

Symbiota: a specimen-based biodiversity portal platform

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National Science Foundation
WHERE DISCOVERIES BEGIN

Symbiota Software Project

- Open source
- Virtual flora/fauna
 - Specimen search engine
 - Biodiversity inventories
 - Identification keys
- Images, maps, descriptions, common names, etc

The screenshot displays the SCAN website interface. At the top, the SCAN logo is visible, along with a photograph of a beetle. Below the logo, the specimen *Euscepes longisetis* is featured, including a detailed image of the insect and a descriptive text block. To the right, a map shows the distribution of specimens across the southwestern United States. Below this, the website entry for *Agoseris aurantiaca* is shown, featuring a large image of the orange flower and a detailed botanical description. A smaller map to the right of the description shows the distribution of this plant in the region. The interface includes navigation elements like 'Go to Encyclopedia of Life' and 'Family: Curculionidae'.

Specimen Centric Model

- Baseline data
- Expert reviewed vouchers
- Verifiable
- Proof of occurrence
- Reproducible
- Millions of occurrence records



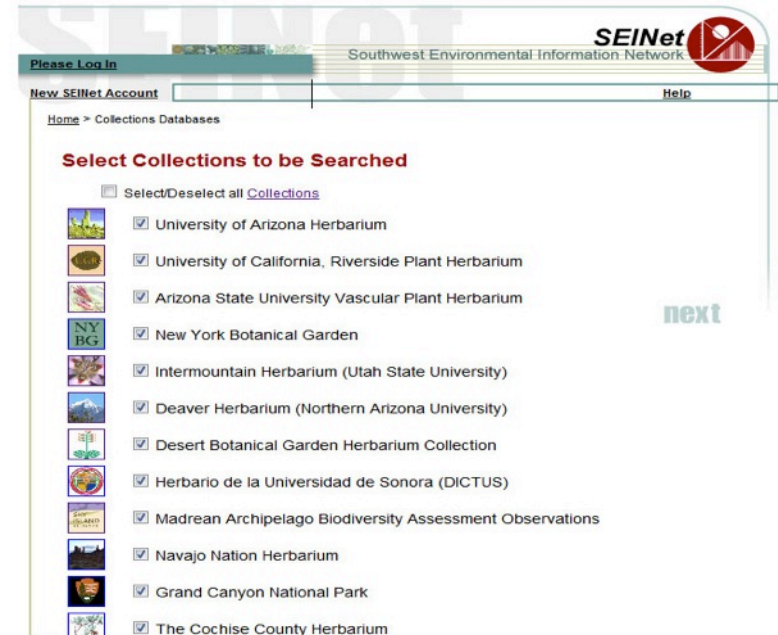
History - Initial Funding

- NSF Award
DBI-0847966
- 2008 – 2011
- Integrate systems
 - Symbiota Keys
 - SEINet
- Data exchange
- Web services



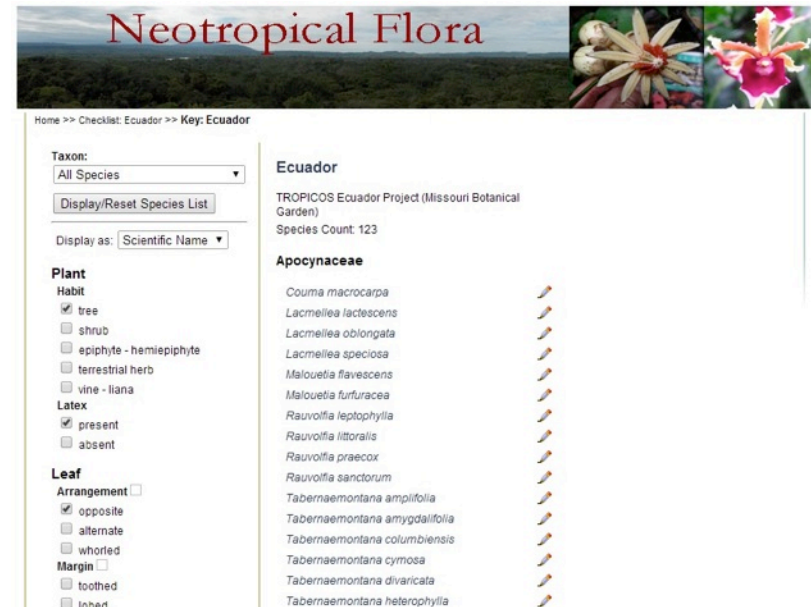
History -> SEINet

- Prototype: 2001
- Specimen search engine
- Java/JSP & MS SQL
- Distributed databases
- Arizona herbaria
 - DES, ARIZ, ASC, ASU
- Taxonomic thesaurus
- Read-only



History -> Symbiota Key

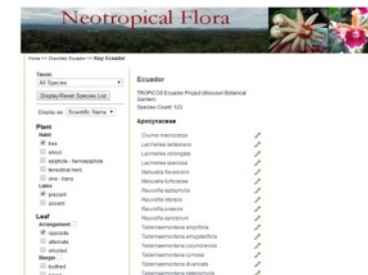
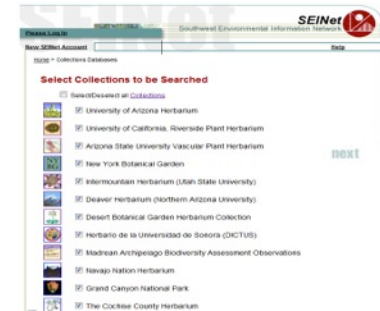
- Interactive Key
- PHP / MySQL
- Character “matrix”
 - DELTA standard
 - Relational database
- Taxonomy
- Static checklists
- Keys for complex lists
- Issue: No specimens



