Horticultural Considerations in the Face of Climate Change
Protecting the Wildland-Urban Interface in California: Native Greenbelts vs Thinning for Wildfire Threats to Homes – Greg Rubin, California's Own Native Landscape Design

Tuff on Turf: Modernizing an American Icon – Audrey Pongs, Greenbelt Growers Nursery

Emphasizing California Natives in a Water Utility's Drought Resiliency Strategy – Lindsey Stuvick, Moulton Niguel Water District

Saying “Native” Last: Promoting California Native Gardens to New Audiences During Drought and Defending Their Installation During Times of Watering Restrictions – Scott Kleinrock, Chino Basin Water Conservation District
Protecting the Wildland-Urban Interface in California: Native Greenbelts vs Thinning for Wildfire Threats to Homes

Presented by
Greg Rubin
With contributions by
Dr. Jon Keeley and Rick Halsey

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Bona Fides of the Co-Principal Investigators

• Dr. Jon Keeley, Research Scientist, USGS Sequoia National Park
  • One of the leading fire ecologists in the country
    • Published over 400 papers to date
    • Responsible for experimental design and interpretation

• Greg Rubin (C-27 no. 717147), Landscape Contractor specializing in California Native Landscapes
  • Around 800 installations in Southern California
  • Author of 2 best-selling books on native landscaping (with Lucy Warren)
  • Approximately 20 installations directly involved in major fire events, without loss of a single home.
Background – the Problem

• Structure loss in wind-driven fire events often blamed on vegetation
• Standard prescriptions for defensible space are based on anecdotal evidence (at best)
  • Requirements are regionally inconsistent and often ecologically devastating
  • On occasion, these approaches may exacerbate vulnerabilities
  • A need exists to objectively test methodologies, including an innovative technique that has shown consistent success across a wide range of fire events.
Background – Classic Approaches

• Clearance to bare ground of all (or most) of your property will protect your home.
Background – Classic Approaches

• Clearance to bare ground of all (or most) of your property will protect your home.
• Many properties involved in large fire events had been cleared for hundreds of feet in all directions (complete habitat destruction).
Background – Classic Approaches

- Clearance to bare ground of all (or most) of your property will protect your home.
- Complete vegetation removal leaves your house exposed to the “perfect bowling alley for embers”.

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Background – Classic Approaches

• Groundcovers like iceplant are the only appropriate "defensible" vegetation.
Background – Classic Approaches

- Groundcovers like iceplant are the only appropriate “defensible” vegetation.
  - Unfortunately, iceplant/succulent can quickly dehydrate & burn.
Background: A New Approach

• Based on the work of the late Bert Wilson, founder of Las Pilitas nursery (and CalFire fire-fighter for 14 years):
  • Chaparral plants in general can be difficult to ignite directly (without fuel ladders)
  • Hydration level (referred to as Live Fuel Moisture Content, LFMC) appears to be the key to fire resistance, rather than plant selection
  • Compared with other “drought tolerant” plant materials, natives require the least amount of supplemental moisture (light overhead irrigation) to achieve defensible levels of fire resistance.

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Background – A New Approach

• The following properties were involved in major fire events without loss of dwellings:
  • Poomacha-Mount Palomar (1)
  • Pines-Julian (2)
  • Cedar (7 - 1 in Santa Ysabel, 3 in Ramona, and 3 in Poway)
  • Witch creek (6 - 3 in Ramona, 3 in Rancho Bernardo)
  • Harris (2)
  • Hidden meadows (1)
Background – Basic Unscientific Research

- Scant scientific research on defensible space vegetation
- Bert Wilson published data for leaf ignition times on his website
  - Although not scientific, each data point based on average of multiple tests
  - Tests do stand up as relative measure of flammability between species
- We ran native vegetation burn tests on hydrated plants
  - Again, not scientific, but to illustrate a point.
Hydration takes precedence over plant lists

An unscientific burn test with native plants exposed to ~.25” of equivalent precipitation a week earlier...
• Hydration takes precedence over plant lists
• But add dead or dormant, dry flashy fuels to the mix...

