

HERBARIUM SPECIMEN VOUCHER RATES FOR ENDANGERED PLANTS IN CALIFORNIA

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The Problem - Each field season...

- ❖ California botanists conduct hundreds of field surveys for rare/threatened/endangered plants
- ❖ Each season, dozens of new occurrences are documented

How often are these new discoveries being properly vouchered with herbarium specimens?

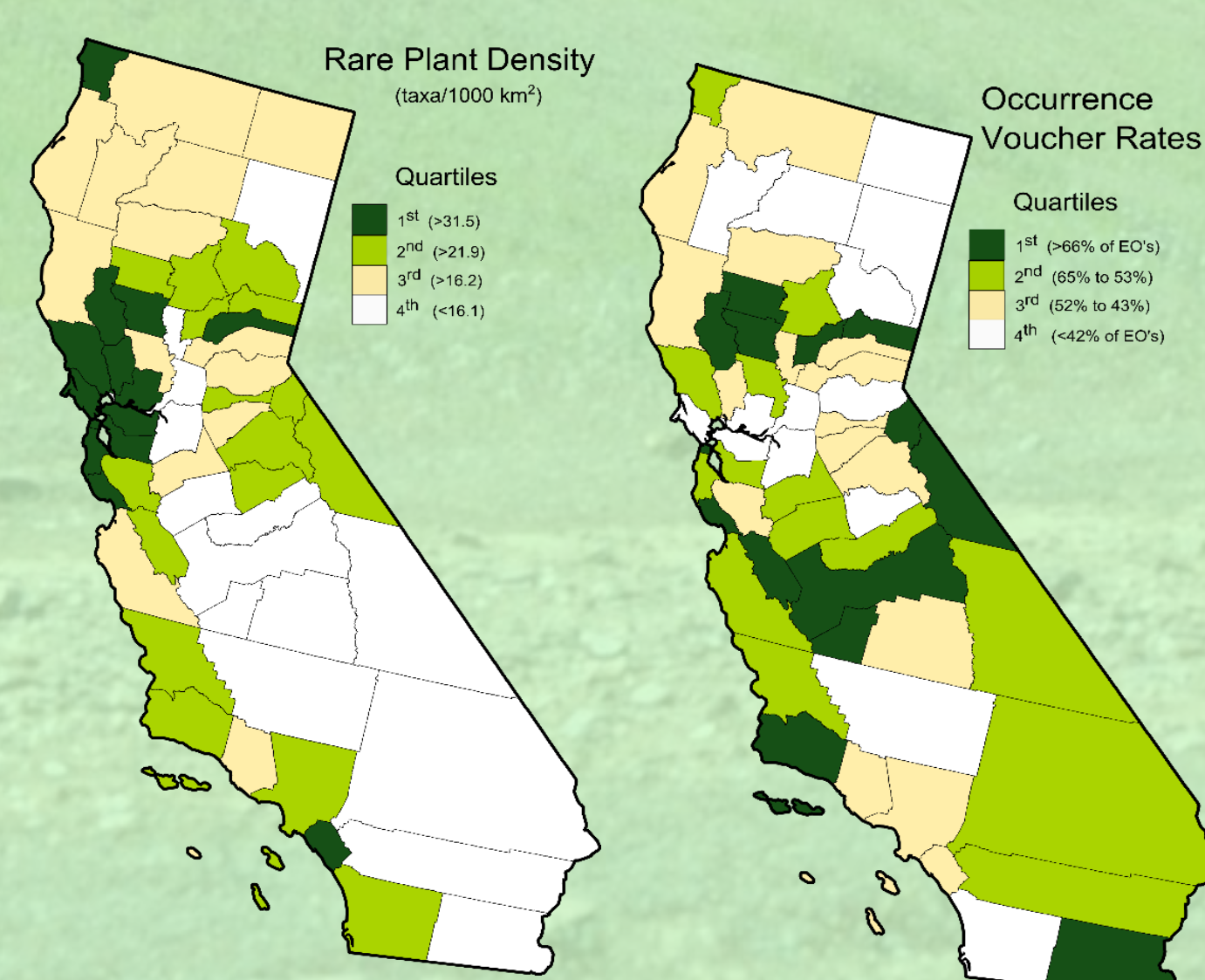
Data for this study

- Reviewed 14288 Natural Diversity Data Base records (~35% of the total) for vouchers, consisting of two subsets
 - a) random 10% sample (3478 occurrences)
