

Consortium of Pacific Northwest Herbaria

Ben Legler

University of Washington

blegler@u.washington.edu

<http://www.pnwherbaria.org/>

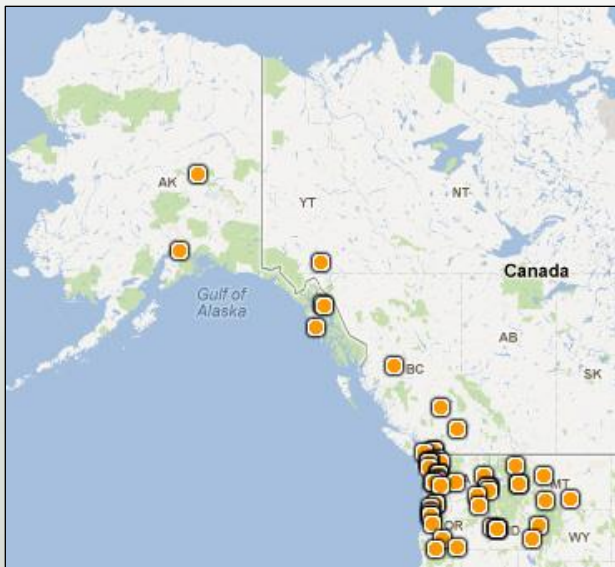


Development of PNW Herbaria

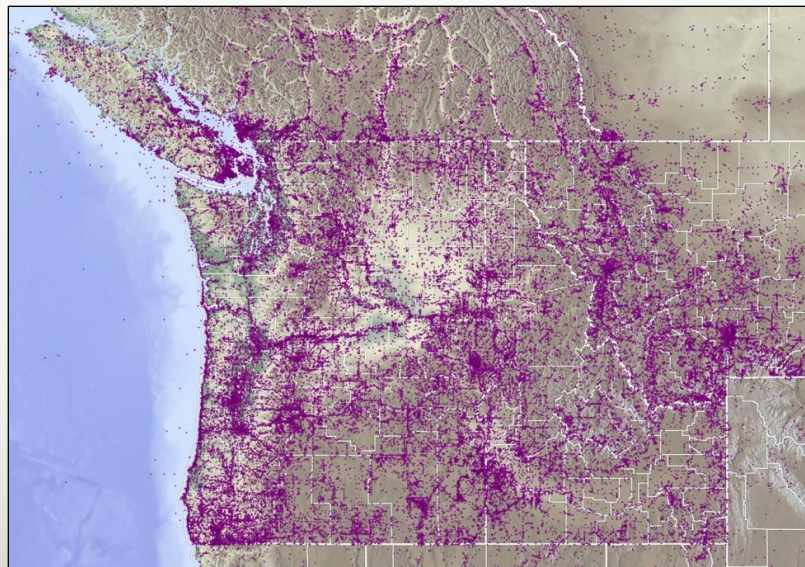
- Started in 2007 with goal of creating a single access point for all PNW herbarium specimen data and to promote collaboration among herbaria.
- Launched web site with 700,000 specimen records from three herbaria (ALA, OSC, WTU) with DiGIR access points.
- Our recent NSF BRC grant (2010-2013) enabled us to:
 - broaden participation and communication among regional herbaria,
 - image and/or database specimens at 19 herbaria,
 - integrate pre-existing specimen data from 8 other herbaria,
 - build technology solutions for imaging and databasing, and
 - expand the web site.

PNW Herbaria hosts 2.25 million specimen records and provides access to 640,000 specimen images.

- 27 herbaria currently share data through PNW Herbaria.
- Includes 52% of all specimens in all herbaria in the region.
- Includes all herbaria in the region with > 30,000 specimens.
- 58% of specimens are georeferenced; 28% are imaged.



Map of all 58 Pacific Northwest herbaria



Georeferenced specimens

Home

Specimen Data

Online Resources

Member Herbaria

External Links

Documentation

About

Contact Us

Herbarium specimens from the Pacific Northwest

2,127,197 specimen records and 595,578 images from 27 herbaria.



Alaska
British Columbia
Idaho
Montana
Oregon
Washington
Yukon Territory

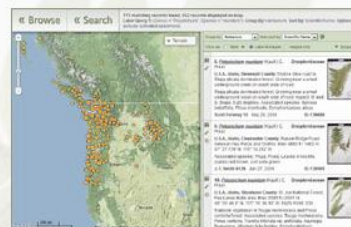


Delphinium glaucosum

About Us

The Consortium of Pacific Northwest Herbaria was created in 2007 to bring together regional herbaria and provide an online portal to the wealth of existing and emerging information about the flora of Pacific Northwest North America. Over 3.6 million specimen records and numerous online electronic resources are managed by the region's 57 herbaria, representing an irreplaceable storehouse of information for research and public education. [More](#)

Search the database:



Specimen Data:



Specimen Database

Search for herbarium specimens by label data or geographic location. Results show full label data, images of specimens sheets, and a distribution map. Results can also be downloaded or distilled into a species checklist.

Year	Number of Specimens	Number of Images
2007	1,234,567	456,789
2008	1,345,678	567,890
2009	1,456,789	678,901
2010	1,567,890	789,012
2011	1,678,901	890,123
2012	1,789,012	901,234
2013	1,890,123	1,012,345
2014	1,901,234	1,123,456
2015	2,012,345	1,234,567
2016	2,123,456	1,345,678
2017	2,234,567	1,456,789
2018	2,345,678	1,567,890
2019	2,456,789	1,678,901
2020	2,567,890	1,789,012
2021	2,678,901	1,890,123
2022	2,789,012	1,901,234
2023	2,890,123	2,012,345
2024	2,901,234	2,123,456
2025	3,012,345	2,234,567

Data for Download

Download text files containing the label data for all specimen records in the Consortium database, or for individual herbaria.

