

**Databasing work
flows at the
Wisconsin State
Herbarium (WIS)**

<http://herbarium.wisc.edu>

University of Wisconsin-Madison



Mark Allen Wetter

Senior Academic Curator/Collections Manager

Table 2. Collections of the Wisconsin State Herbarium (WIS). Numbers of specimens for each collection, partitioned by geography, are estimates except for Wisconsin vascular plants. That exact number is known because all specimens have been databased. In particular, notice WIS' outstanding collections of North American lichens and angiosperms, parasitic fungi, and Latin American angiosperms

	Wisconsin	North America	Latin America	Old World	TOTALS
Algae	140	3,120	40	170	3,470
Parasitic Fungi	37,800	36,900	3,300	22,000	100,000
Lichens	30,220	94,060	30,490	52,730	207,500
Bryophytes	13,510	33,140	2,050	11,190	59,890
SUBTOTAL: 'Cryptogams'	81,679	167,220	35,880	86,090	385,860
Lyco+Pteridophytes	11,730	10,600	6,310	3,300	31,940
Gymnosperms	2,160	3,290	4,480	660	10,590
Angiosperms	238,070	340,730	119,400	73,160	771,360
Teaching Collection	16,000				16,000
SUBTOTAL: Vascular Plants	267,960	354,620	130,190	77,120	814,890
TOTAL: ALL GROUPS	349,630	521,840	166,070	163,210	1,200,750

Vascular plant data and images being contributed as part of the Tri-trophic and Great Lakes TCN's

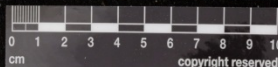


Plants, Herbivores, and Parasitoids: A Model System for the study of Tri-Trophic Associations (2011)

<http://tcn.amnh.org>



Documenting the Occurrence through Space and Time of Aquatic Non-indigenous Fish, Mollusks, Algae, and Plants Threatening North America's Great Lakes (2014)



297

UNIVERSITY OF WISCONSIN MADISON
v 0017224 WIS

WISCONSIN
DANE CO.
Town of
Pitchburg
Steep RR
embankment
along north
south or-
iented RR
tracks.
With:
Helleopsis
helleanthoides, Anemone canadensis, Monarda
fistulosa, Apocynum androsaemifolium,
A. cannabinum, Tradescantia ohioensis, etc.

Asclepias syriaca L.

(T64 N; R9 E; Sec. 26)

Date: 30 June 1985

No.:

Coll.: A. Clark

MAPPED FOR
FLORA OF WISCONSIN

WI Tri-trophic Families

Family	WI specimens
Apiaceae	3899
Asteraceae	33068
Chenopodiaceae	1439
Cupressaceae	691
Cyperaceae	23676
Fabaceae (s.l.)	7712
Fagaceae	2094
Grossulariaceae	1804
Juglandaceae	688
Lamiaceae	6571
Oleaceae	763
Pinaceae	1261
Poaceae	20353
Polygonaceae	4943
Rhamnaceae	692
Rosaceae	14283
Salicaceae	4640
Scrophulariaceae	5590
Solanaceae	1379
Zygophyllaceae	6
TOTAL	135552

- All vascular plant specimens from Wisconsin were already barcoded and databased prior to our participation in the TCN's
- Databasing was started in 1994 and label data was entered into a Paradox7 (relational) database that was developed in-house.
- Migrated to an Access (flat file) database in (2000) and then recently migrated to Specify (relational) in 2012.



Table 1. Genera (and their corresponding family) targeted by this effort. Lists were generated by querying NOAA's GLANSIS database <http://www.glerl.noaa.gov>. 'Watchlist' genera not included.

PLANTS & ALGAE		FISH		MOLLUSKS	
Genus	Family	Genus	Family	Genus	Family
<i>Conium</i>	Apiaceae*	<i>Alosa</i>	Clupeidae	<i>Bithynia</i>	Bithyniidae
<i>Cirsium</i>	Asteraceae*	<i>Apeltes</i>	Gasterosteidae	<i>Cipangopaludina</i>	Viviparidae
<i>Pluchea</i>	Asteraceae*	<i>Carassius</i>	Cyprinidae	<i>Corbicula</i>	Corbiculidae
<i>Solidago</i>	Asteraceae*	<i>Cyprinus</i>	Cyprinidae	<i>Dreissena</i>	Dreissenidae
<i>Impatiens</i>	Balsaminaceae	<i>Enneacanthus</i>	Centrarchidae	<i>Elimia</i>	Pleuroceridae
<i>Alnus</i>	Betulaceae	<i>Esox</i>	Esocidae	<i>Gillia</i>	Hydrobiidae
<i>Myosotis</i>	Boraginaceae	<i>Gambusia</i>	Poeciliidae	<i>Lasmigona</i>	Unionidae
<i>Nasturtium</i>	Brassicaceae	<i>Gymnocephalus</i>	Percidae	<i>Pisidium</i>	Sphaeriidae
<i>Rorippa</i>	Brassicaceae	<i>Lepisosteus</i>	Lepisosteidae	<i>Potamopyrgus</i>	Hydrobiidae
<i>Butomus</i>	Butomaceae	<i>Lepomis</i>	Centrarchidae	<i>Radix</i>	Lymnaeidae
<i>Cabomba</i>	Cabombaceae	<i>Misgurnus</i>	Cobitidae	<i>Sphaerium</i>	Pisidiidae
<i>Myosoton</i>	Caryophyllaceae	<i>Morone</i>	Moronidae	<i>Valvata</i>	Valvatidae
<i>Chenopodium</i>	Chenopodiaceae*	<i>Neogobius</i>	Gobiidae	<i>Viviparus</i>	Viviparidae
<i>Carex</i>	Cyperaceae*	<i>Notropis</i>	Cyprinidae		
<i>Lupinus</i>	Fabaceae*	<i>Noturus</i>	Ictaluridae		
<i>Myriophyllum</i>	Haloragaceae	<i>Oncorhynchus</i>	Salmonidae		
<i>Hydrocharis</i>	Hydrocharitaceae	<i>Osmerus</i>	Osmeridae		
<i>Iris</i>	Iridaceae	<i>Petromyzon</i>	Petromyzontidae		
<i>Juncus</i>	Juncaceae	<i>Phenacobius</i>	Cyprinidae		
<i>Lycopus</i>	Lamiaceae*	<i>Proterorhinus</i>	Gobiidae		
<i>Mentha</i>	Lamiaceae*	<i>Salmo</i>	Salmonidae		
<i>Lythrum</i>	Lythraceae	<i>Scardinius</i>	Cyprinidae		
<i>Marsilea</i>	Marsileaceae				
<i>Nymphoides</i>	Menyanthaceae				
<i>Najas</i>	Najadaceae				
<i>Epilobium</i>	Onagraceae				
<i>Agrostis</i>	Poaceae*				
<i>Alopecurus</i>	Poaceae*				
<i>Echinochloa</i>	Poaceae*				
<i>Glyceria</i>	Poaceae*				
<i>Poa</i>	Poaceae*				
<i>Puccinellia</i>	Poaceae*				
<i>Polygonum</i>	Polygonaceae*				
<i>Rumex</i>	Polygonaceae*				
<i>Potamogeton</i>	Potamogetonaceae				
<i>Lysimachia</i>	Primulaceae				
<i>Frangula</i>	Rhamnaceae*				
<i>Salix</i>	Salicaceae*				
<i>Veronica</i>	Scrophulariaceae*				
<i>Solanum</i>	Solanaceae*				
<i>Sparganium</i>	Sparganiaceae				
<i>Trapa</i>	Trapaceae				
<i>Typha</i>	Typhaceae				
<i>Nitellopsis</i>	Characeae (algae)				

