



Principles of Integrated Pest Management to Maintain Landscapes Sustainably

Santa Clara Valley Urban Runoff Pollution Prevention Program

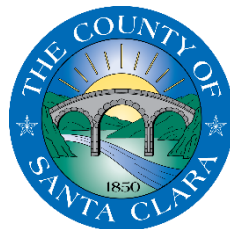
Webinar, May 25, 2021

Naresh Duggal, Manager-IPM
County of Santa Clara

Naresh.Duggal@ceo.sccgov.org

Web site: <http://IPM.sccgov.org>

Sustainable Landscape Management:
<https://www.sccgov.org/sites/slm/Pages/Home.aspx>



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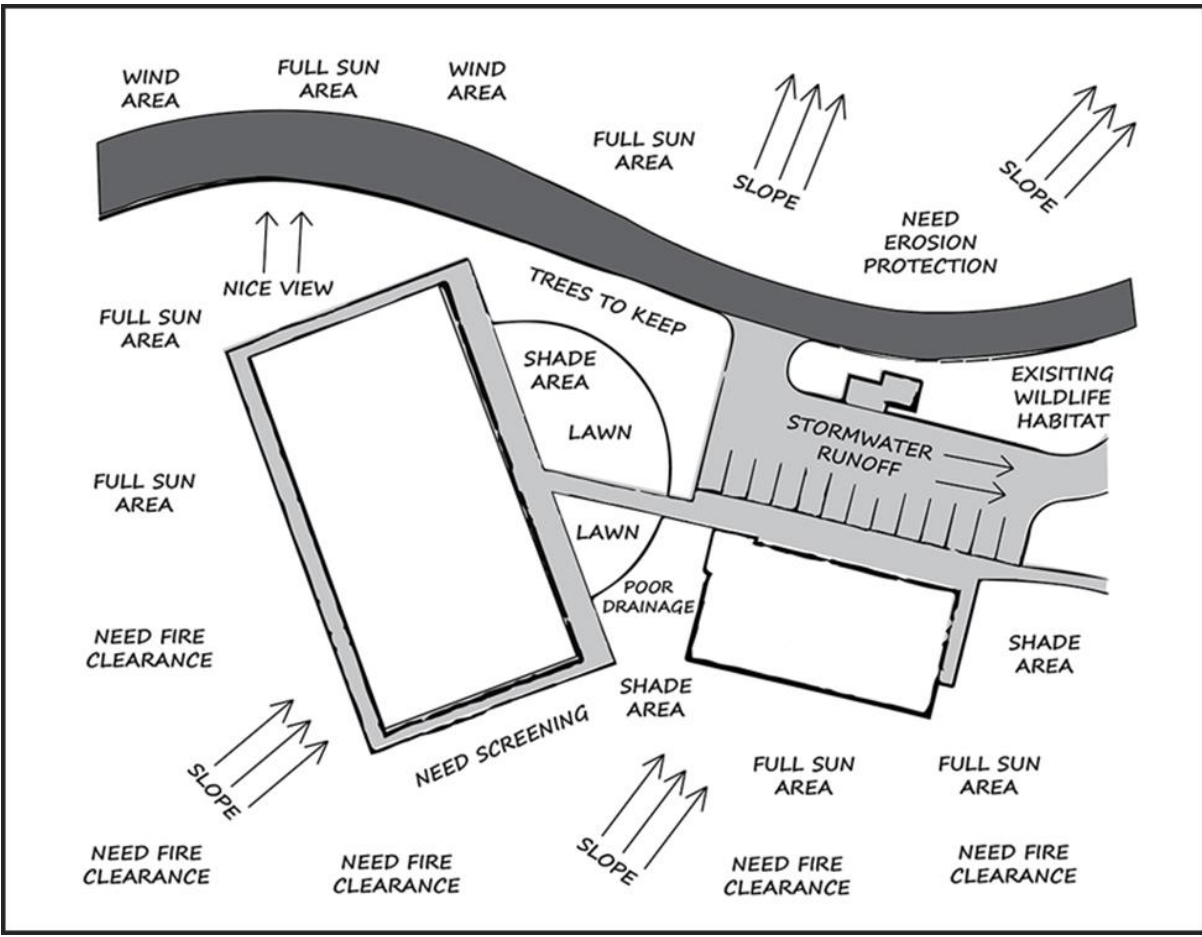