Natives require much less water to hydrate than non-natives
Why the U.S. Navy was interested

- The Navy manages huge residential complexes on its bases
  - Often completely surrounded by wildlands & vulnerable to fire
- After attending several presentations, personnel were interested in all the potential advantages of native greenbelts surrounding these communities.
- In 2014 they awarded our company a research grant to study this phenomenon.
Ecologically Sustainable Fire Risk Reduction

• ESFRR – Scientific study with the following mutual objectives:
  • Research fuel management strategies
  • Ecologically sustainable (supporting natural habitat)
  • Lower water & maintenance requirement
  • Aesthetically pleasing
  • Data collected/entered into “Fuel & FireTools” modeling software

©Richard Halsey

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Ecologically Sustainable Fire Risk Reduction

- Experimental design—selection criteria
  - Homes located at WUI, survived a major fire event, & include:
    - A lightly irrigated native landscape
    - Natural chaparral/CSS thinned according to common prescriptions
    - A control area of natural shrubland vegetation
Ecologically Sustainable Fire Risk Reduction

Experimental Design
Ecologically Sustainable Fire Risk Reduction - Results

LFMC Levels by Species for all 3 Treatments, by Season & Averaged
Ecologically Sustainable Fire Risk Reduction - Results

Flame Length by Species for all 3 Treatments

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Ecologically Sustainable Fire Risk Reduction - Results

Rate of Fire Spread for all 3 Treatments, by Species

©California's Own Native Landscape Design, Inc.
Ecologically Sustainable Fire Risk Reduction - Results

Rate of Fire Spread for all 3 Treatments, as a Function of Slope & Wind Speed
Native Fire-Resistant Landscape Approaches

• Use Zonal approach, including Zone 0 (first 5 feet)
• Zone 1 (or A) is usually the next 30-50'
• Zone 2 (or B) usually includes the next 50-70' (or more)

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Native Fire-Resistant Landscape Approaches

- Site hygiene
  - Remove all non-native weeds/thatch
  - Prune up existing shrubs & remove dead branches in Zones 1 and 2
Native Fire-Resistant Landscape Approaches

• Features
  • Zone 1: lots of hardscape & permanently irrigated plantings
  • Zone 2: either lightly irrigated native landscape, or

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Native Fire-Resistant Landscape Approaches

• Irrigation
  • Low-volume overhead irrigation is best, especially MP-Rotators
    • Emulate rainfall
    • Consolidate mulch
  • Typical monthly schedules during warm weather on established plantings
    • Run time is usually around 30-40 minutes with MPs, which is 0.20” to 0.25” equiv. precip.
    • 1-2 times per month for coastal areas
    • 2-3 times per month for intermediate zones
    • 3-4 times per month in hot interior areas
    • 4 times per month for hot, south facing interior slopes. Can break up cycles.
Native Fire-Resistant Landscape Approaches

• Planting
  • 1-5 gallon containers (typically)
  • Water, water, water...
  • Can apply granular pre-emergent over new plants

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Native Fire-Resistant Landscape Approaches

• Mulching
  • 3-4” Shredded Redwood bark is best organic mulch for plant health & hydration (not including Desert plantings)
  • Must be CONSOLIDATED with overhead irrigation to minimize oxygenation & flammability
  • Getting banned in many northern communities 😞
  • In REAL wildfires it has performed wonderfully
  • Next best mulch is chipped pine & oak, followed by clean arborist trimmings

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The End – Thank you!
TUFF ON TURF
MODERNIZING AN AMERICAN ICON
Audrey Pongs
As American as Baseball
A Timeless Trend
“I discovered that the most important appearance of status in the suburbs is the lawn” – American Green

“Lawn monoculture melded perfectly with the ethos of conformity so central to 1950’s suburbia” – American Green
Lawns are bad, right?

