

Threatened & Endangered Vascular Plants of Oregon: An Illustrated Guide



U.S. FISH AND WILDLIFE SERVICE

THREATENED AND ENDANGERED VASCULAR PLANTS
OF OREGON:

AN ILLUSTRATED GUIDE

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Erigeron delicatus Cronquist

Funded by the U.S. Fish and Wildlife Service
Office of Endangered Species
Region 1
Portland, Oregon

With assistance from

U.S. Forest Service
Region 6
Portland

Bonneville Power Administration
Portland

Bureau of Land Management
Oregon State Office
Portland

Corps of Engineers
Walla Walla, Washington

Cover: Erigeron decumbens var. decumbens

TABLE OF CONTENTS

	<u>PAGE</u>
Preface.....	v
Acknowledgments	vii
Introduction.....	ix
Threatened and Endangered: a definition.....	x
Summary of Taxa Included.....	x
Future Considerations.....	xi
Table 1. Alphabetical List of Oregon Plants: and Under Review.....	xii
Format of Text and Illustrations.....	xvii
Oregon Listed or Proposed Threatened and Endangered Vascular Plants.	1
Oregon Vascular Plants Under Review for Listing as Threatened or Endangered.....	9
Literature Cited.....	337
Appendix I. Species Under Review, not Illustrated.....	347
Appendix II. Species Reviewed and Determined Ineligible for Listing.....	349

PREFACE

The following document presents a series of one-page descriptions of those vascular plants in Oregon currently being reviewed by the U.S. Fish and Wildlife Service for possible protection under the Endangered Species Act of 1973, as amended. It offers basic information on the identification, ecology, and geographic distribution of each taxon. Its purposes are to summarize current knowledge of each of these species and to stimulate further research on them.

It is anticipated that this guide will be useful to both the professional and the concerned layperson. It should be of interest to anyone working with the rare plants found in Oregon. However, it has been designed primarily for those government land managers and field personnel who are responsible for determining and implementing public land policy affecting the majority of candidate species within the state. It is not a substitute for technical floristic works or detailed local reports, but provides the degree of familiarization necessary for land managers who wish to recognize the potentially threatened or endangered plants which occur in their areas.

What is presented here is an initial effort and should not be interpreted as a definitive statement on the status of the plants described. Comprehensive information is not available on all the species, particularly those found east of the Cascades where field work has not been as extensive as in western Oregon. Species thought to be endangered or possibly extinct one year have been discovered to be plentiful the next, while those believed "secure" have been suddenly faced with extirpation. The list must change as necessary to reflect new information, but this dynamic quality should not be taken as an indication of lessened importance.

Comments concerning the content of this manual are welcome and should be addressed to the author or the U.S. Fish and Wildlife Service's Office of Endangered Species in Portland.

Correspondence is especially solicited from readers with new or overlooked data which may have a bearing on the status of any of the plants discussed in the following pages.

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ACKNOWLEDGMENTS

Many individuals and several Federal agencies have made contributions essential to the completion of this manual. Research space and access to specimens was made available by the Oregon State University Herbarium in Corvallis. Work space was also donated by the Nature Conservancy in Portland. Financial support was provided by the U.S. Fish and Wildlife Service, U.S. Bureau of Land Management, U.S. Forest Service, U.S. Army Corps of Engineers and the Bonneville Power Administration.

A number of outstanding botanical illustrators lent their talents to the project. Artists who prepared illustrations specifically for the manual are: Bobbi Angell (New York Botanical Garden), Kim Brandon (Humboldt State University), Natalie Geiger (Southern Oregon State College), Kate vanGelder (Portland State University), Bonnie Heidel (Fish and Wildlife Service), Frank Lang (Southern Oregon State College), Chuck Meinke (Oregon State University), and Linda Vorobik (University of Oregon). The University of Washington Press gave permission for the use of certain illustrations by Jeanne Janish from the first four volumes of Vascular Plants of the Pacific Northwest by C.L. Hitchcock et al. (1959-1969), as well as a few drawings of members of the family Compositae (Asteraceae) by John Rumley from volume 5 of the same work. Drs. Peter Hoch and Peter Raven (Missouri Botanical Garden) graciously provided illustrations of *Oenothera wolffii* by Wanling Peng, and *Epilobium siskiyouense* by Keith West, both of which will be used in forthcoming publications. Finally, Dr. James Reveal (University of Maryland) permitted use of Jeanne Janish's recent drawing of *Eriogonum crosbyae* (Brittonia 33:443. 1981), a welcome last minute addition.

