



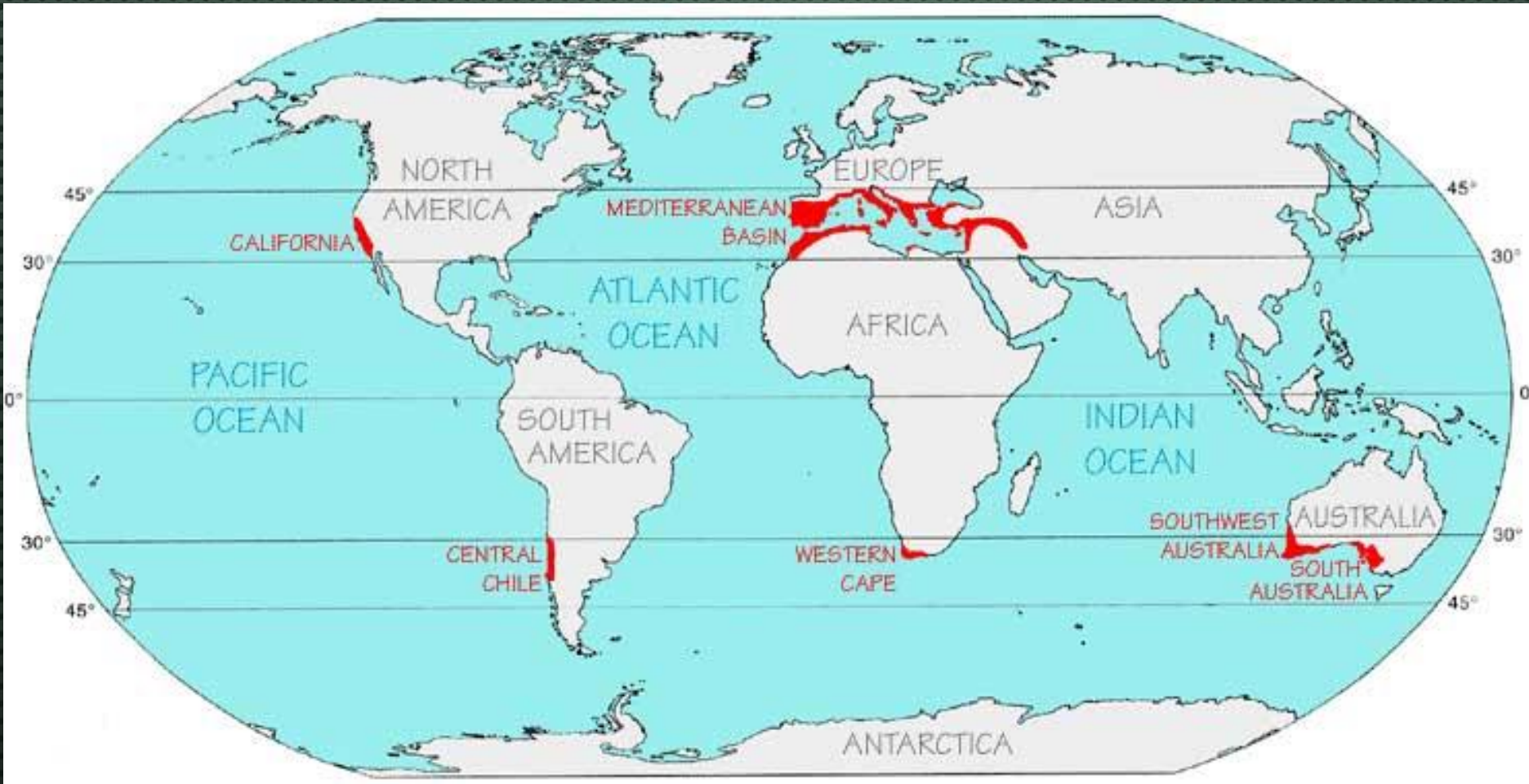
**INVASIVE
PLANTS!!!**



Hooray for Biodiversity!

(And that California is a
GLOBAL
biodiversity hotspot!)

WHERE DO INVASIVE PLANTS COME FROM?



HOW DO INVASIVE SPECIES GET HERE?



Photo by NPS





SEED DISPERSAL STRATEGIES

Animals



Eat and Excrete

Birds, drawn to brightly colored fruit, will eat the fleshy part and excrete the seeds far away.



Carry and Bury

Larger animals, mostly rodent mammals, will hide fruit and seeds for winter eating. Once forgotten, the seeds sprout in new locations.



