EAST BAY MUNICIPAL UTILITY DISTRICT

EBMUD
Landscape Advisory Committee
General Meeting

Sheet Mulching for Professionals and Other IPM Tips

June 13, 2022

Kristin Bowman, EBMUD Water Conservation
Chris Geiger, Lacewing Collaborations, LLC

Kristin Gallego, Artistic Turf
Loren McIrvin, Allied Landscape
Suzanne Bontempo, Our Water Our World

Announcements

Landscape Rebates - Standard, Super, Median, Irrigation Upgrades

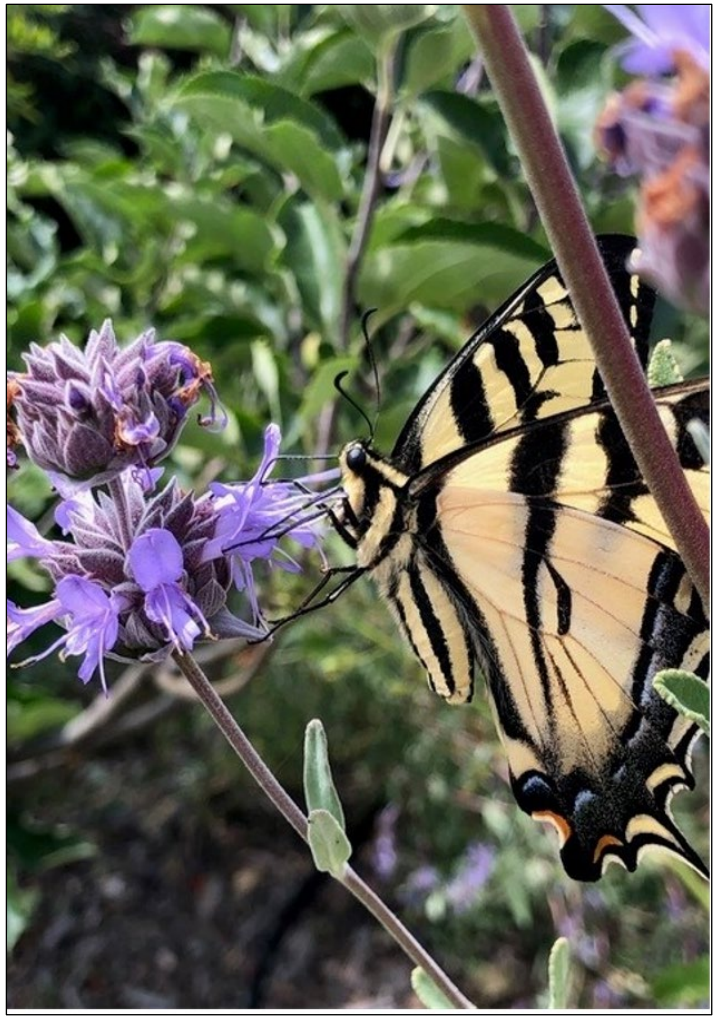
Virtual Landscape Rebate Office Hours - 12noon and 5pm Tuesdays **(ebmud.com/watersmart)**

Qualified Water Efficient Landscaper Training (online)
Mon. June 20, 6-8:30pm (Mon-Thurs for two weeks)

19th Annual Water Conservation Showcase - free/virtual
July 20, 27, August 3 and 10

Garden Photo Challenge – Single Family, HOAs and CII – TBD
Payback Calculator – LAC Project Committee/EBMUD
Landscape Design Assistance Program – TBD

EBMUD Watersmart Garden Youtube Channel (English and Spanish)

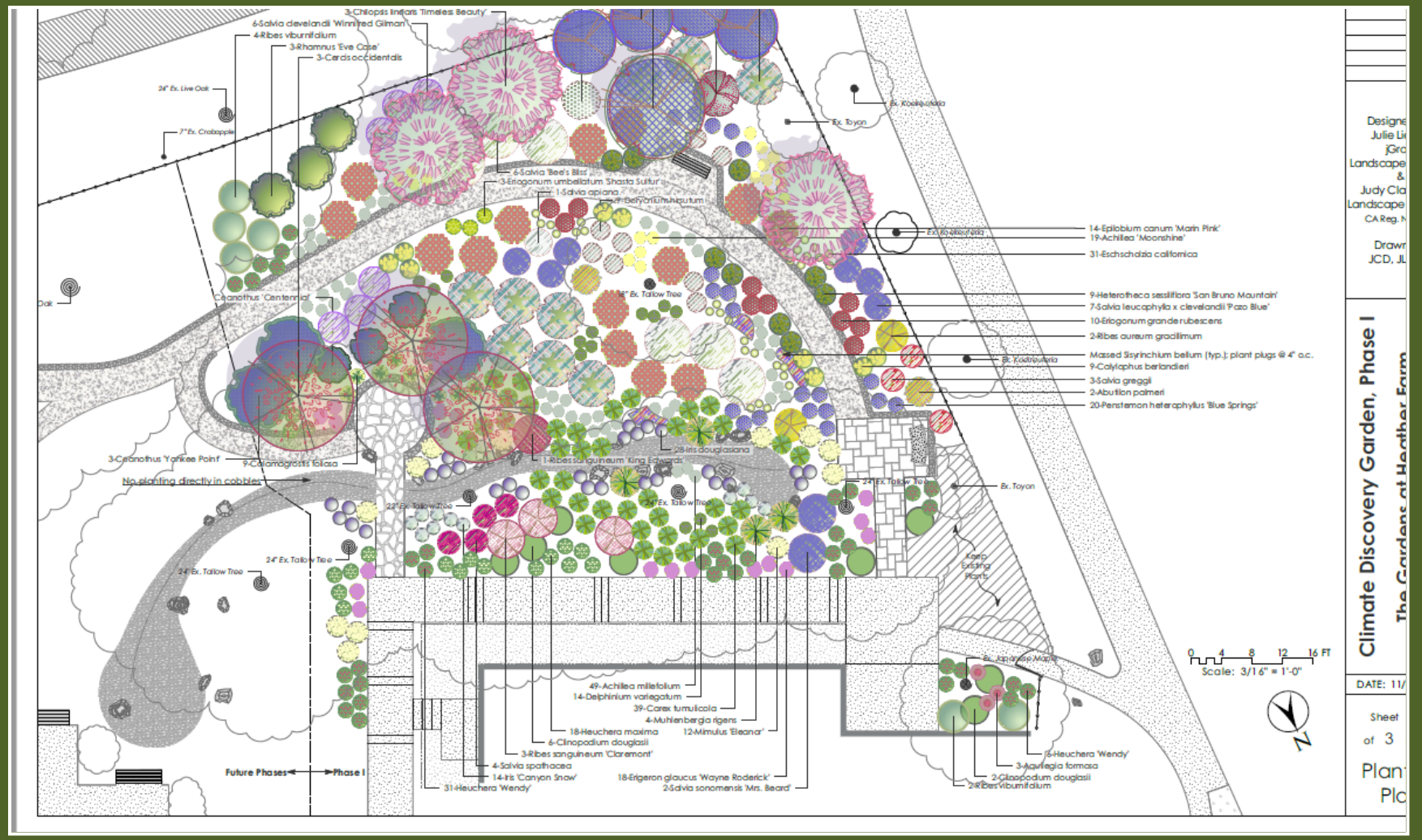


Gardens at Heather Farms

Climate Discovery Garden

15,000 sf garden to demonstrate regenerative gardening practices to the community

https://gardenshf.org/climate-discovery-garden/



EBMUD Drought Stage 2

- Mokelumne River watershed, driest Jan-March on EBMUD record
- Mandatory 10% water reduction District-wide
- 8% drought surcharge on water used (starts in July)
- Section 28 water use restrictions found on **ebmud.com/drought**
  - No more than 3 non-consecutive days of irrigation
  - Irrigate between 6pm and 9am
  - No irrigating public turf median strips
- Excessive use penalty in effect – above 1646 gallons/day residential. Fine $2/unit above threshold (unit = 748 gallons)
- State Water Resources Control Board – ban on watering non-functional turf. Does not apply to residential. Starts June 16.
  https://www.waterboards.ca.gov/water_issues/programs/conservation_portal/regs/docs/emergency-reg-faq-june-22.pdf

Water Production 2022 vs 2020 Comparison

Monthly Comparison CY2022 vs 2020 Baseline Demand, June 12

**Italicized numbers for the current month indicate a to-date comparison with baseline year, otherwise monthly data are totals*

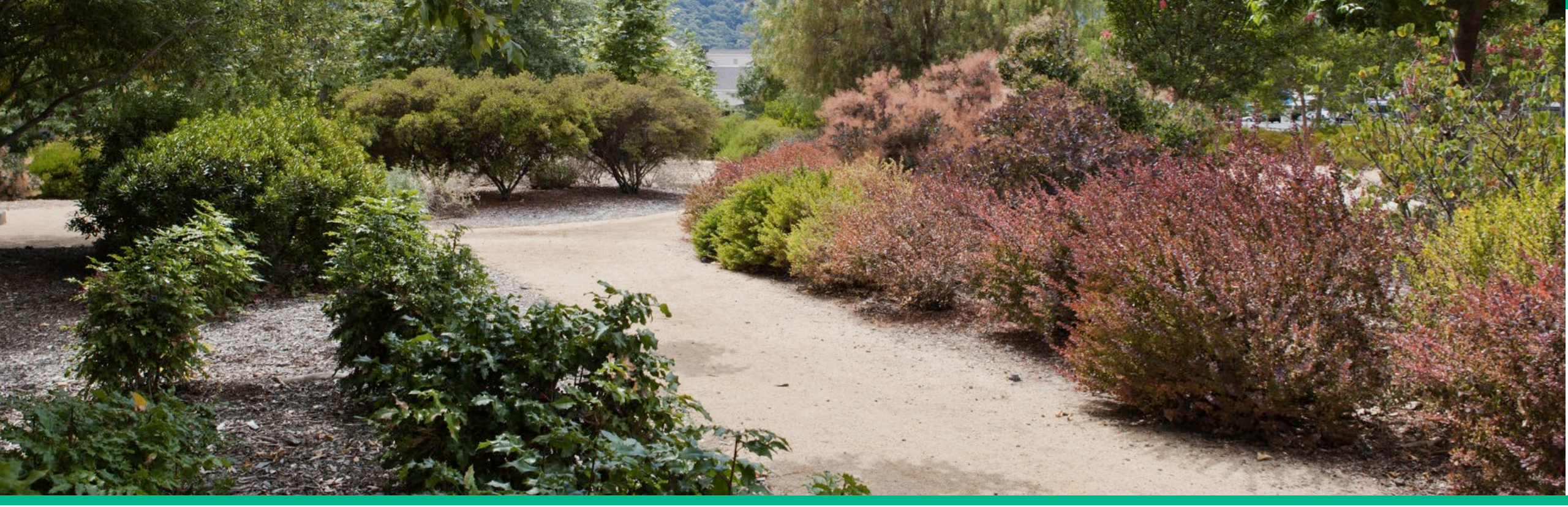
	Gross Water Production (mgd)											
	Jan-22	Feb-22	*Mar-22*	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22
Actual	123	139	145	146	165	*173*	-	-	-	-	-	-
WOH 2022	98	105	107	109	116	*118*	-	-	-	-	-	-
EOH 2022	25	34	38	37	49	*55*	-	-	-	-	-	-
2020 Baseline Demand	123	141	143	148	175	*198*	210	211	200	185	153	135
WOH FY2020	98	108	109	109	121	*133*	137	137	133	125	112	104
EOH FY2020	25	33	34	39	54	*65*	73	74	67	60	41	31
% Change	0%	-1%	1%	-1%	-6%	*-13%*	-	-	-	-	-	-