Individuals who have contributed unselfishly of their time and expertise with regard to preparation of the text include: Dr. Kenton Chambers (Oregon State University), who offered critical advice and the use of personal plant species files; Mary Sue Henifin (New York Botanical Garden), for preliminary data compilation; Dr. Janet Hohn (U.S. Fish and Wildlife Service) for logistic support and invaluable assistance throughout the manual preparation; and Jean Siddall, for sharing information on a number of taxa. Others who provided valuable assistance were Dr. Douglass Henderson (University of Idaho), Dr. Fred Johnson (University of Idaho), Dr. Pat Packard (College of Idaho), Dr. James Smith (Humboldt State University), Dr. Robert Steele (U.S. Forest Service), Karl Urban (Blue Mountain Community College), Dr. David Wagner (University of Oregon), and Margaret Williams (Northern Nevada Native Plant Society). Special thanks are extended to Jacque Greenleaf and Jack Kennison, compatriots in the basement of The Nature Conservancy in Portland and exceptional morale boosters during the early stages of the work. Appreciation also to Sadie Airth and Jane Tuor, typists.

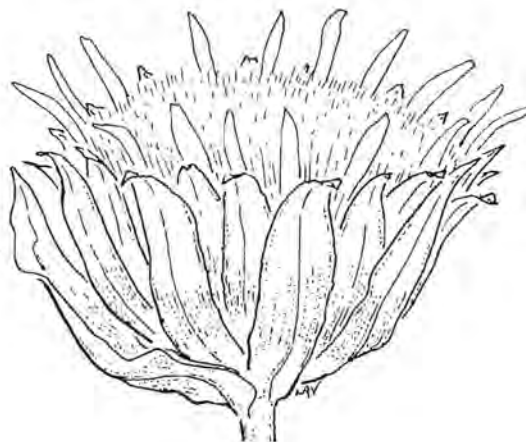
Undoubtedly the greatest share of credit due, however, goes to the many field botanists in Oregon, amateur and professional alike. These are the individuals who, often with little or no remuneration, have fanned out across the state in the last few years in search of rare plants, diligently compiling an excellent and impressive record of our threatened and endangered flora. It is largely their efforts which are reflected in this guide and their efforts which will be so vital to future revisions. To all these and to those who follow, the author extends his sincerest thanks and best wishes.



OREGON

96981 SQUARE MILES

251180 SQUARE KILOMETERS



INTRODUCTION

With the passage of the Endangered Species Act (ESA) in 1973, the plight of thousands of plants and animals facing extinction in the United States and elsewhere, was impressed upon the national consciousness. Threatened and Endangered plants, in particular, long overshadowed by more conspicuous creatures, began to gain a measure of recognition. Plants like the Furbish lousewort, Virginia roundleaf birch and Eureka Valley dunegrass could now share the spotlight with such notables as the whooping crane and gray wolf. Since its inception, the Endangered Species Act has provoked contrasting reactions. Some see its potential to interfere with economic development; others its ability to contribute to broad goals of environmental conservation. In practice, the potential for irresolvable conflict has rarely been realized. The more usual effect of considering endangered species in land use planning has been to lessen undesirable environmental effects while allowing planned projects to go forward.