Stick Tight

Furry mammals and feathery birds will often brush against low growing seeds that will cling to their fur or feathers and be moved far away.

Wind



Wings

Many seeds are light, dry, and aerodynamic to catch the wind on their natural wings.



Parachute

Other seeds are tiny and attached to fluffy structures that float in the air with the slightest breeze.

Water



Float

Some seed packages are hollow inside (containing air pockets) that allow the light-weight structure to float downstream and across bodies of water.

TOP 10: INVASIVE PATHWAYS

- HEAVY EQUIPMENT
- TOP SOIL IMPORTATION
- ROAD CONSTRUCTION
- RIGHT-OF-WAY WORK
- STAFF



- GRAZING
- VISITOR VEHICLES
- WIND
- VISITOR HIKING
- WILDLIFE

PREVENTION

Six Ways to Shut Down Weed Invasions

1. EDUCATE YOUR COMMUNITY AND LOCAL NURSERIES SO INVADERS ARE NOT PLANTED!!
2. SEARCH FOR EARLY DETECTION SPECIES
3. STOP MOVEMENT OF WEEDS
4. AVOID DISTURBING SOIL
5. AVOID INTRODUCING DISEASES
6. EDUCATE, ENCOURAGE, AND MAYBE EVEN HELP YOUR NEIGHBORS PULL WEEDS!

FIRST DO NO HARM...



VEHICLES AND TOOLS
AS VECTORS



TRAMPLING OF NATIVE PLANTS



Phytophthora tentaculatum ON STICKY MONKEYFLOWER



- **REMOVE** plants, animals & mud from boots, gear, pets & vehicle.
- **CLEAN** your gear before entering & leaving the recreation site.
- **STAY** on designated roads & trails.
- **USE CERTIFIED** or local firewood & hay.

TAKE THE
PLAYCLEANGO
PLEDGE!

CAUTIONARY PAUSE FOR

Phytophthora

- MORE THAN JUST SOD (CALPHYTOS.ORG)
- NURSERY PLANTINGS ARE A MAJOR RISK
- MUD AND SOIL CAN CARRY WATER MOLDS—
CLEAN TOOLS AND BOOTS (PREVENTS WEEDS
AS WELL)

Problem	Method	Disinfect	Activity	Clean	Vector
Weeds	Brush or Air		<ul style="list-style-type: none">• Vegetation Management• Any Soil Disturbance• Fuels	Debris Vegetation Mud	Vehicles equipment Boots Tools Pots Potted plants Soil, plants
Sudden Oak Death	Then Water (optional) Recommended but not required; 10% bleach, Lysol or 70% + isopropyl				
Phytophthora Root Rot	Brush or Air No water	Required; 70% isopropyl or 10% Bleach			
Phytophthora in Nursery Stock	Seed instead of planting, use younger stock Purchase from Accredited Nursery*****	Required; 70%+ isopropyl 10% Bleach Quaternary Ammonium	Planting		



PRIORITIZE YOUR SITES



- HIGH QUALITY HABITAT
- RARE, THREATENED AND
ENDANGERED PLANT POPULATIONS
- SPREADING EDGE
- VISIBILITY TO BUILD PROGRAM
- ACCESSIBILITY



