Tools for Rare Plant Conservation and Research: The CNPS Inventory, CNDDB RareFind, and DFG BIOS

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March 8, 2008
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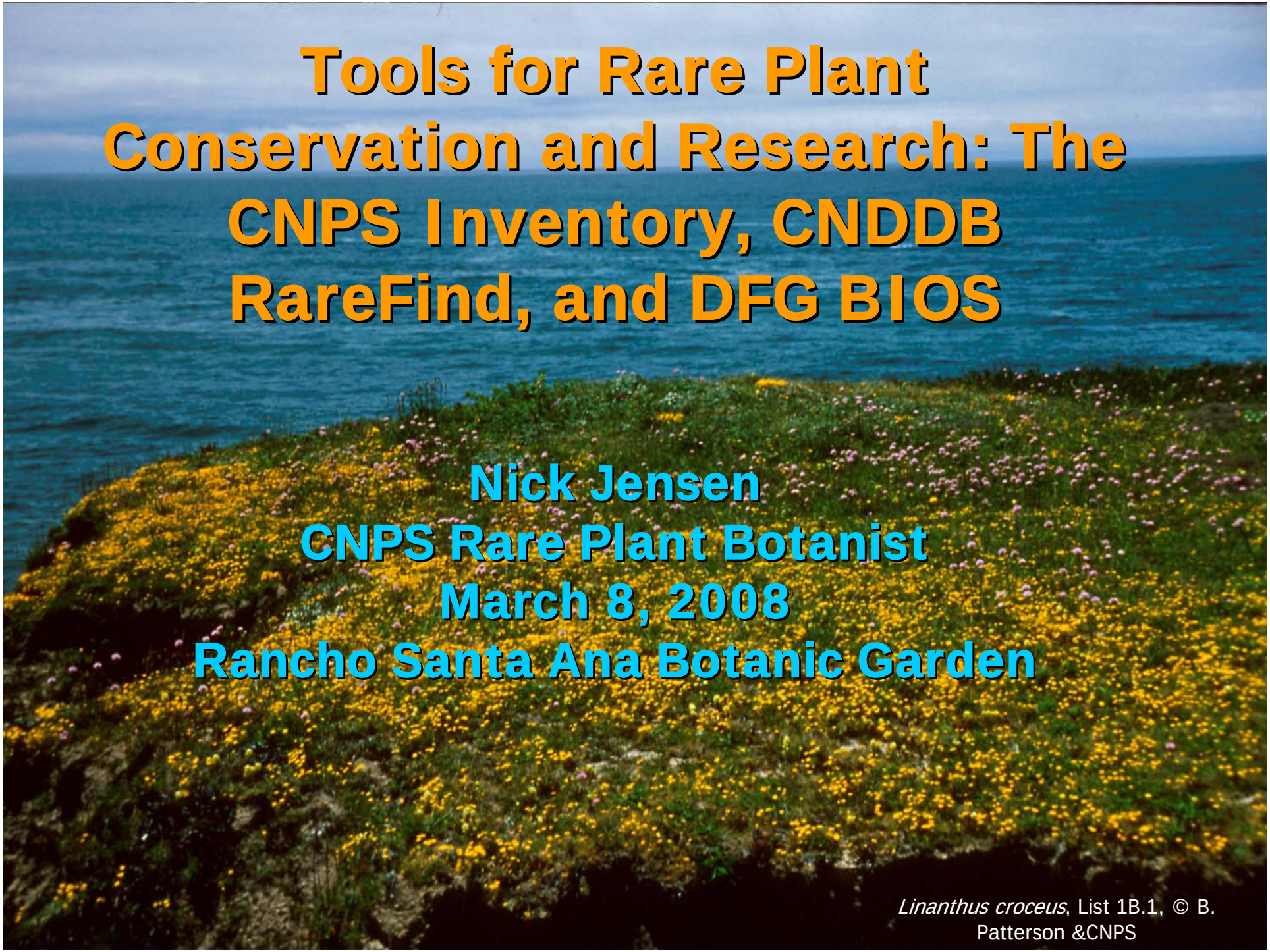

Linanthus croceus, List 1B.1, © B. Patterson &CNPS

Outline

I. The CNPS Inventory
II. The CNDDB (California Natural Diversity Database) and RareFind
III. DFG BIOS (Biogeographical Information and Observation System)

Collomia rawsoniana, List 1B.2 © V. Dains and CNPS

I. The CNPS Inventory

Sclerocactus polyancistrus, List 4.2

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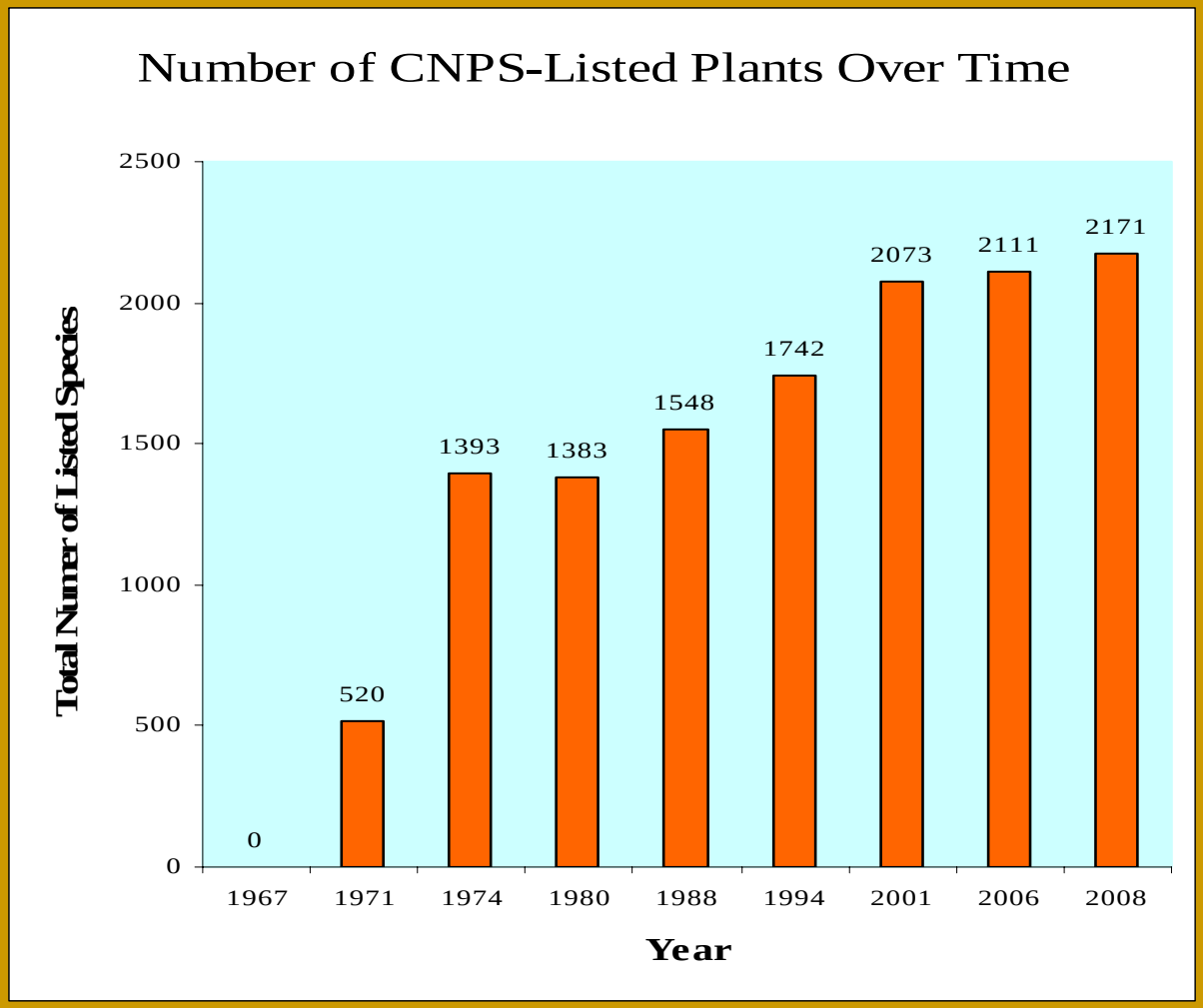
The History of the CNPS Inventory

