carbon compounds are locked more permanently into the soil. Thus, many scientists look at soil carbon sequestration as a viable means of mitigating the impact of GHG emissions.

Supporting Resources & Programs

The following programs and resources come from and represent a small sampling of the many organizations, agencies, and businesses that support the watershed approach:

Awahnee Water Principles (Local Government Commission's Water Principles)

http://www.lgc.org/wordpress/docs/ahwahnee/ahwahnee_water_principles.pdf

California Native Plant Society <http://www.cnps.org/>

California Urban Water Conservation Council (Sustainable Landscaping – Market Transformation Framework)

<http://cuwcc.org/Portals/0/Document%20Library/Committees/Programmatic%20Committees/Landscape/Resources/Sustainable%20Landscaping%20Market%20Transformation%20Framework%20-%20DRAFT.pdf>

California Urban Water Conservation Council (New Norm Landscape Symposia Report)

<http://cuwcc.org/Portals/0/Document%20Library/Resources/Workshops/Landscape%20Symposia/CUWCC%20Landscape%20Symposia%20Report.pdf>

City of Santa Monica (9-year case study contrasting a conventional yard with a native garden)

<http://www.smgov.net/uploadedFiles/Departments/OSE/Categories/Landscape/garden-garden-2013.pdf>

EcoLandscape California (River-Friendly Landscaping Green Gardener Training Program)

<http://www.ecolandscaping.org>

Friendly Brands (A series of "Friendly" themed brands promote similar sustainable water use and watershed approach landscaping values: [Bay-](#), [California-](#), [Creek-](#), [Fish-](#), [Garden-](#), [Ocean-](#), [River-](#), [Russian River-](#), [River \(Sacramento\)-](#) Friendly)

G3 - Green Gardens Group (Watershed Wise Landscape Programming & Training)

<http://www.greengardensgroup.com/programs/>

Metropolitan Water District (BeWaterWise Demonstration Gardens) <http://www.bewaterwise.com/gardens2visit.html>

Surfrider Foundation's Ocean Friendly Gardens Program (CPR: Conservation, Permeability and Retention)

www.oceanfriendlygardens.org

TreePeople (Plant Native and Climate Appropriate) <http://www.treepeople.org/plant-native-and-climate-appropriate>

The following references support claims in the above section – 'Alignment with California Legislation.'

Water Supply

<http://www.fao.org/docrep/009/a0100e/a0100e08.htm>

<http://irrigatedag.wsu.edu/soil-organic-matter-boosts-water-holding-capacity/>

http://msue.anr.msu.edu/news/compost_increases_the_water_holding_capacity_of_droughty_soils

<http://www.allianceforwaterefficiency.org/WorkArea/DownloadAsset.aspx?id=9155>

http://www.ppic.org/content/pubs/cep/EP_706EHEP.pdf

Water Quality

http://water.epa.gov/polwaste/nps/urban_facts.cfm

http://www.pbs.org/newshour/bb/environment-jan-june13-pledge_03-14/

http://socialwater.org/images/SCWC_Stormwater_White_Paper_Case_Studies.Smaller.pdf

Green Waste Reduction

<http://compostingcouncil.org/admin/wp-content/uploads/2010/09/Compost-and-Its-Benefits.pdf>

<http://compostingcouncil.org/strive-for-5/>

http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_053288.pdf

<http://www.calrecycle.ca.gov/75Percent/WhatItMeans.pdf>

Carbon Sequestration

<http://www.landlearnsw.org.au/sustainability/climate-change/agriculture/crops-pastures/soil-carbon>

<http://www.kristinohlson.com/books/soil-will-save-us>

<http://www.soilfoodweb.com/Article.html>

<http://pubs.rsc.org/en/Content/ArticleLanding/2008/EE/b809492f#!divAbstract>

<http://www.thebluecarbonproject.com/the-problem-2/>