The screenshot displays the 'Neotropical Flora' website interface. At the top, there is a banner with the title 'Neotropical Flora' and two images of flowers. Below the banner, the navigation path is 'Home >> Checklist: Ecuador >> Key: Ecuador'. The main content area is divided into two columns. The left column contains a 'Taxon:' dropdown menu set to 'All Species', a 'Display/Reset Species List' button, and a 'Display as:' dropdown menu set to 'Scientific Name'. Below this are several filter sections: 'Plant Habit' with checkboxes for 'tree' (checked), 'shrub', 'epiphyte - hemiepiphyte', 'terrestrial herb', and 'vine - liana'; 'Latex' with checkboxes for 'present' (checked) and 'absent'; and 'Leaf' with checkboxes for 'Arrangement' (unchecked), 'opposite' (checked), 'alternate', 'whorled', and 'Margin' (unchecked), 'toothed', and 'lobed'. The right column is titled 'Ecuador' and includes the text 'TROPICOS Ecuador Project (Missouri Botanical Garden)' and 'Species Count: 123'. Below this, the family 'Apocynaceae' is listed, followed by a list of species names: *Couma macrocarpa*, *Lacmelia lactescens*, *Lacmelia oblongata*, *Lacmelia speciosa*, *Malouetia flavescens*, *Malouetia furfuracea*, *Rauvolfia leptophylla*, *Rauvolfia littoralis*, *Rauvolfia praecox*, *Rauvolfia sanctorum*, *Tabernaemontana amplifolia*, *Tabernaemontana amygdalifolia*, *Tabernaemontana columbiensis*, *Tabernaemontana cymosa*, *Tabernaemontana divaricata*, and *Tabernaemontana heterophylla*. Each species name is followed by a small red pencil icon.

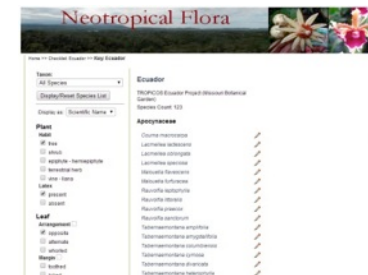
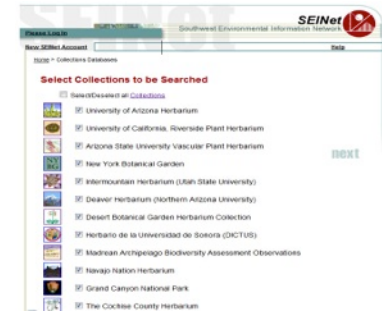
History -> Change or Plans

- SEINet issues
- Unstable
- Problematic infrastructure
- Offline databases
- Limited use of standards
- Solution: merge!



Symbiota - Prototype

- SEINet functionality merged into Symbiota
- Centralized cache of specimen data
- Robust indexing
- Dynamic keys
- Central Taxonomic Thesaurus



Power of an Integrated Dataset

The screenshot shows the SEINet website interface. At the top right, the SEINet logo is displayed next to the text "Southwest Environmental Information Network". Below the logo, the text "Welcome Edward Gilbert!" is visible. The navigation menu on the left includes "Logout", "SEINet Home", "Search Collections", "Image Library", "Plant Games", "Links", "Flora Projects", "Arizona", "Colorado Plateau", "New Mexico", "Intermountain", "NPS Flora", "USFWS Flora", "MABA Flora", "Sonoran Desert", "Teaching Checklists", "Dynamic Floras" (circled in red), "Dynamic Checklist", "Dynamic Key", and "Sitemap". The main content area features a "Welcome to SEINet" section with a paragraph about the network's purpose and a "Plant of the Day" section with a photograph of a plant. A text box at the bottom right provides information about the development of SEINet and its funding sources.

SEINet
Southwest Environmental Information Network

Welcome Edward Gilbert!

[Logout](#) | [My Profile](#) | [Help](#)


Welcome to SEINet

The Southwest Environmental Information Network was created to serve as a gateway to distributed data resources of interest to the environmental research community in Arizona and beyond. Through a common web interface, we offer tools to locate, access and work with a variety of data.

SEINet is more than just a web site - it is a suite of data access technologies and a distributed network of departments, museums and agencies that provide environmental information. Initially created to integrate databases within the Arizona State University, SEINet is growing to extend this network to other partners within the Southwest.

To learn more about the features and capabilities available through this site, read [Making Good Use Of SEINet](#) or visit the [Symbiota Help Pages](#). Join SEINet as a regular visitor and please send your feedback to seinetAdmin@asu.edu. Visit the [Data Usage Policy](#) page for information on how to cite data obtained from this web resource.

Plant of the Day



What is this plant?
[Click here to test your knowledge](#)

Development of SEINet, Symbiota, and several of the specimen databases have been supported by National Science Foundation Grants (DBI 9983132, BRC 0237418, DBI 0743827, DBI 0847966)

Pan, zoom and click on map to capture coordinates. Upon submitting coordinates, a species list will be generated by looking at all specimens collected within the area. [More Details](#)

Point (Lat, Long): **31.81002, -110.41428**

Taxon Filter (optional)



Home >> 31.81002, -110.41428; within 20 miles Key

Taxon:

All Species

31.81002, -110.41428; within 20 miles

Display/Reset Species List

Species Count: 1357

Display as: Scientific Name

Plant

habit

herb

shrub

tree

vine

grass-like

cactus-like / desert succulent

fern & allies

aquatic

longevity

annual or biennial

perennial

Acanthaceae

Anisacanthus thurberi

Carlowrightia arizonica

Carlowrightia linearifolia

Carlowrightia texana

Dicliptera resupinata

Dyschoriste schiedeana

Elytraria imbricata

Justicia sonorae

Ruellia nudiflora

Tetramerium nervosum

Adoxaceae

Sambucus nigra

Aizoaceae

Trianthema portulacastrum

Alismataceae

Alisma triviale



Welcome Max Licher!