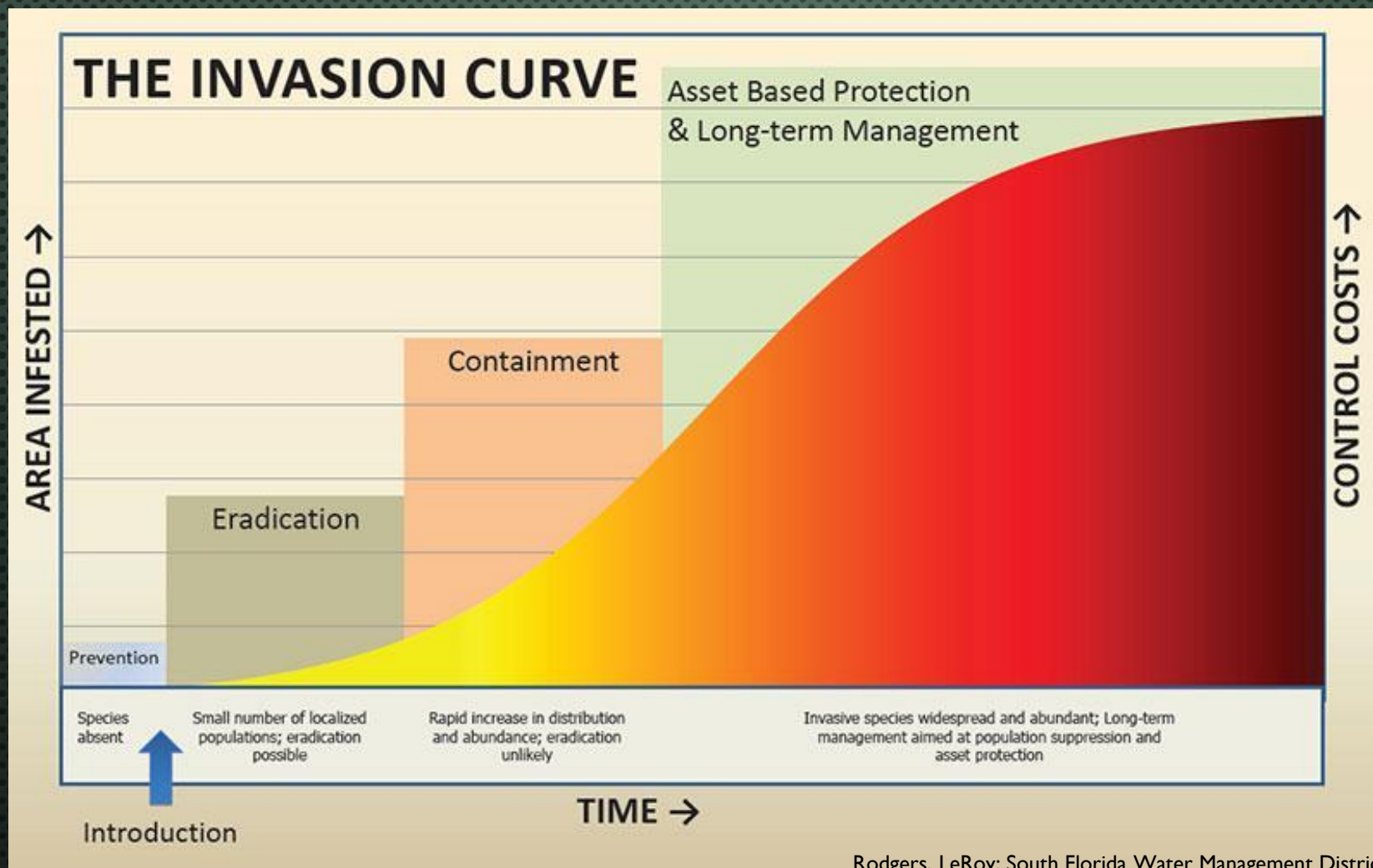
PRIORITIZE YOUR WEEDS

- ASSESS RISKS
ASSOCIATED WITH WEEDS
 - IS IT NEW TO THE
AREA?
 - IS IT SPREADING
QUICKLY?
 - IS IT MANAGEABLE
WITH THE RESOURCES
AVAILABLE?



Why this weed?

INVASION CURVE



INVASIVE PLANT CONTROL TECHNIQUES



KNOW YOUR TARGET WEED SPECIES

- **REPRODUCTIVE STRATEGY**
- **SEED LONGEVITY**
- **GERMINATION TIMING**
- **SEEDLING VIGOR**
- **MECHANISM OF INVASION**
- **ROOT/STEM/FLOWER REGENERATION**

LIFE HISTORY STRATEGIES:

HOW DO DIFFERENT PLANTS GROW, REPRODUCE, AND COMPETE?



Annuals and Biennials:
“Live fast, die young”



Annual grassland

Perennials, Vines, Trees:
“Slow and steady wins the race”



Redwood forest

ANNUALS: **LIVE FAST, DIE YOUNG**

TWO BASIC PRINCIPLES FOR MANAGING ANNUALS:

1. PREVENT NEW SEED
PRODUCTION

2. DEplete EXISTING SEED BANK

HOW LONG WILL SEEDS SURVIVE IN
THE SOIL?