Sheet Mulching for Professionals and Other IPM Tips

Panelists

- Chris Geiger, Ph.D. – Lacewing Collaborations, Formerly San Francisco Department of the Environment Green Purchasing and Integrated Pest Management, Program Manager
- Kristin Gallego, Artistic Turf Owner and incoming CLCA President
- Loren McIrvin, Allied Landscape Owner, CLCA President
- Suzanne Bontempo, Our Water Our World Program Coordinator, Plant Harmony, Owner

CEU'S available - ReScape, QWEL, Master Gardeners, AWWA



Introducing Pest Prevention by Design for Landscapes

EBMUD, 6/13/22

Chris Geiger, PhD

Lacewing Collaborations LLC

SF Environment

Our home. Our city. Our planet.

A Department of the City and County of San Francisco

Pest Prevention by Design

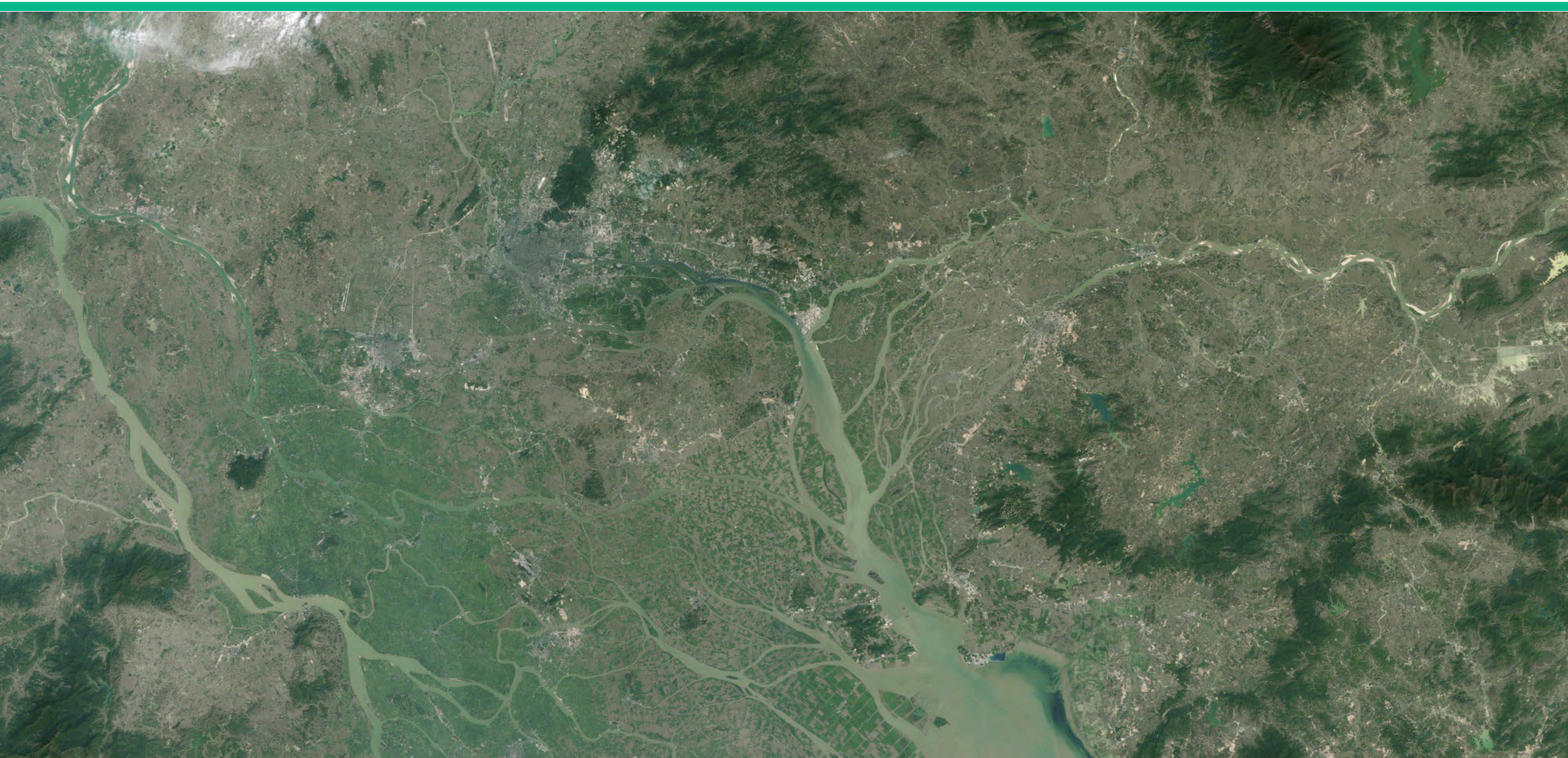
Authoritative guidelines for designing pests out of structures

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

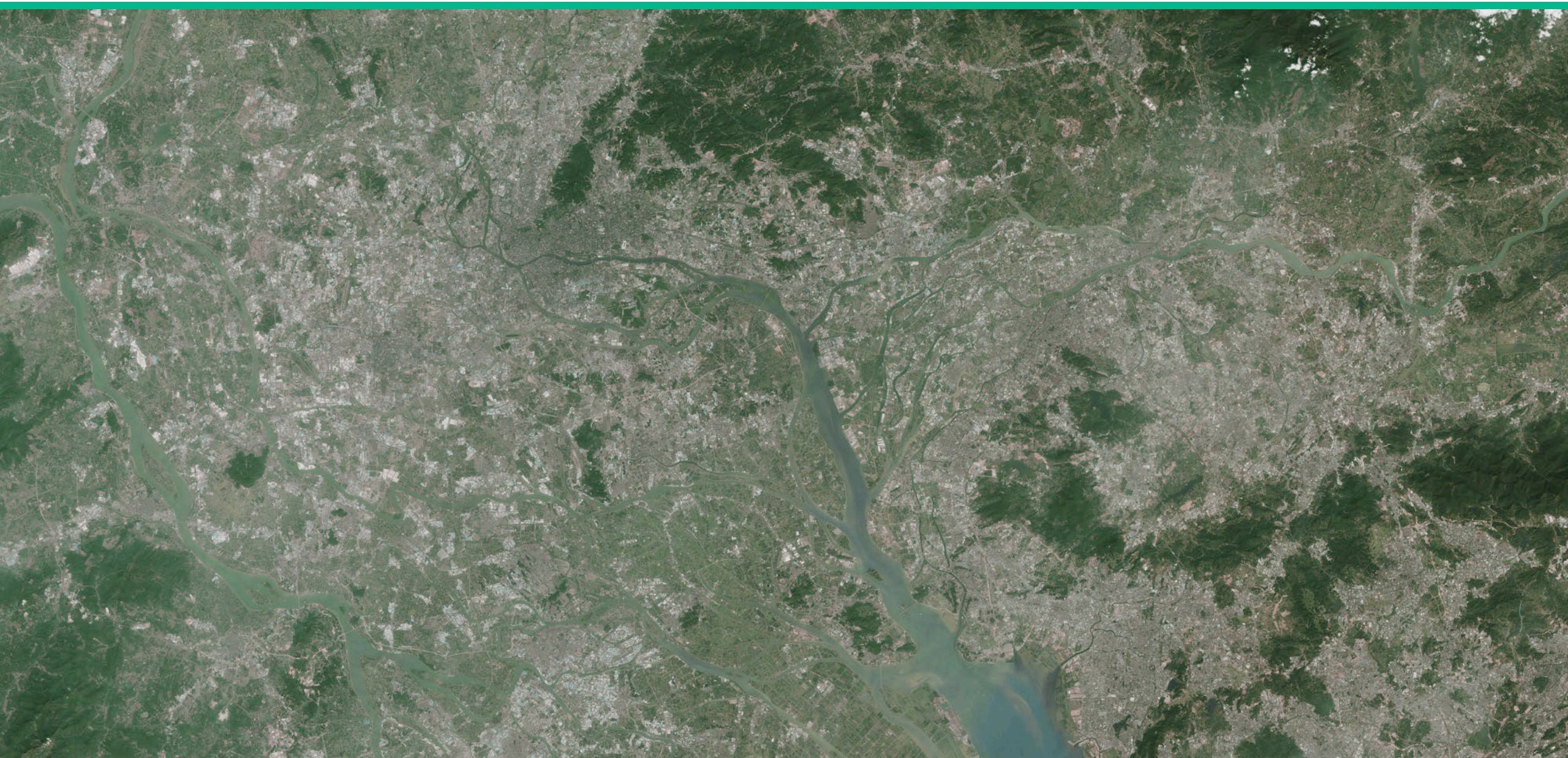
ICC
INTERNATIONAL CODE COUNCIL

Applications in affordable housing

What about landscapes?



What about landscapes?