* = Plant family targeted by "tri-trophic" TCN



Wisconsin: Dane County
Apiaceae
Pistia stratiotes L.



Retention pond; assoc.: *Eichhornia crassipes* and *Potamogeton nodosus*. Banks lined with *Phalaris arundinacea*, *Typha angustifolia*, and a shrubby *Salix* sp.

These were the only water plants noted. [Collected and brought in by G. Coombs. Identified, pressed, labeled, and mounted by T. S. Cochran as No. 14914.]

DATE: 09E 06 NW4 NW4
LAT: 43°00' N
LONG: 89°30' W

Both *Eichhornia* and *Pistia* grow in intermittent clusters all along the perimeter of the north pond. A single small cluster of *Pistia* was noted in a little pool in the wetland outside the second, gated outlet at the southwest corner of the north pond. Mr. Coombs searched again for these species. "This is a good one, but not the one I had. It seems they did not survive that winter. I found it in 1991." (T. S. Cochran)

City of Middleton: Northern of two retention ponds in Orchard Heights Park, between (0.5 mi. E of Pheasant Branch Rd. and (0.5 mi. W of Co. Hwy. Q, 0.5 mi. N of Century Ave. (= Co. Hwy. M)).

Collector: Coombs, Guerdon
Cat. No.: 14914
Date: 22/Sep/2008
Det.: Cochran, Theodore S. 23/Sep/2008

Vascular plant specimens are being databased by student workers entering the label information directly from specimens into Specify workbench template

Specify 6.5.05

File Edit Data System Tabs Help

Welcome Data Trees Reports Interactions Statistics Query Workbench SGR Plugins Lifemapper Attachments

backup Search

Actions

- Import Data
- Import Images
- New Data Set
- Export Data Set
- Export MS Excel Template
- Create Data Set from Record Set

Reports

- Data Set Summary
- Basic Label
- Chart
- Top 10

Data Sets

- ANDGER
- Test import 1
- Test import 2
- WIS_DATA_ENTRY_FORM_03042014

Institution: Accession Number:

Genus: Species: Subspecies:

Family: Variety:

Place:

County: State: Country:

Latitude1: Longitude1: Latitude/Longitude Type: Precision:

Latitude2: Longitude2:

T1: R1: S1:

T2: R2: NSEW_2: S2:

Elevation:

1 of 1

☒ Highlight Invalid Cells: 0 ☐ Highlight New Records

WIS_DATA_ENTRY_FORM_03042014

Botany Plants mawetter

2:00 PM 10/4/2014

Or by leveraging crowd sourcing label transcription by volunteers

- As specimens being imaged the resulting CR files are stored in separate folders by genus.
- CR files are too large (ca. 28,000KB/image) to export directly to volunteers.
- Large sets of CR files of images are turned directly into JPEG's using Adobe Bridge.
- Volunteers' enter the label data into an Excel spread sheet based on Specify workbench template.

Converting CR image to JPEGs using Adobe Bridge

- ❖ Open Bridge.
- ❖ Select the folder with the Camera Raw Images then do Select All (under Edit).
- ❖ Go to Tools and Select Photoshop > Image Processor.
- ❖ Select Folder (location where to save images)
- ❖ Select File Type
- ❖ Hit Run
- ❖ JPEGs will be saved in the folder you selected

Computer > Macintosh HD > Users > mfeist > Desktop > Convert Test >

Sort by Filename

Sort by Filename

FAVORITES FOLDERS

Computer

mfeist

Desktop

Documents

Pictures

Drag Favorites Here...

FILTER COLLECTIONS

Batch03_Misfits (11)

Batch03_Misfits2 (4)

Redo (4)

