Sustainable Garden Design

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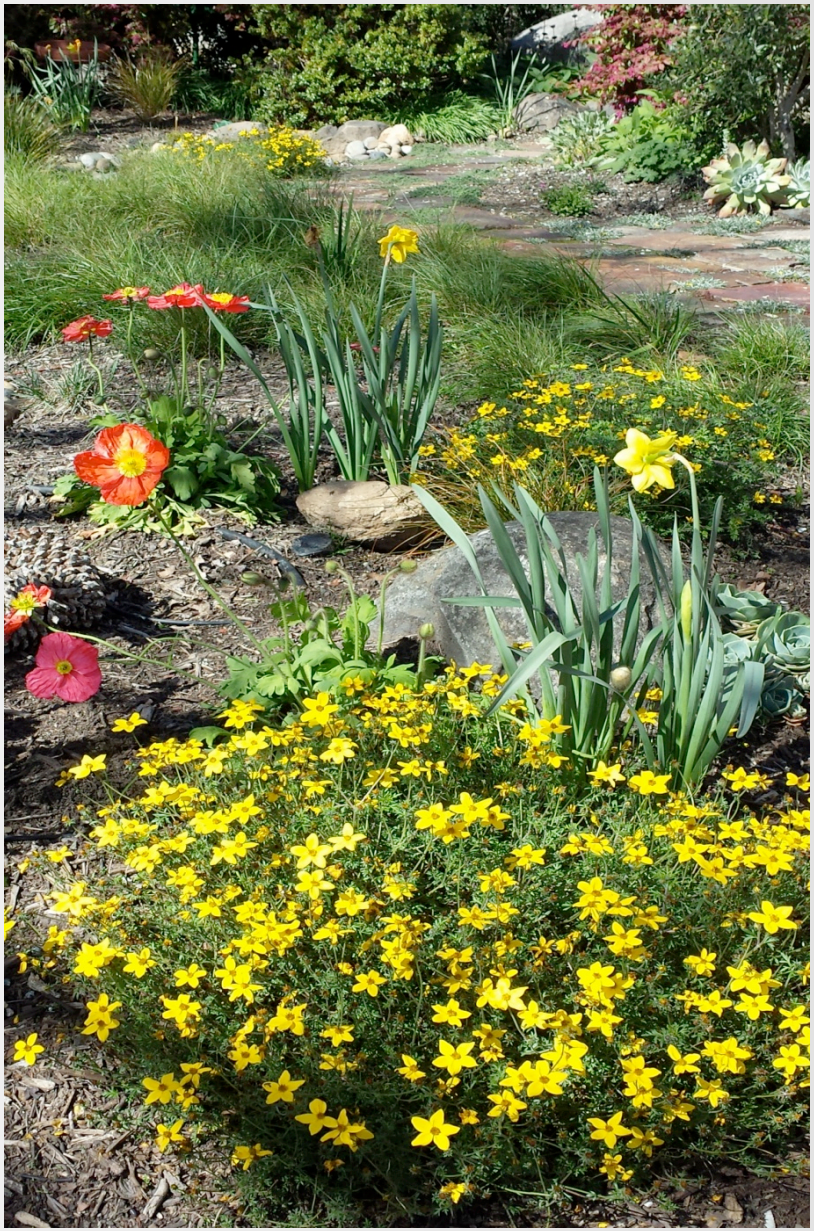
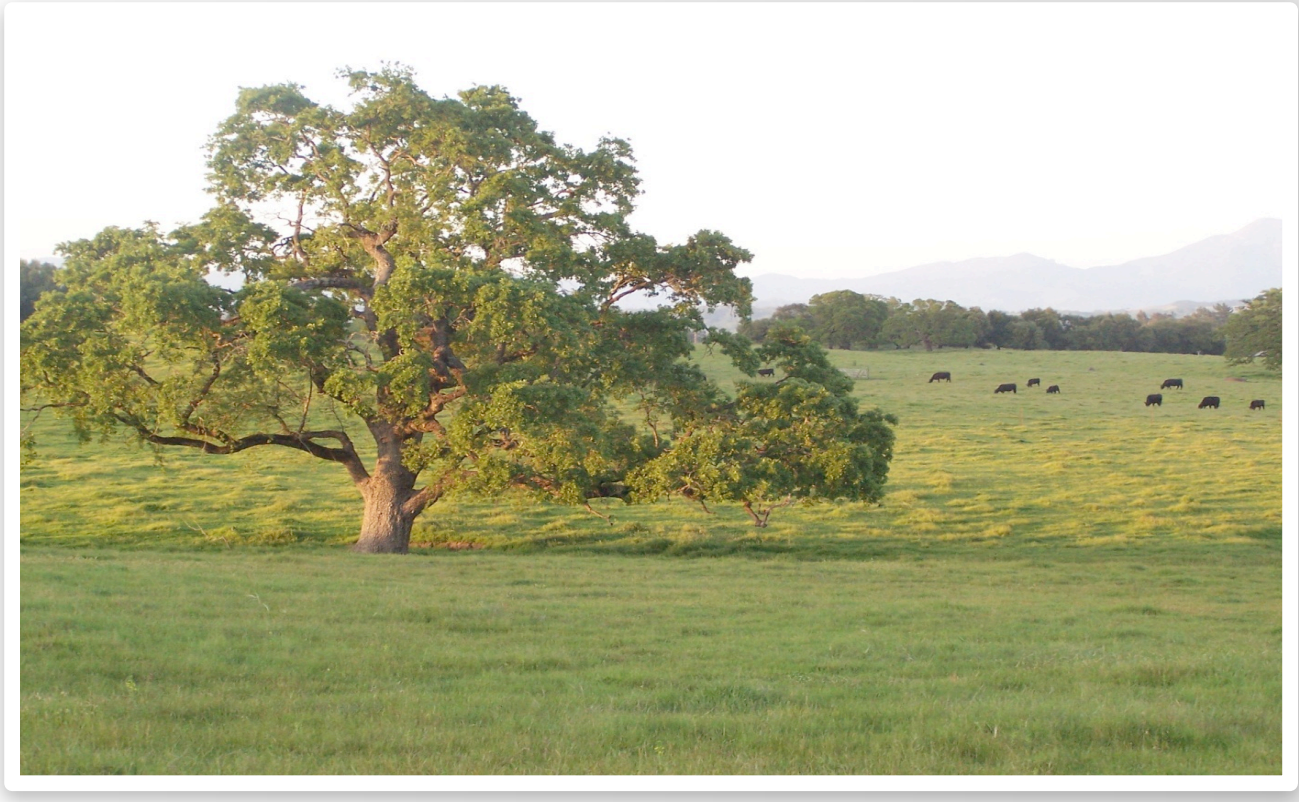
What is a Sustainable Garden?