- Resource Demanding
  - Fertilizers
  - Herbicides
  - Insecticides
  - Irrigation
  - Regular maintenance
Lawns are bad, right? Then again maybe not.

- Resource Demanding
  - Fertilizers
  - Herbicides
  - Insecticides
  - Irrigation
  - Regular maintenance

- Environmental benefits
  - Carbon capture
  - Ground water cycling
  - Cooler temperatures
  - Reduced Erosion
  - Wildlife refuge
  - Better mental health
Experience Green time
Solace in the outdoors
Water wise
Have no Fear!

Native plants are here
Ideal Lawn Replacements

True Lawn Replacements
- Walkable
- Mowable
- Adaptable
- Resource efficient
- Visual similarity to turf
- Forgiving
- Industry proven
- Readily available

Meadow Plants
- Biodiversity hotspot
Mowable Meadows
Festuca Rubra

- Lush and green
- Minimal water needs
- Highly adaptable
  - Suitable throughout the state
- Full sun or part shade
- Cold hardy for mild winters
- Enjoys regular mowing
- Moderate foot traffic
- Suggested cultivar - Molate
Carex praegracilis

- Lush and green
- Moderate water needs
  - Less suitable for zones with long dry summers
- Highly adaptable
- Full sun or part shade
- Cold hardy for mild winters
- Enjoys regular mowing
- Minimal–moderate foot traffic
- Suggested cultivar – Chisai
Carex pansa

- Lush and green
- Moderate water needs
  - Less suitable for zones with long dry summers
- Highly adaptable
- Full sun or part shade
- Cold hardy for mild winters
- Enjoys regular mowing
- Minimal-moderate foot traffic
Agrostis pallens

- Light green and even textured
- Minimal water needs
- Moderately adaptable
- Full sun or mostly shade
- Cold hardy for mild winters
- LOVES regular mowing
- Moderate foot traffic
Bouteloua (Buchloe) dactyloides

- Blue-green with fine leaves
- Ideal ground cover/filler
- VERY drought tolerant
- Highly adaptable
- Full sun to dappled shade
- Looks beautiful natural
Bouteloua gracilis

- Blue-green with fine leaves
- Ideal in groups
- VERY drought tolerant
- Highly adaptable
- Full sun to dappled shade
- Looks beautiful natural
Bouteloua curtipendula

- Bright green with a soft texture
- Ideal for texture and accents
- VERY drought tolerant
- Highly adaptable
- Full sun to light shade
- Looks beautiful natural
Aristida purpurea

- Green and Red, feather texture
- Ideal in groups
- VERY drought tolerant
- Highly adaptable
- Full sun
- Looks beautiful natural
Deschampsia cespitosa

- Green foliage with hints of gold
- Ideal for texture and accents
- Requires supplemental water
- Makes a great midground filler
- Full sun to partial shade
- Looks beautiful natural
Calamagrostis foliosa

- Green foliage with a purple tint
- Ideal for texture and accents
- Requires supplemental water
- Adaptable
- Full sun to partial shade
- Looks beautiful natural
Muhlenbergia rigens

- Pale green fine leaves
- Ideal for texture
- VERY drought tolerant
- Highly adaptable
- Full sun
- Looks beautiful natural
Success is key

- Well drained soil
- Proper prep
- Irrigate
- Prevent weeds
- Avoid extreme temperatures
- Plant small plants
- Seasonality
- Get creative
- Have fun
Grow More Grass

Save this for later
Emphasizing California Native Plants in a Water Utility’s Drought Resilience Strategy

Lindsey Stuvick, Water Efficiency Manager
Moulton Niguel Water District

- Drinking water, wastewater treatment, recycled water
- 7-member Board of Directors
- 170,000 customers
- Recognized locally, statewide, and nationally for innovation, environmental stewardship, customer service, and workforce culture
- Top workplace in Orange County
- AAA credit rated from Fitch and S&P
- Lowest average bill in South Orange County
Water Supply

