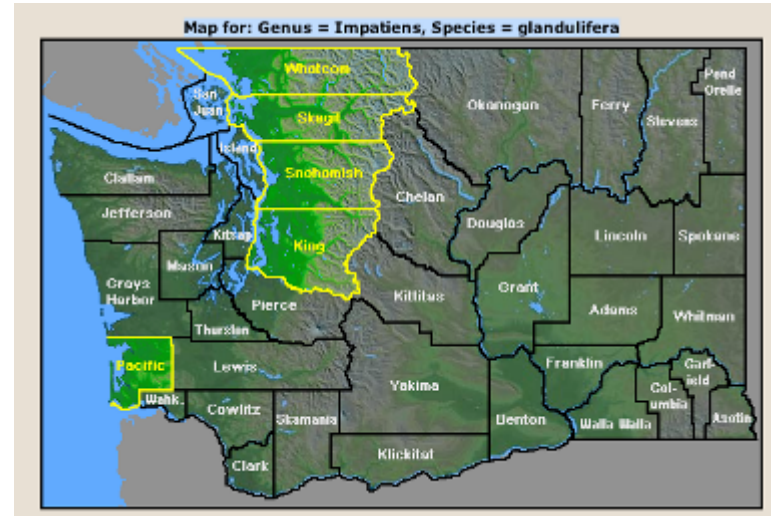


Herbarium Collections and Invasive Species Biology: Understanding the Past, Present, and Future



David Giblin, Ph.D.

Ben Legler

Richard G. Olmstead, Ph.D.

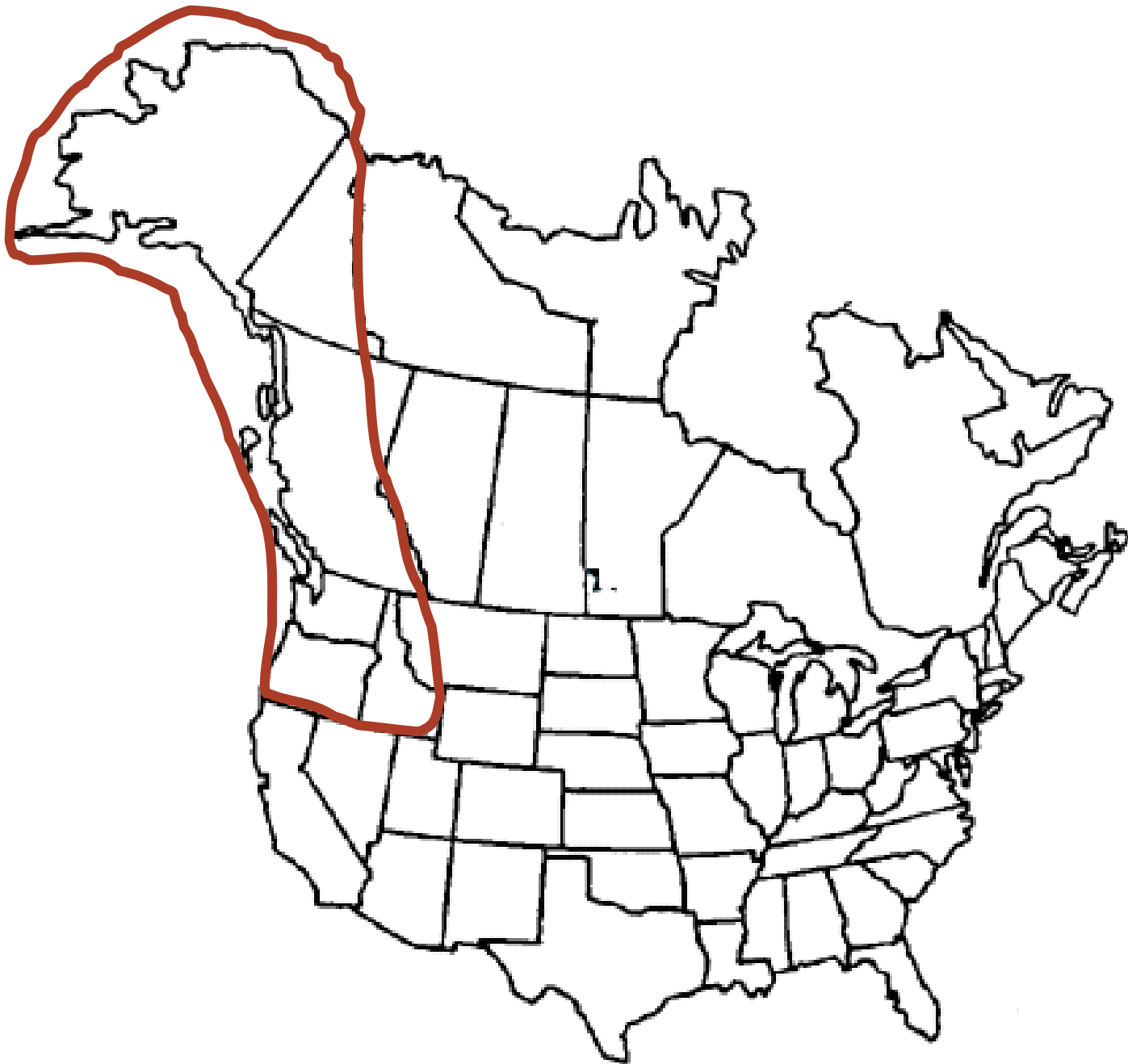
University of Washington Herbarium - Burke Museum