[Logout](#)[My Profile](#)[Help](#)

Home >> 31.81002, -110.41428; within 20 miles Key

Taxon:

All Species

Display/Reset Species List

Display as: Scientific Name

Plant**habit** herb shrub tree**sap** latex absent (sap clear) latex present**Leaves****type** simple compound**stipules** stipules absent stipules present**arrangement** alternate opposite whorled fascicled/clustered along stem**blade margin**

31.81002, -110.41428; within 20 miles

Species Count: 62

Adoxaceae*Sambucus nigra***Anacardiaceae***Rhus microphylla**Rhus virens***Bignoniaceae***Catalpa bignonioides**Chilopsis linearis**Tecoma stans***Cannabaceae***Celtis reticulata***Cupressaceae***Juniperus coahuilensis**Juniperus deppeana***Ericaceae**

Home >> 31.81002, -110.41428; within 20 miles Key

Taxon:

All Species

Display/Reset Species List

Display as: Scientific Name

Plant

habit

- shrub
- tree

Leaves

type

- simple
- compound

arrangement

- opposite
- whorled

blade margin

- entire
- toothed
- lobed

Fruit

consistency at maturity

- dry/leathery
- fleshy

31.81002, -110.41428; within 20 miles

Species Count: 10

Adoxaceae

Sambucus nigra



Bignoniaceae

Catalpa bignonioides



Tecoma stans



Cupressaceae

Juniperus coahuilensis



Juniperus deppeana



Oleaceae

Fraxinus gooddingii



Fraxinus velutina



Rubiaceae

Cephalanthus occidentalis



Sapindaceae

[Home](#) >> 31.81002, -110.41428; within 20 miles Key

Taxon:

All Species

Display/Reset Species List

Display as: Scientific Name

Plant

habit

- shrub
- tree

Leaves

type

- compound
- once-pinnately compound
- trifoliolate (w/ 3 leaflets)

arrangement

- opposite

Inflorescence

position

- axillary
- terminal

type

- raceme
- umbel
- panicle

31.81002, -110.41428; within 20 miles

Species Count: 5

Adoxaceae

Sambucus nigra



Bignoniaceae

Tecoma stans



Oleaceae

Fraxinus gooddingii



Fraxinus velutina



Sapindaceae

Acer negundo





Acer negundo L.

Go to [Encyclopedia of Life...](#)

Family: Sapindaceae

boxelder, more...

[*Negundo aceroides* (L.) Moench [, more](#)]



Max Licher

VPAP Treatment

JANAS 29(1)

Plant: tree; to 10 m high, sparsely to densely pubescent on young growth and lower leaf surfaces, usually dioecious; young twigs glabrous to densely pubescent, often more or less glaucous, the epidermis smooth, greenish or reddish, the older twigs more or less rough, gray; buds covered by two reddish, tan, or yellowish valvate scales, these sparsely to densely hairy, the pubescent inner scales greatly elongating as the bud opens **Leaves:** mainly 3-foliolate, occasionally 3-lobed, 3.5-13.5 cm long, 3.5-18 cm wide, concolorous, the terminal leaflet up to 11 cm long by 8 cm wide, the lateral leaflets up to 9 cm long by 6 cm wide; apex of leaflets acute to acuminate; base of leaflets rounded to cuneate, sometimes oblique in lateral leaflets, sometimes acuminate in terminal leaflets; petiole 2-7.5 cm long, green or reddish; margin of leaflets coarsely toothed or lobed, the teeth acuminate to obtuse **INFLORESCENCE:** inflorescences many flowered, the staminate umbel-like, the pistillate racemose **Flowers:** ca. 5 mm long, less than 1 mm wide at base of perianth, the perianth greenish-yellow, with ca. 4 subelliptic segments ca. 0.2-2 mm long, the receptacle blending with filiform pedicel; pedicels 1-4 cm long **Fruit:** samaras 2.3-3.6 cm long, the wing 0.7-1.4 cm wide, the infructescences up to 15 cm long **Misc:** Riparian habitats and other wet wooded areas; 900-2750 m (3000-9100



Max Licher



Max Licher



Max Licher



Max Licher



[Open Interactive Map](#)

Scientific Community Portals

- Modular framework
- Community-based biodiversity portals
- Distinct datasets
 - Taxonomic scope
 - Geographic scope
- Custom look & feel
 - CSS, config files

The screenshot shows the homepage of the Consortium of North American Lichen Herbaria. At the top right, there are two small photo credits: "Photos by M. Von Konrat" and "Photos by F. Burgartz". The main header features the text "Consortium of NORTH AMERICAN LICHEN HERBARIA" next to a large, textured image of lichen. Below the header is a "Main Menu" sidebar with the following items: "Search Collections", "Image Library", "Flora Projects" (with sub-items: Arizona, California, Wisconsin, Southern Subpolar Region, USNP Project), "Dynamic Floras" (with sub-items: Dynamic Checklist, Dynamic Key), "Log In", and "New Account". The main content area is titled "Welcome to the Consortium of North American Lichen Herbaria" and contains two paragraphs of introductory text. The first paragraph states the consortium's purpose as a gateway to distributed data resources. The second paragraph describes it as a suite of data access technologies and a distributed network of institutions. At the bottom of the page, there is a footer with the text "Join CoTRAM as a regular visitor and please send your feedback to Leslie Landrum" and a row of small, colorful images.