CONTENT



JPEG



v0293560WIS.CR2



v0293561WIS.CR2



v0293562WIS.CR2



v0293563WIS.CR2



v0293564WIS.CR2



v0293565WIS.CR2



v0293566WIS.CR2



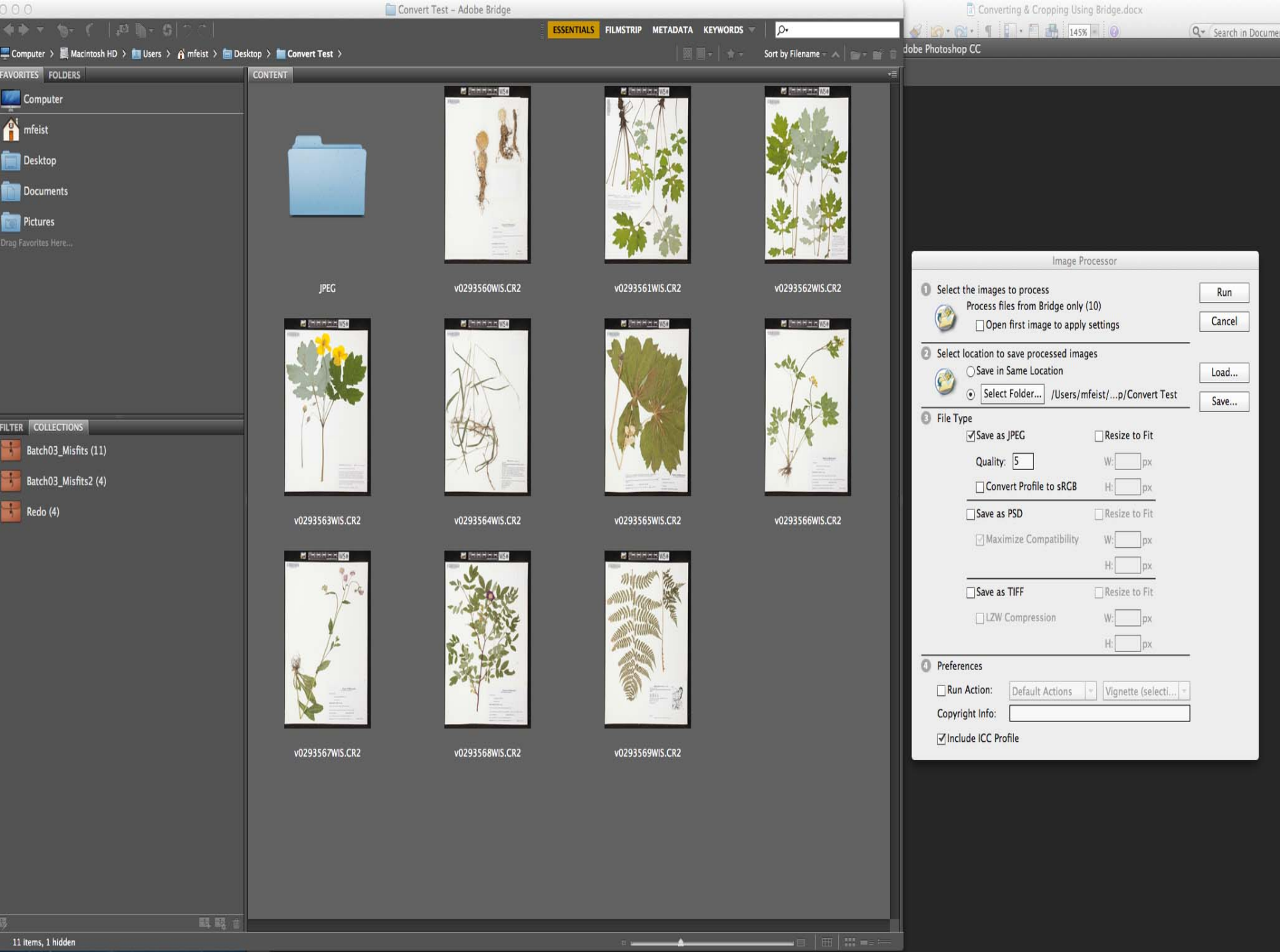
v0293567WIS.CR2



v0293568WIS.CR2

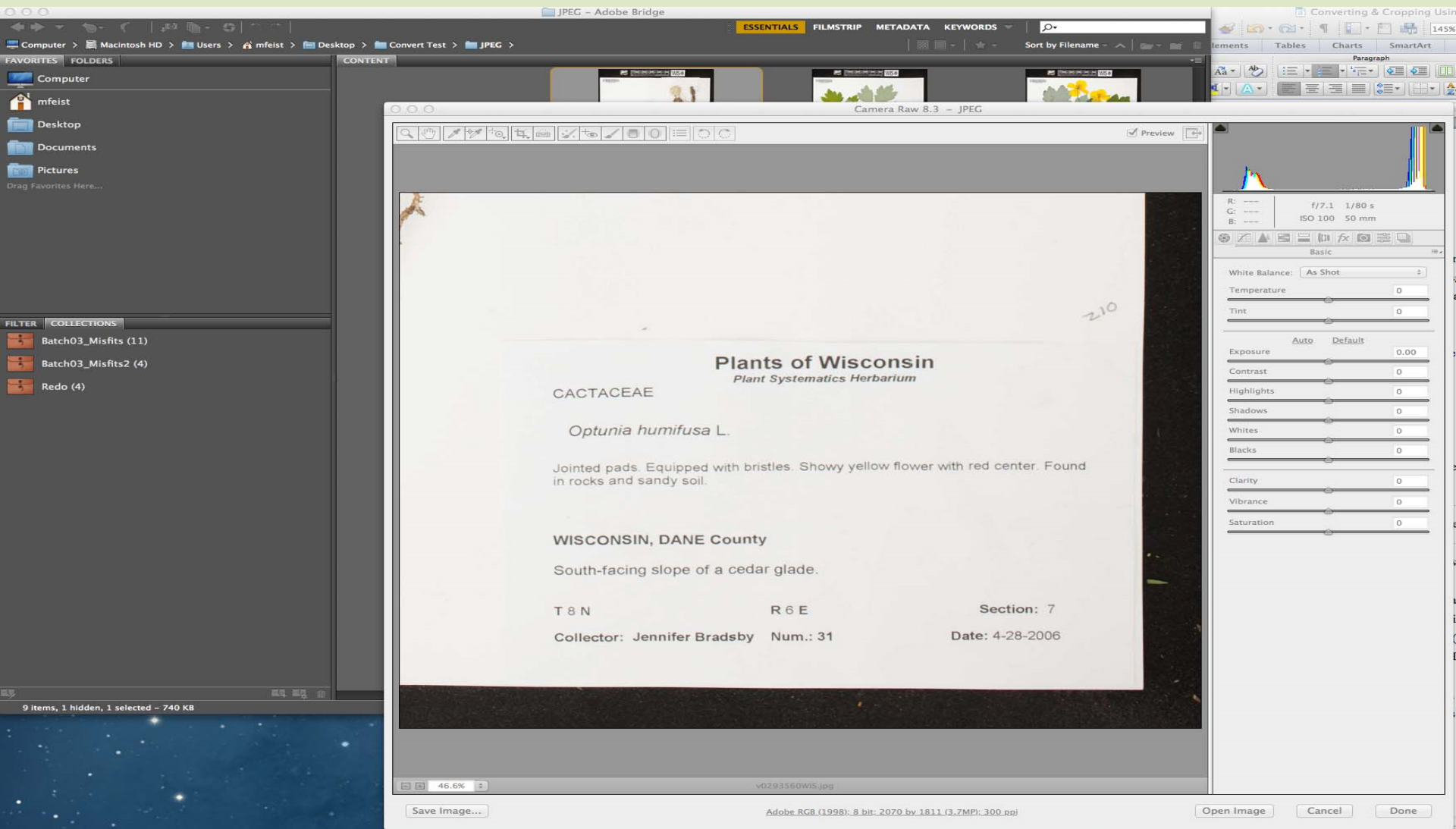


v0293569WIS.CR2



JPEGs of entire image can be sent to volunteers (generally using DropBox)

Or further manipulation of images can be done to crop just the label (only works if label is in the lower right hand corner) and the JPEGs of only the cropped labels can be sent to volunteer.