Solanum clokeyi, List 4.2 © R. York & CNPS

- In 1968 G.L. Stebbins started a card file of CA plants with a distribution of less than 100 miles.
- This information was sent to other botanists for review.
- The first widely distributed plant list appeared in 1971 with 520 plants.

The CNPS Rare Plant Inventory Over Time

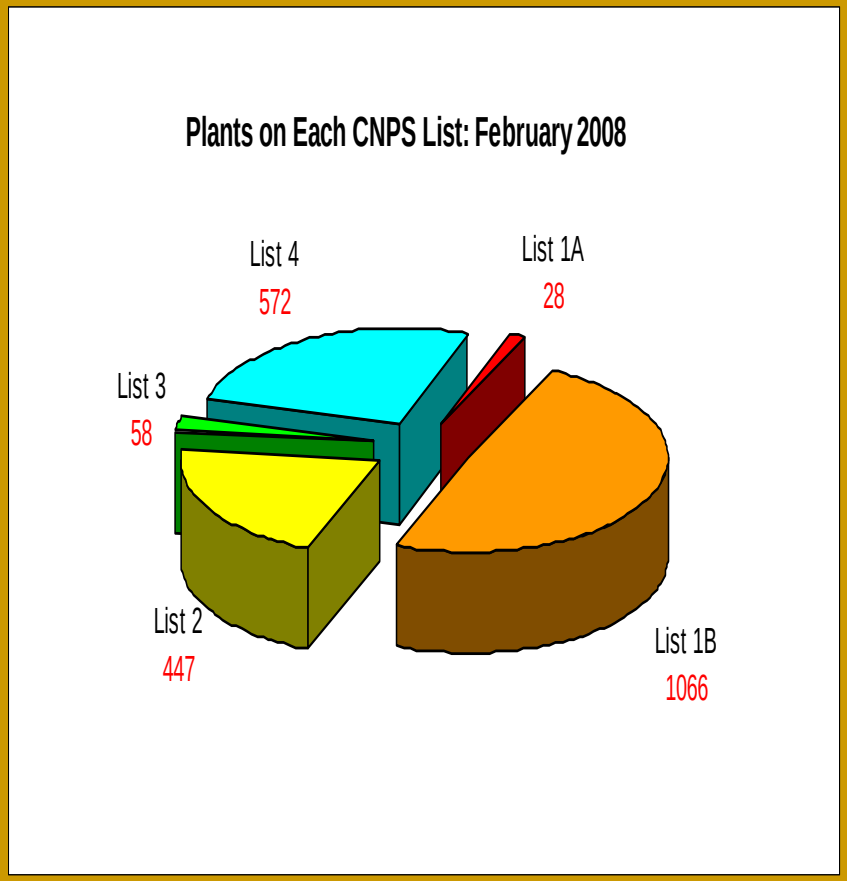


Fritillaria pluriflora, List 1B.2, © A. Ackley & CNPS

The Composition of the CNPS Inventory

- Total of 2171 plants
- 71 % (1541) on Lists 1A, 1B or 2
- 186 Federal ESA; 220 CA ESA Listed

Allium shevockii, List 1B.3, © B.Ertter & CNPS



The CNPS Ranking System

Castilleja mendocinensis, List 1B.2,
© G. Snyder & CNPS

- List 1A: Presumed extinct in CA
- List 1B: Plants rare or threatened endangered in CA & elsewhere (<50 occurrences)
- List 2: Plants rare, threatened or endangered in CA but more common elsewhere
- List 3: Plants about which more info is needed-often w/ taxonomic issues
- List 4: Plants of limited Distribution-a “watch list” (>50 occurrences)

The CNPS Rare Plant Review Process

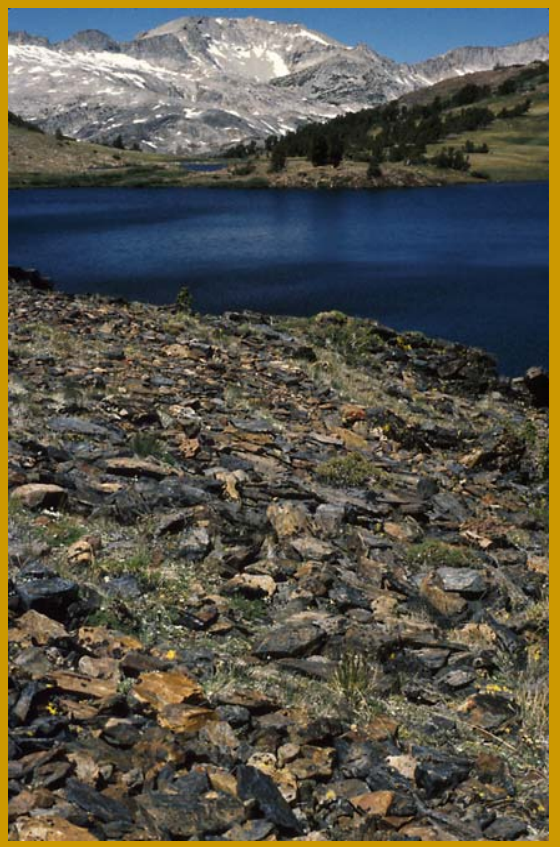
1. Species identified as of potential conservation concern
2. Literature and herbarium review, communication with experts
3. Based on available information, a List recommendation is made (1B, 2, 3 or 4)

Darlingtonia californica, List 4,
© R. Bittman & CNPS

The CNPS Rare Plant Review Process (cont.)