Work group

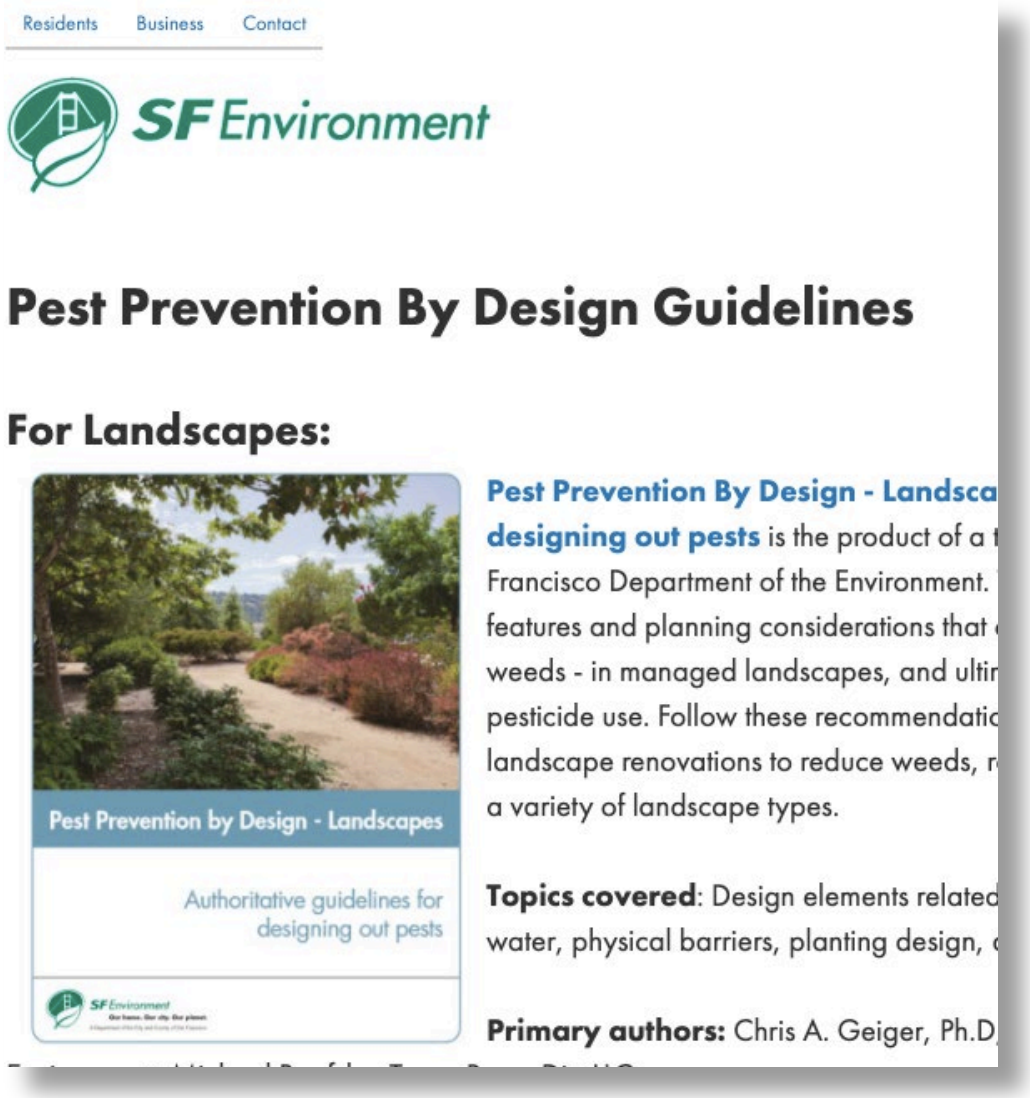
Bob Fiorello, San Francisco Recreation & Parks Department
Carlos Agurto, Pestec
Carolyn Adams, San Francisco Recreation & Parks Department
Casey Brierley, East Bay Municipal Parks District
Cheryl Wilen, University of California Integrated Pest Management Program
Christa Conforti, Presidio Trust
Daniel Grogg, San Francisco Recreation & Parks Department
Daniel Levy, Gardeners Guild
DeShelia Mixon, San Francisco Public Works
Donna Petralia, Gardeners Guild
Eryn Portlock, San Francisco Unified School District
Gordon Matassa, San Francisco Department of the Environment
Jennifer de Graaf, de Graaf Design Associates
Jessica Shores-Appel, San Francisco Public Utilities Commission
Kary Windbiel-Rojas, University of California Integrated Pest Management Program
Katherine Knecht, Marin County Parks Department
Koa Pickering, San Francisco Public Works

Work group, cont'd

Luis Agurto, Jr., Pestec
Marcia Anderson, US Environmental Protection Agency
Mark Heath, Shelterbelt
Martine Glacos, Presidio Trust
Matt Swagler, San Francisco Recreation & Parks Department
Matthew Pruitt, San Francisco Recreation & Parks Department
Mia Ingolia, San Francisco Public Utilities Commission
Nader Shatara, San Francisco Department of Public Health
Nita Davidson, California Department of Pesticide Regulation
Pamela Beitz, East Bay Municipal Parks District
Peter Brastow, San Francisco Department of the Environment
Rick Maia, San Francisco Unified School District
Sarah Sutton, PlaceWorks
Shayne Martinsen, San Francisco Public Utilities Commission
Tanya Drlik, Contra Costa County

Notes on using the guidelines

- Landscape emphasis
- Design and retrofit emphasis
- Guidelines, not standards



Chapter 1. Maintenance Plan Development

Chapter 1. Maintenance Plan Development

- **Include maintenance in administrative systems and budgets**
- **Include maintenance and sanitation infrastructure in physical designs.**

1.6 Plan for cleaning equipment

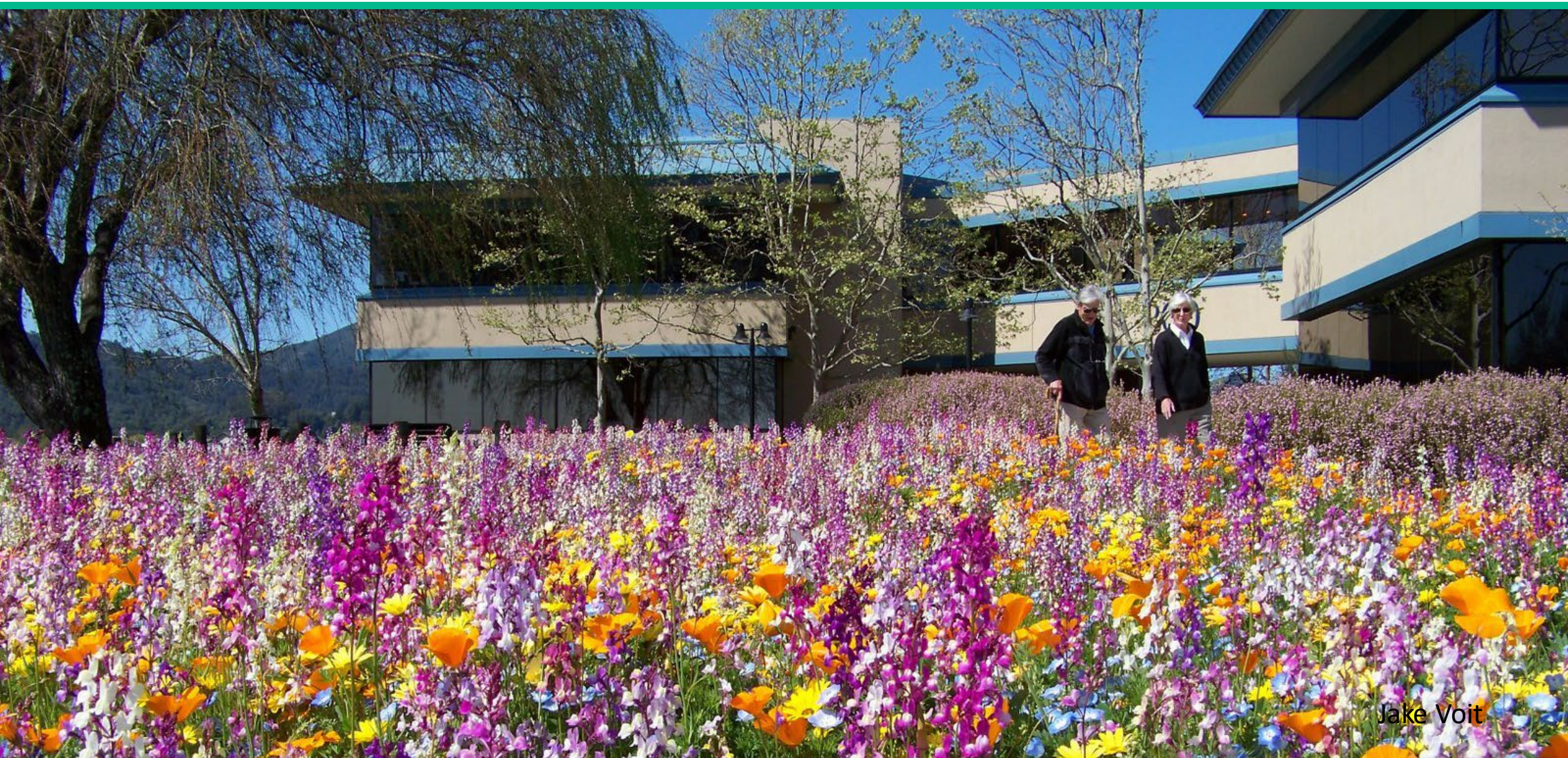
Chapter 2. Soils and Water

Chapter 2. Soils and Water

- **Use the site's soil and water factors to inform plant selection**
- **Manage soils to reduce pest problems.**