Sustainable gardeners select plants, including edible plants, that are adapted to their climate and microclimate while implementing design & maintenance practices to conserve water, protect water quality, nurture soil, recycle organic matter, incorporate integrated pest management (IPM), protect and encourage desirable wildlife, and conserve energy.


Sustainable Home Gardening
Right Plant, Right Place
Protect & Encourage Wildlife
Incorporate Integrated Pest Management
Nurture Soil
Conserve Energy
Protect Water Quality
Conserve Water



Water and Land are Limited Resources

- In California, the predicted population growth of more than 15 million additional people by 2020 could increase urban water use by 30%.
- California's water demand already substantially exceeds available supplies.
- Native plant and wildlife diversity are threaten from habitat loss from land conversion for urban development and agricultural expansion.

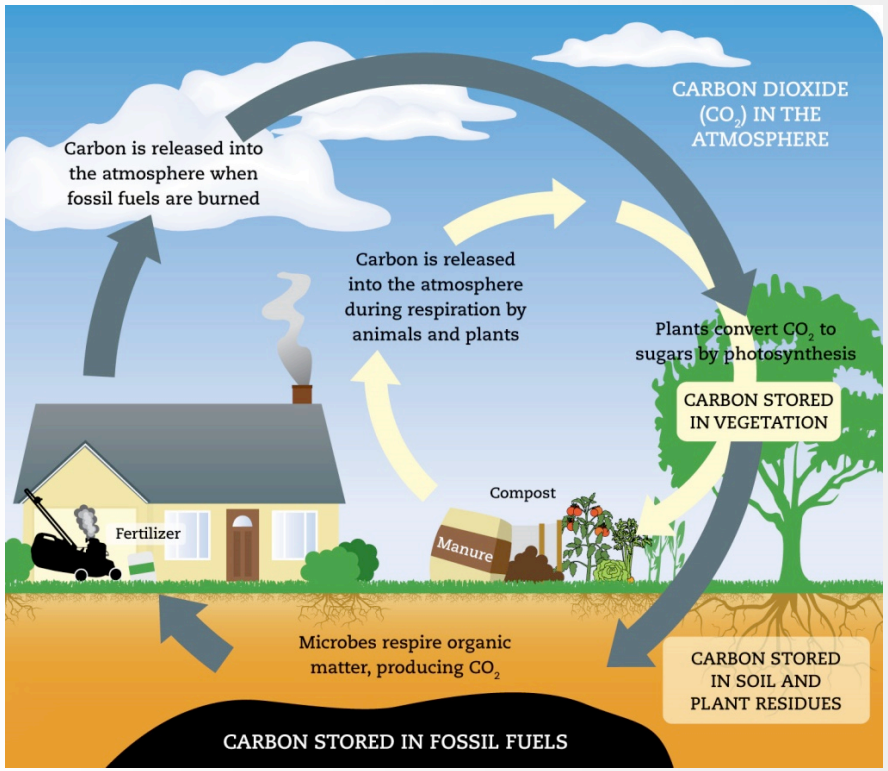
How is Water Managed Now?