Talk Outline

- **UW Herbarium**
- Herbaria and Invasive Plant Research
- Inadequate Invasive Plant Collections
- Recent Invasives Data from WTU
- Digital Resources at WTU
- Conclusions and Future Needs

The University of Washington Herbarium

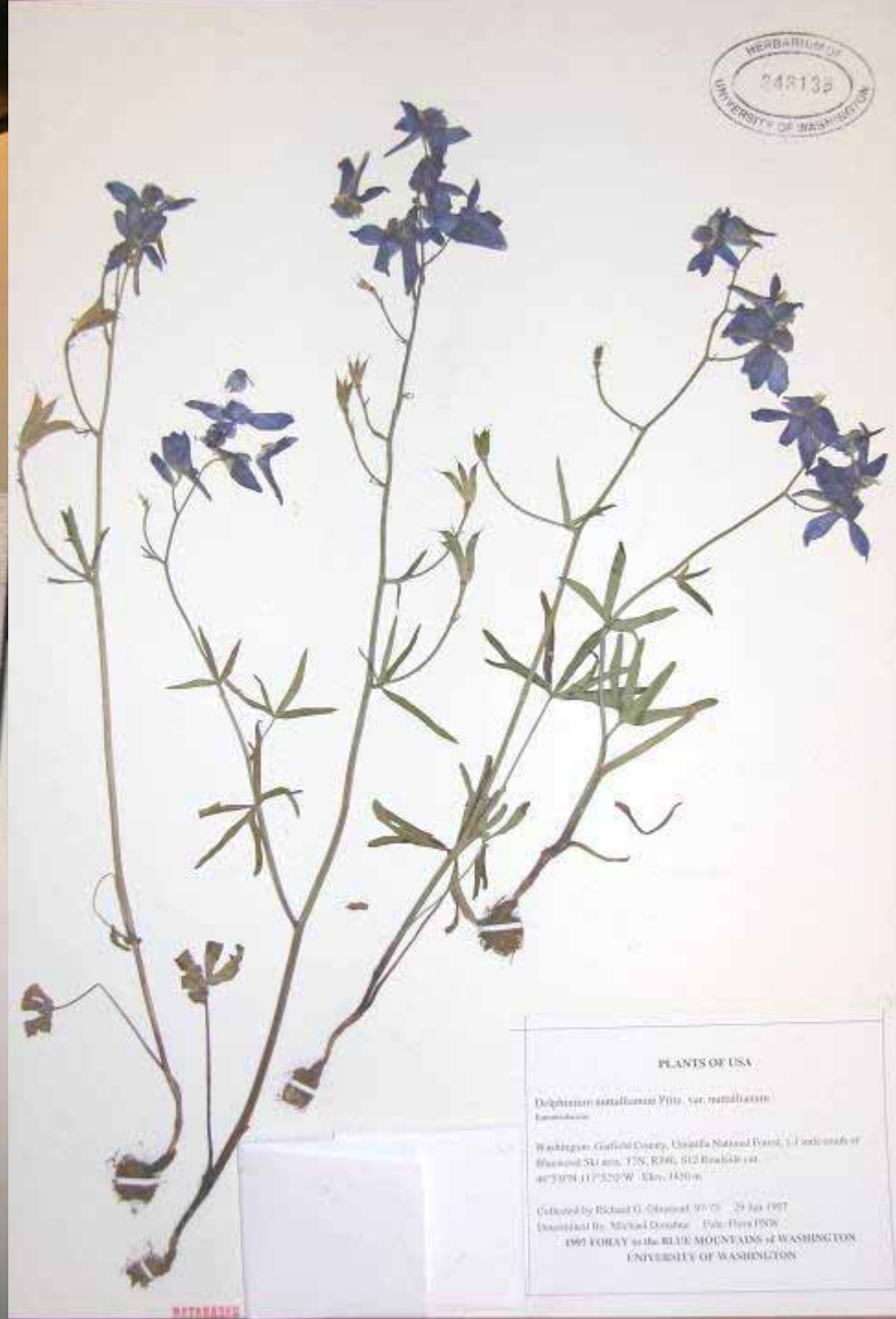
- Founded in 1882 - now part of Burke Museum
- Largest in Pacific Northwest