SEINet Network

- Integrated Data
- Distributed Network
 - Great Plains
 - InterMountain
 - MABA
 - SEINet – AZ
 - SEINet – NM
 - SERNEC
 - VPlants



Symbiota - Biodiversity CMS

- Read-only user interface
- Password Protected
 - Online Browser-based application
 - Platform independent
 - Globally accessible
 - No special software installation (free)
 - Make use of web services

The screenshot displays the 'Editor' interface for a specimen record in the Texas Tech University - Invertebrate Zoology (TTU:TTU-Z) Biodiversity CMS. The interface is organized into several sections:

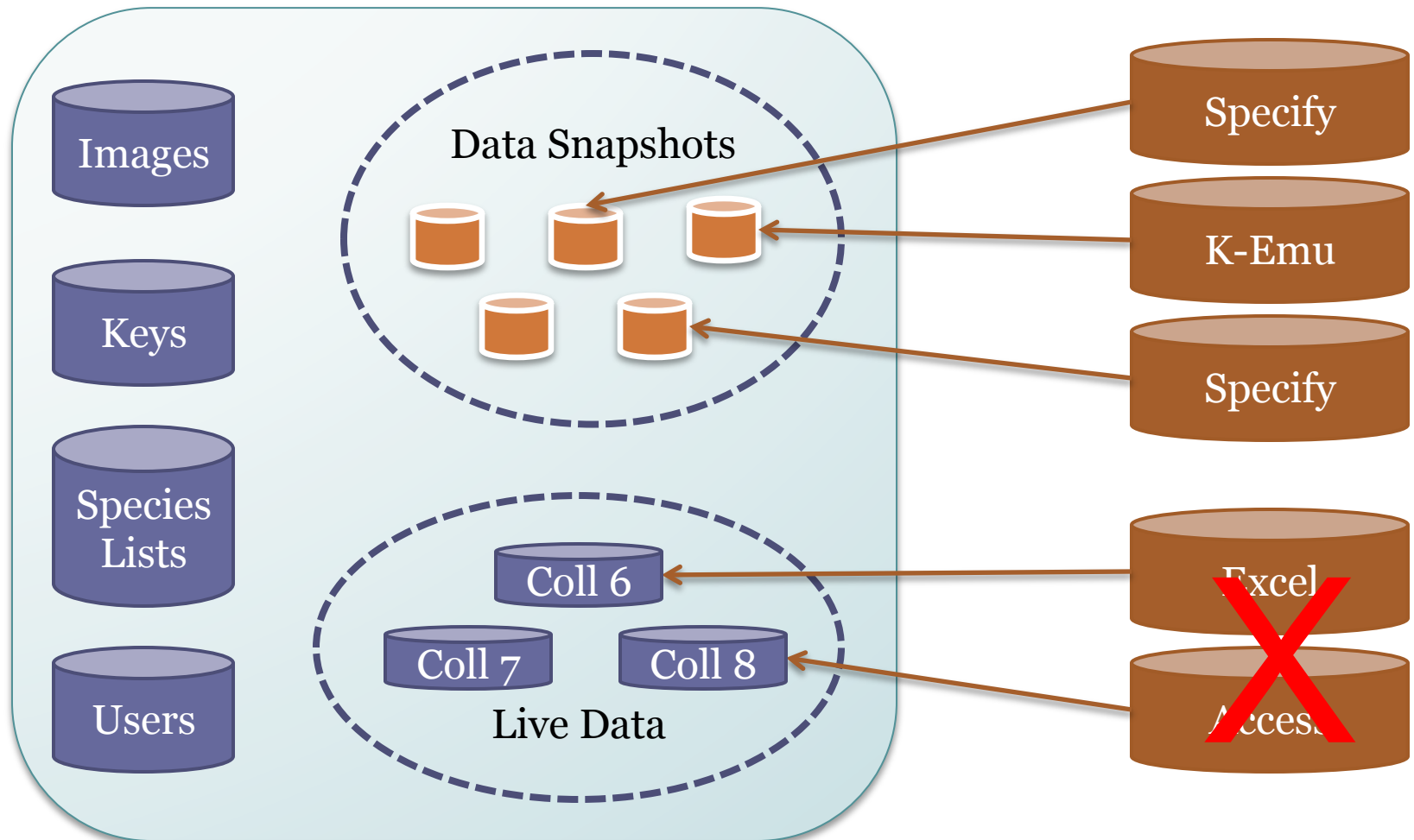
- Occurrence Data:** Includes fields for Catalog Number (TTU-Z 212-677), Accession #, Collector, Number, and Date. It also features a 'Dupes?' button and an 'Auto search' checkbox.
- Latest Identification:** Contains fields for Scientific Name, Author, ID Qualifier, Family, Identified By, and Date Identified.
- Locality:** Includes fields for Country, State/Province, County, and Municipality. A 'Locality Security' checkbox is present.
- Misc:** Includes fields for Habitat, Substrate, Associated Taxa, and Description.
- Notes:** A large text area for entering specimen notes.
- Bottom Section:** Includes fields for Life Stage, Sex, Individual Count, Sampling Protocol, and Preparations.

The interface is designed for data entry and management, with a clear layout and various input fields for detailed specimen information.

Additional Features

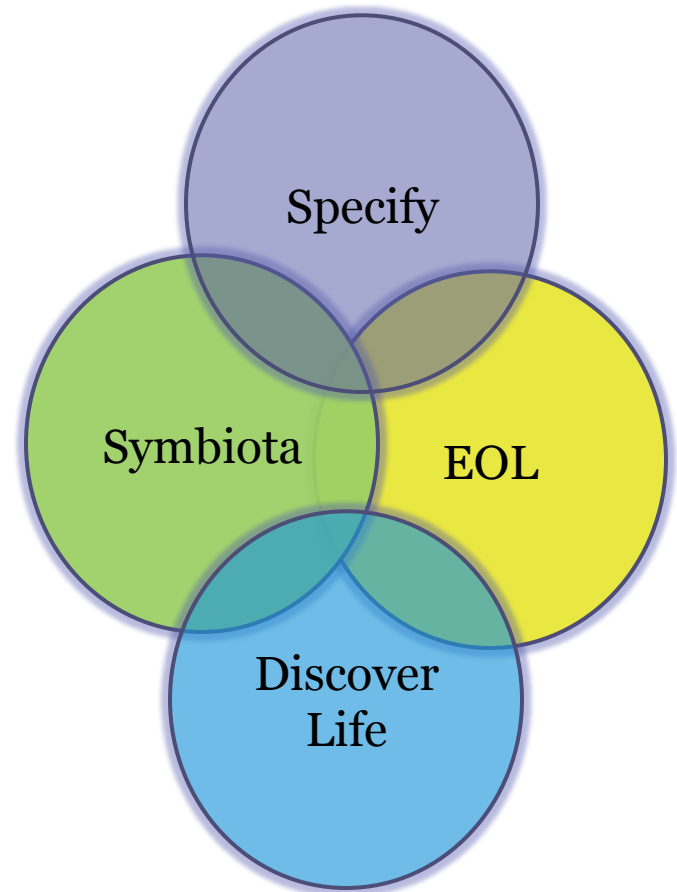
- Duplicate linking
- Exsiccati
- Loan management
- Genetic linkages
- Specimen comments
- OCR / NLP
- Crowdsourcing
- Versioning of Edits
- Batch georeferencing
- Darwin Core Archive Publishing
- Data Cleaning
- Multiple taxonomic thesauri