 - b) all occurrences for 10 most speciose CFP genera (*Astragalus*, *Arctostaphylos*, *Carex*, *Dudleya*, *Erigeron*, *Eriogonum*, *Galium*, *Lupinus*, *Mimulus* (sensu lato), *Monardella*, *Phacelia* and *Streptanthus*)
- Determined voucher for an occurrence based on
 - a) NDDDB citation of a specimen, or where none was cited, then examination of ...
 - b) Consortium of California Herbarium records
- Databased other NDDDB reported data for analysis
 - date of first field survey form or report for each EO#
 - population size, population area, latitude

Data from 616 taxa reviewed (mostly List 1B or List 2)

tidbit no. 1

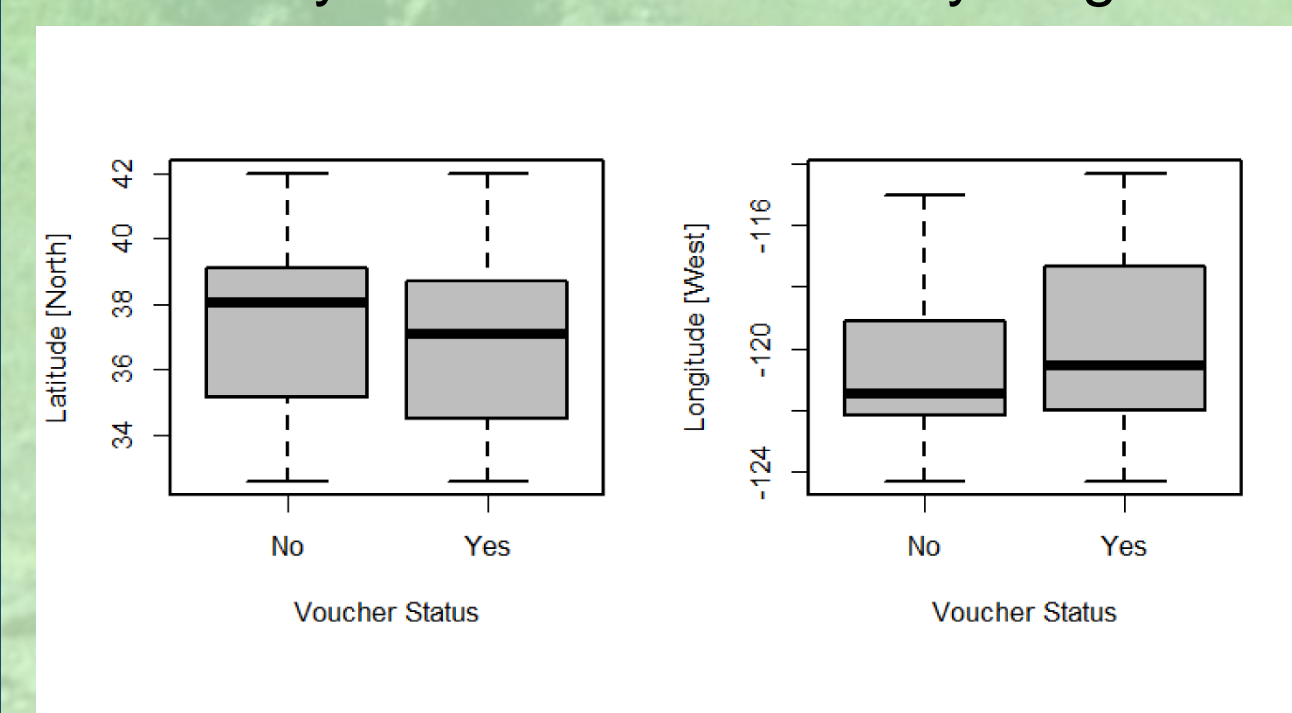
High density of rare plants in the Bay Area, but low voucher rates