- 63% of all water used in Sonoma County is for residential purposes.
- 70% of all single-family residential water use is outdoors.
- In suburban areas up to 70% of rain that falls to the ground is drained directly to the street and sewer systems.

How does this affect us?

- Pesticides and fertilizers are leached from the soil by irrigation and rainwater. The pollutants drain into our sewers ending up in our water sources and harming our habitat.
- Over use of well water and drilling deeper for water are depleting aquifers that take many years to replenish.
- Pollinator and other beneficial insects are lost to chemical use, lack of native food sources, and habitat.

Climate Friendly Gardening



Global warming is largely a result of an imbalance in this carbon cycle, due to the release of vast quantities of ancient carbon that have been burned as fossil fuel.

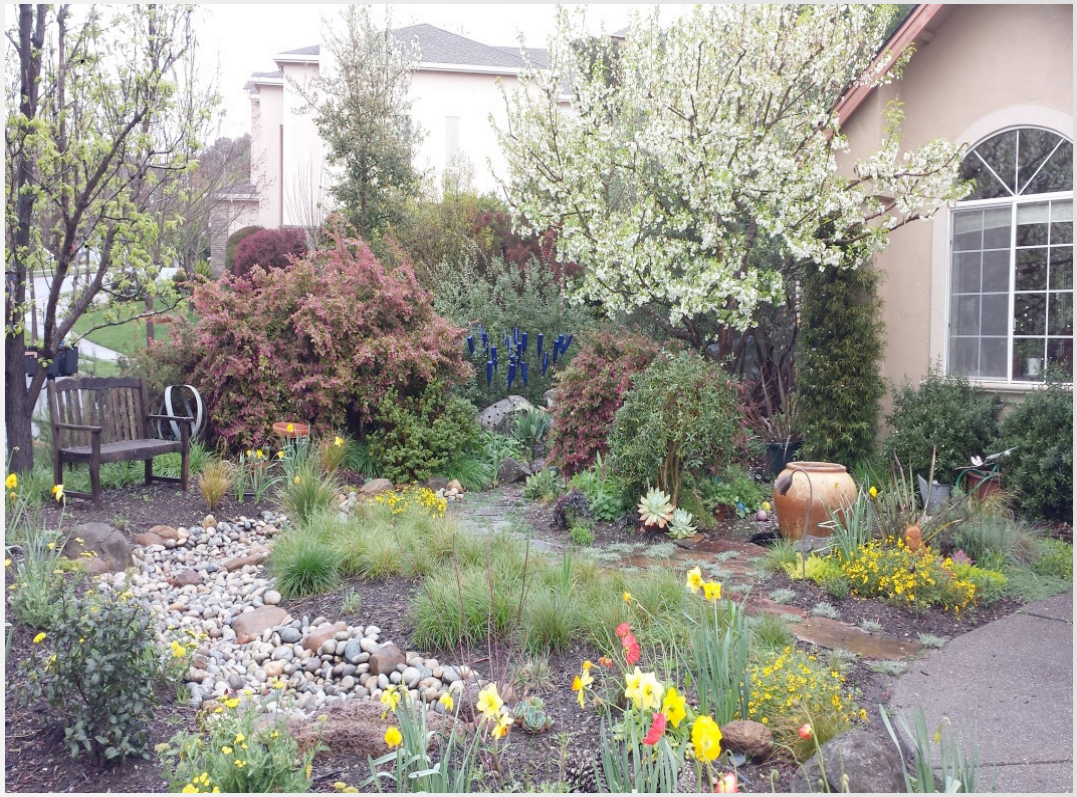
1. Choose low-emission garden products and practices (use electric equip., no fossil based chemicals).
2. Don't leave garden soil naked (mulch).
3. Plant trees and shrubs (shade, traps CO 2).
4. Recycle yard and food waste (compost, not landfill).