Cropping Labels Using Bridge

- 1) Open Bridge.
- 2) Open the folder of JPEGs.
- 3) Select one of the JPEGs, then choose File > Open in Camera Raw.
- 4) Crop it. Close Camera Raw.
- 5) Copy the settings from the cropped one (Edit > Develop Settings > Copy Camera Raw Settings) select all the other images (Invert Selection), then choose Edit > Develop Settings > Paste Camera Raw Settings.
- 6) A window will open “Paste Camera Raw Settings.” Under Subset choose Crop. Hit OK.
- 7) They should all be cropped the same way now.
- 8) Select all the cropped images. Under File select Open In Camera Raw. Select All. Hit Save Image and Select Folder (where to save cropped images). Under Format select jpeg. Quality 5. Hit Save.

Sort by Filename

PREVIEW



Whitcomb Strait Barbatum

Lobelia adpressa L.

Lafayette Co. Yellowstone Lake State Park. In company with *Silene* (det.) *Fendleria* (pink). Locally dominated with *Trifolium angustifolium*, *L. glauca*, *Carex lasiocarpa*, *Equisetum hyemale*, *Equisetum parviflorum*, *Deschampsia cespitosa*, *Aster spaldingii*, *Helleborus grossularifolius*, *Lyopogon umbellatus*, *Regeliana laevifolia*, *Sedum spectabile*, *Senecio*, *Phacelia prostrata* (det.), *Polypodium amplifolium*, *Carex pensilvanica*, and *Deschampsia* (det.). Understory is low (< 1 m).

TOWNE 346; Sec 1 N4848-4 - 42°14'34" N, 109°58'73" W.
 8/21/01. 0.0°C 28.0°C 78% (13ex 2011)

Whitcomb Strait Geoplot for study
 University Department of Natural Resources

Wisconsin State Herbarium

Prunella angustiloba L. W. Robbins

Lake Umbagog Co. Yellowstone Lake from Twin Falls Park
about 1000, flowers half 1" than W. along lake 85° 50' N. Local
common in open woods 2-20 days on S side of lake.

TYPE: HARV. Aca. 3252 (NW) = 42, 5678 (W), 49, 9638 (W)

Russ P. (C) Correll 853

3 Sept. 2011

Wisconsin State Herbarium
University of Wisconsin - Stevens Point

Wisconsin State Herbarium
Bentley Herbarium, Madison

LAMARET, Co. Yacumoto Lake State Park, 1000 ft. alt., below 4000 ft. 30 Jan. Patches of emergent marsh central of lake. *Typha angustifolia*, *Arundo donax*, *Scirpus americanus*, *Phragmites communis*, *Kuhnia cordifolia*, *Sagittaria arifolia*, *Hydrocotyle angustifolia*, *Potamogeton amplipetiolatus*, *Carex stricta*, *C. lasiocarpa*, *Sagittaria arifolia*, *Eleocharis acicularis*, *Juncus* sp.

UDN 3004, Sec. 2, NW 1/4 42°52'N, 89°05'W.
Rym. P. 0000007959. 15 Nov 2013

Wisconsin State Herbarium
Palm Springs Department of Natural Resources



Whoonia State Herbarium

Thuja occidentalis L.

Loc 444111 Co. Yellowknife Lake Sask. Sask. Dominant in emergent marsh below caribou trail end of park. 9th July 1968. Leaves aromatic. Lvs in cones. Squamately membranous. Lvs persistent. Squamately papery, erect plane. Petioles proconvex. Evergreen. Inflores. terminal fertile. Subglobular. cones. Fertility erect. Male. Magnificent. cones. aromatic. Lvs dark. aromatic.

TARA R. & J. (N 45°) 42.76, 54° N, 103° 57' W
 Ryan P. O'Connor 061 1 Sept 2011

Whoonia State Herbarium
 University of Saskatchewan

- Keywords
- White Balance
- Camera Raw



Wicomico State Herbarium

Agaveas parvifolia Ait.

ROBERT CO. Henry Creek Wildlife Area. First Collection.
 131117 W 22nd, Jan 6. S. SW on Oak Knoll Rd. in
 performing area. Soil: 0-20 in. 100% S. in 100-200 in. 10
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Wisconsin State Herbarium
Helianthus argenteus C.K. Schneize

KESWICK CO. New Missouri River Island No. 5111.59 to
 T1N 20R 77E Sec. 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 83

[illegible]

Wisconsin State Barberry

Maackelia amurensis (L.) Reichenbach

Manitowish County, Bullhead Creek at Ohio Ave., Decker et al.
 plants in 2200s immediately W. of road crossing. Associated
hepatitis repens, *agrostis sanguinalis*, *erigeron*, *erigeron*,
erigeron, *erigeron*, *erigeron*, *erigeron*, *erigeron*, *erigeron*, *erigeron*,
 L. SN. RACW Sec. 29 S. 24 S. 4 E. 43 74° 18' N. 40 67 03" W.

Ryan P. O'Conner 1991 13 Sept 23 F.

Wisconsin Natural Heritage Inventory
 Division of Natural Resources

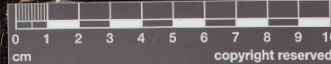
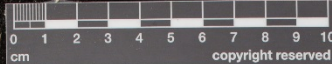
v0288058WIS.jpg



Once Excel files are returned they checked and verified by one of the curators or by designated student to ensure complete data capture.

Post data editing is especially important if volunteer has only been sent the cropped labels, as there is often additional data elsewhere on the sheet.