IPM is a holistic approach to control insects, plant diseases, weeds, and other pests through

1. Pest Prevention by Design and Maintenance Approach
2. Correct Pest or Symptom Identification
3. Regular Surveying for Pests
4. Develop Action Thresholds
5. Apply Appropriate Management



Principle 1: Pest Prevention By Design & Maintenance Approach



Pink Flowering Currant
Ribes sanguineum glutinosum



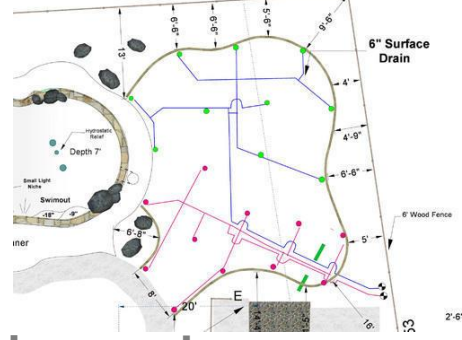
California Poppy
Eschscholzia californica



Yarrow
Achillea millefolium

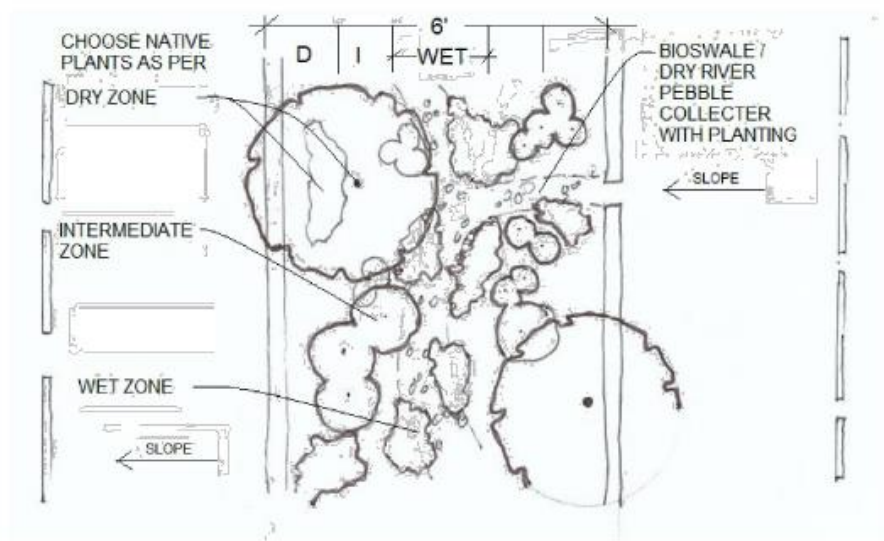
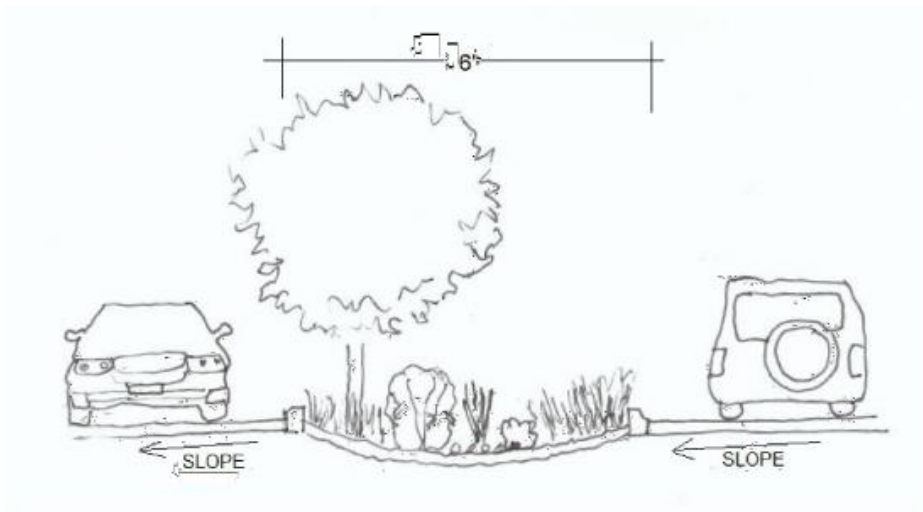