2.3 Prevent soil compaction

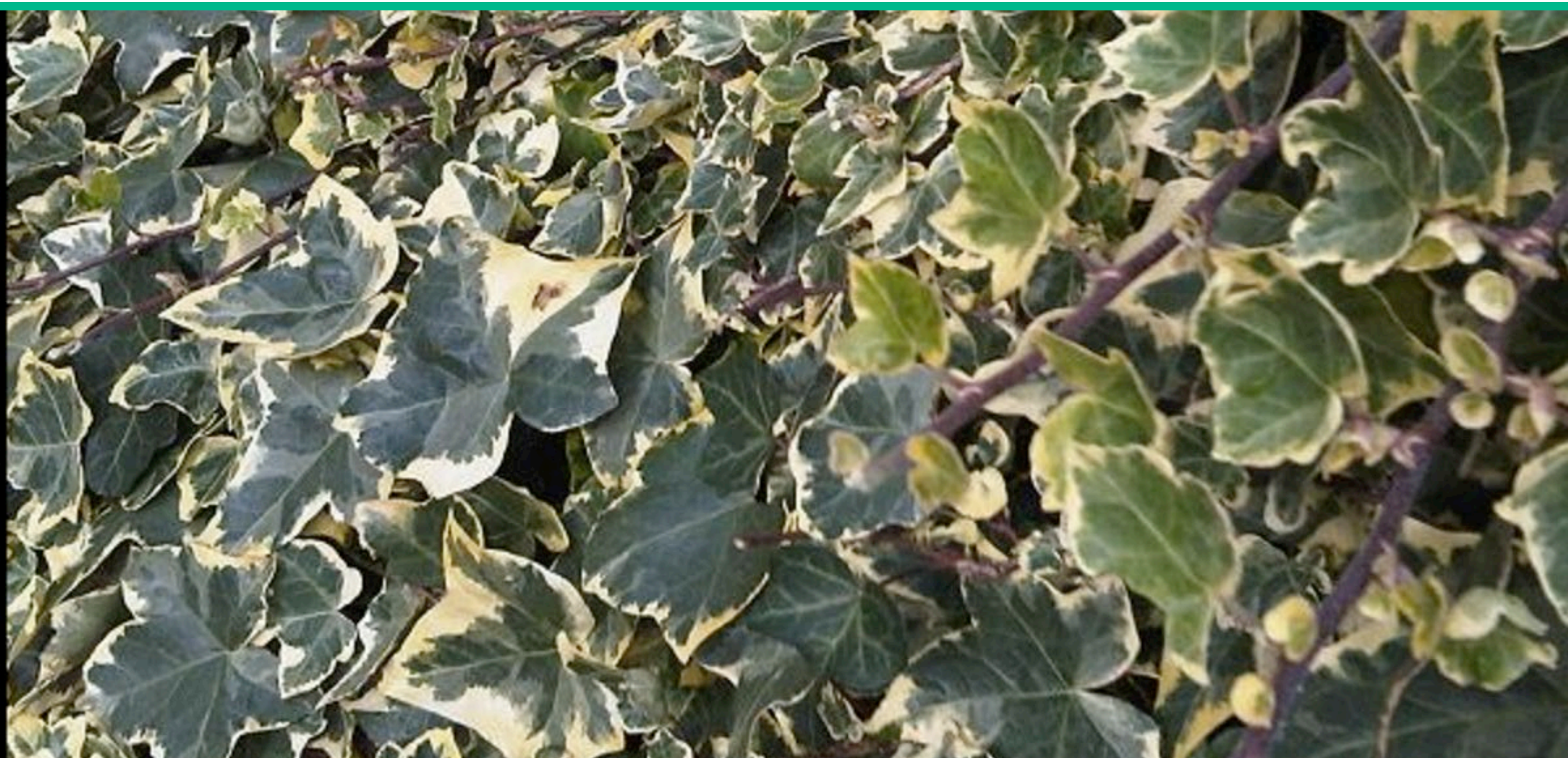
Chapter 3. Planting Design



Chapter 3. Planting Design

- **Design with the whole area in mind**
- **Prioritize plant diversity**
- **Beware of introducing invasive plants**
- **Choose pest-resistant plants**

3.6 Select plants not favored by rats



Chapter 4. Physical Barriers

Chapter 4. Physical Barriers

- **Restrict pest infestations using physical barriers**
- **Consider mulch as a soil covering, but choose carefully**

4.6 Use wood chip mulch correctly

4.7 Use inorganic mulch near structures

4.16 Consider geotextile weed fabric (or not!)

4.13 Install underlaying wire barriers for rodents

Chapter 5. Sanitation

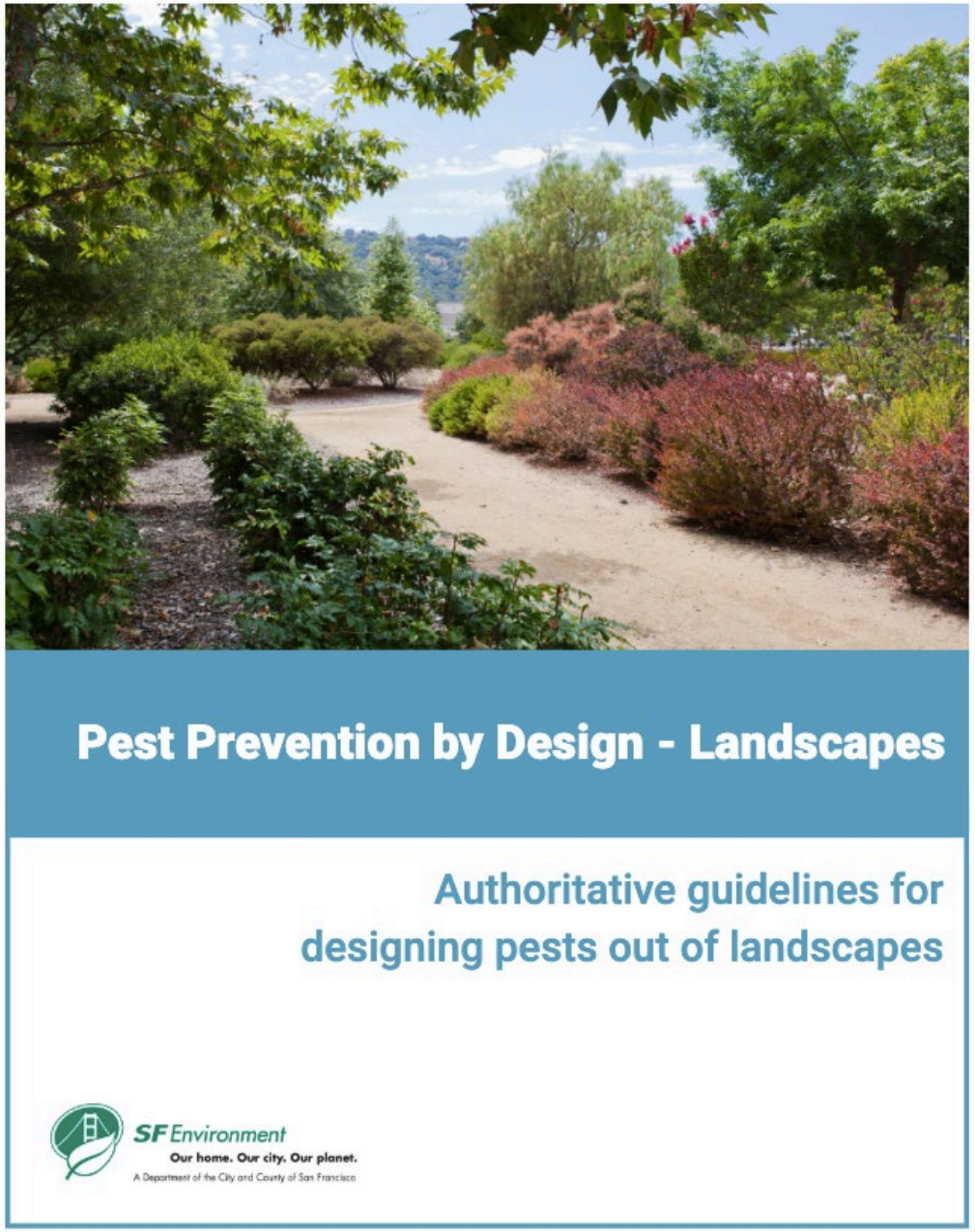
Chapter 5. Sanitation

- **Screen seeds and nursery stock before planting**
- **Minimize refuse as a pest food source**
- **Prevent the import of new pests and diseases**

5.1 Conduct pre-planting pest inspections

Two ways to use the guidelines:

#1: PDF download



4.11 Use edging at boundaries

APPLICABILITY: DESIGN STAGE

PESTS AFFECTED: Tree roots, Weeds

DETAILS

The purpose of edging is to restrict weed growth and invasion into adjacent areas, and sometimes to contain mulch.

Install vertical edging such as concrete, wood, steel or composite products between planted areas, or between plantings and hardscapes.

CSI CODE

32 94 13 - Landscape Edging

EFFECT ON PEST

Edging reduces weed infestations. It can eliminate the need for herbicide or mechanical controls along various boundaries within a planted landscape.

RELATED TOOLS AND PRODUCTS

Product	Manufacturer or Source
Earth Edge - 8" rubber roll	Valley View Industries
Steel Edging	Col-Met attached image © 2017 www.deavita.com

TRADEOFFS WITH OTHER DESIGN OBJECTIVES

Edging can create additional removal and replacement work when landscape is modified. Steel edging materials tend to resist degradation, but often sink and disappear or become covered in irrigated, mulched landscapes. Wooden bender boards may biodegrade, requiring ongoing replacement. Synthetic or hybrid edging products may crack, break, bend or shatter, depending on their quality, UV exposure, irrigation and soil.