Once data is edited the Excel files are imported into Specify workbench and then uploaded into database



UNIVERSITY OF WISCONSIN-MADISON 0001
v 0056081 WIS

216

UNIVERSITY OF WISCONSIN-MADISON 0001
v 0047793 WIS

216

SHEET 1 OF 3 SHEETS

WISCONSIN
Waukesha Co.

Lythrum salicaria L.

Cor. bright red-violet.

Two small colonies. (Here

and there throughout the

county wherever culverts

divert sedge meadow water.

Gorgeous, extensive wet

fen on deep marl w/ mar

ginal shrub swamps adjoining

OTTAWA LAKE on all sides, the

latter a 2-lake + streams

complex remnant in an old

glacial lake basin. Lake it-

self = 20 acres, w/ pH 7.8 &

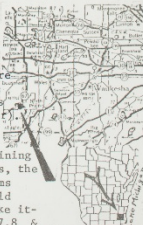
total alkalinity (ppm CaCO₃)

265. Southern Unit of Kettle Moraine St. For.

Scientific Area, 4 1/2 mi. (by air) N. of EAGLE.

(T6N, R17E, sec. 34 NW 1/4 of NW 1/4) 23 July 1976

T. S. Cochrane, w/ M. Tans & B. A. Cochrane



INNER, WETTEST OF THREE ZONES SURROUNDING LAKES,
a lakeshore wet marsh dominated by *Typha lati-*
folia, with *Scirpus acutus*, *S. americanus*, *Lysi-*
machie terrestris, *Lythrum salicaria*, *Scutellaria*
galericulata, *Lycopus uniflorus*, *Campanula spari-*
noides var. *grandiflora*, *Galium trifidum*, *Utricu-*
laria intermedia, and *Eupatorium perfoliatum*.

102 ^{Collected 1972} MAPPED 1972
FLORA OF WISCONSIN

WISCONSIN
Kewaunee County

Lythrum salicaria L.
var. *lomentosa* (Mill.) D.C.

Common in the wet swampy area
just north of the town of
Kewaunee, 4 ft. tall.



(2 23N; R. 25E; Sect. 18) .SE 1/4

Date: August 11, 1971 No. 417

Collector: Bruce & JoAnn Hansen

- Prior to our participation in the Lichen & Bryophyte TCN there were very few lichen (7500) or bryophyte (0) specimens databased.
- Since we were in the transition period between database systems we weren't be able to develop a functioning database system to allow for rapid databasing of these collections.
- Separate barcode series for both lichen and bryophytes. Barcodes are in different format from those for the vascular plants.
- The lichens and bryophytes are being imaged and databased through the LBCC' Symbiota portals:

North American Lichens and Bryophytes: Sensitive Indicators of Environmental Quality and Change