- Import 100% Drinking Water
  - Diemer Treatment Plant
  - Baker Treatment Plant
- Recycled Water meets >20% of demand
- Local Reliability Projects

State Water Project
Travels 700+ Miles to Southern California

Conservation, Recycling

Colorado River Aqueduct
Travels 250 Miles to Southern California
Benefits of Water Efficiency

• Save water, energy, and money
• Reduce runoff & avoid property damage
• Improve quality of local creeks and beaches
• Delay investment in infrastructure and storage
• Keep water rates low
Drought – Northern CA River Systems
Drought – Colorado River Basin

Lake Powell Storage
Capacity: 24.3 MAF

Lake Mead Storage
Capacity: 26.1 MAF

- Overton Arm

- Minimum Power Pool
- Level 1 Shortage
- Level 2 Shortage

1.61 MAF less than last year
1.83 MAF less than last year
Drought Resilience

- Prepare our communities for a hotter, drier future
- Reduce peak and overall water demand
- Support innovation and market transformation
- Manage portfolio of programs and resources
- Partnerships & engagement critical to success
Water Budget Based Rates

- Effective demand management tool
- Science-based metrics calculate budget
- Provides customized water budget for each meter
- Indicates efficient level of monthly water use
- High bills could indicate leaks or overwatering
Residential Water Budget Formula

INDOOR WATER

OUTDOOR WATER

Persons per Household

Number of Days in Billing Cycle

55 Gallons Per Person

748 Conversion Factor

Irrigable Area

0.7 Plant Factor

Monthly Evapotranspiration

0.62 Conversion Factor

748 Conversion Factor

55 gal 

\[ \frac{\text{Persons per Household} \times 55 \text{ gal} \times \text{Number of Days in Billing Cycle}}{748} \]

\[ \times 0.7 \times 0.62 \div 748 \]
Outdoor Water Budget

- Outdoor Budget calculation elements:
  - Irrigable Area
  - Evapotranspiration (ET)
  - Plant Factor
  - Conversion Factor(s)

- Variation driven by changes in ET

Potable Water Budget = Irrigable Area × Monthly Evapotranspiration × 0.7 × 0.62 ÷ 748

748 Conversion Factor
ET Over Service Area

MNWD Microzone Analysis

Monthly ET Range by Microzone

Inches
SEASONAL PLANT WATER NEEDS (INCHES)

- CA Natives
- Drought Tolerant
- Grass (Warm Season)
Comparison of Supplemental Water Needs

- Bermuda
- St. Augustine
- Buffalo grass

- Cosmos
- Euryops
- Hibiscus

- Cleveland sage
- California fuchsia
- Wooly blue curls
Sustainable Landscape Classes

- Watershed-friendly landscape design
- Rainwater capture, soils, runoff mitigation
- California native plants
- Irrigation retrofits and hand-watering
- 3000 attendees and growing!
- In-person, virtual, and on-demand
NatureScape Turf-to-Native Garden Program

- Must attend sustainable landscape class
- Free landscape and irrigation assessment
- 50% custom landscape design
- Direct installation with instant rebate at $4/sf
- Post-installation educational site visit
- NatureScapers – The Real Landscapes of Orange County
NatureScape Garden Tours

• Featured 7 NatureScape gardens
• Range of garden ages, sizes, designs
• Education stations at each stop
• 850+ registrants
• Estimated 600+ attendees
• Virtual Garden Tour:
  https://www.mnwd.com/garden-tour/the-gustafson
Calscape Nursery Pilot Program

• Unique branding for CA native plants
• Digital & point-of-sale marketing materials
• Educational resources for nursery professionals
• Leverages Calscape.org features
• Create nursery profiles & add plant inventory
• Media kits for water agencies & nurseries
Calscape Nursery Training Program