BIENNIALS

TAKES TWO YEARS TO PRODUCE SEEDS

1st year a rosette grows:
low, flat leaves; most of
growth is underground



**Bull
thistle**

2nd year the plant “bolts”,
or grows a flower stalk



PERENNIALS

- USUALLY TAKES MORE THAN A YEAR TO PRODUCE SEEDS
- PLANTS ARE ALIVE YEAR-ROUND (MAY BE DORMANT AT TIMES); PUTS ON NEW GROWTH EVERY YEAR
- MANY PLANTS CAN RE-SPROUT FROM SMALLER PIECES



Periwinkle

PERENNIALS

SEASONAL VARIATION IN STORED FOOD IN ROOTS OF PERENNIAL PLANTS.

TAKE ADVANTAGE OF THIS DROP IN FOOD LEVELS TO MOW OR CUT--I.E., KICK THEM WHILE THEY ARE DOWN!

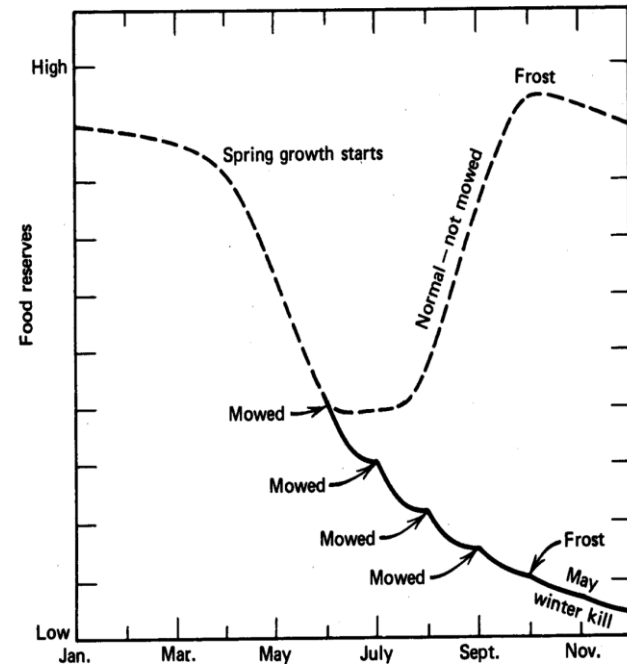
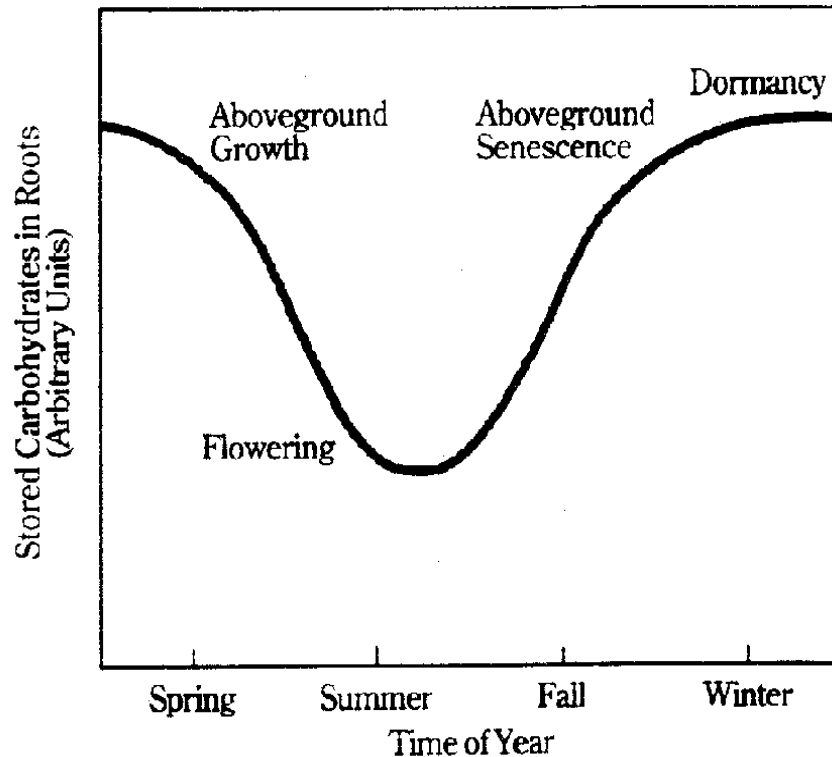


Figure 3-3. Food reserves of a perennial unmowed plant compared with reserves of a repeatedly mowed plant.