<http://lbcc1.acis.ufl.edu>

Photos by F. Bungartz

Consortium of
NORTH AMERICAN LICHEN HERBARIA

<http://lichenportal.org/portal/>



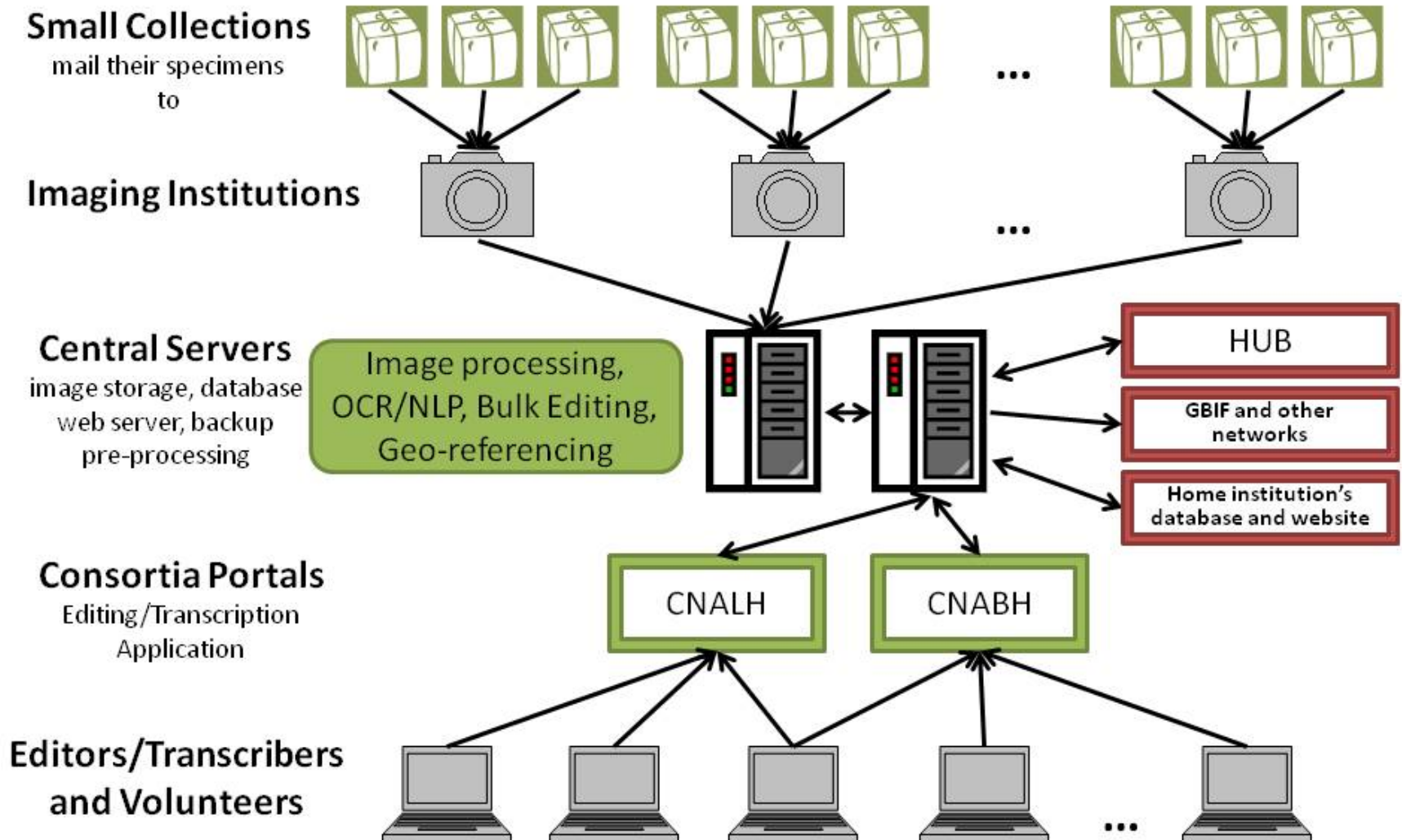
Photos by M. Von Konrat

Consortium of
NORTH AMERICAN BRYOPHYTE HERBARIA

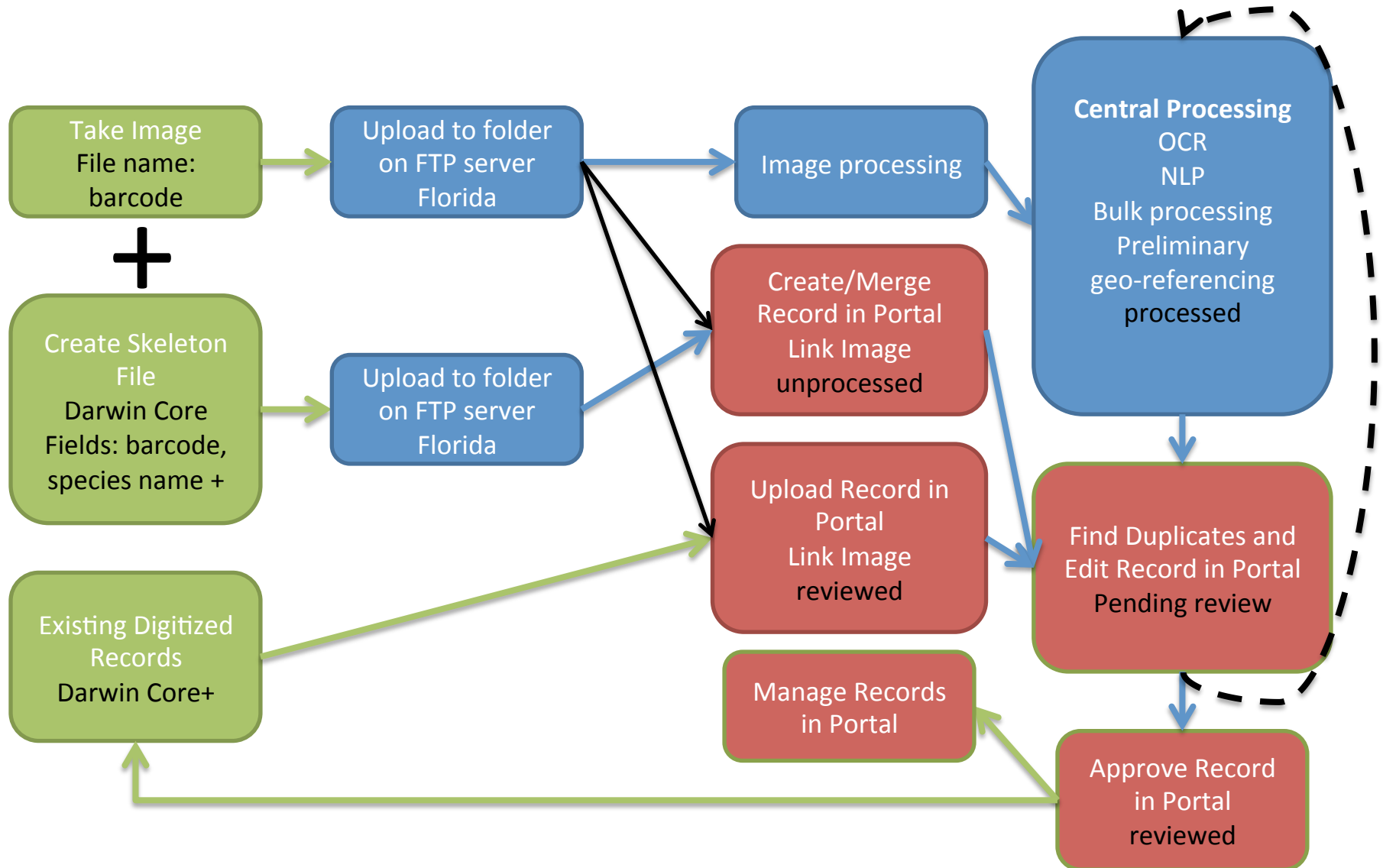
<http://bryophyteportal.org/portal/>



Digitization Workflow



Digitization Workflow



- Images are saved directly as JPEGs.
- A skeleton record set is created, that includes barcode number, genus & specific epithet selected from pre-established thesaurus.
- Minimal geographic information is also entered (country & state).

109293

LICHENS OF MONTANA

Xanthomendoza oregana (Gyelnik) Sochting, Kaernefelt
& S. Kondr.

On *Populus* bark
Itch-kep-pe Park Campground, 1 mi SE of Columbus
Stillwater Co., MT

1145 m 45° 37'N, 109° 16'W

C.E. Seibert
5 May 2007
L178a

Xanthomendoza fulva (Hoffm.) Sochting et al.
det. Caleb A. Morse, 2012
L. McGregor Herbarium (KANU)
University of Kansas, Lawrence, Kansas USA

- Each group of images (lichens and bryophytes) are processed separately since they will be sent to different portals, but the images of the specimen labels are all processed through the same steps.
- Labels are batched and each evening they are run through an Optical Character Recognition (OCR) program. Both Tesseract (open source) and ABBY were initially tested but ABBY produced better results.
- The text generated by OCR is next run through a natural language program which parses the text into data fields.
- Corresponding record is then generated that can be posted on the portal and can be edited.

Occurrence Data	Determination History	Images	Genetic Links	Admin
-----------------	-----------------------	--------	---------------	-------

Collector Info

Catalog Number ? Other Numbers ? Collector ? Number ? Date ?

MONT-L-0008067 ☐ Auto search

Associated Collectors ? Verbatim Date ?

Exsiccata Title Number

Latest Identification

Scientific Name ? Author ?

Xanthoparmelia coloradoensis (Gyelnik) Hale

ID Qualifier ? Family ? Parmeliaceae

Identified By ? Date Identified ?