APPLICABLE LANDSCAPE TYPES

Baylands, Building perimeter, Creek, Golf course, Hospital, Industrial, Lake, Median strip, Military, Museum, Plant nursery, Park, Parking lot, Pipeline row, Plaza, Pumping plant, River, Roadside, Rooftop garden, Sewage treatment plant, Sidewalk, Sidewalk garden, Trails, Turf grass

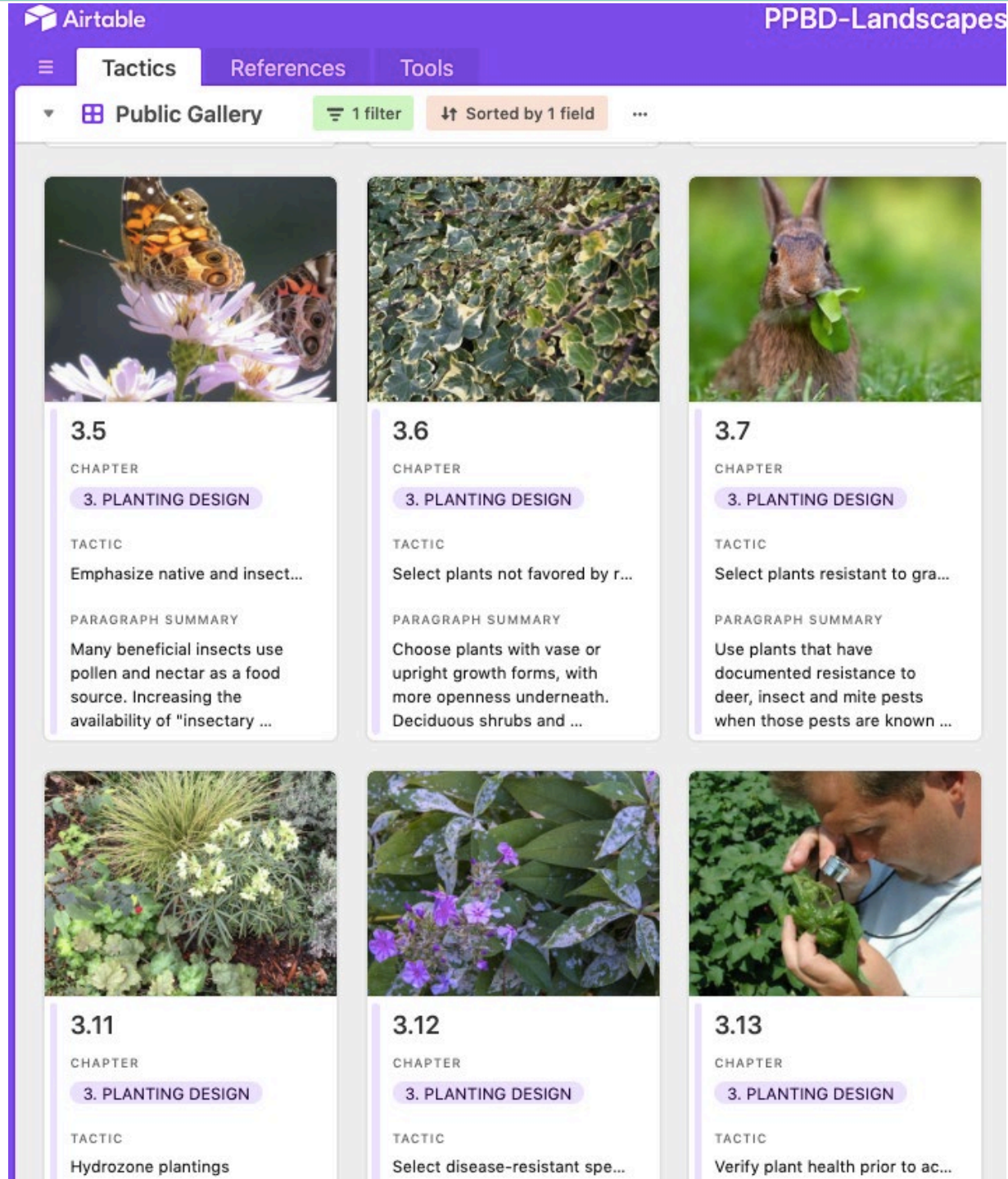
REFERENCES

M. Gilmer & G. Schmidt - Landscape Edging Options (2019)

Two ways to use the guidelines:

#2: Online database

https://airtable.com/shrPOKRSuYzxiKDlg/tblVGD9LT8YIom9bt/viwz0leB5wEJLvOBH?blocks=hide



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Tactics | Tools | References

Public Gallery ··· | Filter | Sorted by 1 field

4.10

CHAPTER

4. PHYSICAL BARRIERS

TACTIC

Install underground root barriers

SUMMARY

Design and install barriers in between hardscapes and invasive plants that spread through roots, surface growing stems (stolons)...

4.11

CHAPTER

4. PHYSICAL BARRIERS

TACTIC

Use edging at boundaries

SUMMARY

The purpose of edging is to restrict weed growth and invasion into adjacent areas, and sometimes to contain mulch....

4.12

CHAPTER

4. PHYSICAL BARRIERS

TACTIC

Install mowstrips

SUMMARY

Install mowstrips along fence lines or along the boundaries between landscaped areas and turf or groundcovers. This element ...

4.13

CHAPTER

4. PHYSICAL BARRIERS

TACTIC

Install underlaying wire barriers f...

SUMMARY

Use corrosion-resistant wire mesh barriers to exclude or limit movement of rodents into parts of the landscape. ...

4.14

CHAPTER

4. PHYSICAL BARRIERS

TACTIC

Install wire baskets for gophers

SUMMARY

For a limited number of highly managed landscape situations, gopher baskets may help protect plantings. However, this tactic is...

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Gallery ··· | 1 filter | Sorted by 1 field

AMS 3/14" Basic Soil ...

DETAILS

This kit gives you the ability to auger in most materials up to 12' and then collect a soil core sample....

MANUFACTURER OR SOURCE

AMS

URL

https://www.ams-samplers.com/...

Bearicuda Varmint Va...

DETAILS

MANUFACTURER OR SOURCE

Bearicuda Bins

URL

https://www.bearicuda.com/critt...

BearSaver Cart Garage

DETAILS

MANUFACTURER OR SOURCE

BearSaver

URL

https://bearsaver.com/collection...

Boot Blaster™ Wet S...

DETAILS

Boot sanitizer

MANUFACTURER OR SOURCE

ESCA

URL

https://www.esca-tech.com/Pro...

Commercial Grade W...

DETAILS

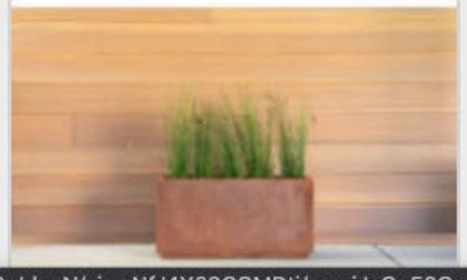
6 ft. x 300 ft. of 20-Year Guarantee Heavy-Duty, Commercial Grade Weed Barrier

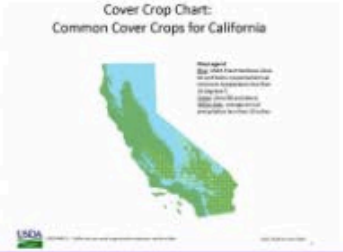
MANUFACTURER OR SOURCE

Home Depot

URL

https://www.homedepot.com/p/...





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Tactics | Tools | References

Grid view ··· | 4 hidden fields | 1 filter | Group | Sorted by 1 field

	Reference-Short	Reference-Full	URL	Relevant tactics
1	A. Budelman - The performance of selected leaf mulches in temperature reduction and moisture conservation in the upper soil stratum (1989)	Budelman, A. "The performance of selected leaf mulches in temperature reduction and moisture conservation in the upper soil stratum." A. Agroforestry Systems 8, pp. 53-66, Feb. 1989. link.springer.com/article/10.1007%2FBF00159069.	https://doi.org/10.1007/BF00159069	4.3
2	A. Eskalen & B.A. Faber - Pest Mgmt - Phytophthora... (2016)	Eskalen, A. & B.A. Faber. "Agriculture: Avocado Pest Management Guidelines - Phytophthora Root Rot (Phytophthora cinnamomi)." UC Statewide IPM Program, UC ANR Pub. 3436, 2016. www2.ipm.ucanr.edu/agriculture/avocado/phytophthora-root-rot/.	http://ipm.ucanr.edu/PMG/r8100111.html	4.6
3	A. Muller & M. Fink - Studies on allelochemical and mineral compounds for sustainable weed control in a pavement filler from brick recycling material (2017)	Muller, A., and M. Fink. "Studies on allelochemical and mineral compounds for sustainable weed control in a pavement filler from brick recycling material." The Journal of Horticultural Science and Biotechnology, 92(2), pp. 214-222, 2017. ...	https://doi.org/10.1080/14620316.2016.1252699	3.2
4	A.L. Antonelli & R.L. Campbell - Root Weevil Control on Rhododendrons (1984)	Antonelli, A.L., and R.L. Campbell. Root Weevil Control on Rhododendrons. Pullman: Washington State Univ. Extension. Bull. 0970, 1984. Retrieved from ipm.ucanr.edu/PMG/GARDEN/PLANTS/INVERT/tblblvineweev.html.	http://ipm.ucanr.edu/PMG/GARDEN/PLANTS/INVERT/tblblvineweev.html	3.7
5	A.L. Shober et al. - Soil Compaction in the Urban Landscape (2018)	Shober, A.L. et al. "Soil Compaction in the Urban Landscape." Soil and Water Science Department, UF/IFAS Extension, March 2010, revised July 2018. edis.ifas.ufl.edu/pdffiles/SS/SS52900.pdf.	https://edis.ifas.ufl.edu/pdffiles/SS/SS52900.pdf	2.3
6	A.M. Haravandi et al. - Turfgrass Selection for the Home Landscape (2011)	Haravandi, A.M. et al. "Turfgrass Selection for the Home Landscape." UC ANR Pub. 8035, 2011. anrcatalog.ucanr.edu/pdf/8035.pdf.	https://anrcatalog.ucanr.edu/pdf/8035.pdf	3.9
7	B. De Cauwer et al. - Integrating preventative and curative non-chemical	De Cauwer, B., et al. "Integrating preventive and curative non-chemical weed control strategies for concrete block pavements." Weed Research,	https://doi.org/10.1111/wre.12057	3.2

138 records

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Tactics | References | Chapters

Gallery | Filter | Sorted by 1 field

4.13

CHAPTER

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TACTIC

Make void spaces accessible

SUMMARY

Design easy access to empty spaces underneath and around statues, planters, boardwalks, sheds and concrete structures. F...

4.16

CHAPTER

4. PHYSICAL BARRIERS

TACTIC

Consider geotextile weed fabric

SUMMARY

Install geotextiles beneath planting areas, benches, tables, bocce ball courts, pathways, dry creeks, or other hardscape elements to ...

4.17

CHAPTER

4. PHYSICAL BARRIERS

TACTIC

Seal drainage system against mo...

SUMMARY

Specify that all drains, drainage devices, and stormwater treatment devices incorporate mosquito-free design. ...

5.1

CHAPTER

5. SANITATION

TACTIC

Conduct pre-planting pest inspec...

SUMMARY

Prior to accepting new plants from nursery and installing them, inspect them for pests (weeds, pathogens, arthropods) and rejec...