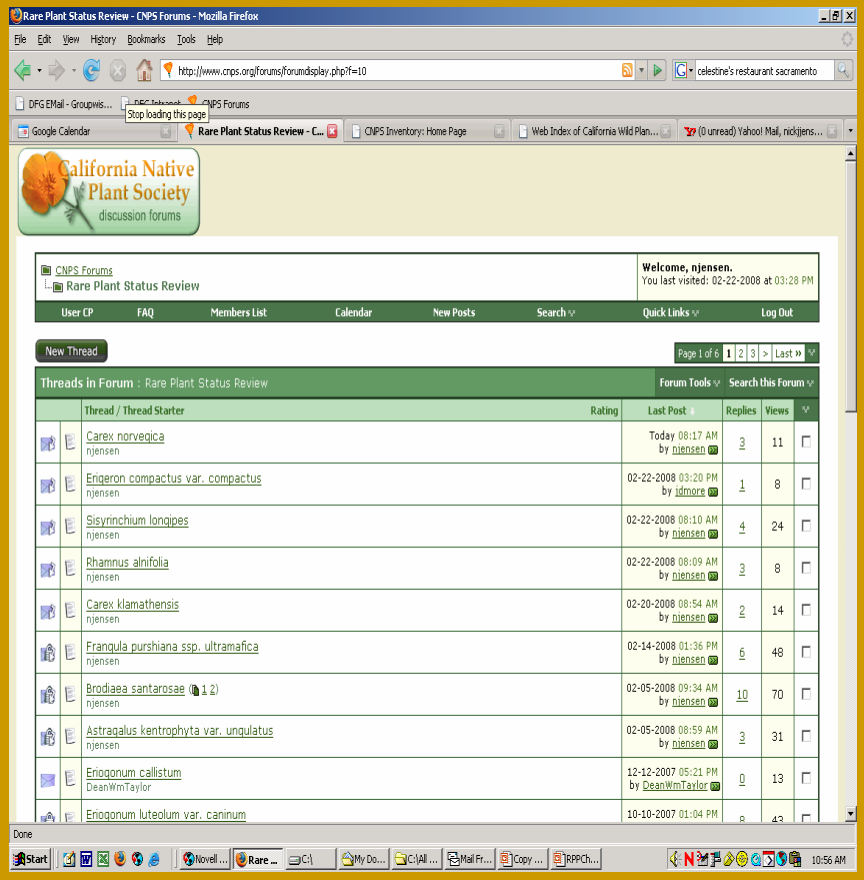
4. Input from Outside Sources:
   A. Rare Plant Review Groups (7 groups statewide with over 300 members)
   B. Online discussion forum (http://www.cnps.org/forums/index.php)

5. Final Decision: Based on available info and input from outside sources



Arabis tiehmii, List 1B.3,
© J. Palmer & CNPS

The Rare Plant Review Forum



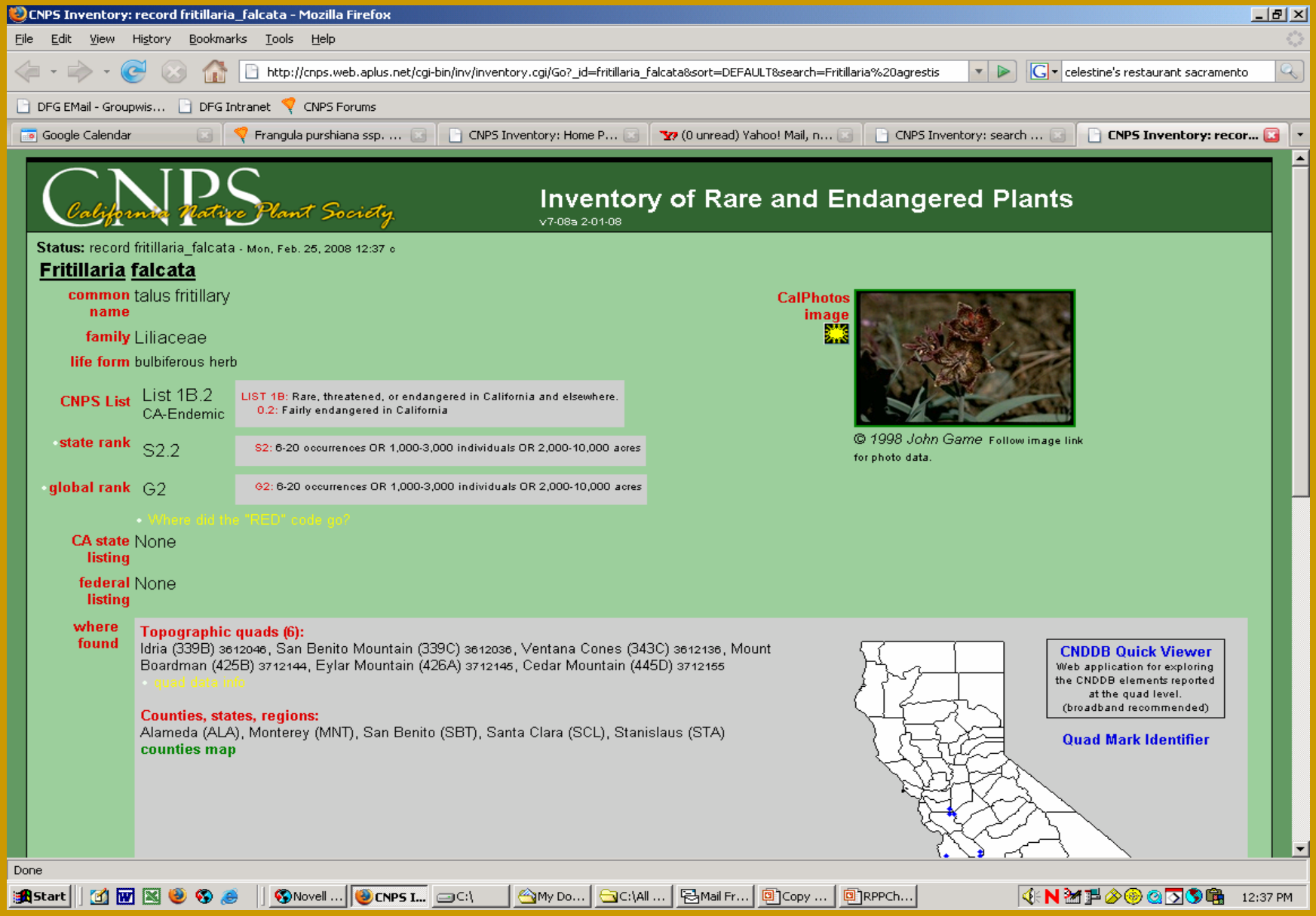
CNPS Threat Rankings

- No longer using the R-E-D (Rarity- Distribution-Endangerment) Code; info is still available in the online inventory but is not updated
- New Threat Rankings (.1, .2, .3)

  .1 : Seriously endangered in CA
  .2 : Fairly endangered in CA

  .3 : Not very endangered in CA (or no information about threats at this time)

Erythronium pusaterii, List 1B.3,
© L. Norris & CNPS



A sample Page of the CNPS Online Inventory

Importance of Outside Input

Linanthus orcuttii, List 1B.3, © B. Patterson &CNPS

- More accurate data in the CNPS Inventory. More detailed habitat and distribution information makes the database even more useful for conservation purposes
- The rare plant review process thrives on outside input. The more input we receive, the more robust our decisions become.