- Free native plant training for nursery staff - 6 languages
- Emphasis on Nursery Maintenance & Customer Interaction
- Earn 8 CEUs toward CCN Pro Certification
- Opportunities to develop advanced trainings
- Managed by California Water Efficiency Partnership (CalWEP)
California native plants:
- Conserve water
- Require little maintenance
- Create an eco-friendly environment
- Create a habitat for wildlife and pollinators
- Provide year-round beauty
- Help prevent pollution from urban runoff

Find plants native to your region and connect with local nurseries who carry them!
QuickStart Watering Guide

• Limited resources to advise customers
• Highlights water savings benefits of native plants
• Tangible, simple guidance
• Feedback is welcome
• Access our watering guide!
Contact Us

Name: Lindsey Stuvick
Email: LStuvick@mnwd.com
Phone: 949-448-4065

www.mnwd.com
26161 Gordon Rd., Laguna Hills, CA 92653

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Saying “Native” Last:
Promoting California Native Gardens to New Audiences
During Drought and Defending their Installation During Times of Watering Restrictions

Download PDF at cbwcd.org/presentations
A Special District Providing Water Conservation Services to the Urban Western Edge of San Bernardino County

Protecting and Replenishing the Chino Groundwater Basin
• Demonstration garden and public park

Three acres of demonstration landscapes open Mon-Sat in Montclair
What we do to engage audiences

• In-person and online workshops: cbwcd.org/waterwiseworkshops
• Website: Waterwise Garden Planner - waterwisegardenplanner.org
• YouTube channel: cbwcd.org/youtube
More people than ever are thinking about getting rid of their lawns

But MANY will still be the first on their block to do so

The VAST MAJORITY would be the FIRST to plant a California native garden in their immediate neighborhood
• Most participants in most programs do not already know what the term “native plant” refers to or why that might be important.

• There is lots of confusion between “low water demanding” plants and “native plants.”
“What’s next?”
People *SELF REPORT* that design is the most frequent barrier

- BUT this is also the *first* barrier they encounter

- Design workshops consistently draw our largest attendance
  - focus on DIY techniques, not just beautiful high-cost gardens

- But then resources are needed for two sub-groups
  - DIY installation, establishment, and care
  - how to tell a contractor what you want, find and hire one, know enough about ongoing care

I’m working on a new tutorial series: cbwcd.org/DIYdesign
Most people we interact with do not want to consider themselves “gardeners”

- They want a nice landscape, and many like the idea of it being environmentally beneficial, but they are not attracted to the idea of gardening becoming a hobby of theirs.

- Many are willing to “do the work” to care for it, but do not see that as something exciting.

- For these people we usually recommend KEEPING IT SIMPLE (and using no more than 12-20 different species in an average front or backyard landscape).
What’s in it for them?

• People are realizing that conventional landscapes require a lot, especially in terms of water, which right now is not sufficiently available.

• What if there was a group of plants that...

• The idea that NATIVE LANDSCAPES DO MORE has emerged for us as an important overarching message and entry point.
• What do you put into your landscape and what you can get out of it in return?

• Overall, native plants happen to DO THE MOST in our landscapes while requiring the least in return, making them a logical choice.

• How much turf do you want to use? What can you do with the rest of the space that will do more for you than the turf ever did?

• Okay to balance open spaces and planted spaces.
Beauty is a minimum!

• Helps us get beyond “low-water” or “California friendly” plants and on to the additional benefits of natives.

• Promoting the fact that songbirds and butterflies will spend time in native gardens and are an integral part of their beauty.
• Intergenerational places of life-long learning
You think that is beautiful?

• Some people have more flexible criteria for beauty than others. I see two main groups, and different ways to engage each:

• Ready for new things - open to seeing the beauty in dormancy or balancing summer evergreen and summer down plants, open to finding beauty in dry foliage and seed heads, the morning light shining through them, the birds they bring, etc.
You think that is beautiful?

• Open to the idea of native plants but will not buy in to something that does not look “tidy” and “green” by conventional European landscape aesthetic standards.