Date	Provider	# Specimens Included
2007	U.S. Consortium Herbaria, Western Consortium	7,722
2008	U.S. Consortium Herbaria, Western Consortium	8,812

Compiled Resources:



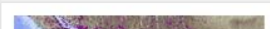
Species Checklists by County

Create species lists for any counties in Washington, Oregon, Idaho, or Montana. Lists can include vascular plants, bryophytes, lichens, algae, and/or fungi.



Datasets for Mobile Devices

View or download pre-packaged datasets intended for use on mobile devices without an internet connection. Includes county checklists, distribution maps, and specimen label data.



Documentation & Links:



Specimen Imaging Documentation

Learn how CPNWH images herbarium specimens. Included are detailed descriptions of our equipment and workflows. Software scripts are available for download.



Collections Digitization Documents

A comprehensive list of documents and links relevant to digitizing biological collections, particularly herbarium specimens. Maintained by the Consortium of Northeast Herbaria.



« [Browse](#)

Search:

2,127,197 specimen records and **595,578** images from **27** participating herbaria.
Use of the data requires agreement to the terms and conditions in our [Data Usage Policy](#).

Search Label Data:

Enter any combination of search terms. Partial terms are accepted in most fields. See below for a list of search operator.

[+ Add Query](#) [✗ Clear Queries](#) [▼ Query List \(1\)](#)

Family Tax. Group

Genus Species Intraspecies
Scientific Name

(use the % wildcard for partial text searches)

Expand search to include synonyms and accepted names.

Country (e.g., U.S.A.) State/Prov. County/Munic.

Region

Locality

Min. Max. Unit
Elevation to feet

Collector Collector's #

Day (1-31) Month (1-12) Year (4-digit)
Collection Date

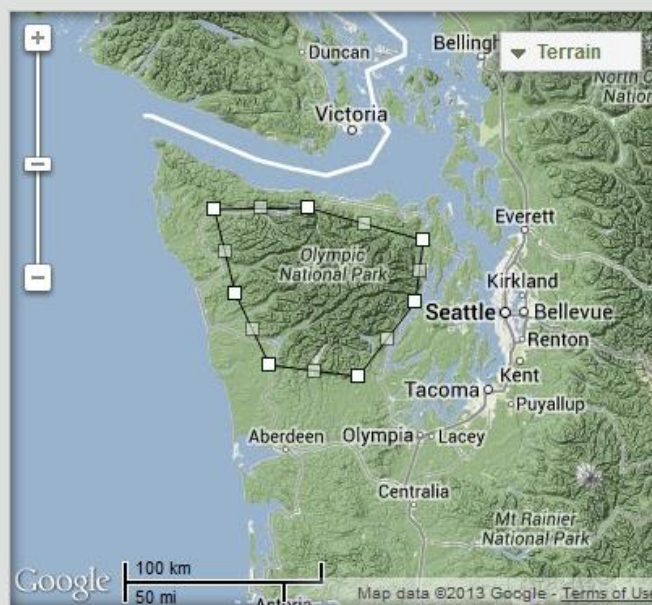
Accession #, Catalog #, or Barcode



Search by Location:

Zoom in, click "Create Polygon", then click your mouse to draw a polygon around the area you want to search.

[Create Polygon](#) [✗ Remove Polygons](#)



[Search »](#)

Search Options:

Group By

Then Sort By

Sort Order

- Show only specimens with images
- Show only type specimens
- Exclude cultivated specimens

Retrieve Results as:

- Web page (specimen list and map)
- Text file with label data
 - Tab-delimited
 - CSV
- Google Earth file (KML)
- PDF with label data
 - Include thumbnail images
- Checklist of species names
 - HTML
 - PDF
 - Text (tab)

Select Herbaria to Search:

Search all herbaria

- ALA (University of Alaska, Fairbanks - Museum of the North)
- BABY (B. A. Bennett Herbarium, Yukon Government)
- CIC (College of Idaho, Harold M. Tucker Herbarium)
- EVE (The Evergreen College)
- HJAEF (H.J. Andrews Experimental Forest)
- HPSU (Portland State University)

Search Operators:

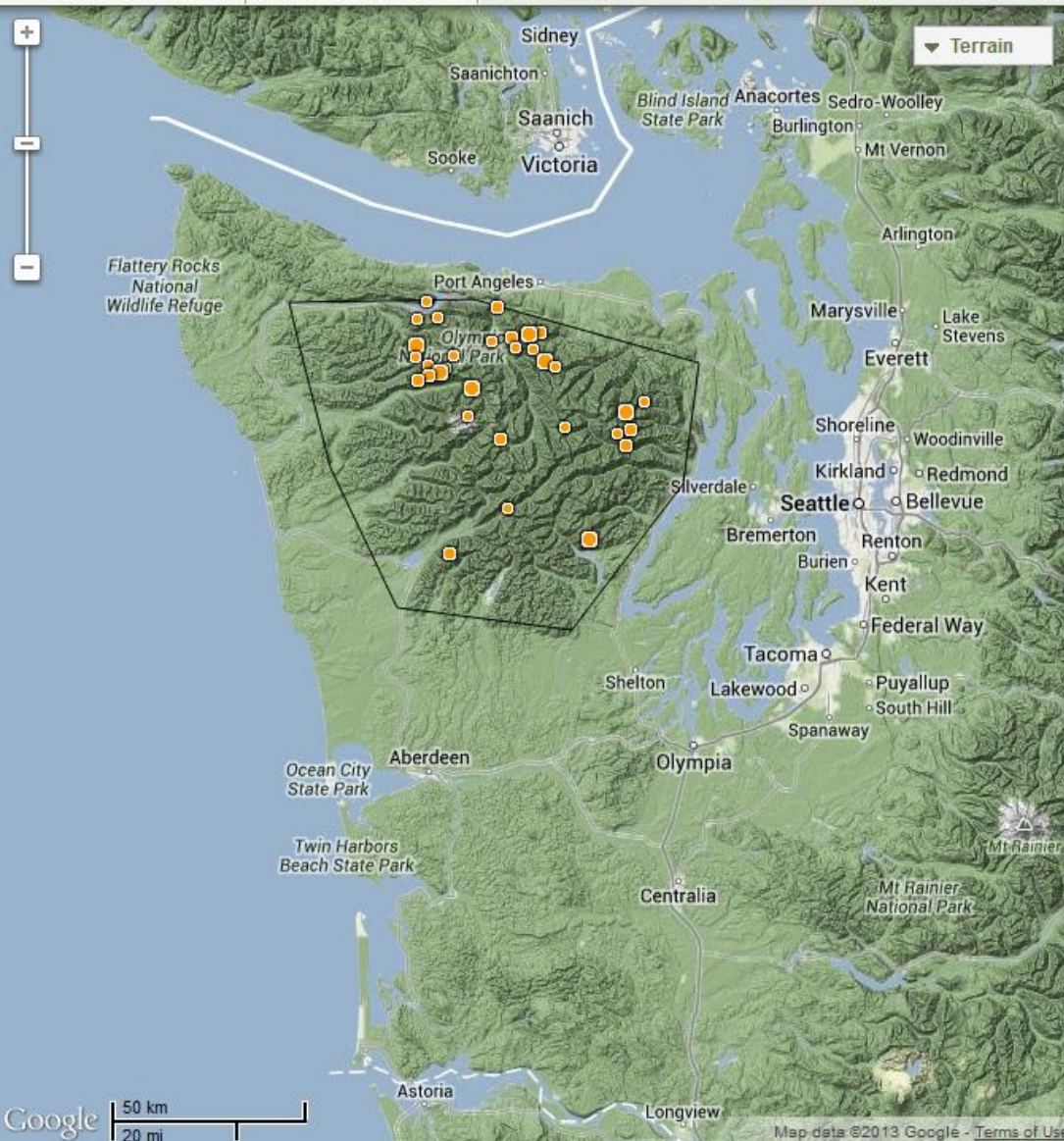
Operator	Usage
%	Partial text match (e.g., Poly%) (text fields)
>	Greater than (numeric fields)
>=	Greater than or equal (numeric fields)
<	Less than (numeric fields)
<=	Less than or equal (numeric fields)
..	Range of values (numeric fields)
=	Not equal to

« Browse

« Search

108 matching records found. 108 records displayed on map.

Label Query 1: (Genus = "Castilleja", including synonyms). Polygons: 1 polygon defined. Sort By: Year. Options: exclude cultivated specimens.



Group by (not grouped) then sort by Collection Year Largest

View as: Table Label & images Images only Download

▼ 0 - 49

1. *Castilleja parviflora* Bong. var. *olympica* (G. N. Jones) Orobanchaceae

Ownbey

U.S.A., Washington, Clallam County: Olympic National Park. North side of Hurricane Ridge, ca. 50 feet down trail to Happy Lake. Elev. 5084 ft. 47° 58' N, 123° 31' W

Among rocks and at margin of salt marsh near beach. Flowers fuchsia. Reproductive state: Flowers. Origin: Native.

Alison Colwell 02-38 Aug 12, 2002

WTU 351534

With Gerald Schneeweiss, Hanna Weiss, Andreas Tribsch, Peter Schoenswetter

2. *Castilleja miniata* Douglas ex Hook. var. *miniata* Orobanchaceae

U.S.A., Washington, Clallam County: Olympic Mountains, Hurricane Ridge, about 1 mi (air) west of Eagle Point, 4.5 mil from Visitor's Center along road to Obstruction Point. Elev. 5350 ft. 47° 56.25' N, 123° 25' W

West-facing slope, meadow surrounded by subalpine forest with *Abies lasiocarpa*, *Lupinus*, *Saussurea americana*, *Eucephalus paucicapitatus*, *Phacelia*, *Valeriana*, *Heuchera*, *Artemisia*, *Aquilegia formosa*, *Delphinium*, *Cirsium edule*, *Allium crenulatum*. Reproductive state: Flowering.

Mark Fishbein 4362 Aug 11, 2000

ID 117232, ID124317

With Shelley McMahon, Karen Hooper, Marilyn McMahon



ID124317

3. *Castilleja parviflora* Bong. var. *olympica* (G. N. Jones) Ownbey Orobanchaceae

U.S.A., Washington, Clallam County: Olympic Mountains, Hurricane Ridge, saddle southwest of Steeple Rock, 2.0 mi from Visitor's Center along road to Obstruction Point. Elev. 5050 ft. 47° 57.75' N, 123° 27.5' W

Ridge top, opening in subalpine forest with *Abies lasiocarpa*, *Campanula rotundifolia*, *Arenaria*, *Antennaria*, *Orthocarpus imbricatus*, *Vaccinium*, *Eriophyllum lanatum*, *Linnaea borealis*, *Achillea*, *Pedicularis racemosa*, *Artemisia tilesii*, *Luina hypoleuca*, *Eucephalus paucicapitatus*, *Piperia unalascensis*. Reproductive state: Flowering. Origin: Native.