The University of Washington Herbarium

- Founded in 1882 - now part of Burke Museum
- Largest in Pacific Northwest
- ~600,000 specimens
 - vascular plants (380,000)
 - bryophytes (120,000)
 - fungi (50,000)
 - lichens (22,000)
 - marine algae (25,000)





2006 North Cascades National Park Foray

Lomatium brandegei (Coulter & Rose) Macbr.

[Apiaceae]

Det. by Ben Legler, 14 Aug 2006. Fide: Flora of PNW

USA, Washington, Chelan County:

Stehekin Valley. Southwest side of McGregor Mountain. West side of Coon Creek along the McGregor Mountain trail. 934m/3066ft
48° 23.811' N, 120° 49.560' W, WGS 84

Coniferous forest dominated by *Pseudotsuga menziesii* and *Pinus ponderosa*, interspersed with open shrublands dominated by *Ceanothus velutinus* and *Paxistima myrsinites*. Aspect southwest. Slope: 15- 22 degrees.

Common. Clumpy. In partial shade, deeper soil.

Diane Doss, 06-01

28 Jun 2006

w/David Giblin, Anders Huseeth, Cheryl Lowe

[WTU Database #152698]

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Specimen-based Research



Marion Ownbey - *Tragopogon*

Specimen-based Research



Marion Ownbey - *Tragopogon*



Richard Mack - *Bromus tectorum*

Specimen-based Research



Marion Ownbey - *Tragopogon*



Richard Mack - *Bromus tectorum*



Sarah Reichard - Invasive Ornamentals

Specimen-based Research



Marion Ownbey - *Tragopogon*



Richard Mack - *Bromus tectorum*



Sarah Reichard - Invasive Ornamentals



Peter Zika - Native/Exotic congeneric hybridization

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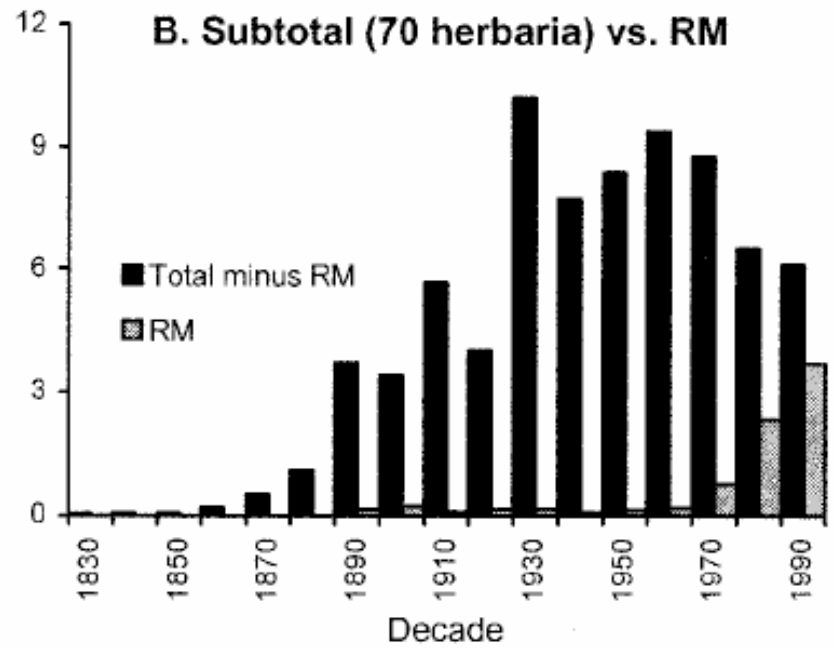
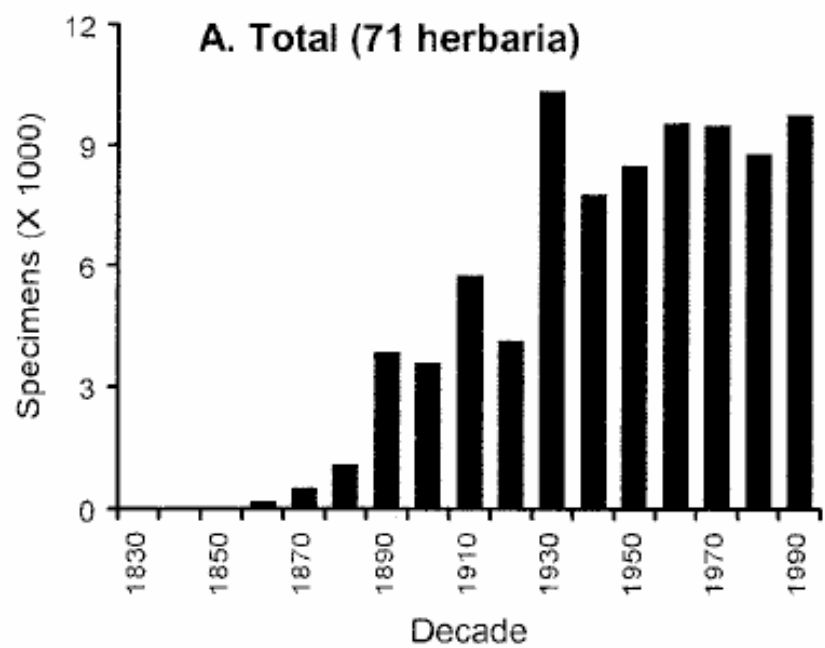
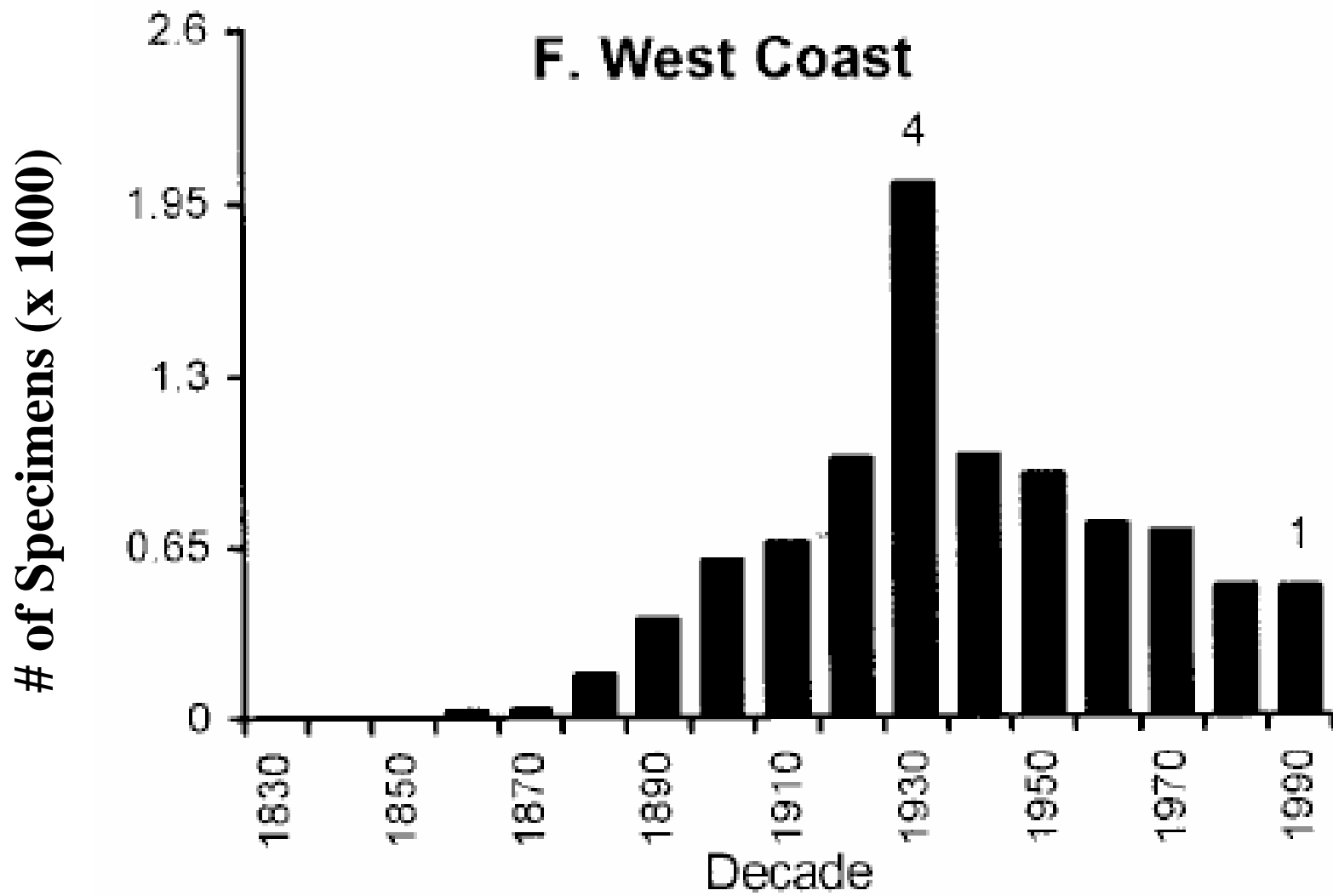
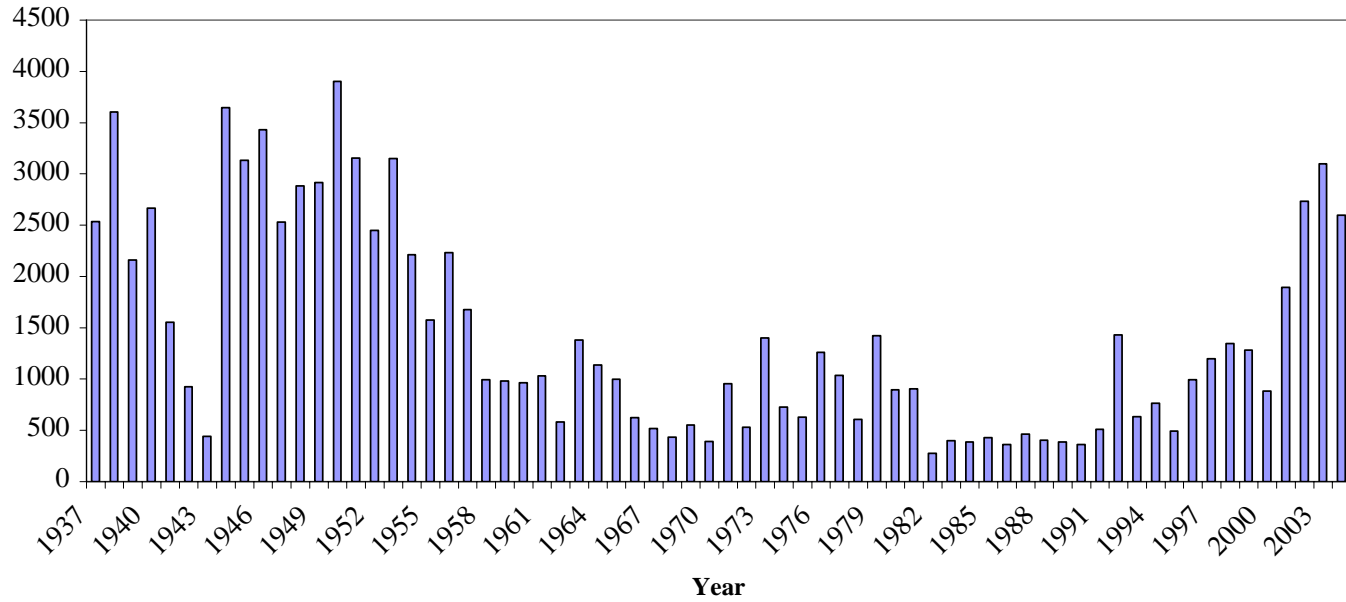