Locality

Country State/Province County Municipality

United States Wyoming

Locality

☐ Locality Security

Latitude Longitude Uncertainty ? Datum ? Verbatim Coordinates

Elevation in Meters Verbatim Elevation

Misc

Habitat

Substrate

Associated Taxa

Description

Notes

Life Stage ? Sex ? Individual Count ? Sampling Protocol ? Preparations ?

Phenology ? Establishment Means ? ☐ Cultivated

Curation

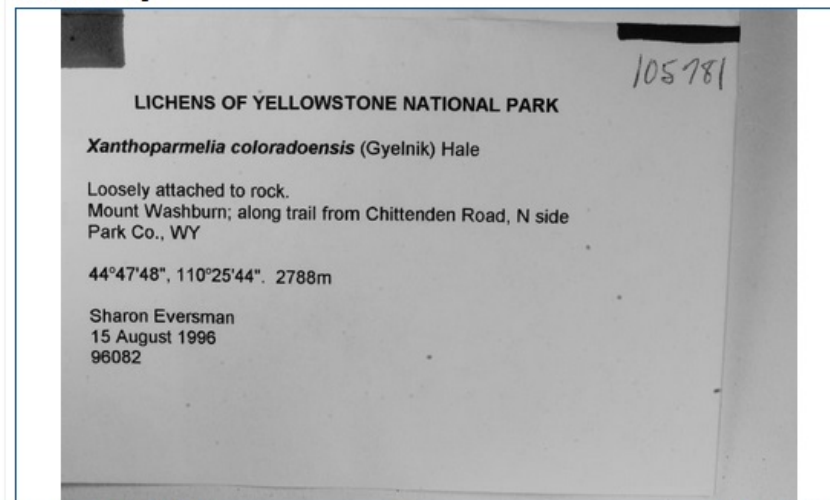
Type Status ? Disposition ? Occurrence ID ? Field Number ?

Owner Code ? Basis of Record ? Language Label Project

Dupe Count Processing Status

Unprocessed

Label Processing



OCR Image

Options

- ☐ OCR whole image
- ☐ OCR w/ analysis

Image 1 of 1

105781; LICHENS OF YELLOWSTONE NATIONAL PARK
 Xanthoparmelia coloradoensis (Gyelnik) Hale Loosely attached to rock.
 Mount Washburn; along trail from Chittenden Road, N side Park Co., WY
 44°47'48", 110°25'44". 2788m
 Sharon Eversman 15 August 1996 96082

Notes:

Source:

ABBY:2013-07-12

1 of 1

Occurrence Data	Determination History	Images	Genetic Links	Admin
-----------------	-----------------------	--------	---------------	-------

Collector Info

Catalog Number ? Other Numbers ? Collector ? Number ? Date ?

MONT-L-0008067 Sharon Eversman 96082 1996-08-15

Dupes? ☐ Auto search

Associated Collectors ? Verbatim Date ?

Exsiccati Title Number

Latest Identification

Scientific Name ? Author ?

Xanthoparmelia coloradoensis (Gyelnik) Hale

ID Qualifier ? Family ? Parmeliaceae

Identified By ? Date Identified ?

Locality

Country State/Province County Municipality

United States Wyoming Park

Locality

Mount Washburn; along trail from Chittenden Road, N side

☐ Locality Security

Latitude Longitude Uncertainty ? Datum ? Verbatim Coordinates

44.79667 -110.42889 44°47'48"N, 110°25'44"W

Elevation in Meters Verbatim Elevation

2788 - 2788m

Misc

Habitat

Substrate

Associated Taxa

Description

Notes

Life Stage ? Sex ? Individual Count ? Sampling Protocol ? Preparations ?

Phenology ? Establishment Means ? ☐ Cultivated

Curation

Type Status ? Disposition ? Occurrence ID ? Field Number ?

Owner Code ? Basis of Record ? Language Label Project

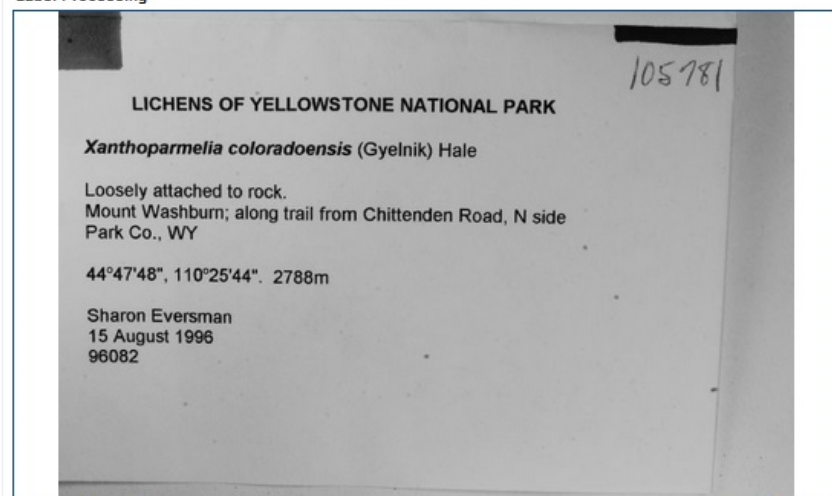
PreservedSpecimen

Dupe Count Processing Status

Unprocessed

Primary Key: 1467182 Date Last Modified: 2013-07-26 18:48:19 Entered By:

Label Processing



OCR Image

Options

- ☐ OCR whole image
- ☐ OCR w/ analysis

Image 1 of 1

i> LICHENS OF YELLOWSTONE NATIONAL PARK

Xanthoparmelia coloradoensis (Gyelnik) Hale Loosely attached to rock.