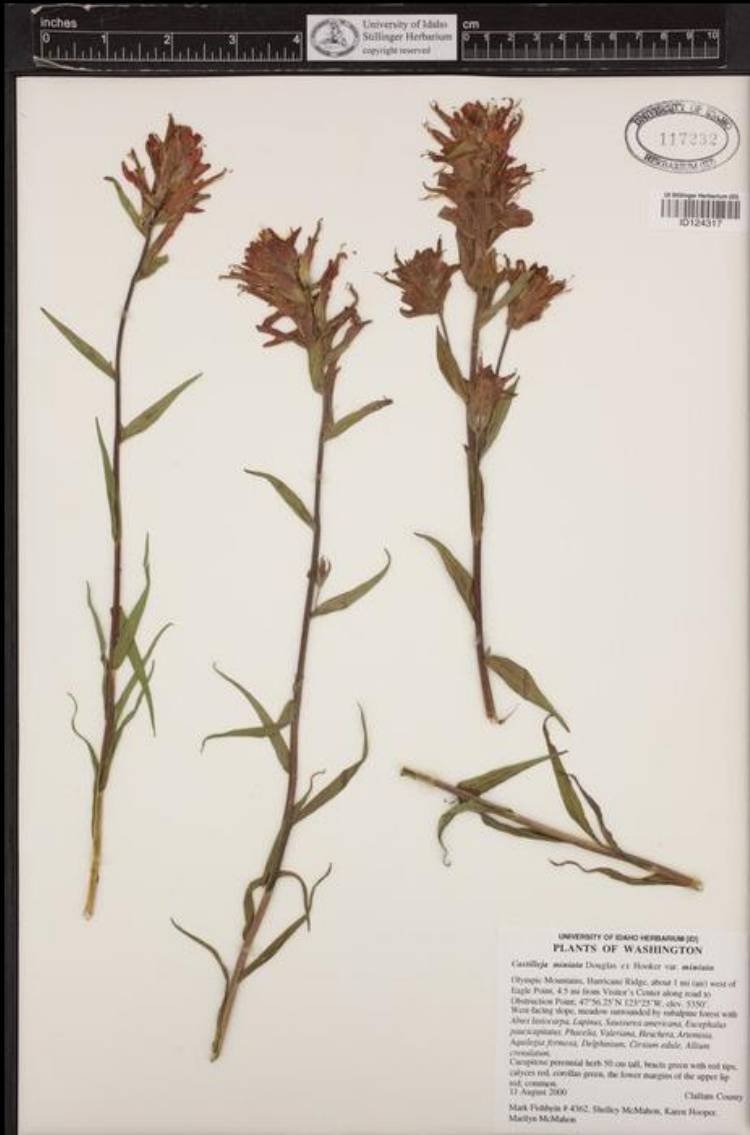
Mark Fishbein 4359 Aug 11, 2000

ID 117229, ID124489

With Shelley McMahon, Karen Hooper, Marilyn McMahon



ID124489



tion defined. Sort By: Year. Options: exclude cultivated specimens.

(not grouped) then sort by Collection Year Largest

Table Label & images Images only Download

49

Castilleja parviflora Bong. var. *olympica* (G. N. Jones) Ownbey Orobanchaceae

S.A., Washington, Clallam County: Olympic National Park. North side of Hurricane Ridge, ca. 50 feet down trail to Happy Lake. Elev. 5084 ft. 48° 58' N, 123° 31' W

along rocks and at margin of salt marsh near beach. Flowers fuchsia. Reproductive state: Flowers. Origin: Native.

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West-facing slope, meadow surrounded by subalpine forest with *Abies lasiocarpa*, *Lupinus*, *Saussurea americana*, *Eucephalus paucicapitatus*, *Phacelia*, *Valeriana*, *Heuchera*, *Artemisia*, *Delphinium*, *Cirsium edule*, *Allium senulatum*. Reproductive state: Flowering.

Mark Fishbein 4362 Aug 11, 2000

ID 117232, ID124317

with Shelley McMahon, Karen Hooper, Marilyn McMahon

Castilleja parviflora Bong. var. *olympica* (G. N. Jones) Ownbey Orobanchaceae

S.A., Washington, Clallam County: Olympic Mountains, Hurricane Ridge, saddle southwest of Steeple Rock, 2.0 mi from Visitor's Center along road to Obstruction Point. Elev. 5050 ft. 48° 57.75' N, 123° 27.5' W

ridge top, opening in subalpine forest with *Abies lasiocarpa*, *Campanula rotundifolia*, *Arenaria*, *Antennaria*, *Orthocarpus bicricatus*, *Vaccinium*, *Eriophyllum lanatum*, *Linnaea borealis*, *Chamaenerion lillea*, *Pedicularis racemosa*, *Artemisia tilesii*, *Luina hypoleuca*, *Eucephalus paucicapitatus*, *Piperia unalascensis*. Reproductive state: Flowering. Origin: Native.

Mark Fishbein 4359 Aug 11, 2000

ID 117229, ID124489

with Shelley McMahon, Karen Hooper, Marilyn McMahon

Consortium of Pacific Northwest Herbaria

Home Specimens Data Online resources Member herbaria External links Documentation News About Contact Us

« Browse « Search

28 matching records found, 4 records displayed on map. Label Query 1: (Tax: Group = "Vascular plants", State = "Washington", County = "Washington", Sort By: Year, Options: show only image specimens, include cultivated specimens)

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Home Specimens Data Online resources Member herbaria External links Documentation News About Contact Us

« Browse « Search

Checking: 86 families, 248 genera, 431 species and infraspecies (named based on 776 matching records). Label Query 1: (Tax: Group = "Vascular plants", State = "Washington", County = "Washington", Sort By: Year, Options: exclude cultivated specimens)