In 1973, the Smithsonian Institution was directed by Congress to prepare an initial list (House Document Number 94-51) indicating plant taxa suspected at that time of being extinct, or in danger of extinction. Over 3,000 plants were included. This list was subsequently published in the Federal Register as a Notice of Review. A year later (June 16, 1976), the Fish and Wildlife Service published a proposal to list nearly 1700 species of plants. This proposal was withdrawn in October 1978. Of the numerous plants which have been reviewed for listing, 63 are at this time officially listed as Threatened or Endangered. Approximately 170 native plants of Oregon are under review for listing as Endangered or Threatened, and one has been proposed for inclusion on the Federal List of Threatened or Endangered Species (listing under Federal law is a regulatory process and requires publication of a proposed rule and provision of an opportunity for public comment before becoming final). Nearly a hundred Oregon plants have been reviewed and subsequently deleted after it was determined that they did not fit the definition of Threatened or Endangered under the Act; many of these were officially deleted in the most recent Federal Register Notice of Review published by the Fish and Wildlife Service on December 15, 1980.

This illustrated guide is limited to Oregon plants that appear in the last Federal Register Notice of Review (December 15, 1980) entitled, "Endangered and Threatened Wildlife and Plants: Review of Plant Taxa for Listed as Threatened or Endangered Species (45:82480-82569)". Only vascular plants are considered and only those with the taxonomic rank of species, subspecies, or variety. The list covers solely those plants which are being reviewed by the U.S. Fish and Wildlife Service for Threatened or Endangered status. In order for a species to qualify for protection under the ESA, it must be in danger of extinction throughout all or a significant portion of its range or threatened with endangerment throughout all or a significant portion of its range. Often, the ESA cannot be invoked in the protection of peripheral or disjunct populations which are separated from their principal populations by political boundaries, i.e., State lines. An example would be a species which has 5% of its populations in one state and 95% in another. It is unlikely that the species would be considered endangered or threatened under the Act on the basis of 5% of the entire range. Hence, the necessity and desirability of

lists generated on a State by State basis. There is no official State list of Threatened and Endangered plants in Oregon nor is there a State Endangered Species Act. There is, however, a list of "special plant species" published and approved by the Natural Heritage Council, State Land Board and State Legislature.

THREATENED AND ENDANGERED: A DEFINITION

These two legal terms taken from the ESA have been used widely and have caused a great deal of confusion. According to the ESA, an Endangered species is a "species (includes subspecies and variety) which is in danger of extinction throughout all or a significant portion of its range ..." A Threatened species is one "which is likely to become an endangered species in the foreseeable future throughout all or a significant portion of its range..." To summarize, an Endangered species is in imminent danger of extinction, and a Threatened species is being reduced in numbers to the point at which it appears to be heading towards Endangered status.

The word "rarity" has also caused much confusion. It is often used in addition to "endangered" or in place of it. Rarity (usually a subjective determination) does not necessarily mean that a taxon is threatened or endangered. A rare plant may be defined as one that occurs sparingly in nature but whose populations are not declining as a result of human activity. If a reduction in numbers of populations does occur, then a rare plant may be considered for threatened or endangered status. It is generally accepted that rare plants are more biologically vulnerable than are common ones and their populations should be monitored for frequency changes.

SUMMARY OF TAXA INCLUDED

The species covered in this guide have been grouped into two sections (see Table 1, page xii). The first section covers Oregon's officially listed and proposed species and includes three plants: *Arabis mcdonaldiana*, *Mirabilis macfarlanei*, and *Stephanomeria malheurensis*. The next section, comprised of 163 taxa, treats "candidate" species which are currently under review for listing. Each section is arranged alphabetically by genus and species.

Of the 163 review species, 159 were listed in the 1980 Federal Register notice as indigenous to Oregon. The remaining four species included (*Cryptantha thompsonii*, *Gratiola heterosepala*, *Lupinus tracyi*, and *Tauschia stricklandii*) are recently discovered additions to the Oregon flora. They appeared on the Federal lists compiled for either California or Washington and their presence in Oregon was not publicized until after the 1980 Federal Register notice went to press. Two species which were included on the 1980 Notice have since been dropped from consideration, *Cypripedium californicum* and *Camassia leitchlinii* var. *leitchlinii*. Appendix II (page 349) lists all the Oregon species which have been reviewed by FWS for listing and judged not to fit ESA's definition of Endangered or Threatened; several species were reviewed and deleted from consideration although they had not been published in a Notice of Review. The 1980 Notice of Review was intended to be as comprehensive as possible.