Front Garden Before

- Lawn used high amounts of water. Water costs are increasing.
- Required weekly mowing, and seasonal fertilizer and herbicide to control weeds which leached into street and water systems.
- Didn't provide diversity and habitat for wildlife and pollinators.
- Moles created unsightly mounds and killing off patches of grass.
- Lawn was unused by family.
- Check with county or city offices for lawn removal rebates.

Front Garden After

- Dry stream collects roof water and drainage from back yard to create a water shed, recharging the ground water.
- Lawn was replaced by smaller meadow watered by subsurface drip irrigation.
- Added California native plants and plants with year round interest.
- Moles are still present but are not an issue any more.
- All leaf litter is used on site as mulch. Composing leaves feed the soil microbes, which feed the plant roots.
- The new design is more interesting and less maintenance.



Remove Lawn with Sheet Mulching

Sheet Mulching
after planting

One year later

Sheet Mulching

4-6” Composed mulch over cardboard, add water to start composing process

Plant directly in composed material.

Rain gardens collect rain water runoff from rooftops and paved surfaces on site to recharge groundwater aquifer. Plants like Juncus and grasses help filter water of pollutants.

Rain Water…

Slow it and Sink it


555

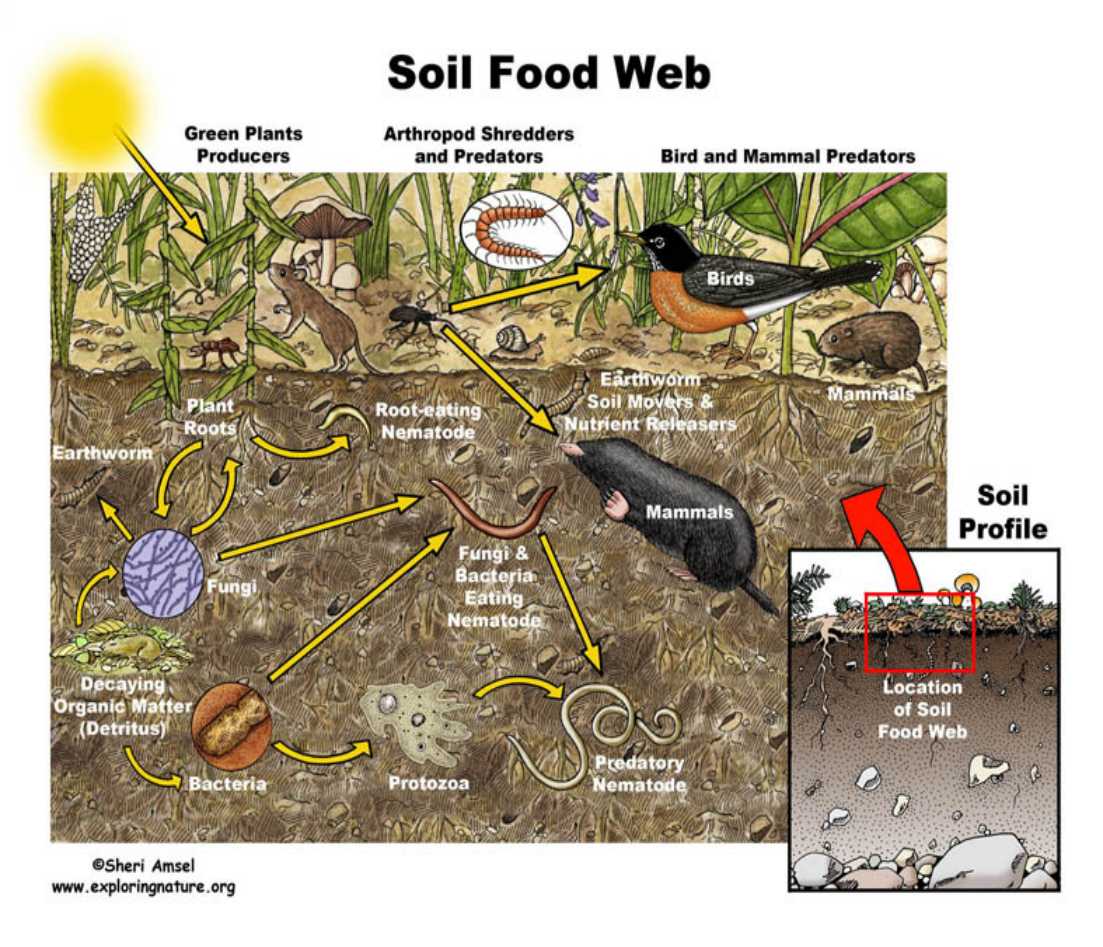
Building a Dry Stream

Permeable Paving

Allows rainfall to percolate down to plant roots and prevents runoff that can clog storm drains and pollute our rivers and lakes.