ADONIAACEAE:
Santalinaceae:
Santalinum nigra L. ssp. canaliculata (Raf.) Balle (2 specimens from WTU)

ALISMATACEAE:
Alisma:
Alisma plantago-aquaticum L. (3 specimens from WTU)
Alisma triviale Pursh (2 specimens from WTU)
Sagittaria:
Sagittaria latifolia Willd. (3 specimens from WTU, WS)

AMBIANTICACEAE:
Conopseaceae:
Conopseum americanum (Mill.) Nutt. var. americanum (2 specimens from WTU)
Sidaea:
Sidaea papillosa (1 specimen from WTU)

ANACARDIACEAE:
Toxicodendraceae:
Toxicodendron diversilobum (Thun. & G. Don) Greene (4 specimens from WS)
Toxicodendron oregonense (Small ex Roth.) Greene (1 specimen from WS)

APURCEAE:
Asplenaceae:
Asplenium grandifolium Nutt. (1 specimen from WS)
Asplenium:
Asplenium sylvaticum (L.) Hoffmann (1 specimen from WTU)
Cicuta:
Cicuta douglasii (DC.) Coult. & Rose (2 specimens from WTU, WS)
Drosera:
Drosera rotundifolia L. (1 specimen from WS)

BRASSICACEAE:
Mertensia:
Mertensia maritima (Mill.) (3 specimens from WS)

HYDROCHARITACEAE:
Hydrocharitaceae:
Hydrocharitaceae (2 specimens from WTU)

LILIACEAE:
Lilium:
Lilium occidentale Coult. & Rose (3 specimens from WTU)

LINACEAE:
Linum:
Linum dissectum (Mill.) Mathias & Constance var. dissectum (1 specimen from WS)
Linum dissectum (Mill.) Mathias & Constance var. multiforme (Mill.) Mathias & Constance (2 specimens from WTU)

ONAGRACEAE:
Onoclitaceae:
Onoclitus serrulata C. Presl ex DC. (2 specimens from WS)

Other:
Clematis bartramii DC. (1 specimen from WS)
Burns Water (2 specimens from WTU)

State	Family	Genus	Species	DNA	Barcode	Year	Herbarium
WA	Vascular Plants	114,024	7,02,000	11,770	11,770	1970-2013	750,013
WA	Vascular Plants	4,754	4,754	DNA: 0 (0.0%)	Natlib: 0 (0.0%)	1970-2013	750,013
WA	Vascular Plants	21,640	21,640	DNA: 0 (0.0%)	Natlib: 0 (0.0%)	1970-2013	750,013
WA	Vascular Plants	4,476	4,476	DNA: 0 (0.0%)	Natlib: 0 (0.0%)	1970-2013	750,013
WA	Vascular Plants	53,548	54,162	DNA: 0 (0.0%)	Natlib: 0 (0.0%)	1970-2013	750,013
WA	Vascular Plants	66,727	0	DNA: 0 (0.0%)	Natlib: 0 (0.0%)	1970-2013	750,013
WA	Paper	19	0	DNA: 0 (0.0%)	Natlib: 0 (0.0%)	1970-2013	750,013
WA	Biophytes	58,139	0	DNA: 0 (0.0%)	Natlib: 0 (0.0%)	1970-2013	750,013
WA	Fungi	2,427	0	DNA: 0 (0.0%)	Natlib: 0 (0.0%)	1970-2013	750,013
WA	Lichens	597	0	DNA: 0 (0.0%)	Natlib: 0 (0.0%)	1970-2013	750,013
WA	Vascular Plants	29,237	0	DNA: 0 (0.0%)	Natlib: 0 (0.0%)	1970-2013	750,013
WA	Fungi	39,863	0	DNA: 0 (0.0%)	Natlib: 0 (0.0%)	1970-2013	750,013
WA	Lichens	5,197	0	DNA: 0 (0.0%)	Natlib: 0 (0.0%)	1970-2013	750,013
WA	Vascular Plants	195,427	0	DNA: 0 (0.0%)	Natlib: 0 (0.0%)	1970-2013	750,013
WA	Vascular Plants	8,759	8,788	DNA: 0 (0.0%)	Natlib: 0 (0.0%)	1970-2013	750,013
WA	Vascular Plants	13,896	13,822	DNA: 0 (0.0%)	Natlib: 0 (0.0%)	1970-2013	750,013
WA	Vascular Plants	5,075	5,106	DNA: 0 (0.0%)	Natlib: 0 (0.0%)	1970-2013	750,013
WA	Vascular Plant	889	1,060	DNA: 0 (0.0%)	Natlib: 0 (0.0%)	1970-2013	750,013
WA	Vascular Plants	127,584	13,478	DNA: 0 (0.0%)	Natlib: 0 (0.0%)	1970-2013	750,013
WA	Vascular Plants	7,379	7,403	DNA: 0 (0.0%)	Natlib: 0 (0.0%)	1970-2013	750,013
WA	Vascular Plants	4,885	4,728	DNA: 0 (0.0%)	Natlib: 0 (0.0%)	1970-2013	750,013
WA	Paper	70,733	0	DNA: 0 (0.0%)	Natlib: 0 (0.0%)	1970-2013	750,013
WA	Biophytes	167,848	0	DNA: 0 (0.0%)	Natlib: 0 (0.0%)	1970-2013	750,013
WA	Fungi	17,865	0	DNA: 0 (0.0%)	Natlib: 0 (0.0%)	1970-2013	750,013
WA	Lichens	41,966	0	DNA: 0 (0.0%)	Natlib: 0 (0.0%)	1970-2013	750,013
WA	Vascular Plants	163,552	17,915	DNA: 0 (0.0%)	Natlib: 0 (0.0%)	1970-2013	750,013
WA	Vascular Plants	89,157	0	DNA: 0 (0.0%)	Natlib: 0 (0.0%)	1970-2013	750,013
WA	Vascular Plants	0	0	DNA: 0 (0.0%)	Natlib: 0 (0.0%)	1970-2013	750,013
WA	Vascular Plants	167,588	0	DNA: 0 (0.0%)	Natlib: 0 (0.0%)	1970-2013	750,013
WA	Biophytes	52,175	137	DNA: 0 (0.0%)	Natlib: 0 (0.0%)	1970-2013	750,013
WA	Fungi	40,025	1,067	DNA: 0 (0.0%)	Natlib: 0 (0.0%)	1970-2013	750,013
WA	Lichens	28,662	27	DNA: 0 (0.0%)	Natlib: 0 (0.0%)	1970-2013	750,013
WA	Vascular Plants	187,519	1,166	DNA: 0 (0.0%)	Natlib: 0 (0.0%)	1970-2013	750,013
WA	Vascular Plants	20,385	22,137	DNA: 0 (0.0%)	Natlib: 0 (0.0%)	1970-2013	750,013
PNW	VASCULAR PLANTS DATABASE	2,645,585	535,470	DNA: 100 (0.0%)	Natlib: 107 (0.0%)	1970-2013	750,013