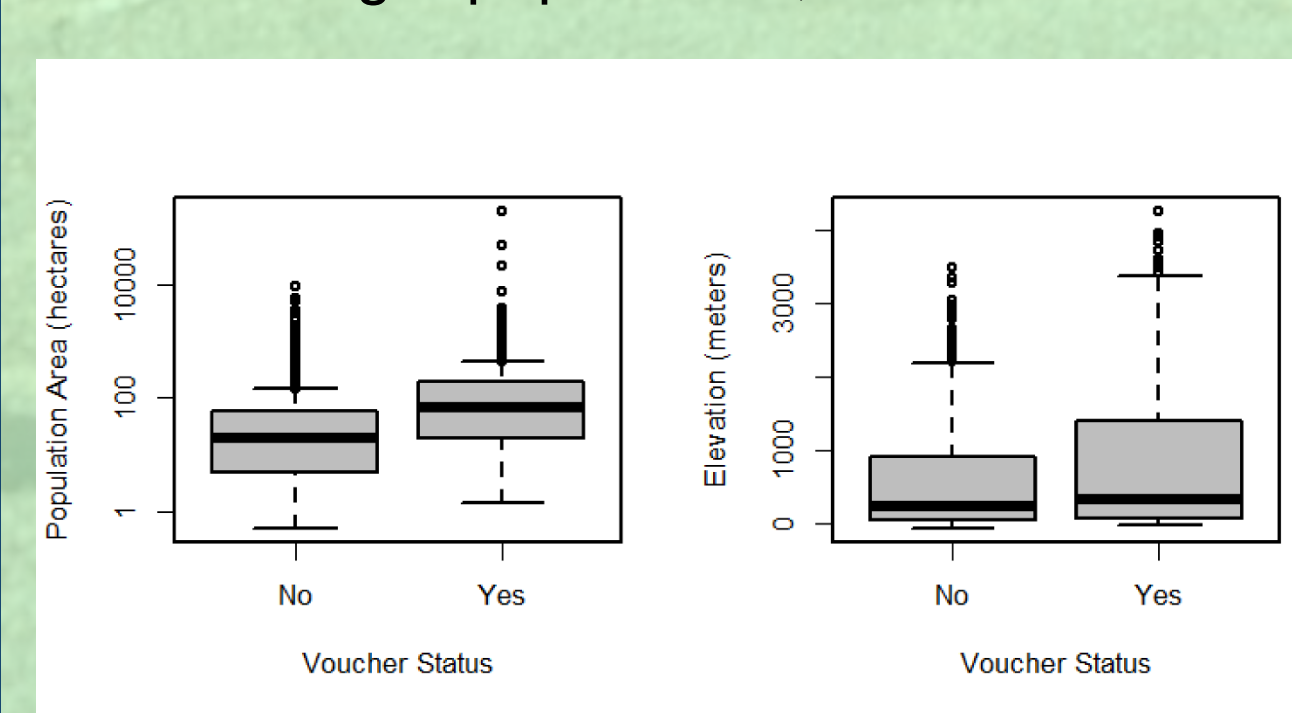
The absolute worst example:
Antennaria flagellaris
(List 4.2) >100 million plants
42 CNDDDB occurrences
ONLY 2 occurrences vouchered

tidbit no. 2

vouchered occurrences more probable at southerly latitudes and westerly longitudes