Adding compost (decomposed plant material) feeds the soil. Microorganisms (Bacteria, Protozoa , Nematodes and Fungi) in the soil work together to provide nutrients to plant roots. Microbes thrive when compost, oxygen, and water are available in the soil. Living soil holds more water and filtrates pollutants.

Nutrient rich living soil = oxygen +water + life (OWL)



Right Plant, Right Place

Place plants with mature size in mind and consider soil, light and water requirements.

Crimes against Horticulture

Allow spaces for plants to grow to mature size.
Shearing is not a sustainable solution.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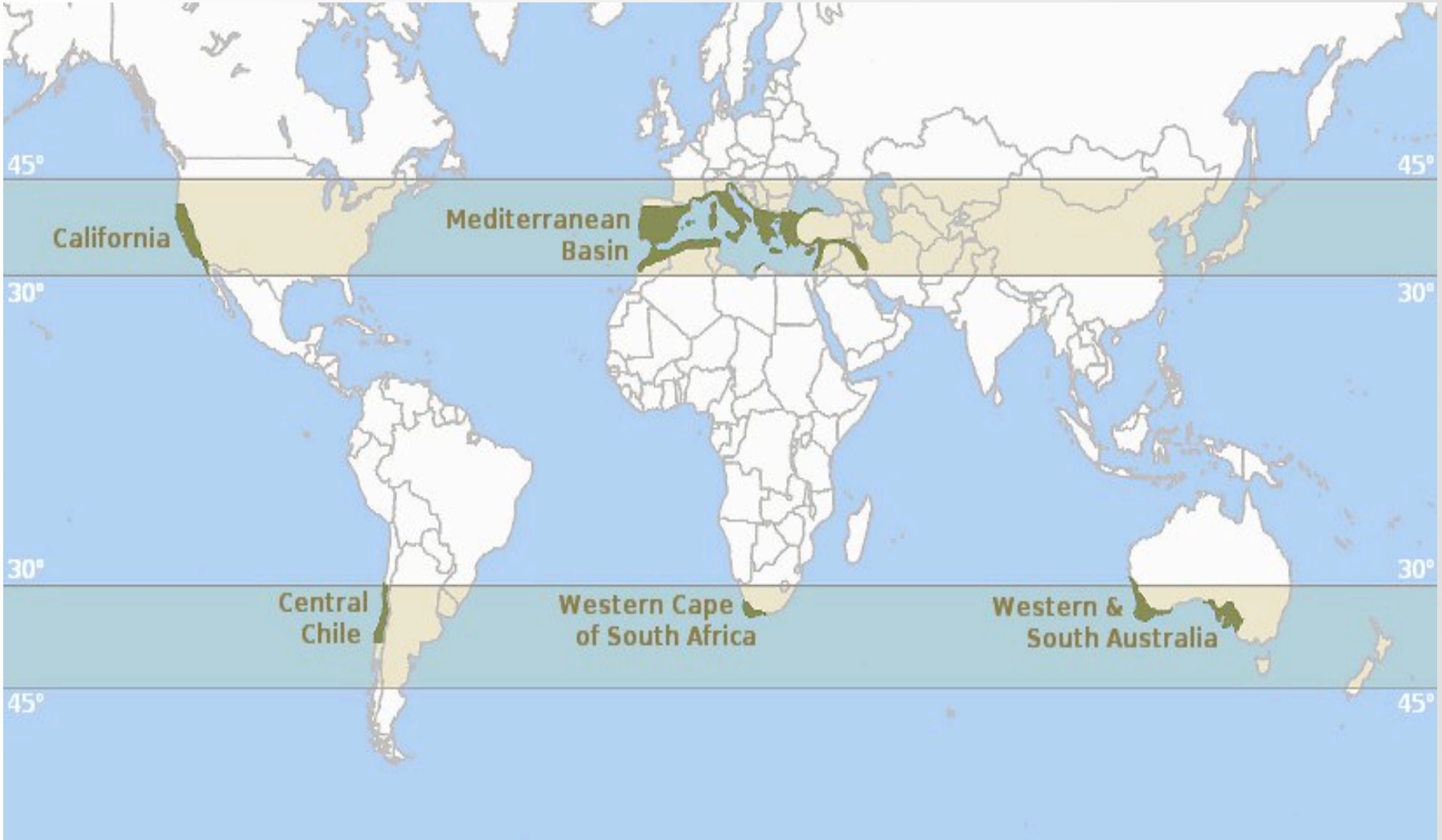
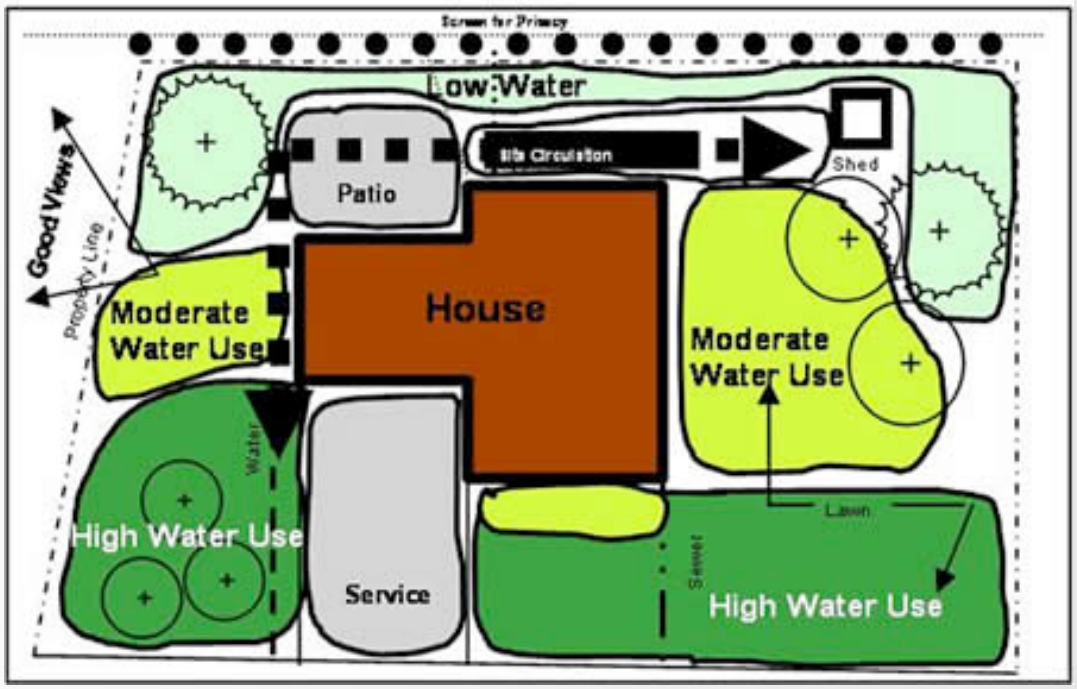
Mediterranean Climate Zones