Why is the CNPS Inventory So Important for Plant Conservation

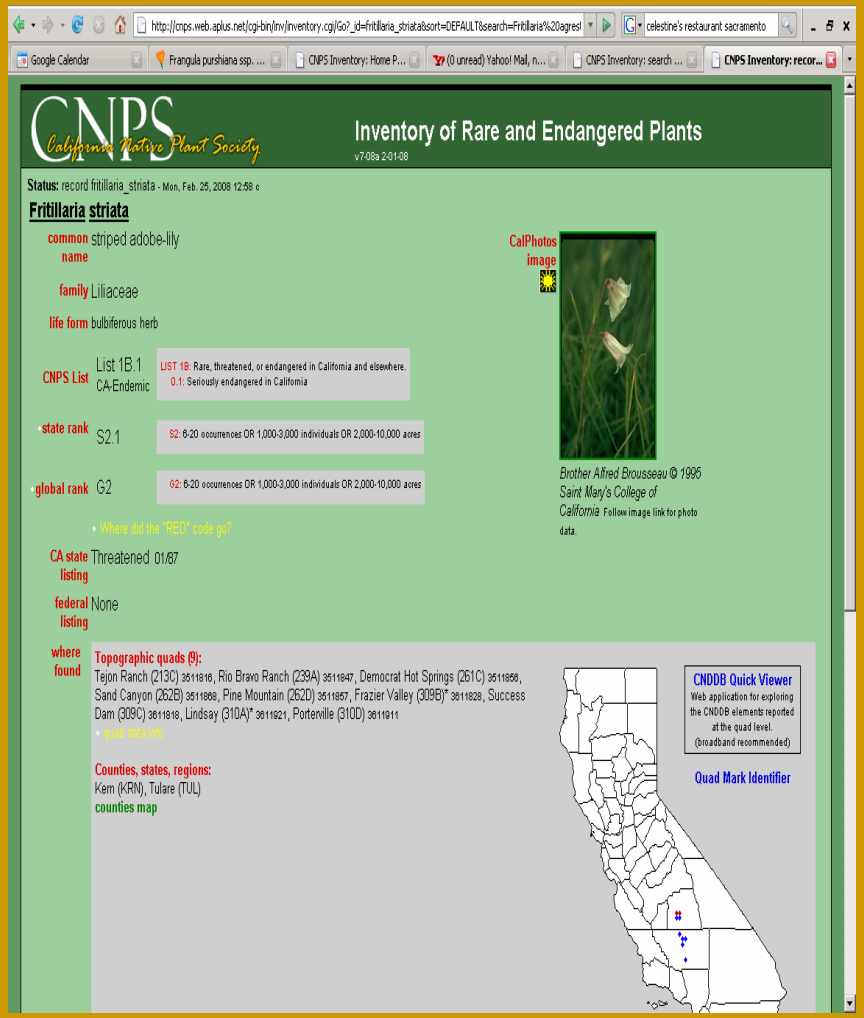
- CEQA 15380 states that any plant that meets the definition of rare, threatened or endangered must be treated as such in environmental documents.
- CNPS List 1A, 1B and 2 plants and some List 3's may qualify under CEQA 15380 and are often given consideration in environmental documents and are mitigated for if unavoidable impacts occur.

Astragalus funereus, List 1B.2
© S. Cochrane & CNPS

The CNPS Online Inventory

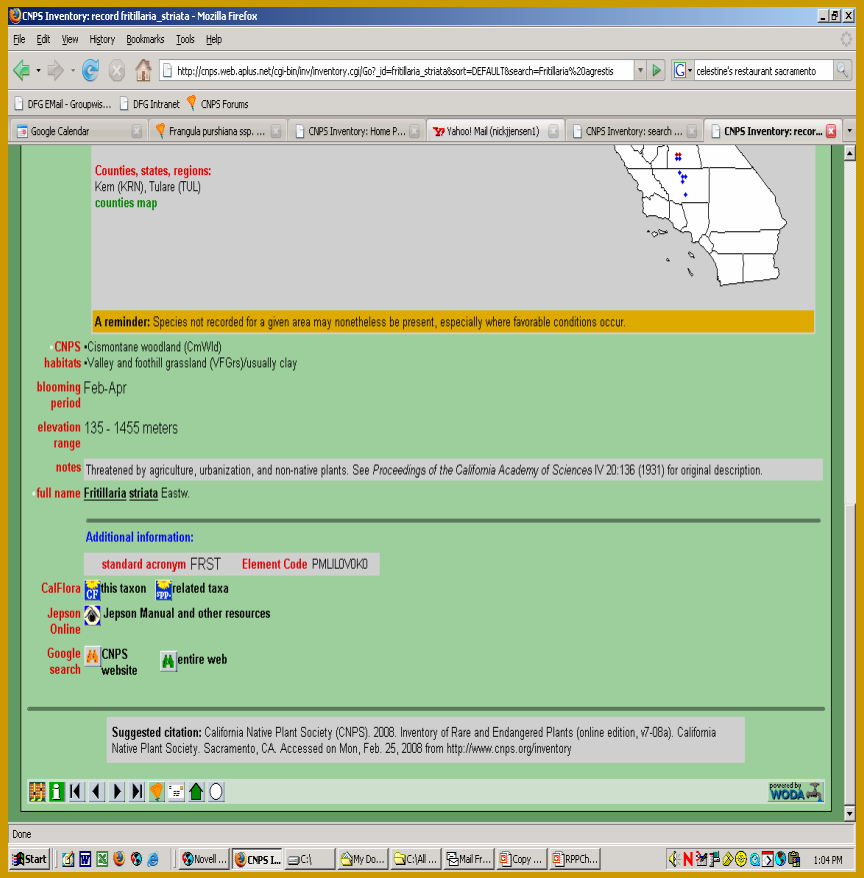
Information Included

- Rarity Information: CNPS, S-Rank, G-Rank
- Photo with link to Calphotos
- ESA Listing Info
- Quad-level Location information with map
- County Distribution with map

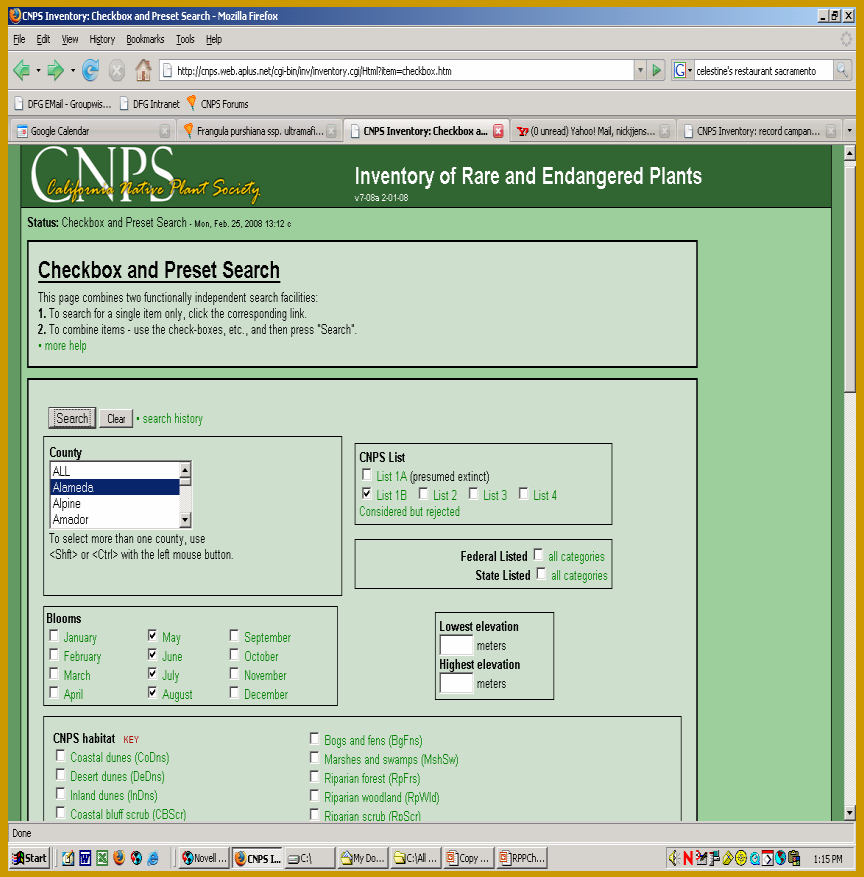


The CNPS Online Inventory (continued)