Appendix I (page 347) briefly summarizes five plants which are on the current review list but which have not been afforded full write-ups here. The first of these, *Phlox peckii*, is a questionable taxonomic entity which may be deleted from review in the near future. The remaining four are taxa whose names have not yet formally appeared in the taxonomic literature. It was considered inappropriate to include illustrations and descriptions of these plants until the authors involved have had the chance to publish the results of their research.

FUTURE CONSIDERATIONS

Research concerning threatened and endangered plants in Oregon has been to date primarily comprised of basic field inventory and the compilation and periodic refinement of review lists. While we still know far less about most of these species than we would like, there are a number of taxa whose situation is now documented fairly well. Plants known to be particularly sensitive will require individual study beyond simple inventorying of populations. Such work has been or is being conducted at Oregon universities on a limited scale, with excellent results thus far. Much more information is needed, however, and it is hoped that faculty, administrators, and Federal agencies across the State will continue to encourage and support these important research efforts. Finally, there exists a great need to evaluate the status of all "candidate" species on the current review list and produce the most credible list possible. A suggestion is to forge ahead and get to the business of listing those species for which the evidence indicates a truly threatened or endangered status, but even more important, we need to adopt a more conservative stance when it comes to the retention of species for continued review. Alpine endemics in remote eastern Oregon Wilderness areas, even if they are known from a single location, hardly seem worthy of appearing on the same list as Willamette Valley taxa clinging to a handful of roadside locations or Siskiyou Mountain species restricted to mineral rich serpentine soils. We need to identify those plants which are seriously threatened or endangered and set them apart from those which are not. The result will be a carefully selected but more credible list; one which should facilitate the listing process.

TABLE 1. VASCULAR PLANT TAXA SUMMARIZED AND ILLUSTRATED

SCIENTIFIC NAME	COMMON NAME	FAMILY NAME
<u>TAXA LISTED</u>		
<i>Arabis mcdonaldiana</i>	McDonald's rockcress	Brassicaceae
<i>Mirabilis macfarlanei</i>	MacFarlane's four o'clock	Nyctaginaceae
<u>TAXA PROPOSED</u>		
<i>Stephanomeria malheurensis</i>	Malheur wire lettuce	Asteraceae
<u>TAXA UNDER REVIEW</u>		
<i>Agastache cusickii</i>	Cusick's giant hyssop	Lamiaceae
<i>Agrostis microphylla</i> var. <i>hendersonii</i>	Henderson's bentgrass	Poaceae
<i>Allium pleianthum</i>	Many flowered onion	Liliaceae
<i>Allium robinsonii</i>	Robinson's onion	Liliaceae
<i>Amsinckia carinata</i>	Malheur Valley fiddleneck	Boraginaceae
<i>Anemone oregana</i> var. <i>felix</i>	Bog anemone	Ranunculaceae
<i>Arabis aculeolata</i>	Waldo rockcress	Brassicaceae
<i>Arabis koehleri</i> var. <i>stipulata</i>	Koehler's rockcress	Brassicaceae
<i>Arabis modesta</i>	Modest rockcress	Brassicaceae
<i>Arabis serpentinicola</i>	Serpentine rockcress	Brassicaceae
<i>Arabis suffrutescens</i> var. <i>horizontalis</i>	Crater Lake rockcress	Brassicaceae
<i>Arctostaphylos hispida</i>	Howell's manzanita	Ericaceae
<i>Arenaria franklinii</i> var. <i>thompsonii</i>	Franklin's sandwort	Caryophyllaceae
<i>Arnica viscosa</i>	Sticky arnica	Asteraceae
<i>Aster curtus</i>	White top aster	Asteraceae
<i>Aster gormanii</i>	Gorman's aster	Asteraceae
<i>Aster paludicola</i>	Western bog aster	Asteraceae
<i>Aster vialis</i>	Wayside aster	Asteraceae
<i>Astragalus applegatii</i>	Applegate milkvetch	Fabaceae
<i>Astragalus collinus</i> var. <i>laurentii</i>	Lawrence's milkvetch	Fabaceae
<i>Astragalus hoodianus</i>	Hood River milkvetch	Fabaceae
<i>Astragalus kentrophyta</i> var. <i>douglasii</i>	Douglas' thistle milkvetch	Fabaceae
<i>Astragalus mulfordae</i>	Mulford's milkvetch	Fabaceae
<i>Astragalus peckii</i>	Peck's milkvetch	Fabaceae
<i>Astragalus robbinsii</i> var. <i>alpiniformis</i>	Robbin's milkvetch	Fabaceae
<i>Astragalus solitarius</i>	Solitary milkvetch	Fabaceae
<i>Astragalus sterilis</i>	Sterile milkvetch	Fabaceae
<i>Astragalus tegetarioides</i>	Deschutes milkvetch	Fabaceae
<i>Astragalus tweedyi</i>	Tweedy's milkvetch	Fabaceae
<i>Astragalus tyghensis</i>	Tygh Valley milkvetch	Fabaceae