5.2

CHAPTER

5. SANITATION

TACTIC

Install pest-proof refuse containers

5.3

CHAPTER

5. SANITATION

TACTIC

Improve rodent-proofing of dump...

5.4

CHAPTER

5. SANITATION

TACTIC

Plan for production of bark or chi...

5.5

CHAPTER

5. SANITATION

TACTIC

Sanitize items in contact with soil

5.6

CHAPTER

5. SANITATION

TACTIC

Install a sanitation station

5.7

CHAPTER

5. SANITATION

TACTIC

Provide sufficient refuse receptac...

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Tactics | Tools | References | Chapters

Gallery | Filter | Sorted by 1 field

Find a view

- Gallery
- Chapters

4.14

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Airtable

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Tactics | Tools | References | Chapters

Chapters ··· | 3 hidden fields | 1 filter | Grouped by 1 field | Sort

	TACTIC #	TACTIC	Image	SUMMARY	HOW TACTIC AFFECTS PEST MANA...	TRADEOFFS	DESIGN OR RETROFIT
▶	CHAPTER 1. MAINTENANCE PLAN DEVELOPMENT Count 7						
▶	CHAPTER 2. SOILS AND WATER Count 7						
▶	CHAPTER 3. PLANTING DESIGN Count 22						
▶	CHAPTER 4. PHYSICAL BARRIERS Count 17						
▼	CHAPTER 5. SANITATION Count 8	Summary					
54	5.6	Install a sanitation station		Design and plan for sanitation systems that can be used prior to and after using certain landscaped areas. This is particularly applicable to habitat remediation projects, botanical gardens, or other specialized project...	Sanitation stations minimize the spread of weeds and pathogens.	It takes time to clean off before and after working in a sensitive area. Creating a clean-off station costs time and materials; even simple mobile systems require at least a water source, a brush and disinfectant.	BOTH DESIGN & RETR...
55	5.1	Conduct pre-planting pest inspections		Prior to accepting new plants from nursery and installing them, inspect them for pests (weeds, pathogens, arthropods) and reject if infested.	Pre-planting pest inspections minimize introduction of pests.	Additional time and scrutiny is required to pre-inspect planting stock.	BOTH DESIGN & RETR...
56	5.2	Install pest-proof refuse containers		Use pest proof containers with tightly closing and sealing lids. Self closing and self sealing are additionally advantageous. Cracks and holes should be sealed as hermetically as possible to prevent attracting and ...	Pest-proof refuse containers eliminate feeding stations and reduce activity to the spill zones of these stations. This reduces risk from pest borne diseases.	Rodent-proof refuse containers may be more expensive than others. Closed containers may result in garbage being thrown on the ground in areas where open trash containers are the norm.	BOTH DESIGN & RETR...
57	5.3	Improve rodent-proofing of dumpsters		Rodent-proof containers reduce presence of rodent populations in the areas directly surrounding these	Rodent-proof dumpsters discourage rodent harborage, decreasing their activity in those areas.	Rodent-proof dumpsters may be more expensive than non-rodent proof dumpsters.	BOTH DESIGN & RETR...

61 records


IT'S
ALIVE!

Thank you!

Chris Geiger, Ph.D.

Lacewing Collaborations LLC

chris@lacewingcollaborations.org

SF Environment

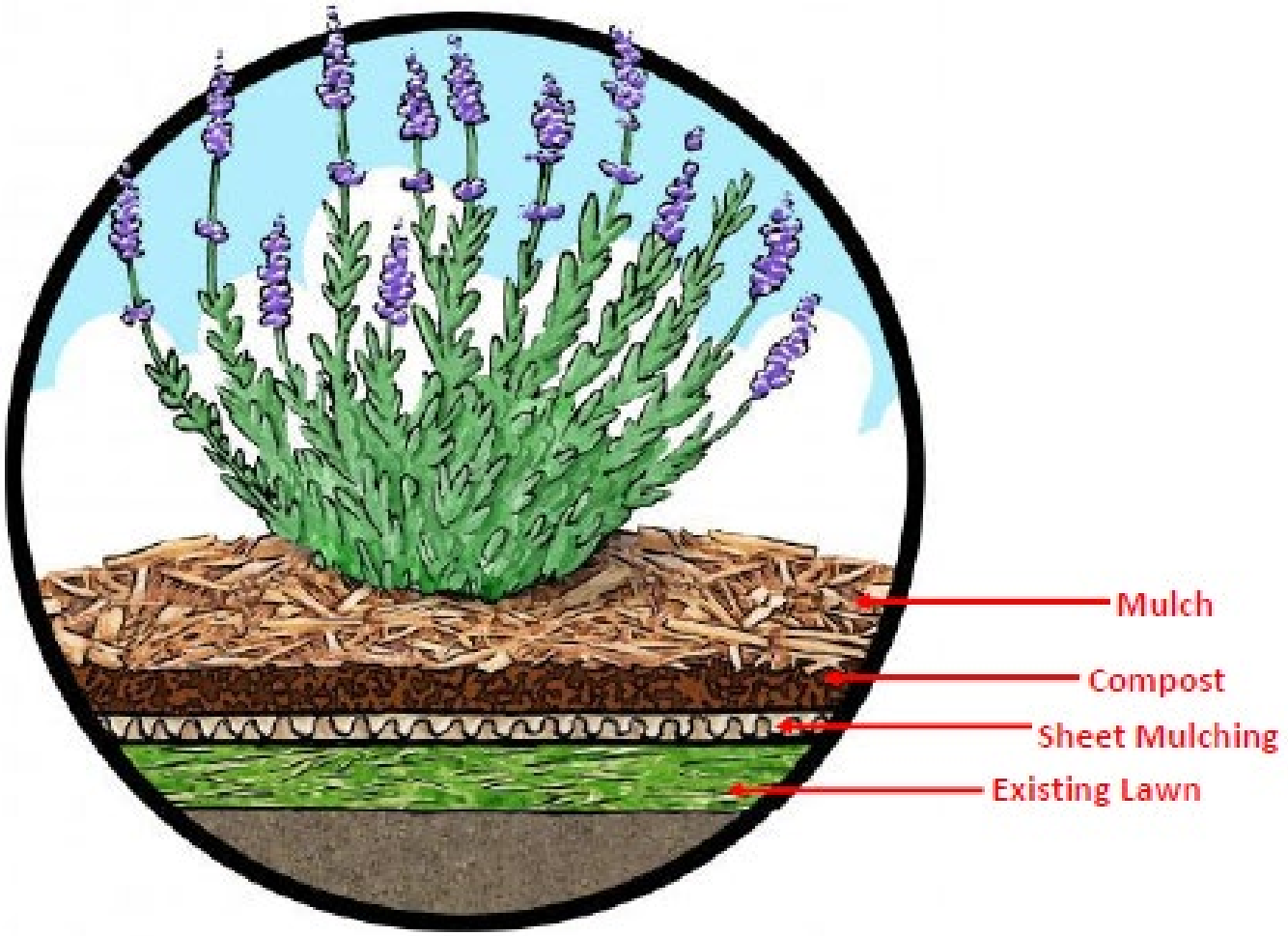
Our home. Our city. Our planet.

A Department of the City and County of San Francisco

Sheet Mulching for Professionals

Residential and Commercial

Kristin Gallego
Artistic Landscape



For More Information, Visit:
https://www.lawntogarden.org

The BENEFITS of Sheet Mulch

- Sheet mulching, a layered mulch system, is a simple, effective technique for improving soil health, managing weeds without herbicides, and increasing soil permeability.

- Sheet mulching can be used either in establishing a landscape or to enrich existing plantings. In both cases, mulch is applied to bare soil or on top of cut or flattened weeds or turf.

- Sheet mulch CAN:

- Suppress weed growth without chemicals
- Reduce labor and maintenance costs—weeds are composted in place
- Improve nutrient and water retention in the soil
- Encourage favorable soil microbial activity and worms
- Enhance soil structure
- Improve plant vigor and health, often leading to improved resistance to pests and diseases

For More Information, Visit:
https://www.lawntogarden.org

For Landscape PROFESSIONALS

- Converting lawns with sheet mulching offers remarkable environmental, economic, and societal benefits, including:

Up to -

- 50% water savings
- 30–70% maintenance labor savings
- 70–80% reduced runoff
- 53 tons/acre greenhouse gas reduction, equal to taking about 10 passenger cars off the road

- In addition, compared to ripping out sod or using an herbicide, every acre of turf that sheet mulched:
- keeps 87 tons of sod out of the landfill, and
- prevents the use of up to 10 lbs. of herbicides.

For More Information, Visit:
https://www.lawntogarden.org

Water SAVINGS with Sheet Mulch

Water Saving Calculator

https://www.lawntogarden.org/water-savings-calculator

Based on Replacing a 3,000sq ft Lawn

Select your city: Danville

Total lawn area to be converted: 3000 (square feet)

A **3,000** square foot lawn is estimated to use **121,446** gallons of water per year, based on your location.[1]

For More Information, Visit:
https://www.lawntogarden.org

Water SAVINGS with Sheet Mulch

Landscape Type	Planting Area (sq. ft)	Water Use	Irrigation Type	Annual Water Use (gal)
Groundcover	1,950	Low	Drip	21,928
Perennials	500	Low	Drip	5,622
Shrubs	500	Low	Drip	5,622
Trees	50	Low	Drip	562
Lawn		High	Spray	0
Annuals		High	Spray	0
Total Area	3,000		**Total Water Use:**	**28,440**

☑ **Sheet Mulching?** Check box to see how much more water you can save by sheet mulching with cardboard, compost and mulch.

Water Savings from Sheet Mulch: 5,295

For More Information, Visit:
https://www.lawntogarden.org

Water SAVINGS with Sheet Mulch

Congratulations!

Your new landscape saves 93,006 gallons per year compared to your existing lawn.

The vertical green line displayed in the graph above indicates the recommended water use of 1234 gallons annually, based on the location and size of your project.[1] Your water use is even lower than this target-- by 38,355 gallons/year!

Here are some tips to reduce your water needs further:

- Place plants with the same water needs together. For instance, place low water-use plants and moderate water-use plants on separate valves. This is called hydrozoning.
- Space plants to accommodate their size at maturity--fewer plants need less water.
- Plant 1 gallon or less size plants--smaller plants need less water to establish.
- Make sure to cover drip lines with mulch to save water and protect the tubing.