- Habitat Information
- Phenology
- Elevation Range
- Special distribution info
- Threats
- Literature citations
- Links to other sites



Use of the Online Inventory

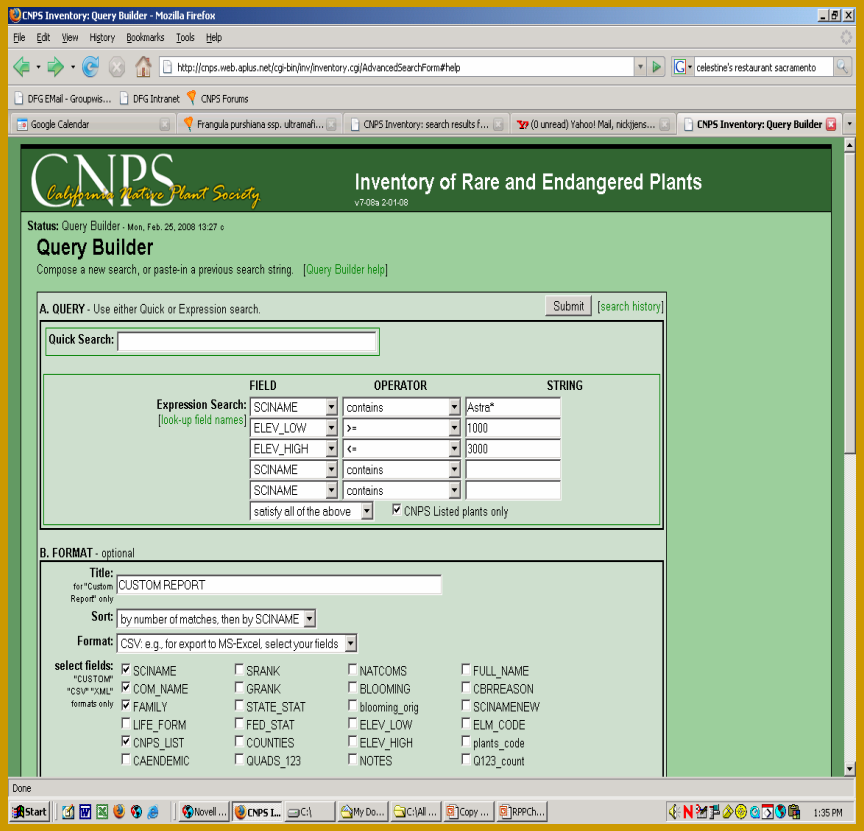


- Simple search: search for a single family, genus or species; can use * as a wildcard
- Checklist and Preset Search-Allows a search for based on a combination of features:

  County, Phenology, Elevation, Habitat, ESA Listing

Use of the Online Inventory (cont.)

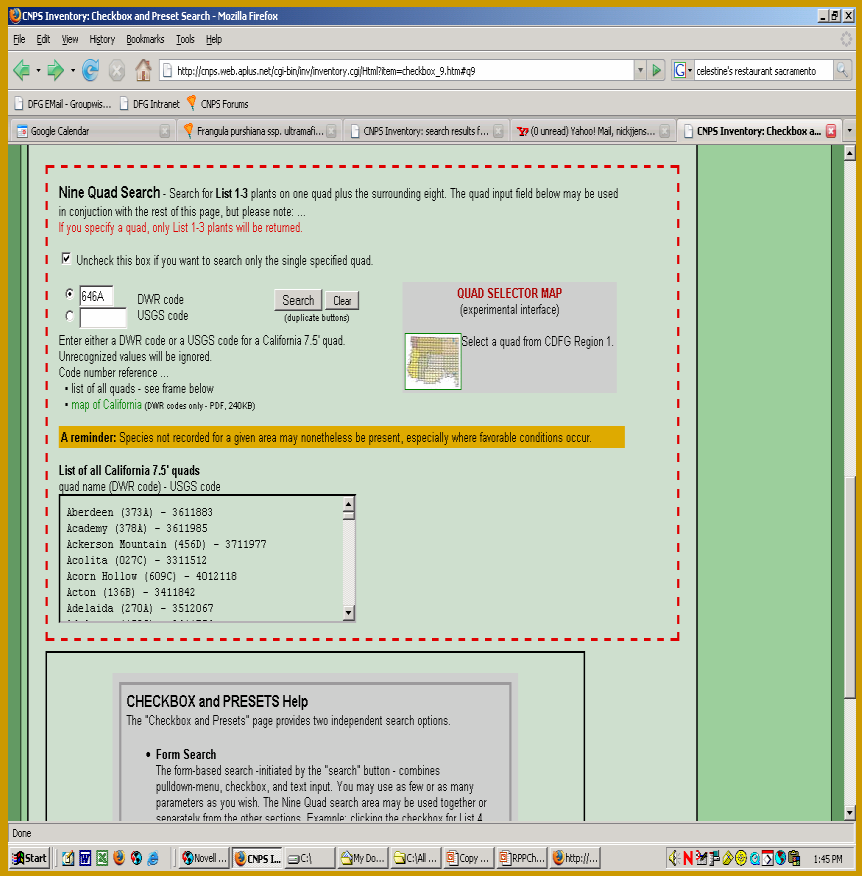
- List By Scientific Name: Allows to query the database for a whole list of plants that has already been generated
- Query Builder: Allows for the creation of complex queries based on multiple fields. Also allows for a number of export options.



Use of the Online Inventory (cont.)

Use of the Nine Quad Search

- Allows for a search of all CNPS-listed plants in a selected quad and the 8 quads around it
- Recommended procedure for use in developing lists of target species to search for when doing rare plant surveys



Use of the Online Inventory (cont.)

Use of Database Indexes

Allows for simple pre-selected searches based on:

- CNPS List
- Federal Status
- State Status
- Family
- County
- Life form
- Topo Quad
- Common Name

Neostapfia colusana, List 1B.1
© R.York & CNPS

Use of the Online Inventory (cont.)

Dudleya stolonifera, List 1B.1
© R. Moran & CNPS

Export Options for Data

Can be done through queries or through the "Plant Press" option

- CSV-for export to MS Excel
- XML
- Status and Rarity
- Location
- Ecological

II. The California Natural Diversity Database and RareFind

Mimulus rupicola, List 4.3

© M. Dedecker & CNPS

What is the CNDDB?

- It is a continually updated, computerized inventory of information on the locations and status of California's rarest plants, animals, and natural communities
- The blueprint used to set up the CNDDB was developed by The Nature Conservancy (TNC); similar programs have been developed in all 50 states, Canada and in Latin America

CNPS and CNDDB

Penstemon stephensii, List 1B.3
© K. Berry & CNPS

- The CNPS works in collaboration with the CNDDB
- CNPS works closely with CNDDB to guide the forums in helping us determine the conservation status of plants and to gather ecological and threat information.
- CNDDB processes all distribution and mapped information and maintains detailed records on each element occurrence.

CNPS and CNDDB (cont.)

- The CNDDB distribution and occurrence data are then used by CNPS and CNDDB to refine the status of the plants
- As part of this close partnership, CNPS chapters receive free copies of RareFind

Phlox hirsuta, List 1B.2 © S. Cochrane & CNPS

Important Definitions

- Element: A plant, animal, or natural community tracked by the heritage program.
- Occurrence: The specific location(s) where an element is known to occur.
- EO = Element Occurrence, the place where an element is found. Separation distance is defined as 0.25 miles

Collinsia multicolor, List 1B.2 © M.Bors & CNPS

The CNDDB is a positive sighting database!