Specimen Management



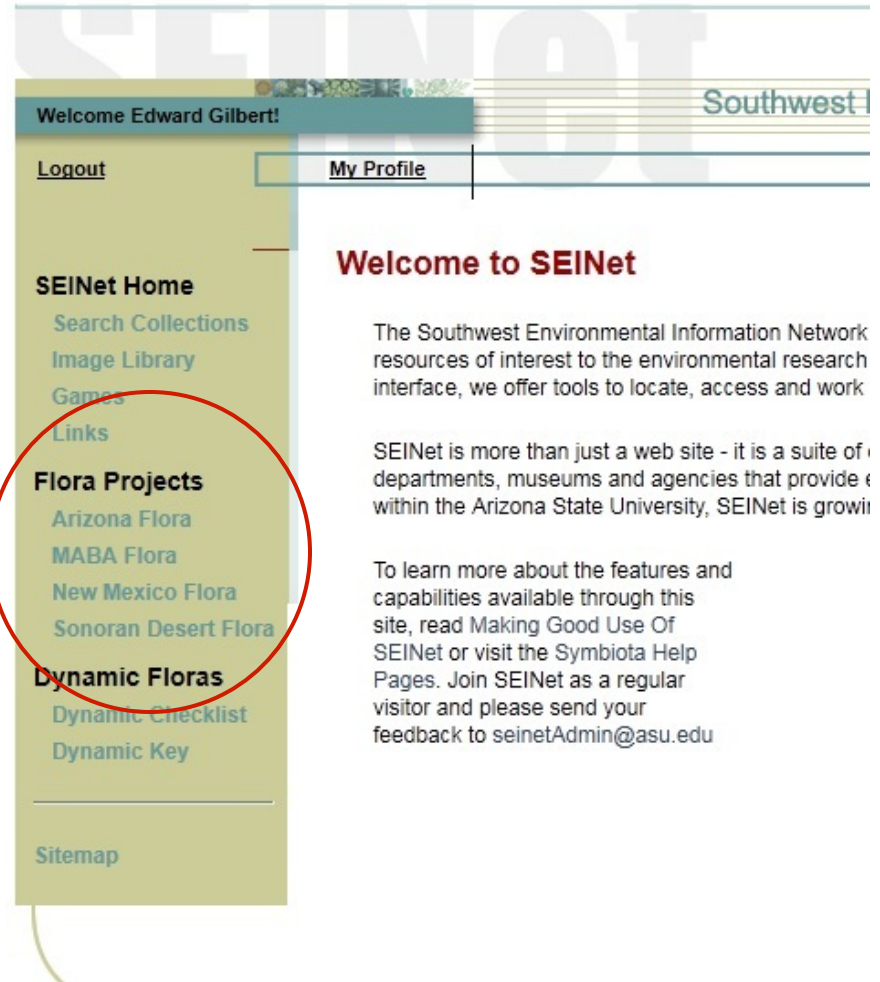
Duplication -vs - Niche Overlap

- Encyclopedia of Life (EOL)
- Specify
- GBIF
- Discover Life
- Navikey / Lucid / Xper2
- Symbiota
 - Community Data Portals
 - Specimen based
 - Biodiversity CMS



Biodiversity Inventories

- Floras & Fauna
- Graduate Research
- Park Service Inventories
- Surveys
- Voucher supported



The screenshot shows the SEINet website interface. At the top, there is a header with the SEINet logo and the text "Southwest Environmental Information Network". Below the header, there is a navigation menu with the following items: "Welcome Edward Gilbert!", "Logout", "My Profile", "SEINet Home", "Search Collections", "Image Library", "Games", "Links", "Flora Projects", "Arizona Flora", "MABA Flora", "New Mexico Flora", "Sonoran Desert Flora", "Dynamic Floras", "Dynamic Checklist", "Dynamic Key", and "Sitemap". The "Flora Projects" section is circled in red. To the right of the navigation menu, there is a "Welcome to SEINet" message that reads: "The Southwest Environmental Information Network resources of interest to the environmental research interface, we offer tools to locate, access and work... SEINet is more than just a web site - it is a suite of departments, museums and agencies that provide... within the Arizona State University, SEINet is growin... To learn more about the features and capabilities available through this site, read Making Good Use Of SEINet or visit the Symbiota Help Pages. Join SEINet as a regular visitor and please send your feedback to seinetAdmin@asu.edu".


SEINet Home[Search Collections](#)[Image Library](#)[Games](#)[Links](#)**Flora Projects**[Arizona Flora](#)[MABA Flora](#)[New Mexico Flora](#)[Sonoran Desert Flora](#)**Dynamic Floras**[Dynamic Checklist](#)[Dynamic Key](#)[Sitemap](#)

Arizona Flora

Project Managers: Arizona State University Vascular Plant Herbarium

Arizona is the third or fourth most floristically rich state in the US with perhaps as many as 3900 species of vascular plants. Over the last 60 years an average of ca. 12 new species records have been reported annually.