Design Plants and Irrigation with Hydro-zones in Mind



Grouping similar water need plants together and using separate valves to maximize efficiency and plant health.

Plant with Diversity for Pollinators

Growing a diverse selection of trees, shrubs and flowers provides food sources and shelter for a variety of wildlife from birds and lizards to beneficial insects. Biodiversity helps landscapes resist disease and insect pests.

Habitats are being lost to development. Lawns and pruned shrubs don't provide food sources.

Heat Island Effect

Not useful for Pollinators, Soil Microbes or Watershed

Mixed Meadow

Carex pansa spaced about 12" o.c. Grows 8 -12 inches tall and spreads by rhizomes to form dense colonies of curling dark green foliage.

Meadow also includes Douglas Iris, Carex tumulicola, Verbena bonariensis 'Little One', Pennisetum orientale, Achillea 'Coronation Gold', Bidens

Plant Selection

Rhamnus californica 'Leatherleaf'

Carex testacea

Ceanothus ‘Diamond Heights’

Bidens

Verbena lilacina

Arctostaphylos ‘John Dourley’

Penstemon heterophyllus

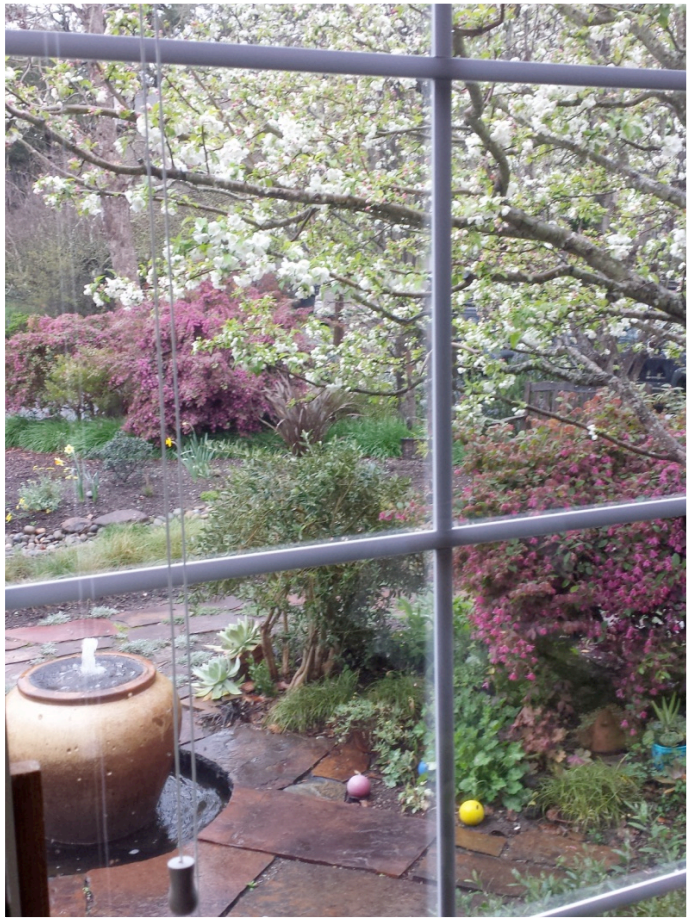
Epilobium ‘Everett’s Choice'

Plant Trees to save Heating and Cooling Costs

Plant deciduous trees on the west and east side of your house to cool in summer.

Plant evergreen trees on the north and northwest sides of your house to block cold winter winds.

Tree Placement

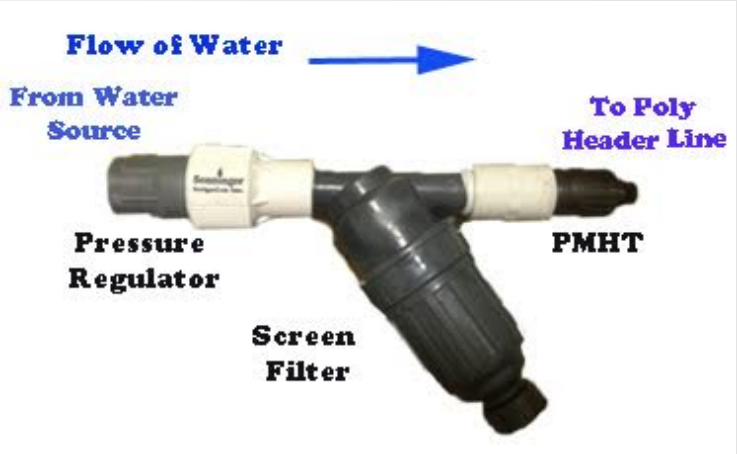


This Crabapple is located on the west side of the house, offering cooling shade in summer, in the winter it drops it's leaves to allow light, and in spring the flowers are a beautiful sight.

Allow space for a tree to grow to maturity don't place a tree under a roof overhang to avoid the need for constant pruning.

Drip conversion from Spray

Add a pressure regulator and filter.

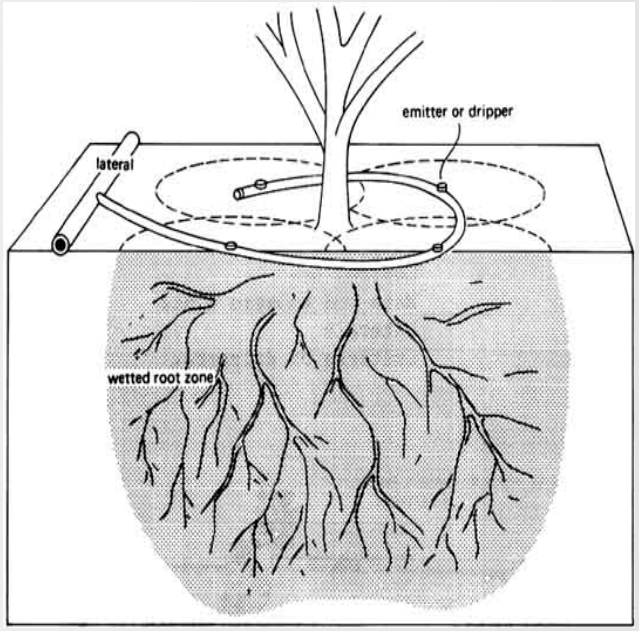


Inline Drip added to Meadow

Closed loop using ½" drip line connected on both sides of ¼" inline tubing spaced about 8" apart. Water is evenly distributed across the whole area. The meadow is on a separate valve from the shrubs and trees.

Inline Drip

Drip Irrigation for Shrubs



Drip Irrigation and Smart

For standard automated controller adjust the amount of water at least each season and turn off in winter.