- CNDDB does not predict where an element might occur; they report only where an element has been documented to occur.
- No provision for recording negative data – except at sites where the element has been previously found.

Calochortus obispoensis, List 1B.2 © M. McLeoud & CNPS

There may be sites with significant resources that have never been surveyed and no one has data. Absence of data in the CNDDB does not mean that no sensitive species occur on a site.

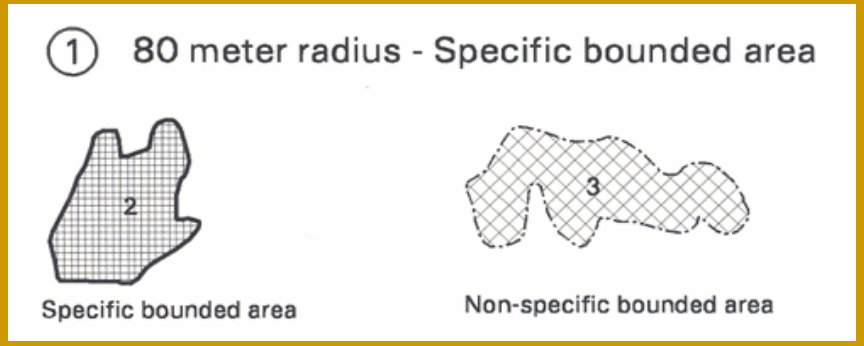
A Land Use and CEQA Planning Tool

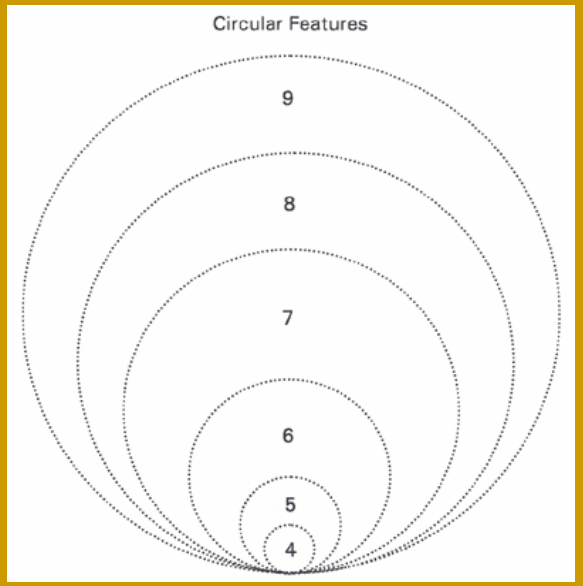
- Plan for project site constraints and avoidance measures
- Determine the need for detailed biological studies
- Determine the need for additional reconnaissance or protocol surveys
- Determine the need for other online tools, eg. CNPS Online Inventory for plants and CWHR for animals
- Determine potential significant impacts

Picea engelmannii, List 2.2 © J. Worrall & CNPS

Plant Occurrences in the CNDDB

- 26,602 Plant Occurrences (Most List 4 Occurrences are not included-too low priority, but many old occurrences have been re-inputted into CNDDB)
- Each occurrence is mapped to as high a level of accuracy as possible: 10 graphic accuracy classes. Specific polygons are preferred, but very accurate data is required.





Sources of Information

- Museum and herbarium records
- Published literature
- Unpublished reports
- Environmental documents
- Field survey forms
- Personal communications
- Digital data

Asclepias solanoana, List 4.2
© R. York & CNPS

What is RareFind?

- PC application of the CNDDB
- Allows complex queries of the data set and a flexible interface with ArcGIS, other GIS software, BIOS
- Free to DFG staff – provided on a subscription basis to all others
- Price is $200
- Free subscriptions are provided to CNPS Chapters

How to Obtain RareFind

- Contact your local Chapter President or Rare Plant Chair
- If you need a copy of the RareFind CD contact Nick Jensen
- For Monthly Updates: Refer to instructions and password provided in the monthly email. To get on the email list to receive monthly password please contact Nick

Eriogonum nervulosum, List 1B.2 © R. Bittman & CNPS

Sensitive Information

- CNPS is provided with the government edition of RareFind software
- You have access to sensitive rare plant and animal information
- Do not share data! Internal chapter use only for non-profit activities.

Lilium maritimus, List 1B.1
© G. Snyder & CNPS

What Can You Do With RareFind?

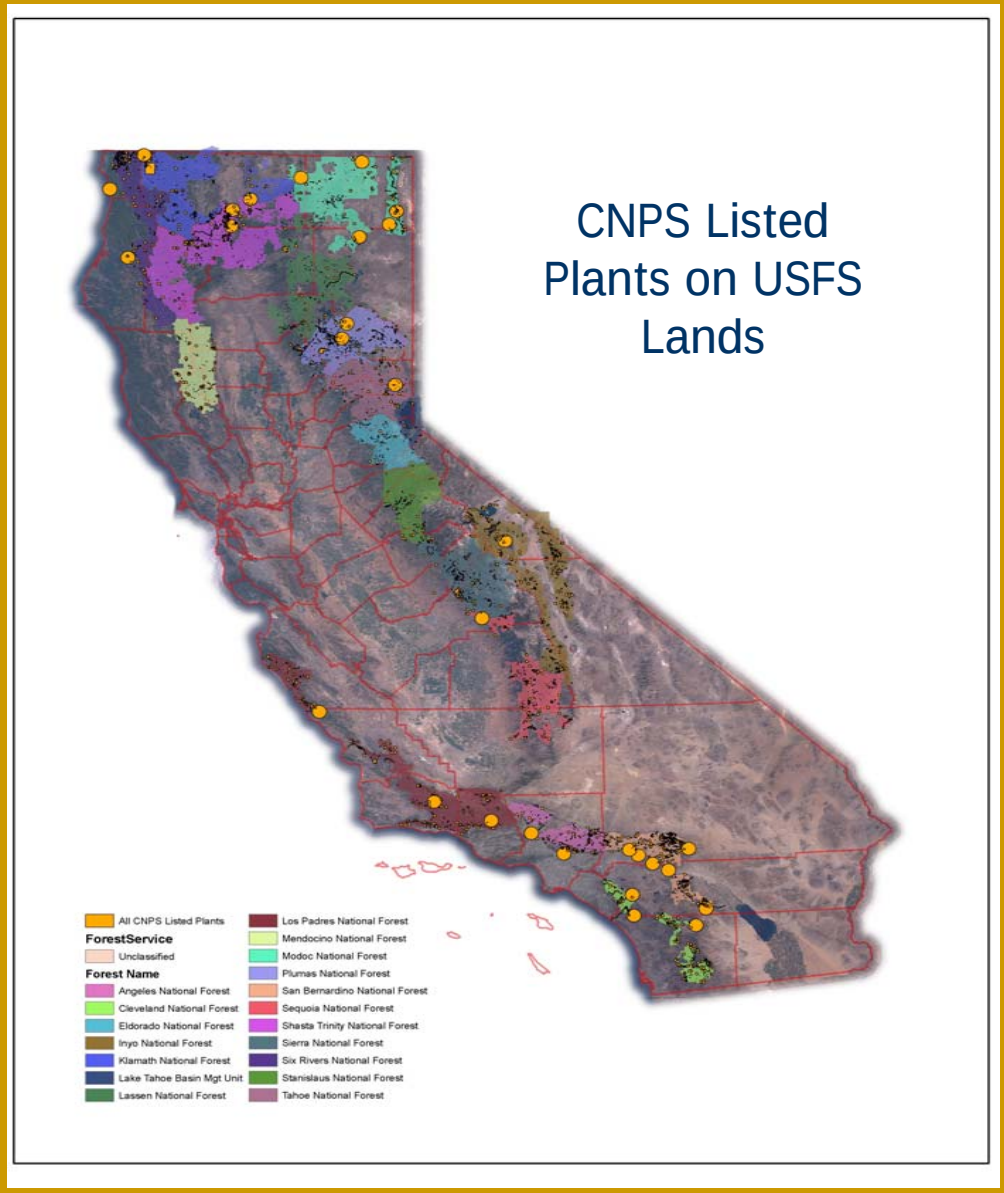
Arctomecon merriamii, List 2.2
© M. Dedecker & CNPS

- Simple queries
  - Locations for species “X”
  - Plants and Animals on quad “Y”
- Complex queries
  - Combinations of taxonomy, status, counties, threats, habitat, etc.
- Export results to BIOS or to ArcGIS
- Print reports

A Demonstration of Rarefind!