Research Checklists

- [Arizona](#) 
- [Arizona Spring Flora](#) 
- [ASU Arboretum - Gold Trail](#) 
- [ASU Arboretum - Maroon Trail](#) 
- [Buckeye Hills Recreational Area](#) 
- [Camp Creek](#) 
- [Canyon de Chelly National Monument](#) 
- [Casa Grande Ruins National Monument](#) 
- [Castle Dome Mountains](#) 
- [Chiricahua National Monument](#) 
- [Eagletail Mountains Wilderness](#) 
- [Escudilla Mountains](#) 
- [Fort Bowie National Historic Site](#) 
- [Grand Canyon National Park](#) 
- [GreenLots - Tucson](#) 
- [Hart Prairie](#) 
- [Hassayampa River Preserve](#) 
- [Hummingbird Springs Wilderness](#) 
- [Lake Pleasant Regional Park](#) 
- [Maricopa County, Arizona](#) 
- [McDowell Mountains Regional Park](#) 
- [Organ Pipe Cactus National Monument](#) 
- [Papago Park](#) 
- [Phoenix Cultivated Plants](#) 
- [Phoenix Flora](#) 
- [Pinal Mountains](#) 
- [Pinaleno Mountains](#) 
- [Saguaro National Park-Rincon Mountain District](#) 
- [San Pedro National Riparian Conservation Area](#) 
- [San Tan Mountain Semi-Regional Park](#) 
- [Santa Catalina Mountains](#) 
- [Santa Teresa Mountains](#) 

San Pedro National Riparian Conservation Area Games

 MD  Spp.

Authors: Elizabeth Makings

Publication: Makings, E 2006. Flora of the San Pedro Riparian National Conservation Area. Desert Plants Vol. 22(2); 104 pp. Makings, E 2003. Flora of the San Pedro Riparian National Conservation Area, Cochise County, Arizona. M. S. Thesis, Arizona State University, Tempe

[More Details](#)

Species List

Families: 95

Genera: 359

Species: 618 (species rank)

Total Taxa: 627 (including ssp. and var.)

Page 1 of 2: 1 | 2

ACANTHACEAE

Anisacanthus thurberi
Carlowrightia arizonica
Carlowrightia linearifolia
Carlowrightia texana
Elytraria imbricata
Ruellia nudiflora

AGAVACEAE

Agave palmeri
Yucca sp.
Yucca elata

AIZOACEAE

Trianthema portulacastrum

AMARANTHACEAE

Alternanthera caracasana
Alternanthera pungens
Amaranthus albus
Amaranthus fimbriatus
Amaranthus palmeri
Erodium cicutarium

Options

Search:

Common Names Synonyms

Filter: Original Checklist

- Common Names
 Display as Images
 Notes & Vouchers
 Taxon Authors

Rebuild List





Avena fatua



Bothriochloa barbinodis



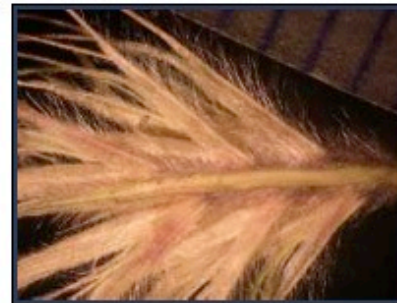
Bothriochloa ischaemum



Bothriochloa laguroides ssp.
torreyana



Bouteloua barbata



Bouteloua chondrosioides



Bouteloua curtipendula



Bouteloua eludens



Bouteloua eriopoda

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[More Details](#)

Species List

Families: 1

Genera: 45

Species: 100 (species rank)

Total Taxa: 105 (including ssp. and var.)

POACEAE

Achnatherum eminens

Elizabeth Makings (1538)

Andropogon glomeratus

rare; Elizabeth Makings (827) , Elizabeth Makings (1682)

Aristida adscensionis

Elizabeth Makings (824) , Elizabeth Makings (594) , Elizabeth Makings (762) , Elizabeth Makings (1300)

Aristida purpurea* var. *longiseta

Elizabeth Makings (865) , Elizabeth Makings (1513)

Aristida purpurea* var. *nealleyi

Elizabeth Makings (803) , Elizabeth Makings (1075) , Elizabeth Makings (1366)

Aristida ternipes

Elizabeth Makings (503)

Aristida ternipes* var. *gentilis

Elizabeth Makings (685) , Elizabeth Makings (492) , Elizabeth Makings (688) , Elizabeth Makings (488)

Aristida ternipes* var. *ternipes

Elizabeth Makings (1214) , Elizabeth Makings (1330)

Arundo donax

Elizabeth Makings (1650) , Elizabeth Makings (813)

Avena fatua

Elizabeth Makings (229)

Bothriochloa barbinodis

Elizabeth Makings (512) , Elizabeth Makings (1040) , Elizabeth Makings (472)

Bothriochloa ischaemum

Elizabeth Makings (1272) , Elizabeth Makings (1659)

Bothriochloa laguroides* ssp. *torreyana

Elizabeth Makings (822) , Elizabeth Makings (1024) , Elizabeth Makings (1048) , Elizabeth Makings (423)

Bouteloua barbata

Elizabeth Makings (1385) , Elizabeth Makings (599) , Elizabeth Makings (646)

Bouteloua chondrosioides

Options

Search: Poaceae

Common Names Synonyms

Filter: Original Checklist

- Common Names
 Display as Images
 Notes & Vouchers
 Taxon Authors

Rebuild List





ASU

Arizona State University Vascular Plant Herbarium

Family: Poaceae

Accession #: 247202

Taxon: *Aristida adscensionis* L.

Collector: Elizabeth Makings (#762)

Date Collected: 07 September 2001

Habitat: alluvial terrace, old agricultural field with scattered sacaton

Associated Species: *Sporobolus wrightii*, *Solanum eleagnifolium*, *Machaeranthera gracilis*,
annuals Conyza coulteri, *Chloris virgata*, *Xanthocephalum gymnospermoides*

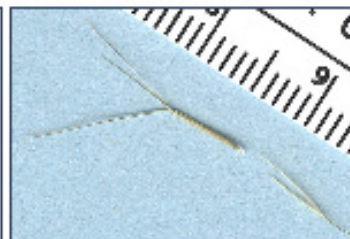
Description: Common annual 60 cm

Locality: USA; Arizona; Cochise County

Upper San Pedro River floodplain, "Cottonwood" site, approx 1 mile south of Hwy 90, ~100m west
of San Pedro

31.8456993 -110.2279968

Elevation: 1239m.