For More Information, Visit:
https://www.lawntogarden.org

Water SAVINGS with Sheet Mulch

Additional benefits from sheet mulching:

- You'll prevent **12,000 pounds of sod** from being sent to the landfull: sod can't be processed by composters because of the rocks and grit.
- You'll sequester **60 pounds of carbon** into the soil every year: adding compost to soil helps plants draw more carbon dioxide from the air and store it deep in the soil.
- You'll prevent **9,600 pounds of greenhouse gas (GHG) emissions**: sheet mulching avoids methane emissions from anaerobic decomposition of sod in the landfull. GHG's are reduced by minimizing soil erosion and use of fertilizer.

For More Information, Visit:
https://www.lawntogarden.org

Lawn Conversion Process WITHOUT Sheet Mulch

- Turn Down (to 50%) Irrigation at Least 2 Weeks Prior to Work
- Use Sod Cutter to Remove Existing Sod for Haul Away/Disposal
- Haul Away/Dispose of Removed Sod
- Use Shovel/Pick to Remove Any Left Root Base of Sod & Trench Around Edge (Approx. 2-3” Wide/Deep) for Sloping at Edge
- Planting, Topsoil & Irrigation Installed *(Dependent on Type of Irrigation Used…Netafim, Drip, etc.)*
- Mulch Installed

Lawn Conversion Process WITH Sheet Mulch

- Turn OFF Irrigation at Least 2 Weeks Prior to Work (Additional Savings to Client During This Period)
- Weed Eat or Mow (Low)
- Use Shovel/Pick to Trench Around Edge (Approx. 2-3" Wide/Deep) for Sloping at Edge
- Planting, Topsoil & Irrigation Installed (Dependent on Type of Irrigation Used…Netafim, Drip, etc.)
- Sheet Mulch Installed
- Compost Installed
- Mulch Installed
- Spray Area with Herbicide (as needed or spot spray for noxious weeds)

- All Old Irrigation Must Be Capped Prior to Sheet Mulching

- We Install New Irrigation Below the Sheet Mulching

- If Tears Occur in Sheet Mulching, Use Staples

Cost(Labor) SAVINGS Sheet Mulch

Cost to Convert a Lawn WITHOUT Sheet Mulch at 3000 Sq Ft

$2,208

- Labor (Cut Sod, Roll Up & Load for Dumping, Remove Any Left Sod Base/Trench Edges) **$1,240** (Based on 2 Person Crew x 20 Hours at Avg $31/Hr, Including Tax/Insurance)
- Sod Cutter (Based on Rental, 1 Day) **$140** (Includes Tax, Does Not Include Delivery)
- Disposal Fees (Based on 12,000lbs for 3,000 sq ft sod) **$828** ($138/Ton, Does Not Include Hauling Cost)

Cost to Convert a Lawn WITH Sheet Mulch at 3000 Sq ft

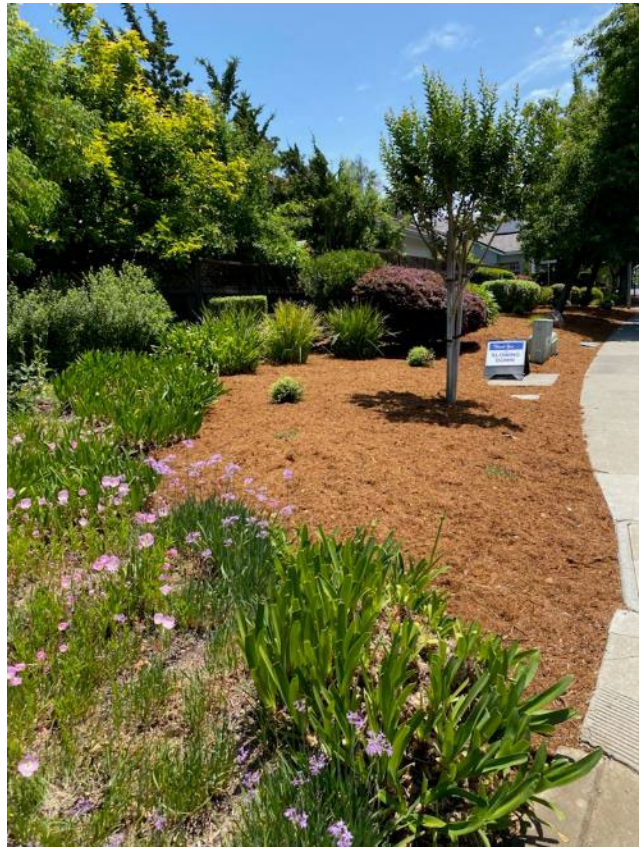
$1,352

- Labor (Mowing/Weed Eating, Trenching Edges, Installing Sheet Mulch) **$992** (Based on 2 Person Crew x 16 Hours at Avg $31/Hr, Including Tax/Insurance)
- Sheet Mulch (Based on 3,000 sq ft) **$360** ($0.12/sq ft, Includes Tax, Does Not Include Delivery)

**Costs associated with planting, topsoil, irrigation & mulch NOT USED in comparison, as costs are the same in both scenarios.*

Lawn Conversion WITH Sheet Mulch

Photos Courtesy of:
Zanker Landscape Materials
Edible Silicon Valley



Before & After

30,000 sf feet

Sheet mulched

No herbicides

794 Davis Street,
San Leandro

2015 - Allied Landscape

Sheet mulching works well for any type of garden. It’s easy to do and much better than tilling because as it breaks down it creates nutrients and all types of biological activity in your soil. - *https://www.lawnstarter.com*

Reduce pests
Reduce maintenance
Save water

Choose climate
appropriate plants

Suzanne Bontempo

Owner of Plant Harmony

Our Water Our World Program Coordinator

Qualified IPM Advocate

ReScape Landscape Professional &

Qualified Water Efficient Landscaper

**Garden for the Environment,
San Francisco**

Plant the Right Plant in the Right Place

- Choose California natives or Mediterranean plants that are climate appropriate
- Match plants to the conditions of the landscape to keep them from being stressed and susceptible to pests
- Choose pest and disease resistant varieties
- The right plant in the right place will require less maintenance

Grow Climate Appropriate Plants

- Choose **drought tolerant** California natives or Mediterranean native plants that are adapted to our climate

- The right plant in the right place will be more water efficient, drought tolerant, and less desirable to pests