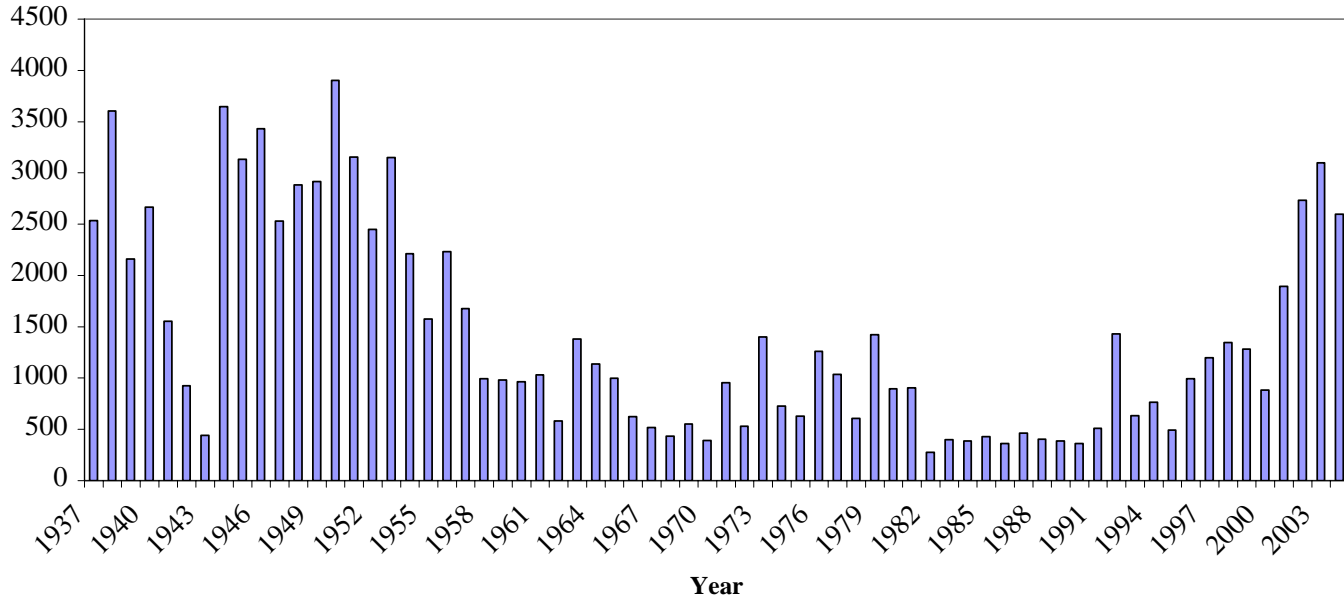
FIG. 3. Total accumulation of sampled specimens by decade for the herbaria included in this survey. A. Total specimens from all 71 herbaria. B. Specimens from RM plotted against the subtotal of the remaining 70 herbaria.