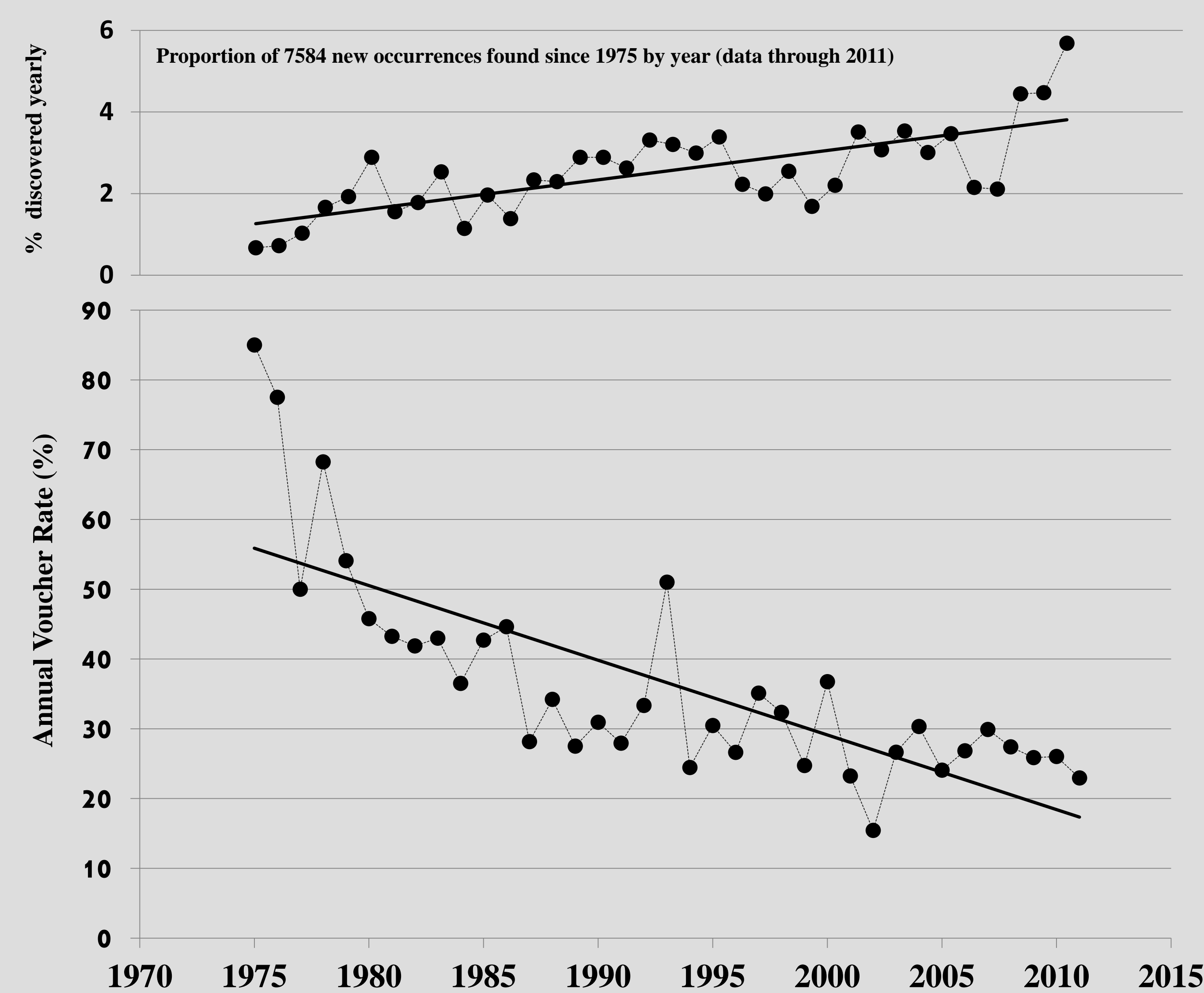
...or from larger populations, or lower elevation



standard Box Plots are shown (out of R)

PRINCIPAL FINDING

Since 1975 (i.e. just after the first CNPS Inventory)
VOUCHER COLLECTION RATE **HAS STEADILY DECLINED**
WHILE the number of newly documented occurrences has **INCREASED**



only 47.3% of all R/T/E/ plant occurrences in CA are vouchered...

!! LETS GET SOCIAL ABOUT VOUCHERING !!