TABLE 1. CONTINUED

SCIENTIFIC NAME	COMMON NAME	FAMILY NAME
<i>Balsamorhiza rosea</i>	Rosey balsamroot	Asteraceae
<i>Bensoniella oregona</i>	Bensoniella	Saxifragaceae
<i>Botrychium pumicola</i>	Pumice grapefern	Ophioglossaceae
<i>Calochortus greenei</i>	Green's mariposa lily	Liliaceae
<i>Calochortus howellii</i>	Howell's mariposa lily	Liliaceae
<i>Calochortus indecorus</i>	Plain mariposa lily	Liliaceae
<i>Calochortus longebarbatus</i> var. <i>longebarbatus</i>	Long bearded mariposa lily	Liliaceae
<i>Calochortus longebarbatus</i> var. <i>peckii</i>	Peck's mariposa lily	Liliaceae
<i>Camassia cusickii</i>	Cusick's camas	Liliaceae
<i>Cardamine pattersonii</i>	Saddle Mountain bittercress	Brassicaceae
<i>Castilleja chlorotica</i>	Green tinged indian paintbrush	Scrophulariaceae
<i>Castilleja fraterna</i>	Fraternal paintbrush	Scrophulariaceae
<i>Castilleja glandulifera</i>	Glandular indian paintbrush	Scrophulariaceae
<i>Castilleja levisecta</i>	Golden paintbrush	Scrophulariaceae
<i>Castilleja steenensis</i>	Steens indian paintbrush	Scrophulariaceae
<i>Castilleja xanthotricha</i>	Yellow hairy indian paintbrush	Scrophulariaceae
<i>Chaenactis nevii</i>	John Day chaenactis	Asteraceae
<i>Cirsium ciliolatum</i>	Ciliate or Ashland thistle	Asteraceae
<i>Collomia macrocalyx</i>	Bristle flowered collomia	Polemoniaceae
<i>Collomia mazama</i>	Mount Mazama collomia	Polemoniaceae
<i>Cordylanthus maritimus</i> ssp. <i>palustris</i>	Saltmarsh birdsbeak	Scrophulariaceae
<i>Corydalis aquae-gelidae</i>	Clackamas corydalis	Fumariaceae
<i>Cryptantha thompsonii</i>	Thompson's cryptantha	Boraginaceae
<i>Cypripedium montanum</i>	Mountain lady's slipper	Orchidaceae
<i>Darlingtonia californica</i>	California pitcher plant	Sarraceniacae
<i>Delphinium leucophaeum</i>	Pale larkspur	Ranunculaceae
<i>Delphinium pavonaceum</i>	Peacock larkspur	Ranunculaceae
<i>Dicentra formosa</i> ssp. <i>oregana</i>	Pacific bleeding heart	Fumariaceae
<i>Draba lemmonii</i> var. <i>cyclomorpha</i>	Lemmon's draba	Brassicaceae
<i>Epilobium oreganum</i>	Oregon willow herb	Onagraceae
<i>Epilobium siskiyouense</i>	Siskiyou willow herb	Onagraceae
<i>Erigeron chrysopsidis</i> var. <i>brevifolius</i>	Dwarf golden daisy	Asteraceae
<i>Erigeron decumbens</i> var. <i>decumbens</i>	Willamette daisy	Asteraceae
<i>Erigeron delicatus</i>	Del Norte daisy	Asteraceae
<i>Erigeron howellii</i>	Howell's fleabane	Asteraceae
<i>Eriogonum chrysops</i>	Golden buckwheat	Polygonaceae