San Pedro National Riparian Conservation Area Games

Authors: Elizabeth Makings

Publication: Makings, E 2006. Flora of the San Pedro Riparian National Conservation Area. Desert Plants Vol. 22(2); 104 pp. Makings, E 2003.

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Andropogon glomeratus

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Aristida adscensionis

Elizabeth Makings (824) , Elizabeth Makings (594) , Elizabeth Makings (762) , Elizabeth Makings (1300)

Aristida purpurea* var. *longiseta

Elizabeth Makings (865) , Elizabeth Makings (1513)

Aristida purpurea* var. *nealleyi

Elizabeth Makings (803) , Elizabeth Makings (1075) , Elizabeth Makings (1366)

Aristida ternipes

Elizabeth Makings (503)

Aristida ternipes* var. *gentilis

Elizabeth Makings (685) , Elizabeth Makings (492) , Elizabeth Makings (688) , Elizabeth Makings (488)

Aristida ternipes* var. *ternipes

Elizabeth Makings (1214) , Elizabeth Makings (1330)

Arundo donax

Elizabeth Makings (1650) , Elizabeth Makings (813)

Avena fatua

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Bothriochloa ischaemum

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Bothriochloa laguroides* ssp. *torreyana

Elizabeth Makings (822) , Elizabeth Makings (1024) , Elizabeth Makings (1048) , Elizabeth Makings (423)

Bouteloua barbata

Elizabeth Makings (1385) , Elizabeth Makings (599) , Elizabeth Makings (646)

Bouteloua chondrosioides

Options

Search: Poaceae

Common Names Synonyms

Filter: Original Checklist

- Common Names
 Display as Images
 Notes & Vouchers
 Taxon Authors


Rebuild List





[Home](#) >> [Return to Checklist](#) >> Checklist Administrator

San Pedro Riparian National Conservation Area

Search statement: (o.county LIKE "%Cochise%") AND (o.locality LIKE "%San Pedro%") 

Non-Vouchered Taxa

Missing Taxa

Voucher Conflicts

Children Vouchers

Reports

Possible Voucher Conflicts

List of specimen vouchers where the current identifications conflict with the checklist. Voucher conflicts are typically due to recent annotations of specimens located within collection. Click on Checklist ID to open the editing pane for that record.

Conflict Count: 21

Checklist ID	Collector	Specimen ID	Identified By
Abutilon palmeri	Elizabeth Makings (1331)	Abutilon abutiloides	C. J. S. Davis (Dec 2011)
Abutilon palmeri	Elizabeth Makings (1277)	Abutilon abutiloides	C. J. S. Davis (Dec 2011)
Abutilon palmeri	Elizabeth Makings (1317)	Abutilon abutiloides	C. J. S. Davis (Dec 2011)
Chamaesyce stictospora	Elizabeth Makings (1404)	Chamaesyce prostrata	Liz Makings (June 2012)
Cyperus odoratus	Elizabeth Makings (569)	Cyperus esculentus	Liz Makings
Eleocharis parishii	Elizabeth Makings (1049)	Eleocharis palustris	Liz Makings

“My Profile”

Welcome Max Licher!

Logout **My Profile** Help

SEINet Southwest Environmental Information Network

SEINet Home

- Search Collections
- Image Library
- Plant Games
- Links

Flora Projects

- Arizona
- Colorado Plateau
- New Mexico
- Intermountain
- NPS Flora
- USFWS Flora
- MABA Flora
- Sonoran Desert
- Teaching Checklists

Dynamic Floras

- Dynamic Checklist
- Dynamic Key

Sitemap

Species Checklists **Specimen Management** **Edit Profile**

Management

Checklists

- Sedona/Oak Creek Canyon ✎ ✕
- Tent Rocks/Cottonwood Basin area ✎ ✕
- Hart Prairie ✎ ✕
- San Francisco Peaks ✎ ✕
- Verde Valley Botanical Area ✎ ✕

Inventory Project Administration

- Arizona Flora ✎
- Colorado Plateau ✎
- Plant Atlas of Arizona Projects (PAPAZ) ✎
- Arizona Native Plant Society Checklists ✎

Create a New Checklist

Checklist Name:

Authors:

Locality:

Plant Atlas of Arizona Project

- Arizona Native Plant Society
- Grand Canyon Trust
- Desert Botanical Garden
- U.S. Forest Service
- Northern Arizona University
- Museum of Northern Arizona



My Profile

Welcome Max Licher!

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Create a New Checklist

Checklist Name:

Authors:

Locality:

Personal Specimen Management

- Data entry
- Data Management
- Label Printing
- Cloud management
 - Password Protected
 - Web browser
 - Platform independent
 - Globally accessible
 - No special software
- Initially “Observations”

General Observations (SEINet)

Home >> Personal Management >> Editor

« [7 of 1234] »

Occurrence Data | Determination History | Images | Admin

Collector info

Catalog Number	Other Numbers	Collector	Number	Date
		M. Licher	3024	2011-03-27

Associated Collectors

Latest Identification

Scientific Name: *Medicago minima* Author: (L.) L.

ID Qualifier: Family: Fabaceae

Identified By: Date Identified:

Locality

Country	State/Province	County	Municipality
USA	Arizona	Yavapai	

Locality: Tent Rocks, SE of Camp Verde, south side of tuff formations

Latitude: 34.496667 Longitude: -111.748972 Uncertainty (meters): 10 Datum: NAD83 Elevation in Meters: 1030 Verbatim Elevation: 3370ft

Verbatim Coordinates: 34° 29' 02.5" N 111° 46' 16.7" W Georeferenced By: Georeference Protocol:

Georeference Sources: Georef. verification Status: Georeference Remarks:

Misc:

Habitat: Dry wash channel at base of tuff formations in Desert Scrub habitat, with widely scattered junip

Substrate:

Plants of Arizona

Scrophulariaceae

Castilleja exilis A. Nels.