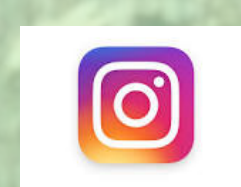
... lazy botanists walk right past em'...
endangered plant DNA being lost



...botanists blow big their chance...
endangered plant DNA being lost



..its so hot and the black flies are huge...
...botanists fail to gather endangered plant DNA



...last I checked, digital photos don't have DNA...

#PressEmNow!

#BotanyisBitchin

#NoVoucherItsARumor



California Native Plant Society

GUIDELINES ON

ETHICS AND BEST PRACTICES FOR COLLECTING NATIVE PLANTS

Statement:

CNPS encourages the ethical collection of native plants for appropriate uses such as: herbarium voucher specimens, research material, biochemical assay, anatomical study, educational material, and for incorporation of plants, seeds or cuttings in botanic gardens and arboreta. Collection of plants should be conducted using best practices and ethical standards whether they are common, rare, threatened, endangered, or otherwise noteworthy.

Intent:

- To foster the collection of plants in a respectful manner that does not impact the population's capacity to reproduce and thrive nor negatively impact the condition, ecological processes or aesthetics of the habitat and surrounding environment.
- To ensure that collected plants are used in a manner that contributes to the understanding, appreciation, and/or preservation of native plants in a meaningful way.
- To support documentation by plant voucher and seed collecting that contributes to the conservation or recovery of rare species.

...we strongly encourage voucher collections of rare and common plants if one or more of the following conditions apply:

- the identity of the plant requires confirmation;
- most all existing voucher specimens lack the key characteristics necessary for identification;
- the plant occurs in an unusual habitat, or if there is an indication of azonal or other change in habitat;
- it is a new or suspected new occurrence, unknown previously to the botanical community;
- it is a known occurrence for which no voucher specimen exists in a participating herbarium of the Consortium of California Herbaria;
- all existing voucher specimens lack viable material for DNA sequencing, or fresh plant material is needed for research, biochemical assay, anatomical study, and/or for conservation in an arboretum or seed bank;
- no vouchers have been collected within the past 5-7 years (for annuals) or 10-15 years (for perennials) and the population has not been adequately vouchered or over-collected (e.g., there is not a significant number of vouchered specimens already from the same population).

Proposed Standard

Voucher all newly documented R/T/E plant occurrences when:

- ☐ nearby occurrences are not vouchered
- ☐ new occurrence extends the known geographic, elevation or habitat range

EDITORIAL

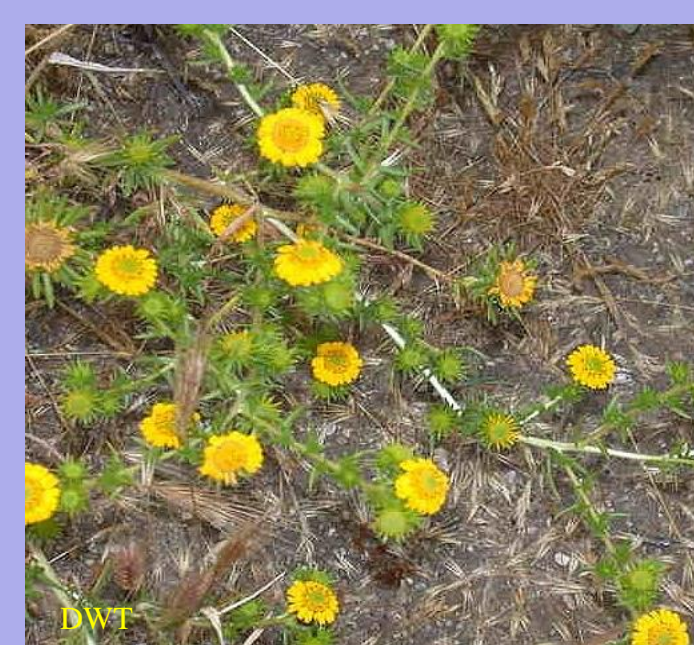
California botanists whom fail to voucher their R/T/E plant discoveries are failing to follow appropriate professional standards. **Renewal of Certification as a botanist should require demonstrated additions to Consortium herbaria.** CNPS collection guidelines provide exact guidance for specimen gathering. All R/T/E survey contracts should allocate time and funding to voucher documentation of new occurrence discoveries. Voucher specimens should be requisite for all State and Federal agency botanical surveys.