TABLE 1. CONTINUED

SCIENTIFIC	COMMON NAME	FAMILY NAME
<i>Eriogonum crosbyae</i>	Crosby's buckwheat	Polygonaceae
<i>Eriogonum cusickii</i>	Cusick's buckwheat	Polygonaceae
<i>Eriogonum pendulum</i>	Waldo eriogonum	Polygonaceae
<i>Eriogonum prociduum</i>	Prostrate buckwheat	Polygonaceae
<i>Eriogonum scopulorum</i>	Cliff eriogonum	Polygonaceae
<i>Filipendula occidentalis</i>	Queen of the forest	Rosaceae
<i>Frasera umpquaensis</i>	Umpqua frasera	Gentianaceae
<i>Fritillaria gentneri</i>	Gentner's fritillary	Liliaceae
<i>Gentiana bisetata</i>	Elegant gentian	Gentianaceae
<i>Gratiola heterosepala</i>	Boggs Lake hedge hyssop	Scrophulariaceae
<i>Hackelia cronquistii</i>	Cronquist's stickseed	Boraginaceae
<i>Hackelia ophiobia</i>	Serpent stickseed	Boraginaceae
<i>Haplopappus racemosus</i> ssp. <i>congestus</i>	Racemed goldenweed	Asteraceae
<i>Haplopappus radiatus</i>	Snake River goldenweed	Asteraceae
<i>Horkelia hendersonii</i>	Henderson's horkelia	Rosaceae
<i>Howellia aquatilis</i>	Howellia	Campanulaceae
<i>Ivesia rhypara</i>	Grimy ivesia	Rosaceae
<i>Kalmiopsis leachiana</i>	Kalmiopsis	Ericaceae
<i>Lasthenia macrantha</i> ssp. <i>prisca</i>	Large flowered goldfields	Asteraceae
<i>Lathyrus holochlorus</i>	Thin leaved peavine	Fabaceae
<i>Lepidium davisii</i>	Davis' peppergrass	Brassicaceae
<i>Leptodactylon hazelae</i>	Hazel's prickly phlox	Polemoniaceae
<i>Lewisia cotyledon</i> var. <i>howellii</i>	Howell's lewisia	Portulacaceae
<i>Lewisia cotyledon</i> var. <i>purdyi</i>	Purdy's lewisia	Portulacaceae
<i>Lewisia oppositifolia</i>	Opposite leaved lewisia	Portulacaceae
<i>Lilium occidentale</i>	Western lily	Liliaceae
<i>Lilium vollmeri</i>	Vollmer's lily	Liliaceae
<i>Lilium wigginsii</i>	Wiggin's lily	Liliaceae
<i>Limnanthes floccosa</i> ssp. <i>bellingeriana</i>	Woolly meadow foam	Limnanthaceae
<i>Limnanthes floccosa</i> ssp. <i>grandiflora</i>	Woolly meadow foam	Limnanthaceae
<i>Limnanthes floccosa</i> ssp. <i>pumila</i>	Dwarf meadow foam	Limnanthaceae
<i>Limnanthes gracilis</i> var. <i>gracilis</i>	Slender meadow foam	Limnanthaceae
<i>Lomatium bradshawii</i>	Bradshaw's lomatium	Apiaceae
<i>Lomatium greenmanii</i>	Greenman's desert parsley	Apiaceae
<i>Lomatium laevigatum</i>	Smooth lomatium	Apiaceae
<i>Lomatium nelsonianum</i>	Nelson's desert parsley	Apiaceae
<i>Lomatium oreganum</i>	Oregon desert parsley	Apiaceae
<i>Lomatium peckianum</i>	Peck's lomatium	Apiaceae