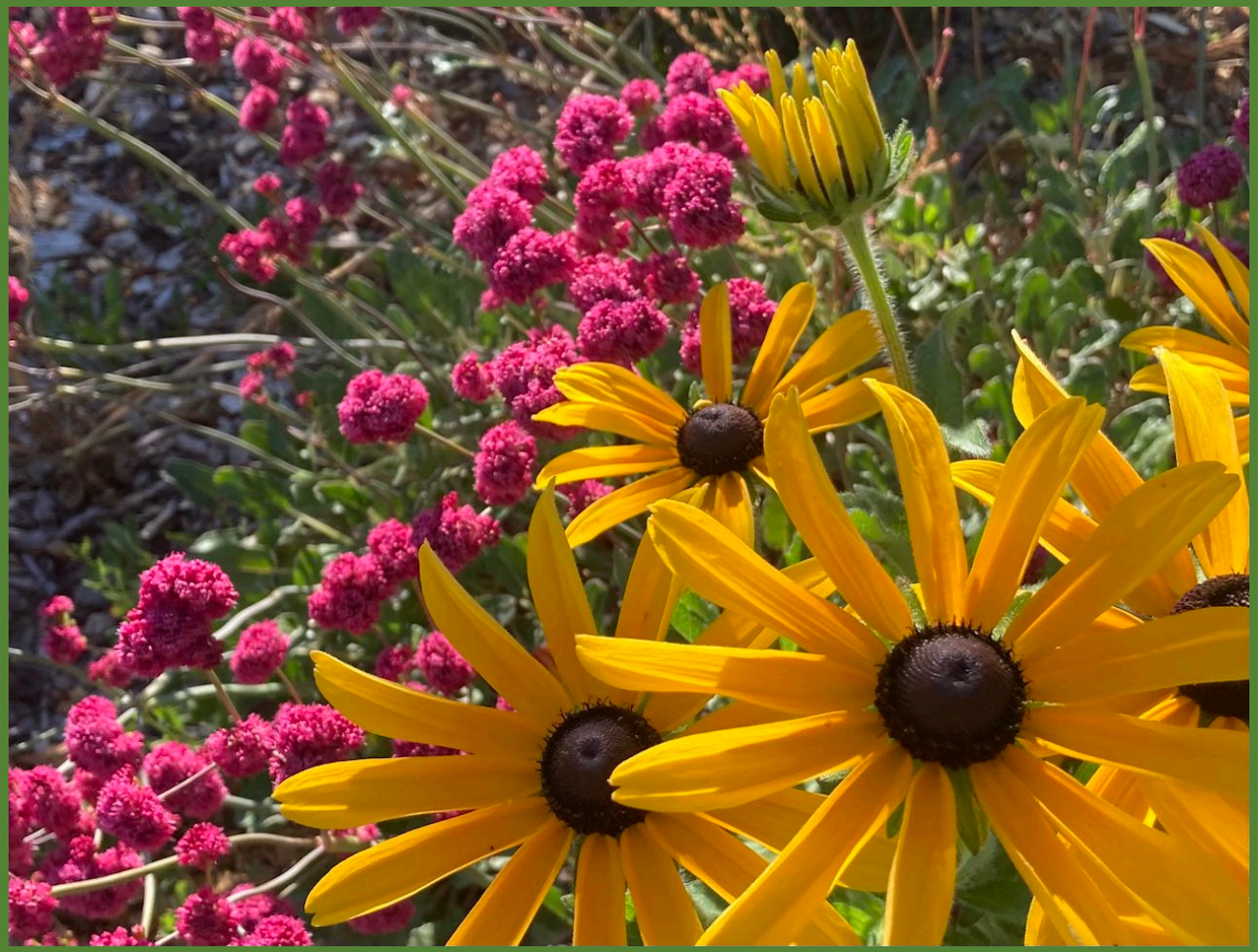


Photo credit: S. Bontempo

Plant California Natives


Pacific Coast Iris


Western Sword Fern


Yarrow


California Fuchsia

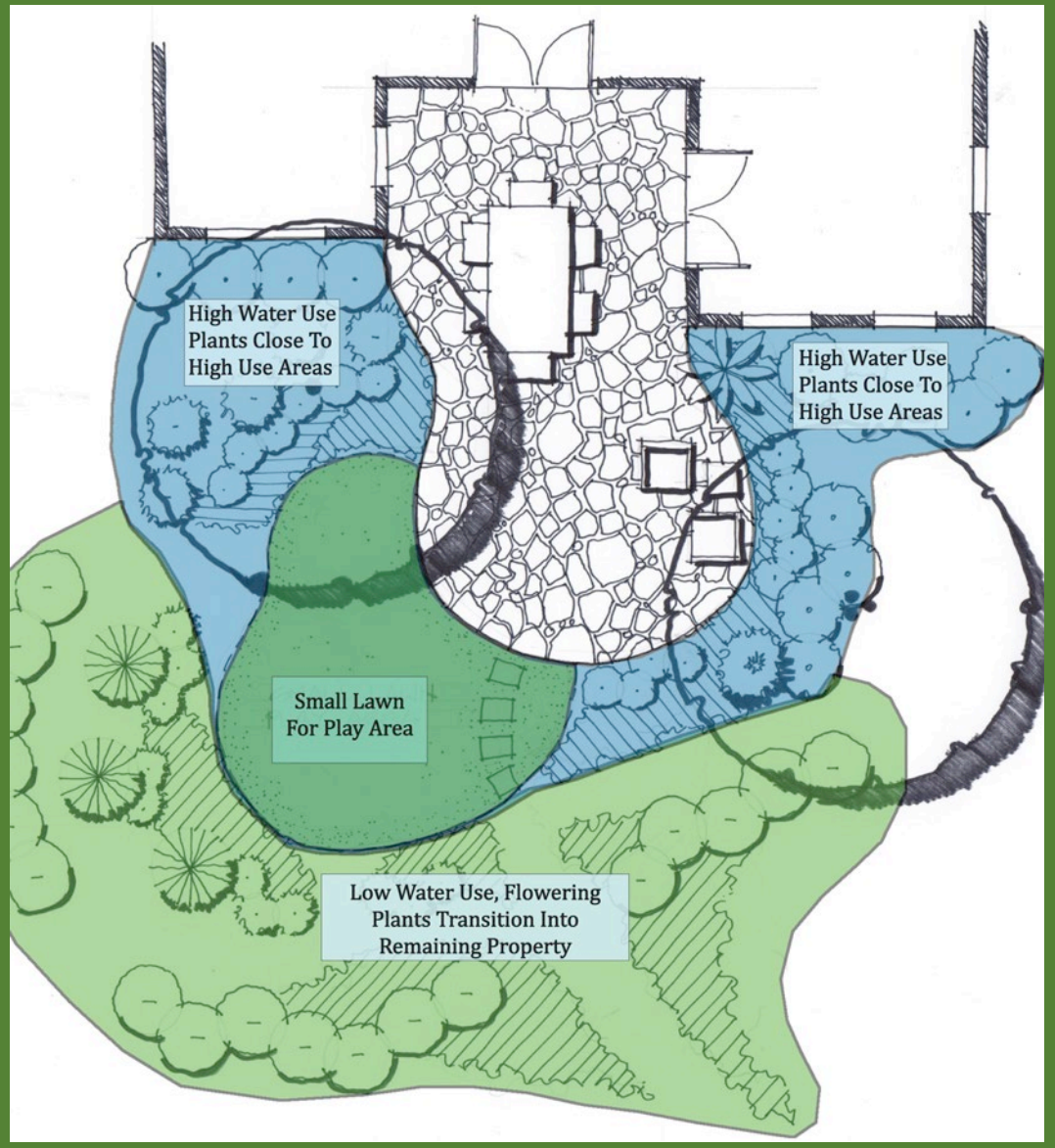

California Buckwheat


California Huckleberry


California Poppy


California Field Sedge


Gooseberry (Ribes)



Group plants with similar needs:

- Similar irrigation needs - hyrdozoning
- Similar microclimate needs –
  - Sun
  - Shade
  - Wind
  - Heat

Some plants are prone to pests

Lavatera maritima is prone to rust

Alyogyne huegelii is a nice substitute

When plants outgrow their space

Over pruning can cause plant stress
Improper irrigation can also cause plant stress

Acacia cognata, cn. River Wattle

Soil shouldn't be an after thought

Build healthy soil with **Compost**

- Goal is to have ~5% organic matter in soil
- Improves the soil structure
- Increases water retention
- Increases the microbiology in the soil
- Reduces the need for chemical fertilizers & pesticides

Invite Beneficial Insects & Pollinators

Green Lacewing

Syrphid Fly

Beneficial bugs will eat or parasitize pests and pollinate flowers.

Lady Beetle

Soldier Beetle

Include a diversity of flowers that provide nectar & pollen
Flowers that grow in clusters of tiny flowers & flowers that look like a daisy

Photo credit: S. Bontempo

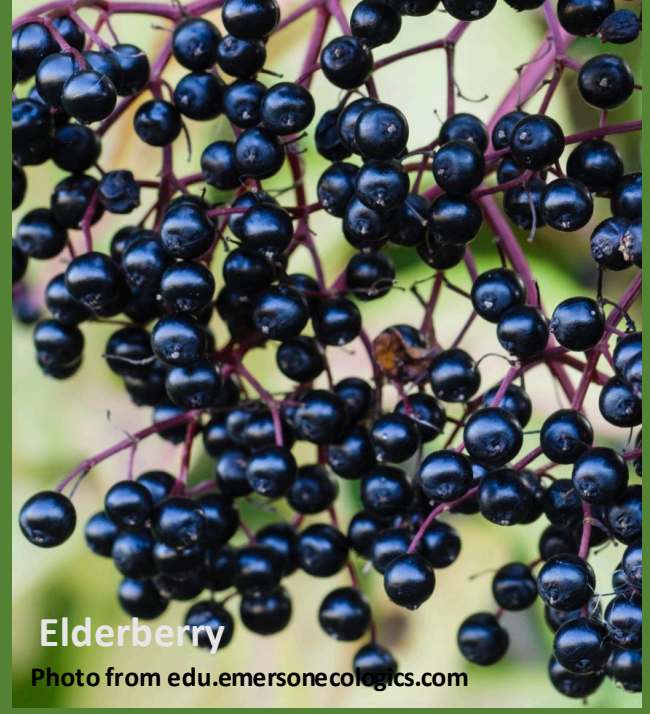
Habitat Heroes

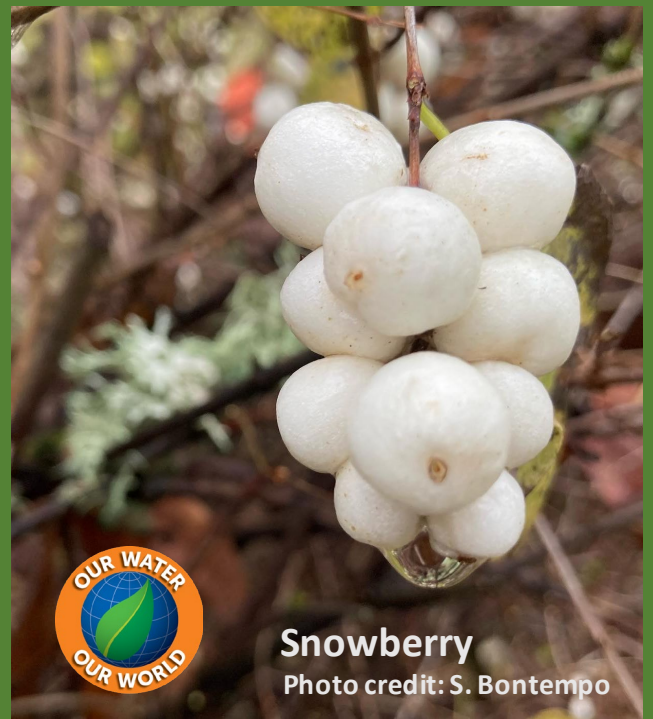
- Buckwheat *(Eriogonum)*
- Manzanita *(Arctostaphylos*)
- California native oaks (*Quercus)*
- California lilac (*Ceanothus)*
- Sages *(Salvia)*
- Culinary herbs

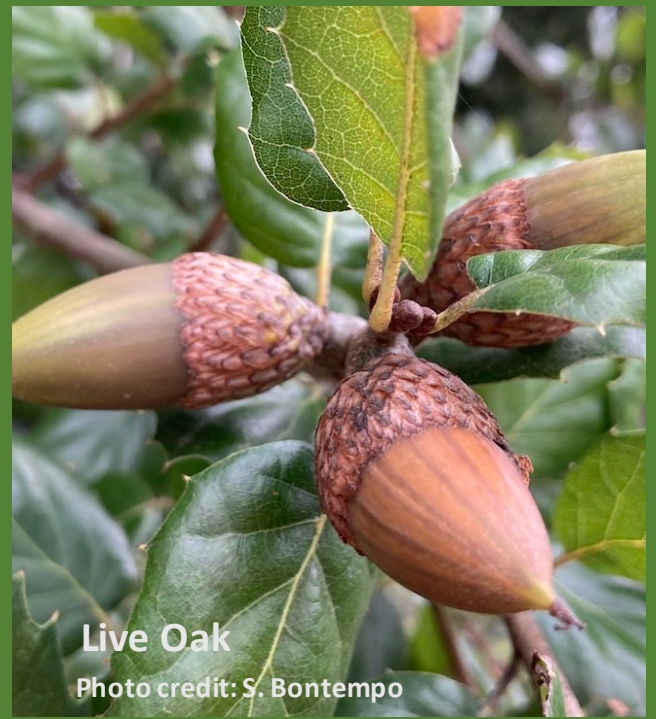
Photos from: top L, Suzanne Bontempo, top R, calflora.org, bottom L, ucanr.edu, bottom R, calflora.org


Aster
Photo credit: S. Bontempo


Japanese Anemone
Photo credit: S. Bontempo


Elderberry
Photo from edu.emersonecologics.com


Snowberry
Photo credit: S. Bontempo


Live Oak
Photo credit: S. Bontempo


Clematis
Photo from dreamstime.com

Thank you!

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