Idaho Fescue
Festuca idahoensis



Incorporating maintenance considerations into landscape designs reduces any future pest problems that might arise from inadequate maintenance staffing or resources.

Principle 1: Pest Prevention By Planting Design & Plant Selection



6' BIO SWALES - TREES, SMALL SHRUBS/ GROUND COVER & TALL GRASSES

LANDSCAPE CONCEPT PLAN/ SEC : 6' VEGETATED SWALES

Principle 1: Pest Prevention By Treatment of the Interface Between Different Elements of the Design



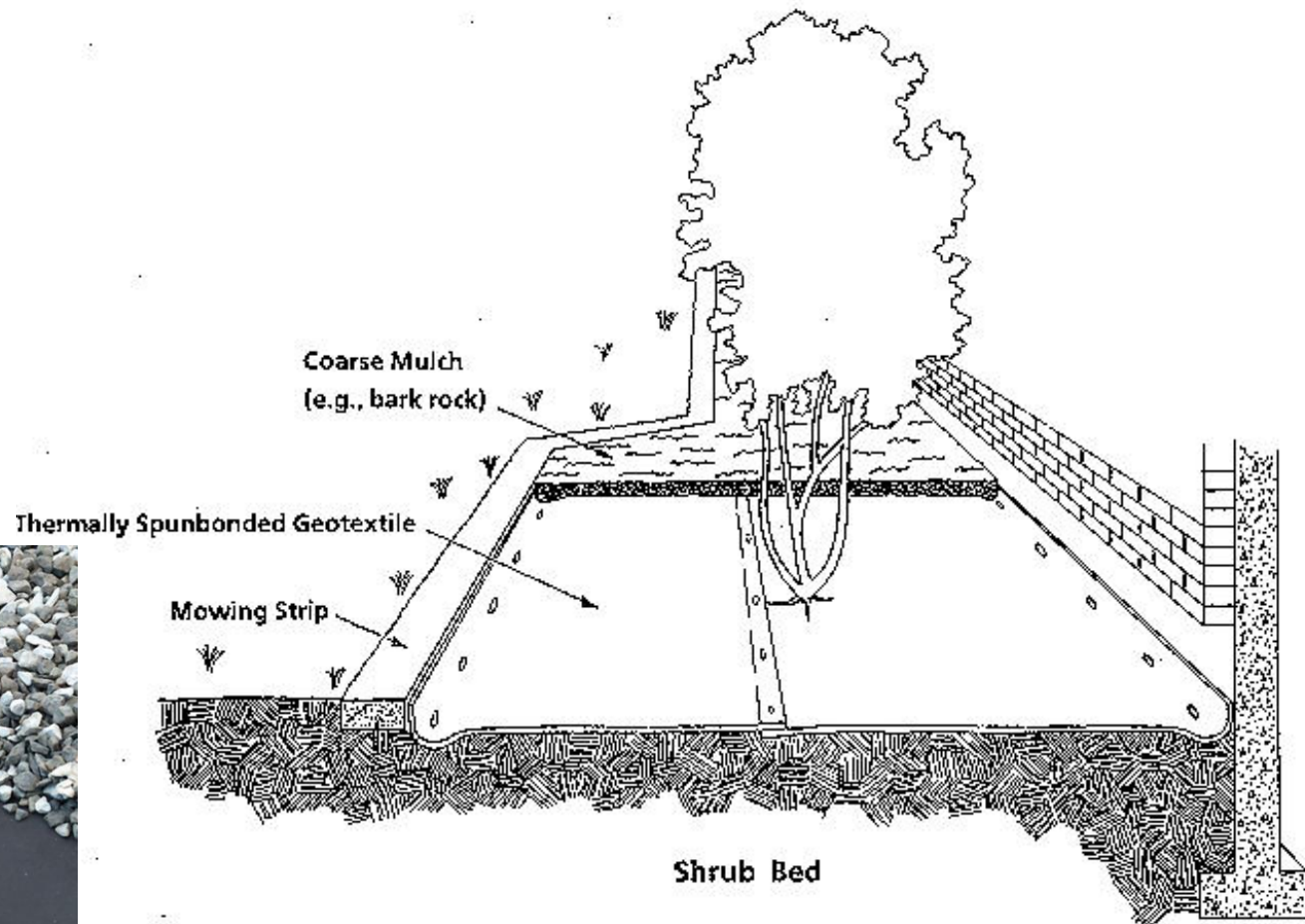
Principle 1: Pest Prevention By Mowing Strips and Underlayment