• Provide options or lists of “formal looking” evergreen native plants, including ones that can be hedge
Native "Formal Looking" Top Trees and Shrubs

Description

One way to help a California native garden "look good" in a conventional sense throughout the entire year is to have a balance of "evergreen" plants that appear green and relatively lush looking year-round combined with colorful spring blooming plants like sages and wildflowers.

This list features our top natives that can be used for that evergreen backbone of a garden, whether it be for a more formal design using California native plants or to "balance" the look of a space when combined with wider looking or seasonally dormant native plants.

These would also be our top recommendations to start with for people who like the idea of working with native plants but prefer a "traditional" look for their landscape.

Plant List

TREES
- Catalina Cherry
- Coast live oak
- Engelmann oak

SHRUBS
- Coffeeberry + cultivars
- Creosote barberry
- Golden Abundance barberry
- Hollyleaf cherry
- Lemonade berry
- Huckleberry
- Pigeon Point Coyote brush
- Santa Cruz Island buckwheat
- Sagebrush
- Sunset manzanita
- Toyon

Theodore Payne Foundation

waterwisegardenplanner.org
Other ideas that seem to be working
• Making sure people know that they do not need to remove everything existing to start planting natives

• Letting people know that combining with some succulents or fruit trees (that receive extra water) is just fine

• Encouraging people just hearing about native plants to consider planting at least 50% native - by the time they research.....
Help them find the vision

• Photos of real-world landscapes with plants identified using common names

Deergrass
Showy Penstemon
Hummingbird Sage
Allen Chickering Sage
Yarrow
• Photos of real-world landscapes with plants identified using common names, and age of planting
Help them find the vision

- Landscape design examples that will be easy to emulate or that they can hand directly to a landscape contractor who understands native plants.

waterwisegardenplanner.org
Help them find the vision

• Landscape design examples that will be easy to emulate or that they can hand directly to a landscape contractor who understands native plants.

waterwisegardenplanner.org
Help them find the vision - and set expectations

- People appreciate not just seeing spring photos to get a true sense of what plants look like in each season both for aesthetics and so they don’t think they are doing it wrong!

- Reminding people that roses are actually pretty ugly for much of the year seems to help people put summer-dormant natives in perspective.
Plants as just part of the garden look to be achieved

• Balancing more formal, tidy, or even modern pathways and gathering spaces with planting that can be looser or wilder (for those who care)
Plants as just part of the garden look to be achieved

• Cues-to-care - It’ll also help with the neighbors
Importance of matching messaging to audience

• Words like “safeguarding biodiversity” might be good while talking to a college ecology class, but often do not work for the general public.

• We find that language more like “providing homes for songbirds, butterflies, and native, non-stinging pollinators who need our help and are a pleasure to see in our gardens” is much more effective in our community.

• STICK TO COMMON NAMES!! - we’ve tried it Latin first.....
Attracting birds and butterflies is a major draw

• The idea of having a “bird and butterfly garden” is popular for people who are thinking about what to plant who either have not heard of or even may have negative connotations about native plants

• Starting here and then teaching people how and why native plants are generally most effective for this
For general audiences, attracting or providing for pollinators is still not a major draw

- When many people hear pollinators, they immediately think about risk of being stung by (European honey) bees and are especially worried about risk to children.

- Building interest in providing for pollinators or “pollinator gardening” requires more “education bandwidth” than promoting plants for birds and butterflies.
Color is a major motivating factor

- Promoting that California native gardens can have blooms in every season works to grab interest
- Providing lists of easy to grow plants that are commonly available at native plant nurseries featuring flowers or foliage color year-round is useful
Did you notice I did not emphasize low water use?

• This is maybe the one thing intuitively understood about “native plants.”

• It is important to mention, but we never lead with it anymore.

• But then we do provide guidance about how to appropriately water
Our biggest goal is to have people leaving with a visceral desire to have a native plant garden and all the wonderful things it will bring to their lives. The idea is that this is the best and most exciting way to landscape the spaces around us and it happens to not need much water.