Irrigation Controller scheduling recommendations go to:

Water Smart - City of Santa Rosa
http://srcity.org/departments/utilities/conserve/Pages/WaterSmart.aspx

Weather based controller with moisture sensor is

30-70 % more efficient than automatic controllers since they water only as needed based on climate conditions.

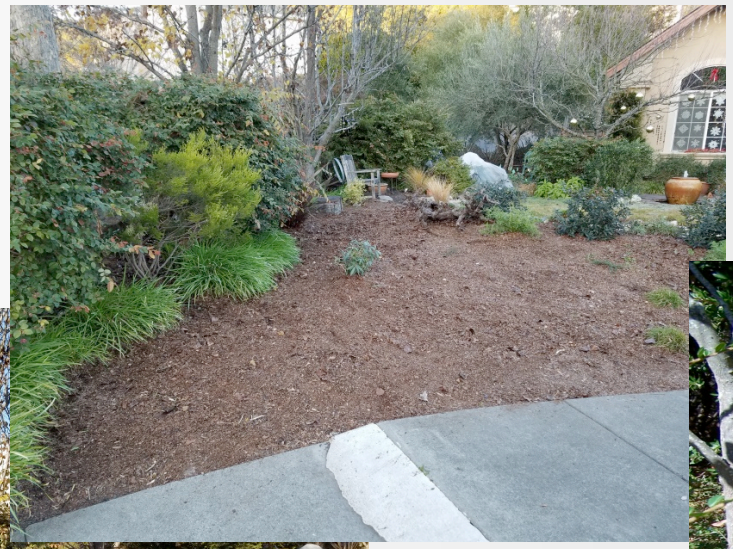
Grey-water

- Laundry system needs to follow guidelines set by city water department. Check local guidelines.
- Grey-water must be contained on site.
- Outlet of the system to be in covered with at least 3" of permeable material like rock or mulch.

Water Storage

Maintain mulch to a minimum depth of 3/4”

Mulch can be any material that protects soil surface and allows air and water through. Leaf mulch provides nutrients as it decomposes. Organic mulches also improve soil texture and water holding capacity.



Growing your own food

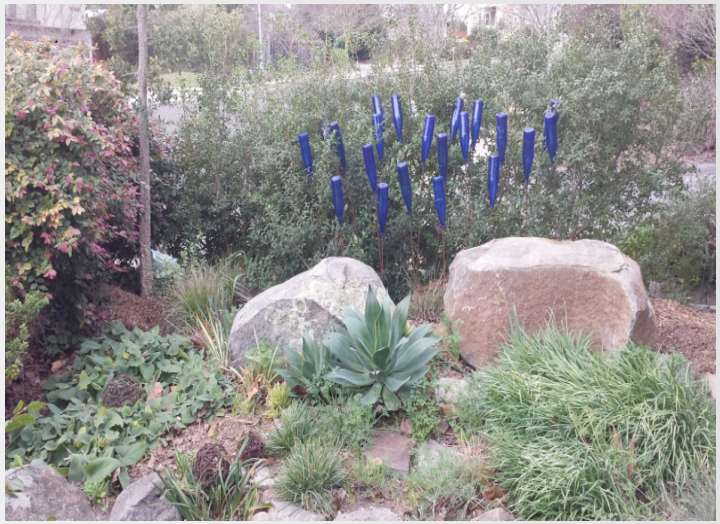
is sustainable gardening

Create a Habitat Garden

Invite Pollinators and Beneficial Insects by…

- Providing year round food sources
- Cover and shelter
- Water source
- Using organic gardening practices

Reuse, Repurpose Materials



Sustainable Design in Review

- **Remove or reduce lawns**, choose a meadow or large scale ground cover.
- **Slow, spread and sink rainwater** on site, create a rain garden water shed and use permeable paving.
- **Feed the soil,** add compost. Oxygen, Water and Life = OWL
- **Hydro-zone plants,** group similar need plants, use a separate valve for each zone.
- **Right plant, Right place,** use native or climate appropriate plants that provide biodiversity, food sources and habitat for wildlife.
- **Efficient drip irrigation**, monitor timer seasonally.
- **Mulch 3-4" depth** to hold soil moisture.

For more information

- Sonoma County Master Gardeners website,
  http://ucanr.org/sites/scmg/
- Russian River Friendly Landscape Guidelines
  http://www.rrwatershed.org
- Sonoma & Marin Water Smart Plant Guide
  www.sonoma.watersavingplants.com
- Irrigation schedule for City of Santa Rosa
  Search Water Smart (aka turf time) city of Santa Rosa

http://srcity.org/departments/utilities/conserve/Pages/WaterSmart.aspx