- Mowing Strips/Underlayment
- Tree Wells
- Walkways
- Payment Edges
- Trash Receptables
- Signage/Electrical Poles



Principle 1: Pest Prevention By Use of Geotextiles for Weed Control, Material Separation, and Surface Stabilization

- Weed abatement
- Filtration
- Drainage
- Reinforcement
- Protection



Physical barriers, fabrics, and mulches of various kinds can prevent weeds, insects and mammals from becoming pests in the first place.

Principle 1: Good Construction Practices



Preventing soil compaction reduces invasive exotic weed infestations and the development and spread of biotic (phytophthora, armillaria) and abiotic (oxygen depletion, water logging) diseases.

Principle 1: To Learn More About Pest Prevention By Design and How to How To Design Biodiverse Landscapes Refer To Following Guides:



Pest Prevention by Design - Landscapes

Authoritative guidelines for
designing out pests



SF Environment
Our home. Our city. Our planet.
A Department of the City and County of San Francisco

https://sfenvironment.org/sites/default/files/fliers/files/sfe_th_ppbd-landscapes_030320.pdf



Designing Biodiverse Urban Landscapes on Google's Campus

Thursday, April 29, 2021 | 10:00 - 11:30 AM

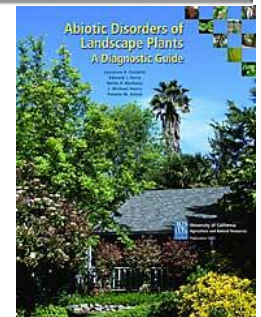
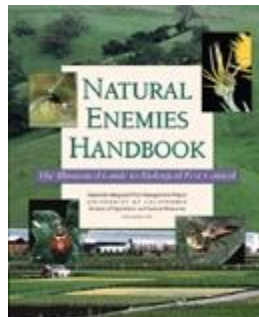
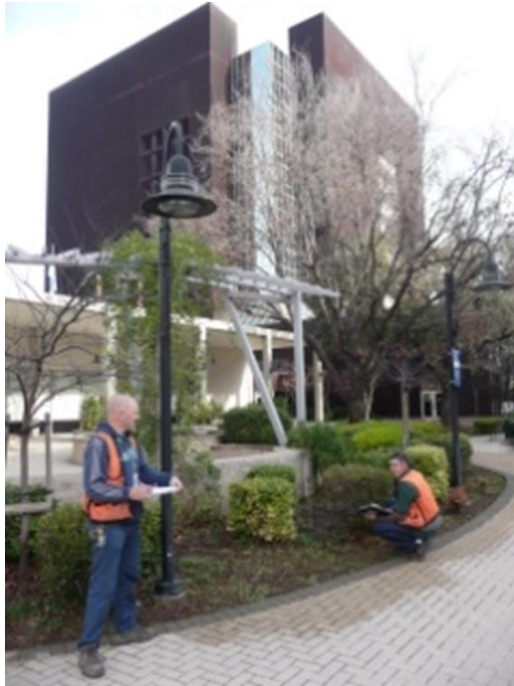
The landscape of the Google campus offers more to Silicon Valley than aesthetics. Google's Ecology program, launched in 2014, aims to expand wildlife habitat, withstand the effects of climate change, and restore ecological functions of the landscape lost to development. The program has supported efforts to "re-oak" Silicon Valley with native valley oaks and expand the footprint of vanishing willow groves by creating new habitats across the campus.