Mug Shots of the best vouchered... (all List 1B)

Astragalus tener var. *tener* (1B.2)
46 of 65



Centromadia pungens ssp. *laevis* (1B.1)
73 of 117



Clarkia delicata (1B.2)
57 of 95

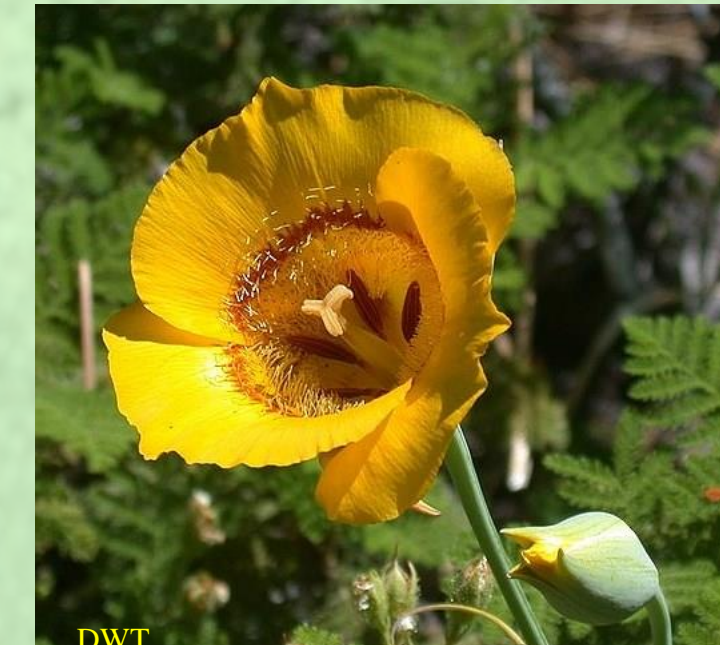


Astragalus leucolobus (1B.2)
66 of 94

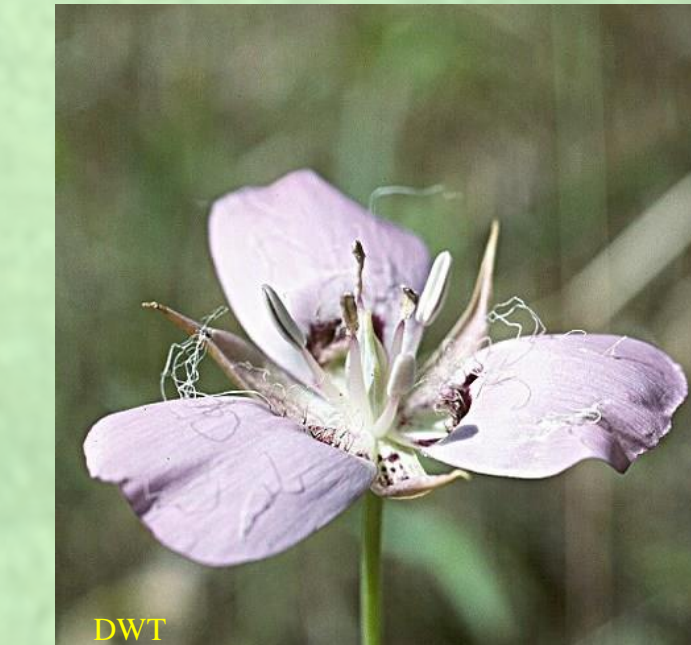


...and the worst...

Calochortus clavatus var. *avius* (1B.2)
6 of 101



Calochortus longebarbatus (1B.2)
14 of 114



Hibiscus californicus (1B.2)
13 of 127



Symphytotrichum lentum (1B.2)
22 of 151