Mount Washburn; along trail from Chittenden Road, N side Park Co., WY

44°47'48", 110°25'44". 2788m

Sharon Eversman 15 August 1996 96082

Notes:

Source:

ABBY:2013-07-12

Save OCR Edits

Parse OCR (LBCC)

Delete OCR

1 of 1

Occurrence Data	Determination History	Images	Genetic Links	Admin
Collector Info				
Catalog Number ? Other Numbers ? Collector ? Number ? Date ? MONT-L-0007935				
Dupes? ☐ Auto search				
Associated Collectors ? Verbatim Date ? 				
Exsiccata Title Number 				
Latest Identification				
Scientific Name ? Author ? Xanthomendoza fulva (Hoffm.) Sechting, Känefelt				
ID Qualifier ? Family ? Teloschistaceae 				
Identified By ? Date Identified ? 				
Locality				
Country State/Province County Municipality United States Montana				
Locality 				
☐ Locality Security				
Latitude Longitude Uncertainty ? Datum ? Verbatim Coordinates 				
Tools				
Elevation in Meters Verbatim Elevation -				
Misc				
Habitat 				
Substrate 				
Associated Taxa 				
Description 				
Notes 				
Life Stage ? Sex ? Individual Count ? Sampling Protocol ? Preparations ? 				
Phenology ? Establishment Means ? ☐ Cultivated				
Curation				
Type Status ? Disposition ? Occurrence ID ? Field Number ? 				
Owner Code ? Basis of Record ? Language Label Project 				
Dupe Count Processing Status Unprocessed				
Primary Key: 1466473 Date Last Modified: 2013-07-26 18:48:19 Entered By:				

Label Processing

109293

LICHENS OF MONTANA

Xanthomendoza oregana (Gyelnik) Sochting, Kaernefelt & S. Kondr.

On *Populus* bark
 Itch-kep-pe Park Campground, 1 mi SE of Columbus
 Stillwater Co., MT

1145 m 45° 37'N, 109° 16'W

C.E. Seibert
 5 May 2007
 L178a

Xanthomendoza fulva (Hoffm.) Sechting et al.
 Det. Caleb A. Morse, 2012
 R. L. McGregor Herbarium (KANU)
 University of Kansas, Lawrence, Kansas USA

OCR Image
Options

☐ OCR whole image
 ☐ OCR w/ analysis

109293

LICHENS OF MONTANA

Xanthomendoza oregana (Gyelnik) Sochting, Kaernefelt & S. Kondr.

On *Populus* bark
 Itch-kep-pe Park Campground, 1 mi SE of Columbus Stillwater Co., MT

1145m 45° 37'N, 109° 16'W

C.E. Seibert 5 May 2007 L178a

Xanthomendoza fulva (Hoffm.) Sechting et al.
 Det. Caleb A. Morse, 2012
 R. L. McGregor Herbarium (KANU)
 University of Kansas, Lawrence, Kansas USA

Notes:

Source:
 ABBYY:2013-07-11

1 of 1

Occurrence Data	Determination History	Images	Genetic Links	Admin
-----------------	-----------------------	--------	---------------	-------

Collector Info

Catalog Number ? Other Numbers ? Collector ? Number ? Date ? ☐ Auto search

MONT-L-0007935 2007-05-05

Associated Collectors ? Verbatim Date ?

Exsiccata Title Number

Latest Identification

Scientific Name ? Author ?

Xanthomendoza fulva (Hoffm.) Sochting, Kärnefelt

ID Qualifier ? Family ? Teloschistaceae

Identified By ? Caleb A. Morse Date Identified ?

Locality

Country State/Province County Municipality

United States Montana Stillwater

Locality

Itch-kep-pe Park Campground, 1 mi SE of Columbus

☐ Locality Security

Latitude Longitude Uncertainty ? Datum ? Verbatim Coordinates

Elevation in Meters Verbatim Elevation

1145 - 1145m

Misc

Habitat

Substrate

On Populus bark

Associated Taxa

Description

Notes

Life Stage ? Sex ? Individual Count ? Sampling Protocol ? Preparations ?

Phenology ? Establishment Means ? ☐ Cultivated

Curation

Type Status ? Disposition ? Occurrence ID ? Field Number ?

Owner Code ? Basis of Record ? Language Label Project

PreservedSpecimen

Dupe Count Processing Status

Unprocessed

Primary Key: 1466473 Date Last Modified: 2013-07-26 18:48:19 Entered By:

Save Edits

Status Auto-Set: Not Activated

Additional Options

Go to New Occurrence Record

Label Processing

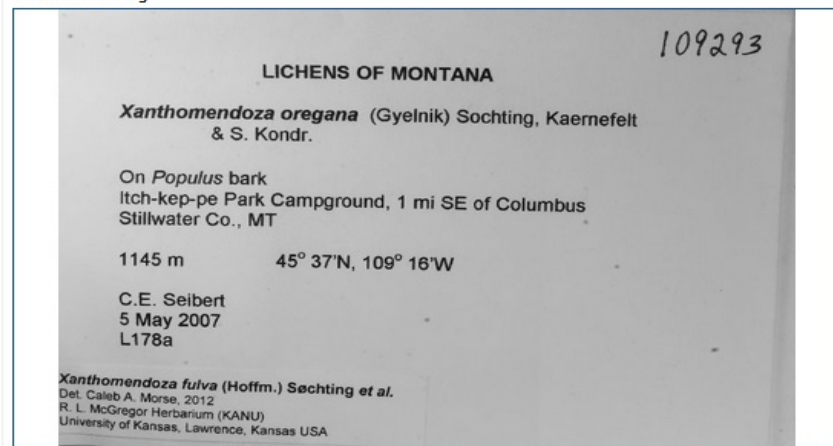


Image 1 of 1

OCR Image

Options

- ☐ OCR whole image
- ☐ OCR w/ analysis

i>2Å,0W3

LICHENS OF MONTANA

Xanthomendoza oregana (Gyelnik) Sochting, Kaernefelt & S. Kondr.

On Populus bark

Itch-kep-pe Park Campground, 1 mi SE of Columbus Stillwater Co., MT

1145m 45Å° 37Å°N, 109Å° 16Å°W

C.E. Seibert 5 May 2007 L178a

Xanthomendoza fulva (Hoffm.) Sochting et al.

Det. Caleb A. Morse, 2012

R. L. McGregor Herbarium (KANU)

University of Kansas, Lawrence, Kansas USA

Notes:

Source:

ABBY:2013-07-11

Save OCR Edits

Parse OCR (LBCC)

1 of 1

Delete OCR

Number of WIS specimens entered in Symbiota databases as of 01 Oct 2014

Bryophyte

Collection Statistics

32846 specimens

0% georeferenced

100% with images

132 families

494 genera

1827 species

Lichens

Collection Statistics

105149 specimens

42% georeferenced

94% with images

124 families

608 genera

5182 species

Our long term goal is to have all bryophyte, lichen, and vascular plant data and specimen images in one Specify database.