Learn about Google Ecology's science-based, collaborative approach to restoration, as well as public resources available for similar projects in the region.

▶ WATCH THE WEBINAR

<https://canopy.org/more-trees-please/designing-landscape-resilience/>

Principle 2: Correct Pest or Symptom Identification is Essential



Principle 2: Ensure to differentiate between Weeds and Desired Turf Grasses



Principle 2: Ensure to differentiate between Pest Damage and Abiotic Disorders



Dry appearance of lawn due to dull mower blade

Dull mower blades



Thin edges, irregular patches, yellowing grass

Nutrient Deficiency



Edge of lawn burned by excess fertilizer

Excess Fertilizer burn



Grass killed by glyphosate herbicide

Herbicide burn



Dark ring

Turfgrass killed by dog urine; note dark green ring

Dog Urine



Weed invasion and puddling due to overwatering

Puddling



Thin spots and bare areas caused by shade

Shade



Compaction caused by high traffic

High traffic



Browning of turf from being cut too low

Uneven mowing scalp



Sprinkler head



Stripes in lawn due to uneven fertilizer application

Uneven fertilization



Damage from soccer ball

Damaged area caused by item left on the lawn

Areas under items

Principle 2: Ensure to differentiate between Good and Bad Bugs; and Save Good Bugs

GOOD BUGS (Beneficials)



Ladybug



Praying Mantis



Predatory Nematode



Spider Mite Predator



Whitefly Parasite



Whitefly Predator



Thrip Predator Mite



Pirate Bug

Meet the Beneficials: Natural Enemies of Garden Pests

Predators hunt, attack, and kill their prey. Encourage these natural enemies by avoiding pesticides that kill them, choosing plants that provide them pollen, nectar, and shelter, and keeping ants out of pest-infested plants. Common predators that eat garden pests are pictured below.



Coverage lady beetles prefer to eat aphids but sometimes eat armitides and other soft-bodied insects. (From left are the adult lady beetle, larva, and cluster of eggs.)



Green lacewing adults eat larvae, eggs, and small insects. Some species also eat mites.



Green lacewing larvae feed on aphids, eggs, and small insects, especially aphids.



Green lacewing eggs are laid on female adults in groups (as shown here) or individually.



Predaceous ground beetle adults eat soft-bodied insects, such as caterpillars and root maggots.



Predaceous ground beetle larvae live on soil and in litter, feeding on ground and insect larvae.



Assassin bugs attack almost any insect.



Pirate bugs attack mites and any tiny insect, especially thrips.



Damsel bugs are predators on a wide variety of small insects.



Soldier beetle adults eat mostly aphids, but larvae eat soft-bodied insects.



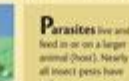
Spiders, including the crab spider, attack all types of insects.



Parasitoid fly (flower fly, hover fly) adults eat pollen and nectar.