Lewisia stebbinsii, List 1B.2 © A. Ackley &CNPS

An Example of a GIS Project with RareFind Data



Tools Used

- CNDDB-export of CNPS Listed Plant Records (over 26,000 total occurrences)
- Intersect Analysis in GIS
- MS Access-Queries

Cypripedium californicum, List 4.2
© D. Imper & CNPS

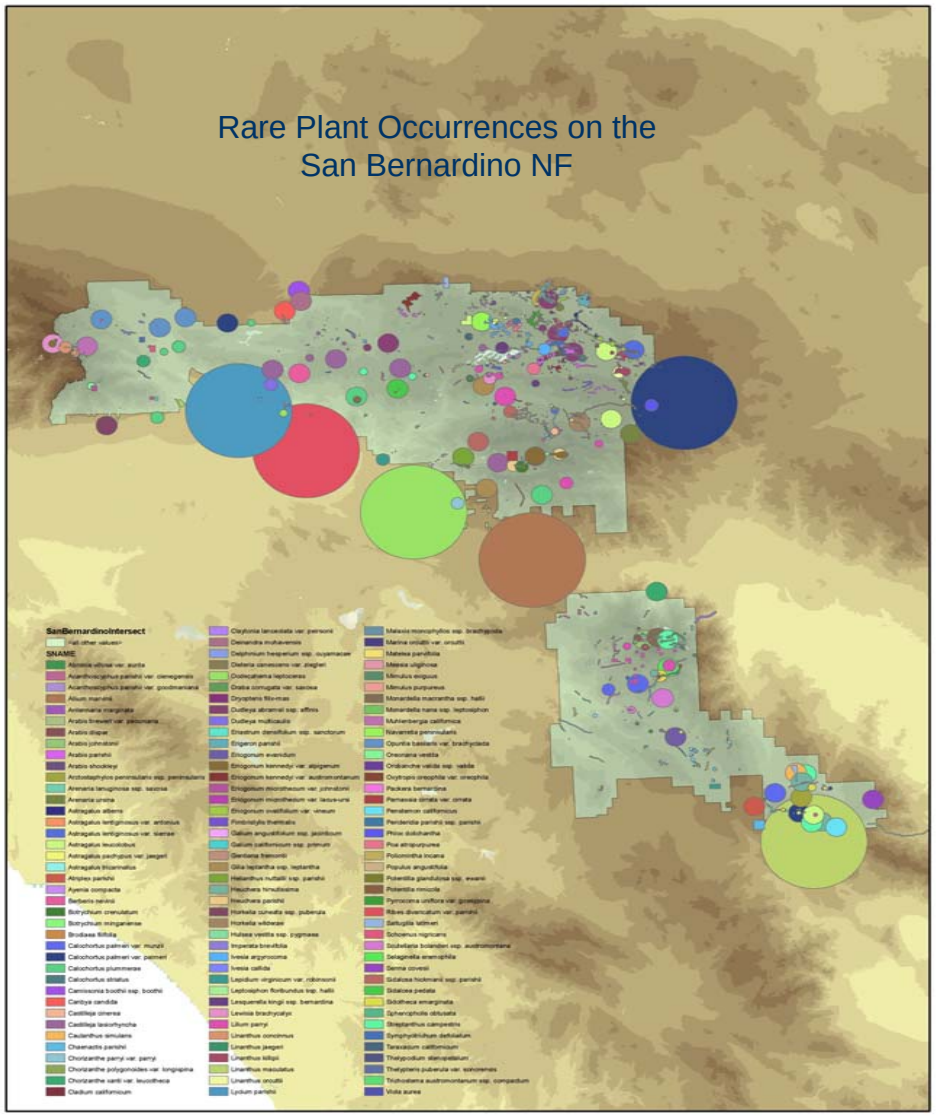
Results

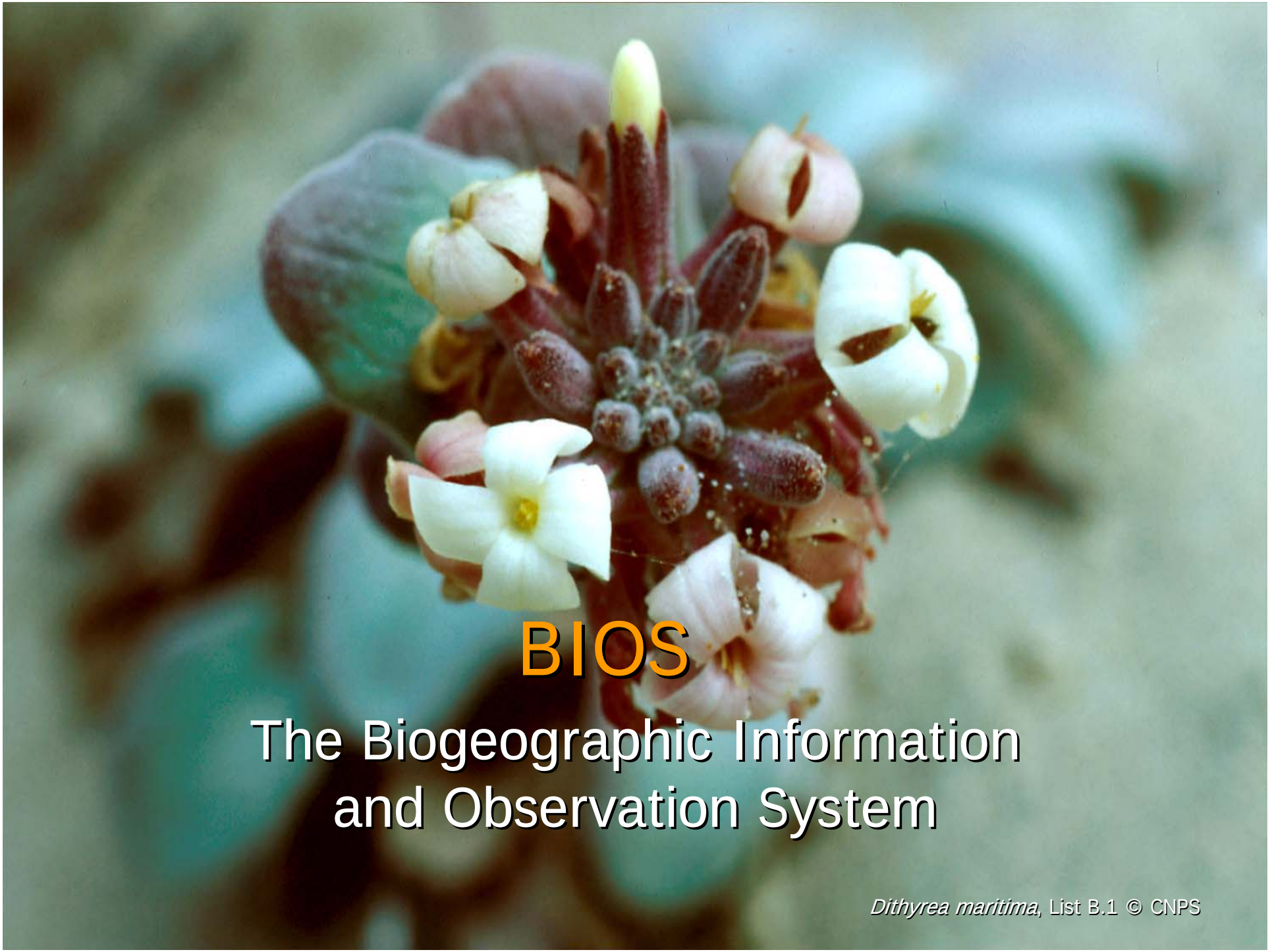
- 7152 Element Occurrences on USFS lands (27% of all known occurrences)
- 491 List 1B Plants, 254 List 2 Plants (745 total = 48% of all 1B and 2 combined)
- 776 = # of plants from all lists on USFS Lands