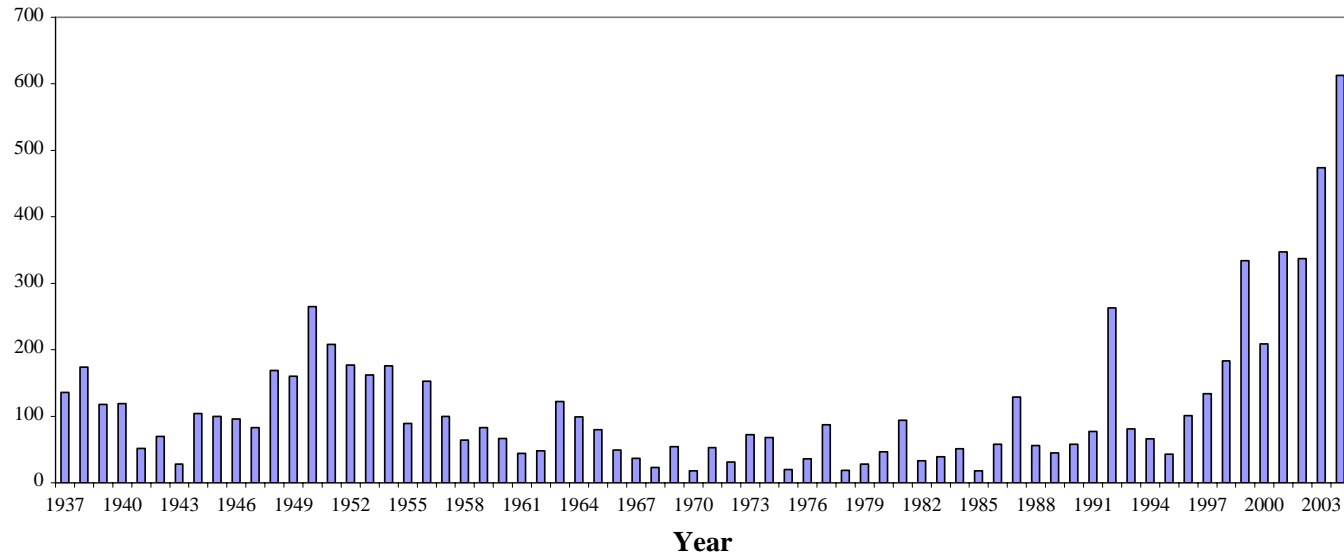
Collections Growth by Year at WTU 1937-2004



Collections Growth by Year at WTU 1937-2004



Specimens of Introduced Species added to WTU 1937-2004





Spartina alterniflora - smooth cordgrass



Polygonum cuspidatum - Japanese knotweed



Buddleja davidii - butterfly bush

Examples of Undercollected Invasives

- *Spartina alterniflora* – 4 specimens (1 prior to 1994)
- *Polygonum cuspidatum* – 13 WA specimens (3 prior to 2000)
- *Buddleja davidii* – 9 WA specimens (3 prior to 2001)

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Murdannia keisak - wartremoving herb



Impatiens x pacifica (*I. ecalcarata* x *I. capensis*) - jewelweed



Geranium lucidum - shining geranium

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» **Collections** » **Vascular Plant Database (130309 records)**

BASIC SEARCH **ADVANCED SEARCH** **FIELD DESCRIPTIONS**

FAMILY

GENUS SPECIES: SSP/VAR:

EXPAND SEARCH TO INCLUDE SYNONYMS OF THE ABOVE NAME

EXPAND SEARCH TO INCLUDE PAST DETERMINATIONS

COMMON NAME

COLLECTOR'S NAME

COLLECTION YEAR

COUNTRY (FULL SPELLING, EXCEPT USA)

STATE (FULL SPELLING)

COUNTY

LOCALITY

ORIGIN

ACCESSION NUMBER

SORT FIRST BY SECOND BY

RETURN RECORDS PER PAGE.