This is necessary to get many community members though all the potential barriers and increases motivation for those who are already interested.
Our highest attended in-person workshop: Colorful and Drought-Proof: Design Your Own California Native Garden
Having a California native garden sounds great, but...

Do we even have enough water to install and care for new native gardens with watering restrictions?
Some ideas before the numbers

In this time of water scarcity, knowing about irrigation can allow you to be a stronger advocate for built California native landscapes

even if it is sooooo boring
Every water provider has a different situation

- The current drought is an overarching factor but...
- Every provider has a different supply portfolio that is being impacted differently
- Restrictions are generally intended for lawns, but for sprinkler systems may be assumed to apply to everything else as well
- In most areas “hand watering” is allowed with no restrictions
Native plant advocates need to be able to actively and accurately engage with officials.
Common SoCal irrigation recommendation range in monthly inches for most native plantings with irrigation systems

NOTE: YOUR RECOMMENDATIONS MAY BE DIFFERENT. THIS IS BEING USED AS AN EXAMPLE

• “Establishment” phase: 0.5”-1” approximately once per week = 2-4” per month

• After establishment: 1”-1.5” every 3-4 weeks = 1-2.2” per month

Sources: this does not precisely represent any single recommend schedule but roughly takes into account the range of total monthly water application of base-line recommendations provided by Scott Kleinrock / Waterwise Community Center, Mike Evans / Tree of Life Nursery, Andreas Hessing / Scrub Jay Studios, and Tim Becker / Theodore Payne Foundation
### Inland SoCal Valley Areas Applied Turf Demands vs. Irrigated Native Landscape Common Practices, July*

<table>
<thead>
<tr>
<th>Plant Water Demands Cool Season Turf</th>
<th>Irrigation Applied Water Demands Cool Season Turf*</th>
<th>Garden Water Recommendations Appropriate Natives</th>
<th>Irrigation Applied Water Recommendations Appropriate Natives with efficient irrigation</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.4”</td>
<td>at least 8.3” (1.3 runtime multiplier)</td>
<td>1-2.2”</td>
<td>1-2.2” (no runtime multiplier, roots will find the water)</td>
</tr>
</tbody>
</table>

One Takeaway: People are not likely to ever be able to go back to LONG TERM having sufficient water for large standard turf lawns without disturbances to sufficient irrigation schedules.

While we can’t guarantee what the future holds for water availability for native gardens, we can guarantee that if appropriately designed, they will be the MOST RESILIENT option in the face of whatever future restrictions may come (best chance to look good during drought!)

*This is based on a July average 8” reference evapotranspiration based on last three years of local weather station data
Inland SoCal Valley Areas Applied Turf Demands vs. Irrigated Native Landscape Common Practices, Annual*

<table>
<thead>
<tr>
<th>Plant Water Demands Cool Season Turf</th>
<th>Irrigation Applied Water Demands Cool Season Turf*</th>
<th>Garden Water Recommendations Appropriate Natives</th>
<th>Irrigation Applied Water Recommendations Appropriate Natives</th>
</tr>
</thead>
<tbody>
<tr>
<td>42.6”</td>
<td>at least 55.4” (1.3 runtime multiplier)</td>
<td>9-19.8”</td>
<td>9-19.8” (no runtime multiplier, roots will find the water)</td>
</tr>
</tbody>
</table>

Irrigated established native landscapes can be expected to receive between 84% and 64% less water than cool season turf lawns. If the new design incorporates totally unirrigated areas like patios, the savings can easily be higher. If replacing “well-watered” but not “over-watered” turf for the entire landscape, this, on average could represent at least a 42%

* This is based on an reference evapotranspiration of 57.5” and standard procedure effective 25% rainfall assumption of 4.3” based on averages from last three years of local CIMIS station data (2019, 2020, 2021)
Example monthly water “allowance” for spray irrigation systems under different local watering restrictions vs. native gardening practices, inches*