© 2007-2013 Consortium of Pacific Northwest Herbaria
 Provided by the Consortium of Pacific Northwest Herbaria
 Data Source: PNW Herbaria Database and Online Herbaria
 Repository: University of Washington, Seattle, WA 98195-1600
 This is a working draft and subject to change without notice.

Consortium of Pacific Northwest Herbaria

Vascular Plants of Skagit County, Washington

Generated from PNW Herbaria database
 July 15, 2013.

108 family names
461 genus names
1,292 species/infraspecies names
 (names highlighted in brown could not be resolved to an accepted name)

{an additional 839 species/infraspecies are to be expected based on presence in one of these adjacent counties: Whatcom, Snohomish; these names are colored gray and enclosed in braces}

FERNS:

ASPLENIACEAE:
Asplenium
Asplenium trichomanes (ID, PSM, WS, WWB)
 ssp. *trichomanes* (WTU)
Asplenium viride (PLU)

Consortium of Pacific Northwest Herbaria

Polypodium scoleri

PNW BC OR WA

Usage Statistics

- Over 70 unique visitors and 900 page views per day.
- 800 database searches and 150,000 specimen records accessed per day.
- Most are return users who have been to the site before.
- Low bounce rate of 28% (meaning most visitors stick around a while).
- Web site usage is steadily increasing with time.

Who is using the data?

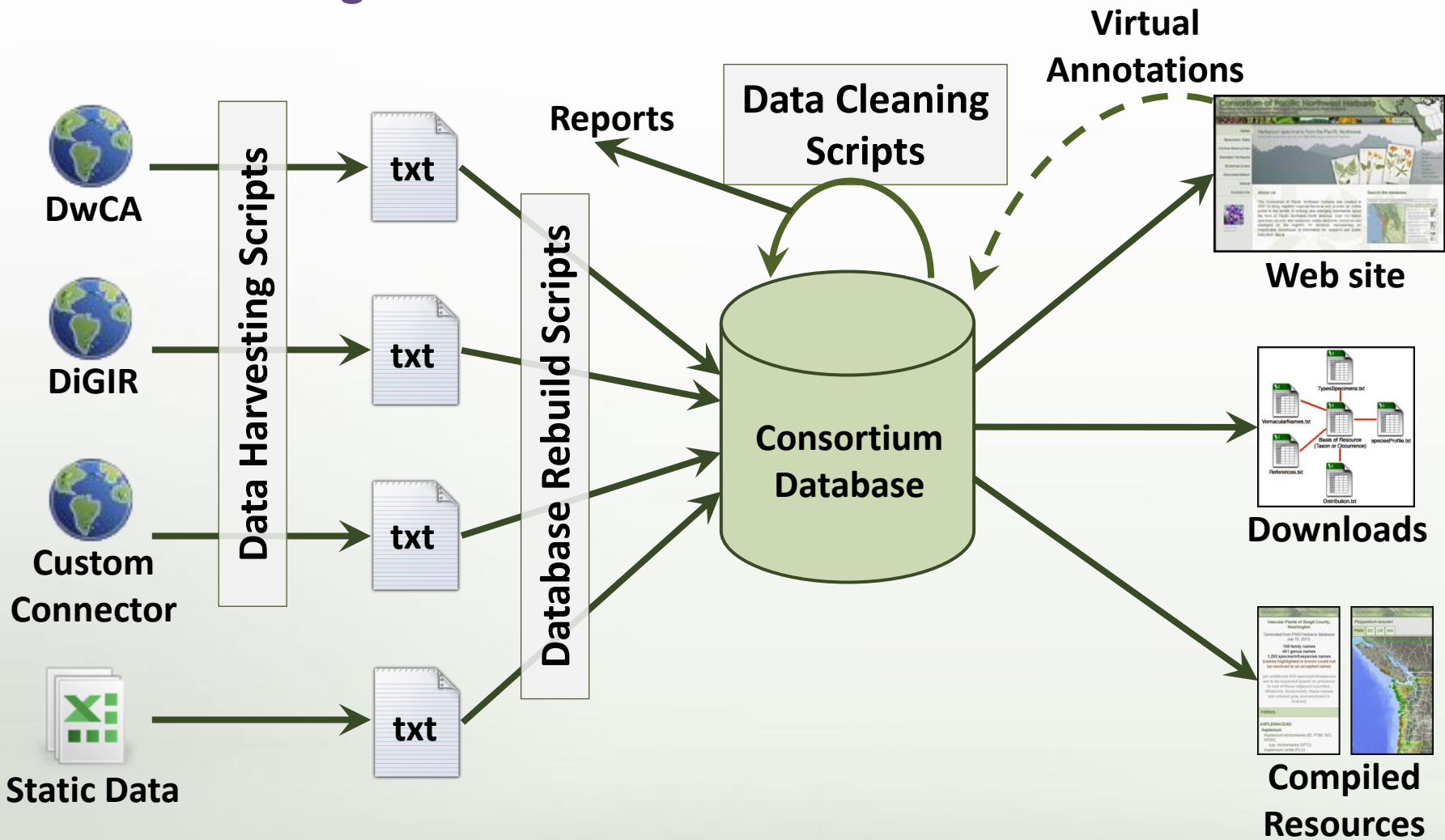
- Government agencies: Natural Heritage Programs, Forest Service, BLM, Fish & Wildlife, noxious weed control.
- Private consultants.
- Academic research: systematists, taxonomists, field botanists, ecologists.
- Herbarium personnel: collections managers, staff, volunteers.
- Higher education: undergraduates, teaching assistants, faculty.
- Citizen Science Programs: invasive species, rare care.
- Amateur botanists, native plant enthusiasts, hikers.