SPECIMEN LIST

RECORD DETAILS

DOWNLOAD



PRINT

FIELD DESCRIPTIONS

Your search query: Genus = *Lepidium*, Species = *perfoliatum*, State = Washington.

Records sorted 1st by Scientific Name (ascending), 2nd by Collection Year (descending).

Viewing records **1-30** of **30** total matching records).

Use  and  to expand and collapse individual records in list.

Expand All

Collapse All

Sort Records 1st by    2nd by    Sort Records

 **1. *Lepidium perfoliatum* L. (Brassicaceae)**

USA, Washington, Klickitat County: Gifford Pinchot National Forest: Conboy Lake National Wildlife Refuge. Outside headquarters of Conboy Wildlife refuge.

Sharon Rodman, 507. Coll. 15 Jun, 2001. **WTU-351950** ([View Full Record](#))

 **2. *Lepidium perfoliatum* L. (Brassicaceae)**

USA, Washington, San Juan County: North edge of Sportsman's Lake, San Juan Island.

Scott R. Atkinson, 304. Coll. 4 Apr, 1992. **WTU-325046** ([View Full Record](#))

 **3. *Lepidium perfoliatum* L. (Brassicaceae)**

USA, Washington, Kittitas County: Yakima Firing Center, along tributary of Hanson Creek.

Joy Mastrogiuseppe, 5553. Coll. 3 May, 1990. **WTU-358208** ([View Full Record](#))

With Calvin Bagley, Donna Wilcox

 **4. *Lepidium perfoliatum* L. (Brassicaceae)**

USA, Washington, Adams County: Lind Shrub-Steppe Preserve, 6.4 mi SW of Lind on the Lind-Hatton Rd.

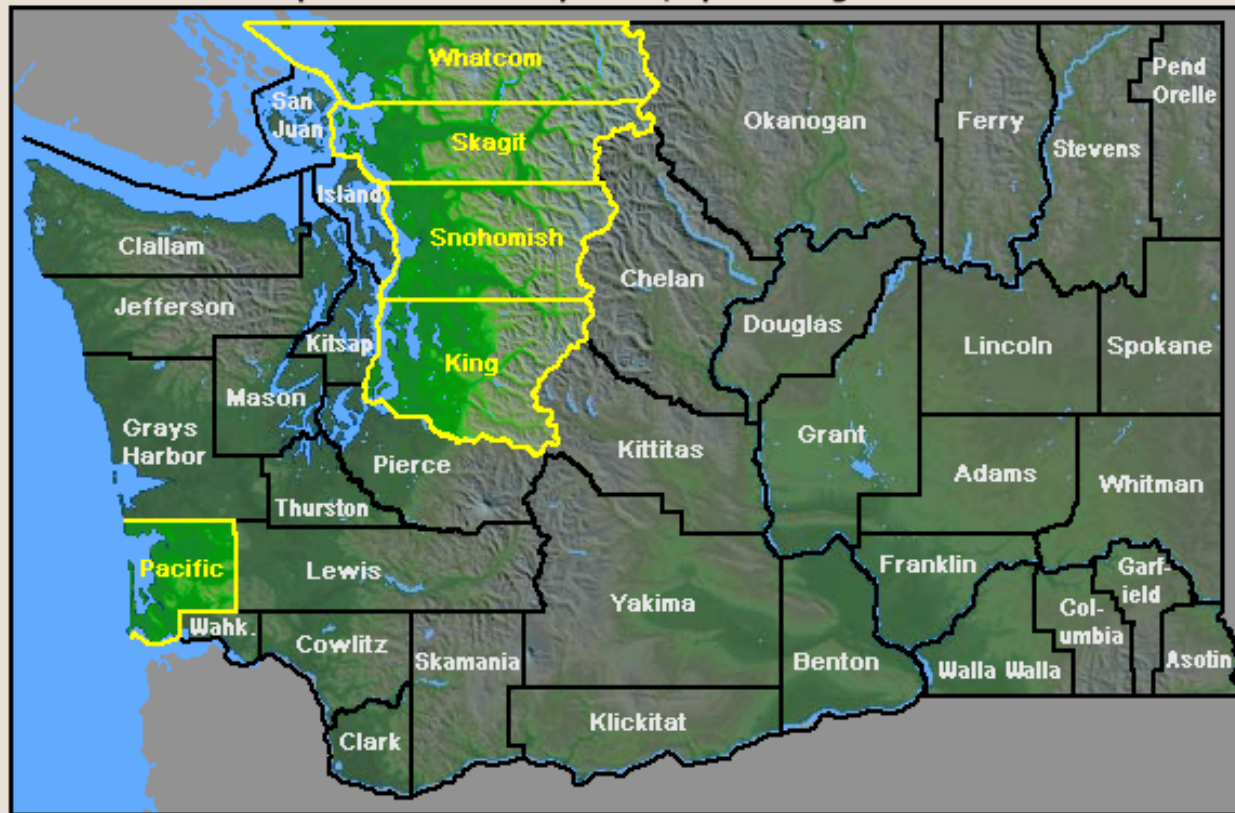
Richard G. Olmstead, NC39. Coll. 26 May, 1983. **WTU-288033** ([View Full Record](#))