<table>
<thead>
<tr>
<th>Water Schedule</th>
<th>Inches per Week</th>
<th>Inches per Month</th>
<th>Established Garden Water Recommendations Appropriate Natives</th>
<th>Water Recommendations During Plant Establishment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 x per week, 8 minutes</td>
<td>0.21</td>
<td>0.84</td>
<td>1-2.2 dry weather</td>
<td>2-4</td>
</tr>
<tr>
<td>2 x per week, 8 minutes</td>
<td>0.43</td>
<td>1.72</td>
<td>1-2.2 dry weather</td>
<td>2-4</td>
</tr>
<tr>
<td>2 days per week, no specific time limit</td>
<td>unlimited</td>
<td>unlimited</td>
<td>1-2.2 dry weather</td>
<td>2-4</td>
</tr>
<tr>
<td>3 days per week, no specific time limit</td>
<td>unlimited</td>
<td>unlimited</td>
<td>1-2.2 dry weather</td>
<td>2-4</td>
</tr>
</tbody>
</table>

*Assuming standard spray nozzles appx. 1.6” per hour precipitation rate with head-to-head coverage, Rain Bird MPR fixed pattern, Toro MPR plus, Hunter MPR Pro fixed spray nozzles, etc.
### Annual water “allowance” for spray irrigation systems under different local watering restrictions vs. native gardening practices

<table>
<thead>
<tr>
<th>Frequency</th>
<th>inches per year</th>
<th>likely implementation for turf landscapes, “ per year</th>
<th>likely implementation for native landscapes, “ per year</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 x per week, 8 minutes</td>
<td>11”</td>
<td>11”</td>
<td>9-19.8”</td>
</tr>
<tr>
<td>2 x per week, 8 minutes</td>
<td>22.2”</td>
<td>22.2”</td>
<td>9-19.8”</td>
</tr>
</tbody>
</table>

*Assuming native landscape irrigation for 9 months of year, not needed due to rainfall of over 1” per month for 3 months per year. Assuming standard spray nozzles appx. 1.6” per hour precipitation rate with head-to-head coverage, Rain Bird MPR fixed pattern, Toro MPR plus, Hunter MPR Pro fixed spray nozzles, etc.*
Weekly Restriction “Take Aways”

• For people doing deep infrequent irrigations anyway, water bills or monthly water meter reads will look identical to their property actively following the “turf intended” restrictions as long as their total monthly use is similar to restrictions, though ideally this would be done with approval of an engaged and supportive water provider.

• Even though water agencies continue to encourage the planting of native landscapes, many watering restrictions do not currently allow for sufficient use of spray systems to establish new native landscapes.
Recommendations for Engagement

- *Engagement with water agencies* around watering schedule allowances for establishment irrigation of native gardens - with a clear and simple approval process for exemptions to standard restrictions
Recommendations for Engagement

- *Engagement with water agencies* around “equivalent restrictions” for monthly spray irrigation allowances that “allot” equal water quantity allowed under weekly restrictions, but applied at a frequency appropriate for native plantings

  Plus a clear and simple approval process for this exemption or adoption as part of watering restriction policy
Recommendations for Engagement

• Engagement with water agencies around technical best practices for irrigation of native plants:

  • “high efficiency rotating nozzles,” and the need for making water users who are trying to “do the right thing” feel comfortable with using these encouraged products even though it will mean up to 4x the minutes of “runtime” compared to standard sprays

• drip irrigation not being the best in all cases, and not necessarily saving water vs. other high efficiency options in “real world” application in native gardens
Engagement with community members that “hand watering can be worth it” and guidance on the most efficient and successful ways to do so.
Questions

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links referenced in presentation:
waterwisegardenplanner.org
cbwcd.org/youtube
cbwcd.org/DIYdesign
cbwcd.org/waterwiseworkshops

download slides at cbwcd.org/presentations