Parasitoid fly larvae eat mostly aphids but also soft-bodied insects.



Some parasitoid fly eggs are laid on insects that parasitize other insects.



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Parasitoid wasps attack mostly mites.



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Adults of predatory wasps, such as this paper wasp, prey on caterpillars and other insects.



Praying mantids don't control pests, because they eat both beneficials and pests.



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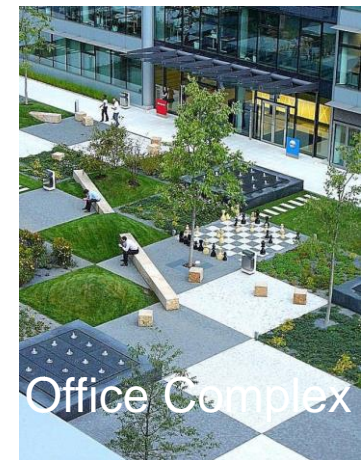
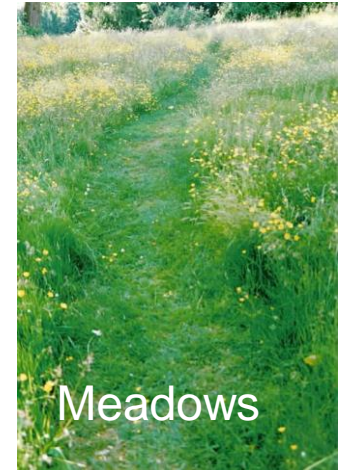
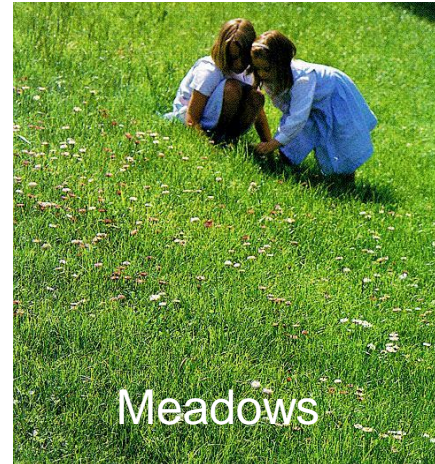


Parasitoid wasps attack mostly mites.

Principle 3: Conduct Regular Surveys for Pests






Principle 4: Establish Standards and Thresholds



Overall, a landscape has to be functional, maintainable, environmentally sound, cost effective, and visually pleasing

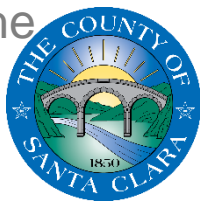
Principle 5: Apply Appropriate Management

		CULTURAL
		PHYSICAL
		MECHANICAL
		CHEMICAL
BIOLOGICAL		
BIORATIONAL		
LEGAL		
EDUCATIONAL		

Principle 5: Sanitation-Plan for cleaning equipment



In situations where equipment is frequently transported between management sites, such as municipal parks, removing seeds and other plant material from the equipment can greatly reduce the spread of invasive weeds.



Principle 5: Sanitation - Plan for frequent refuse removal



- Removing refuse before it attracts pest populations will reduce pest activity in the vicinity of the garbage containers. Increased sanitation has the potential to reduce pest populations on the entire site.



Principle 5: Proper Use of Pesticides



For Proper Use of Pesticides, Refer to UCANR Guide:
<http://ipm.ucanr.edu/WATER/U/watqual.html>



Practice Principles of Integrated Pest Management to Maintain Landscapes Sustainably

Remember, implementing IPM principles and practices can lead to

- ✓ More attractive landscape
- ✓ Easier maintenance
- ✓ Lower water, waste, and energy bills
- ✓ Better storm water detention and filtration
- ✓ Better air and water quality
- ✓ Better habitat for wildlife and people
- ✓ High community and property value
- ✓ little or no chemical input



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