Calochortus striatus, List 1B.2, © K. Berry & CNPS

San Bernardino NF

- 977 Element Occurrences (851 List 1B)
- 123 CNPS Listed Plants





BIOS

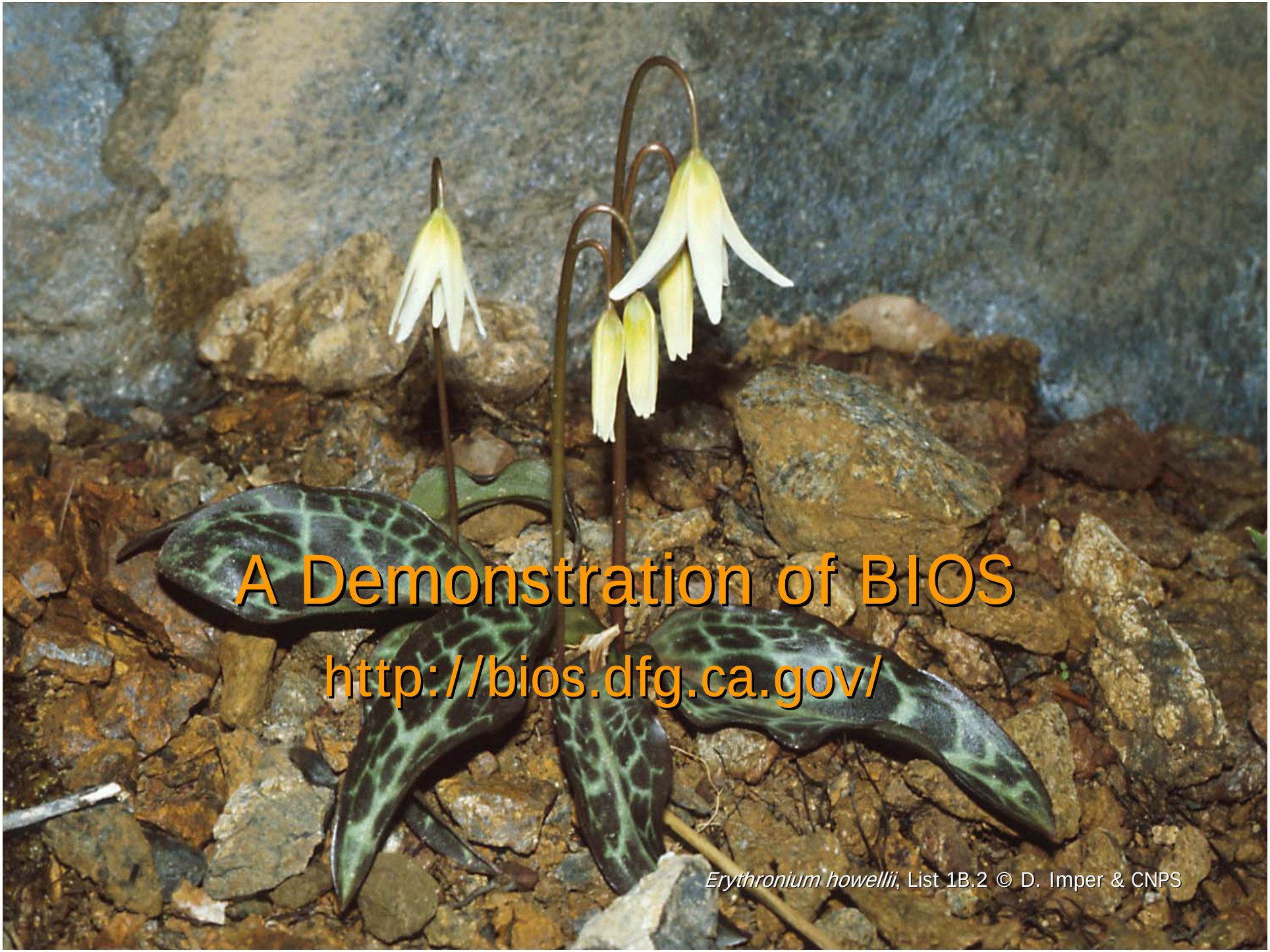
The Biogeographic Information and Observation System

Dithyrea maritima, List B.1 © CNPS

What is BIOS

Abies lasiocarpa, List 2.3
© P. Haddock & CNPS

- It is an easy to use, free online map tool that has many of the capabilities of GIS software
- Provides access to a variety of data layers including CNDDB, USGS Quads, Land Ownership, etc.
- The same password that is used for monthly RareFind updates is required for secure portion of website


A Demonstration of BIOS
http://bios.dfg.ca.gov/
Erythronium howellii, List 1B.2 © D. Imper & CNPS

How do BIOS and CNDDB Differ

Bios

- Internet map program
- Is a warehouse of raw data from a variety of sources
- Datasets are static
- Free to the public

Eriogonum ovalifolium var. *vimineum*, List 1B.1
© J. Dice & CNPS

How do BIOS and CNDDB Differ (Cont.)

Streptanthus callistus, List 1B.3
© D. Mason & CNPS

CNDDB

- Continuously-updated, meticulously maintained database of California's rare species
- Not free to the public (available by subscription)

The future of the CNPS Rare Plant Program

- 2009 Conservation Conference: January 17-19, 2009; Rare Plant Session (A total of 6 hours of presentations)

http://www.cnps.org/cnps/conservation/conference/2009/

The future of the CNPS Rare Plant Program (Cont.)

- Improvements to the CNPS Inventory
- Yearly targets for rare plant research (Plants for which there is little recent data)
- Communication and collaboration with other agencies and organizations
- Your Suggestions!

Nemacladus twisselmannii, List 1B.2, © J. Shevock & CNPS

Special Thanks to Roxanne Bittman and the CDFG!

Trifolium amoenum, List 1B.1 © B. Olson & CNPS

Thank you very much!

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Erysimum ammophilum, List 1B.2,
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