 **5. *Lepidium perfoliatum* L. (Brassicaceae)**

USA, Washington, Yakima County: 1.3 miles west of Wenas-Boise Cascade Camp on Dry Creek Fork road, 25 miles NW of Yakima.

E. Hunn, 275. Coll. 12 Jun, 1977. **WTU-271025** ([View Full Record](#))

Map for: Genus = *Impatiens*, Species = *glandulifera*



This composite image cannot be directly saved to disk. You can, however, capture the screen and paste the image into an image editing program, then save it there, using the following keyboard commands:

Mac users: **Command+Shift+3** (capture entire screen) or **Command+Shift+4** (select section of screen).

Windows: **Alt+Print Screen** (capture screen-shot of active window).

Specimen List:

#:	County:	Full Specimen Name:	Year:	Accession #:
<u>1</u>	King	<i>Impatiens glandulifera</i>	1989	328329
<u>2</u>	King	<i>Impatiens glandulifera</i>	2002	358827
<u>3</u>	King	<i>Impatiens glandulifera</i>	2002	354344
<u>4</u>	Kitsap	<i>Impatiens glandulifera</i>	1950	137432
<u>5</u>	Pacific	<i>Impatiens glandulifera</i>	1953	149808

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- Species Lists:**
- [Family](#)
- [Genus](#)
- [Scientific Name](#)
- [Common Name](#)
- Search:**
- [Name Search](#)
- [Image Search](#)
- [Identification Key](#)
- [Unidentified Photos](#)

Egeria (1):

[\(view as thumbnails\)](#)

[Egeria densa](#)

[what do the ✓'s mean?](#)

Can't find the name you are looking for? Try [searching](#).

Egeria densa

Brazilian waterweed, waterweed, South American waterweed



Blooms: July - September
Habit: herb
Duration: perennial
Origin: Introduced from South America

Conservation Status:
 Not Tracked

Distribution: Introduced from Washington to California, and across the southern half of the United States to the Atlantic; occasional west of the Cascades in Washington and Oregon.
Habitat: Commonly used in aquaria, often escaping

Nomenclature:

Accepted Name: *Egeria densa* Planch.
Synonym: *Anacharis densa*
Synonym: *Egeria densa*
Synonym: *Elodea densa*
Synonym: *Philotria densa*
In Flora of the PNW: *Elodea densa*

Additional Resources:

WTU Herbarium Specimens: View list of *Egeria densa* specimens in the WTU Herbarium database.

Washington Flora website: [Hydrocharitaceae treatment](#).

E-Flora BC: *Egeria densa* atlas page.

CalPhotos: *Egeria densa* images.

USDA Plants Database: *Egeria densa* profile.



Image © 2004, Ben Legler

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Conclusions and Future Needs

- Herbarium records invaluable
- Increase effort to collect invasives
- Deposit duplicates at regionally significant herbaria
- Increase funding for databasing invasives specimens
- Exploit emerging technologies for data sharing

Photo Credits

- Ben Legler
- Fred Weinmann
- Arne Andenberg

Acknowledgements

- National Science Foundation
- Washington Native Plant Society
- U.S. Bureau of Land Management
- Washington Natural Heritage Program
- National Park Service
- Institute of Museum and Library Services
- U.S. Forest Service
- U.S. Fish and Wildlife Service
- Padilla Bay National Estuarine Reserve
- Peter Zika

Contact Information

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- Ben Legler – blegler@u.washington.edu