<http://www.pnwherberia.org/documentation.php>

Technology & Infrastructure

- Windows 2008 server (24 GB RAM, 12 TB storage in RAID5) hosted at U. of Washington. Contents backed up to a remote server at U. of Idaho.
- Apache, MySQL, PHP, Python, Tesseract OCR, HTML, JavaScript.
- Mostly custom code or open-source software (except Google Maps API).
- Web site design is custom; not using a content management system.

Data Harvesting



Specimen Imaging:

Lightbox and digital SLR.

Programs to rename images and capture basic metadata.

Image processing scripts.

Image viewer.

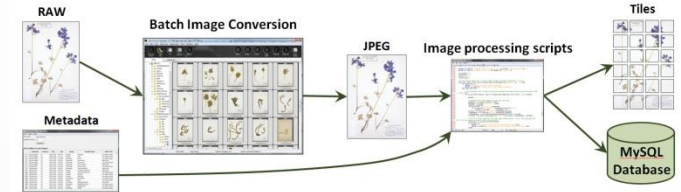
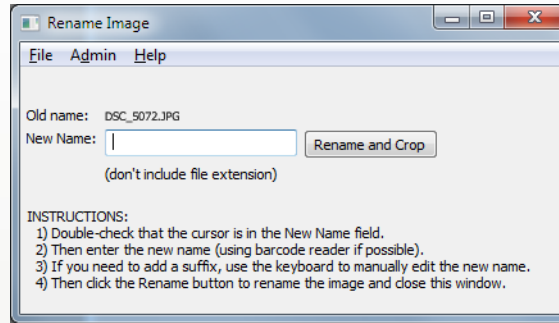


Image Metadata, PNW Herbaria

Your name:

Collection Acronym:

List of folders, in order imaged:

	Imaged By	Acronym	Date	Time	Family	Scientific Name	Folder Code
1	Harriet Hughes	ID	2010-10-08	10:57:01	Araceae	Arisaema	non-Idaho (cream)
2	Harriet Hughes	ID	2010-10-08	11:11:16	Araceae	Calla	non-Idaho (cream)
3	Harriet Hughes	ID	2010-10-08	11:15:46	Lemnaceae	Lemna	non-Idaho (cream)
4	Harriet Hughes	ID	2010-10-08	11:25:42	Lemnaceae	Lemna minor	Idaho (red)
5	Harriet Hughes	ID	2010-10-08	11:38:31	Lemnaceae	Lemna minor	non-Idaho (cream)
6	Harriet Hughes	ID	2010-10-08	11:48:34	Lemnaceae	Lemna trisulca	Idaho (red)
7	Jacob Donton	ID	2010-10-08	12:35:42	Lemnaceae	Lemna trisulca	non-Idaho (cream)
8	Jacob Donton	ID	2010-10-08	12:38:57	Lemnaceae	Lemna turionifera	Idaho (red)
9	Jacob Donton	ID	2010-10-08	12:41:06	Araceae	Lysichiton americanus	Idaho (red)
10	Jacob Donton	ID	2010-10-08	12:47:14	Araceae	Lysichiton americanus	non-Idaho (cream)
11	Jacob Donton	ID	2010-10-08	12:52:15	Araceae	Orontium	non-Idaho (cream)
12	Jacob Donton	ID	2010-10-08	12:53:47	Araceae	Peltandra	non-Idaho (cream)
13	Jacob Donton	ID	2010-10-08	12:54:46	Zosteraceae	Phyllospadix	non-Idaho (cream)
14	Jacob Donton	ID	2010-10-08	12:55:26	Araceae	Pistia	non-Idaho (cream)
15	Jacob Donton	ID	2010-10-08	12:56:30	Lemnaceae	Spirodela polyrhiza	Idaho (red)
16	Jacob Donton	ID	2010-10-08	12:59:42	Lemnaceae	Spirodela polyrhiza	non-Idaho (cream)
17	Jacob Donton	ID	2010-10-08	13:03:16	Araceae	Symplocarpus	non-Idaho (cream)
18	Jacob Donton	ID	2010-10-08	13:05:23	Lemnaceae	Wolffia	non-Idaho (cream)



Costs ca. \$280 (excluding camera & computer)

- Tripod
- Translucent white fabric
- Adhesive velcro or safety pins
- Wire coat hangers
- Clamp lamps & bulbs
- Power strip

- Scissors
- Pliers
- Wire cutters

Databasing software: Custom code built on MySQL, PHP, JavaScript, HTML.
 Accessed through a web browser. Functions like a database.
 Used by 19 herbaria to manage ca. 650,000 specimen records.