CONTROL OF WOODY SHRUBS

- BROOM, COTONEASTER, PRIVET, ITALIAN BUCKTHORN
- LONG LIVED SEED BANKS
- MECHANICAL: WEED WRENCH, LOPPERS, SAWS, SHOVEL, PICK MATTOCK
- PREPARE FOR SEED GERMINATION FROM DISTURBANCE
- GIRDLING (STRIPPING OF BARK)
- REPLANT WITH NATIVE SHRUBS:
 - E.G, REPLACE COTONEASTER WITH TOYON, ITALIAN BUCKTHORN WITH COFFEE

BIOMASS DISPOSAL: PILE MANAGEMENT

EROSION CONTROL

LOCALIZE WEED SEEDS IF PRESENT

BAG AND REMOVE IF CONCERNED OR
BAG AND SOLARIZE THEN DUMP

PLACE WHERE MONITORING IS EASY

PLACE WHERE GERMINATION LESS LIKELY . .
E.G., YST IN THE SHADE

AVOID FUEL LOADING PILES

LEARN



➤ CONSULT THE WEB

- <http://www.cal-ipc.org>
- <http://wric.ucdavis.edu>

➤ ASK AN EXPERT

- WEED MANAGEMENT AREAS
- UC EXTENSION
- FIELD COURSE INSTRUCTORS
- VOLUNTEER FOR A VARIETY OF PROJECTS



➤ EXPERIMENT IN THE FIELD!



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About Us

Across California, invasive plants damage wildlands. Invasive plants displace native plants and wildlife, increase wildfire and flood danger, consume valuable water, degrade recreational opportunities, and destroy productive range and timber lands. Cal-IPC works with land managers, researchers, policy makers, and concerned citizens to protect the state's environment and economy from invasive plants. [More...](#)



Garrett Dickman of the NPS talks restoration in Yosemite Valley on a Symposium field trip.

Quick Links

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Weed Research & Information Center



UNIVERSITY OF CALIFORNIA • COOPERATIVE EXTENSION & AGRICULTURAL EXPERIMENT STATION

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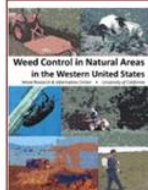


Medusahead
(*Taeniatherum caput-medusae*)

The Weed Research and Information Center is an interdisciplinary collaboration that fosters research in weed management and facilitates distribution of associated knowledge for the benefit of agriculture and for the preservation of natural resources.

WHAT'S NEW

- » [Jasieniuk invited to give the "David W. Staniforth Memorial Lecture"](#)
- » [Federation chooses DiTomaso for James H. Meyer Award](#)
- » [Keeping bindweed in check](#)
- » [Shrestha named American Society of Agronomy fellow](#)
- » [Vigilant seed bank reduction](#): Whatever it takes, don't let weeds set seed
- » [Hanson receives award](#) for Outstanding New Academic
- » [Weed control information for weeds in natural areas](#) (western U.S.)



Weed Control in Natural Areas in the Western United States publication available at

- » UCCE [Central Sierra offices](#) (Amador, Calaveras, El Dorado, and Tuolumne Counties)
- » [Calif. Invasive Plant Council](#) (U.S. sales only)
- » [Western Society of Weed Science](#) (U.S. and Canada sales only)
- » [UC ANR Publications](#) (UC ANR Publ. 3547)

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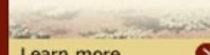
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plant name

[NAME WIZARD](#)

Enter part of a name: common scientific or FAMILY

poppy Papaver POACEAE

duration

- ☐ Annual
☐ Perennial
☐ Biennial

lifeform

- ☐ Grasslike ☐ Tree
☐ Herb ☐ Fern
☐ Shrub ☐ Vine

status

- ☐ Native to California ☐ CNPS rare plants
☐ Not native to California ☐ Affinity to serpentine soil
☐ Cal-IPC invasive plants

community

any
Alkali Sink
Alpine Fell-fields
Bristle-cone Pine Forest
Chaparral
Closed-cone Pine Forest

category

- ☐ Monocot ☐ Bryophyte
☐ Dicot ☐ Lichen
☐ Gymnosperm ☐ Algae
☐ Pteridophyte ☐ Whisk-fern

result format

Photos

[more ...](#)

Order by

scientific name

county

any
Alameda
Alpine
Amador
Butte
Calaveras
Colusa
Contra Costa
Del Norte
El Dorado
Fresno
Glenn
Humboldt
Imperial
Inyo
Kern
Kings
Lake
Lassen
Los Angeles
Madera
Marin
Mariposa
Mendocino
Merced
Modoc
Mono
Monterey
Napa
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Orange
Placer

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