USA, Arizona, Yavapai County, Mesquite Spring, Cottonwood Basin SE of Camp Verde. 34° 29' 02.5" N 111° 46' 16.7" W [NAD83] Elev: 930m. (3040ft)

Damp bank at spring location, N facing slope. Riparian zone in desert scrub habitat.

Annual herb, 45 to 65 cm, green bracts with red tips; infrequent

Associated species: *Solidago altissima*, *Dalea candida*, *Epipactis gigantea*, *Schoenoplectus americanus*, *Toxicodendron rydbergii*, *Mimulus cardinalis*, *Salix laevigata*, *Fraxinus velutina*, *Salix gooddingii*, *Andropogon glomeratus*

M. Licher 2792 16 July 2010

Northern Arizona University Herbarium



Plants of Arizona

Scrophulariaceae

Castilleja exilis A. Nels.

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Plants of Arizona

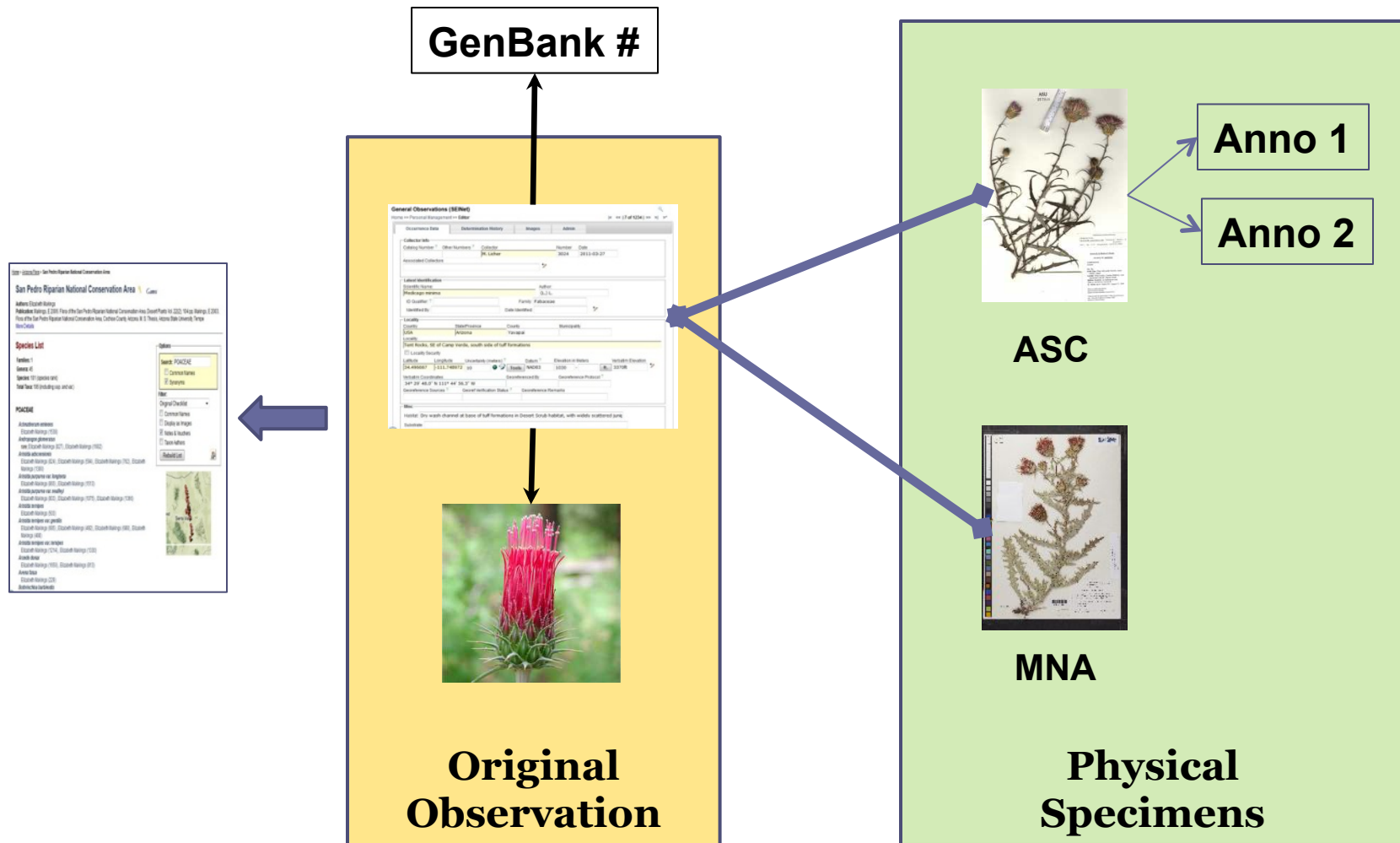
Poaceae

Eragrostis cilianensis (All.) Vign. ex Janchen

USA, Arizona, Yavapai County, Confluence of Mesquite and Cottonwood Springs, Cottonwood Basin SE of Camp Verde. 34° 28' 59.2" N 111° 46' 22.1" W [NAD83] Elev: 920m. (3020ft)

Sandy riparian creek bed without surface water in desert

Voucher Network



Acknowledgments

- National Science Foundation
- Collection managers
- Corinna Gries, Thomas Nash, Nico Franz, Leslie Landrum, Mary Barkworth, Michelle McMahon, Neil Cobb
- Paul Morris, David Lowery, Ben Brandt, Daryl Lafferty
- STRI, Filtered Push, Specify, GeoLocate, iDigBio
- Arizona State University - GIOS and SOLS