The screenshot displays a web-based databasing software interface for specimen records. The interface is divided into a left sidebar for data entry and a main right pane for image viewing.

Left Sidebar (Data Entry):

- Navigation:** Data Entry, Labels & Reports, Tables, Queries, Reference Data, Manage.
- Record Information:** Record ID: 11131, Status: unverified, Databasing Project: CPNWH Imaging, Tags, # of Duplicates.
- Herbarium & Collection:** Herbarium: MONT, Collection: Vascular Plants, Dataset, Accession: 67805, Catalog, Barcode, Other #s, Dups.
- Label Header:** Forest Service Herbarium - United States Department of Agriculture, Footer.
- Annotations:** Add/Edit Annotations, Family: Asteraceae, Accepted Name: Balsamorhiza sagittata.
- Identification:** Code: balsag, Name: Balsamorhiza sagittata, Name Qualifier & Position, Add Name, Edit Name.
- Collector & Date:** Last Name: Stickney, Full Name: Peter F. Stickney, Coll. #: 2666, Coll. Date: 6 Jun 1972, Verbatim Date.
- Site Information:** Site #, Site Lookup..., Find Matching Sites, Dupl. from Skeletal, Country: U.S.A., State or Province: Montana, County: Carbon, Locality: Custer National Forest/Expt. Area, Pryor Mountains, Sage Creek Watershed, Elevation: 6300 ft, USGS, UTM, Easting, Northing, TRS/PLSS: T7S R26E S27, Latitude, Longitude, TRS to Lat/Lng, UTM to Lat/Lng.
- Site Description or Habitat:** Slope: 15%. Exposure: northerly. Site: opening on mountainside. Vegetation type: mountain park hermland.
- Specimen Notes:** (Empty field)
- Phenology & Origin:** Flowers, Origin, Cultivated, Type Specimen, Add/Edit Types.
- Geographic Data:** Site Georef. Latitude: 45.1971, Longitude: -108.5094, Uncertainty: 0.5 mi, Datum: NAD 27, Sources: TRS2LL, Georef. By: Ben Legler, Georef. On: 2012-07-09 00:00:00, Specimen Georef., Remarks, Copy Georef. to Matching Sites.
- Record Management:** Created By: Milagros Del Aguila, On: 2011-05-27 10:29:17, Allow record online, Use Field Notes mode for data entry, Modified By: Milagros Del Aguila, On: 2011-05-27 10:36:07, Allow locality online.

Main Pane (Image Viewer):

- Navigation:** Images, Documents, Map, Browse, Show Thumbnails, Hide Image Viewer, Attach Image, 1 image attached.
- Image:** A photograph of a pressed plant specimen (Balsamorhiza sagittata) with a yellow flower and green leaves. A scale bar (0-4 inches) is visible at the top left of the image.
- Label:** A detailed label at the bottom right of the image, including the text: "FOREST SERVICE HERBARIUM", "Balsamorhiza sagittata (Hook.) Nutt.", "Custer National Forest/Expt. Area", "Pryor Mountains, Sage Creek Watershed", "about 2.5 miles north-northwest of Shriver (HCP); 21 miles east-southeast of Bridger.", "Elevation: 6300 ft", "USGS", "UTM", "East: 713306", "North: 451971", "Date: 6 Jun 1972", "Collector: Peter F. Stickney", "Coll. #: 2666", "Accession: 67805", "Herbarium: MONT", "Bozeman, MT, USA".

Android Apps: Field Notes App to collect herbarium specimen label data in the field.
Familiar workflow: create sites then add specimens to sites.

List of sites and collections:

Collections Settings Upload Help

New Site Select All Delete Selected

Site #2: Jul 22, 2013, 5:30:07 PM
Ben Legler, BSL-914.
 U.S.A., Washington, Whatcom County: Pond at west end of Slide Lake in headwaters of Illabot Creek drainage. Elev. 1035 m. 47.59083° N, 121.73088° W.

▼ **2 collections**

12786. *Prenanthes alata*
 2 duplicates.

12785. *Huperzia miyoshiana*
 1 duplicate. Photographed.

Site #1: Jul 22, 2013, 5:26:07 PM
Ben Legler, BSL-913.
 U.S.A., Washington, Skagit County: Along Illabot Creek Road near junction with Arrow Creek. Elev. 980 m. 47.403484° N, 121.598403° W.

▼ **1 collection**

12784. *Hieracium aurantiacum*
 1 duplicate.

Create/edit site:

Save Cancel Add Coll. ◀ ▶

Site # Site Code

Date Time

Collector

Coll. With

Country State County

Locality

Site Description

Elev. - m.

Degrees Minutes Seconds Hem.

Lat.

Create/edit collection:

Save Cancel Add Coll. ◀ ▶

Site # Coll. #

Date Time

Identification:
 Family

Name

× Name

(to access species lists, enter first three letters of genus followed optionally by a space and first few letters of species; example: 'abi' or 'abi las')

Specimen Notes

Phenology

of Dups

Cultivated Photographed

Lat/Lon

Challenges & Needs

1. Messy data!!! Requires a lot of data cleaning code:
 - Detecting faulty georeferences.
 - Cleaning up and standardizing scientific names.
 - Detecting and flagging cultivated specimens.
 - Standardizing data and values without losing information.
2. Keeping data current and minimizing the use of static snapshots.
3. Data sharing with iDigBio and GBIF.
4. Accepting data corrections, comments and annotations (reverse data flow).
5. Sustainability of PNW Herbaria.