TABLE 1. CONTINUED

SCIENTIFIC NAME	COMMON NAME	FAMILY NAME
<i>Lomatium rollinsii</i>	Rollin's lomatium	Apiaceae
<i>Lomatium suksdorfii</i>	Suksdorf's lomatium	Apiaceae
<i>Luina serpentina</i>	Colonial luina	Asteraceae
<i>Lupinus aridus</i> ssp. <i>ash-landensis</i>	Mount Ashland lupine	Fabaceae
<i>Lupinus biddlei</i>	Biddle's lupine	Fabaceae
<i>Lupinus cusickii</i> ssp. <i>abortivus</i>	Cusick's lupine	Fabaceae
<i>Lupinus sabinii</i>	Sabin's lupine	Fabaceae
<i>Lupinus tracyi</i>	Tracy's lupine	Fabaceae
<i>Mentzelia mollis</i>	Smooth stickleaf	Loasaceae
<i>Mentzelia packardiae</i>	Packard's mentzelia	Loasaceae
<i>Microseris howellii</i>	Howell's microseris	Asteraceae
<i>Mimulus pygmaeus</i>	Pigmy monkeyflower	Scrophulariaceae
<i>Oenothera wolfii</i>	Wolf's evening primrose	Onagraceae
<i>Pedicularis howellii</i>	Howell's lousewort	Scrophulariaceae
<i>Penstemon barrettiae</i>	Barrett's penstemon	Scrophulariaceae
<i>Penstemon elegantulus</i>	Lovely penstemon	Scrophulariaceae
<i>Penstemon glaucinus</i>	Blue leaved penstemon	Scrophulariaceae
<i>Penstemon peckii</i>	Peck's penstemon	Scrophulariaceae
<i>Penstemon spatulatus</i>	Wallow beardtongue	Scrophulariaceae
<i>Perideridia erythrorhiza</i>	Red root yampah	Apiaceae
<i>Phacelia argentea</i>	Silvery phacelia	Hydrophyllaceae
<i>Phacelia capitata</i>	Capitate phacelia	Hydrophyllaceae
<i>Phacelia verna</i>	Spring phacelia	Hydrophyllaceae
<i>Plagiobothrys hirtus</i> ssp. <i>corallicarpa</i>	Coral seeded allocarya	Boraginaceae
<i>Plagiobothrys hirtus</i> ssp. <i>hirtus</i>	Rough popcornflower	Boraginaceae
<i>Plagiobothrys lamprocarpus</i>	Shiny fruited popcorn flower	Boraginaceae
<i>Pleuropogon oregonus</i>	Oregon semaphoregrass	Poaceae
<i>Poa marcida</i>	Weak bluegrass	Poaceae
<i>Poa piperi</i>	Piper's bluegrass	Poaceae
<i>Ranunculus austro-oreganus</i>	Southern Ore. buttercup	Ranunculaceae
<i>Ranunculus reconditus</i>	Obscure buttercup	Ranunculaceae
<i>Rorippa columbiae</i>	Columbia cress	Brassicaceae
<i>Sanicula tracyi</i>	Tracy's sanicle	Apiaceae
<i>Saxifraga occidentalis</i> var. <i>latipetiolata</i>	Saddle Mountain saxifrage	Saxifragaceae
<i>Schoenolirion bracteosum</i>	Large flowered rush lily	Liliaceae
<i>Sedum moranii</i>	Moran's stonecrop	Crassulaceae
<i>Sedum oblanceolatum</i>	Applegate stonecrop	Crassulaceae
<i>Senecio ertterae</i>	Ertter's senecio	Asteraceae
<i>Senecio hesperius</i>	Western senecio	Asteraceae
<i>Sidalcea campestris</i>	Meadow sidalcea	Malvaceae
<i>Sidalcea cusickii</i>	Cusick's sidalcea	Malvaceae
<i>Sidalcea nelsoniana</i>	Nelson's checker mallow	Malvaceae
<i>Sidalcea setosa</i>	Bristly sidalcea	Malvaceae
<i>Silene douglasii</i> var. <i>oraria</i>	Cascade Head catchfly	Caryophyllaceae

TABLE 1. CONTINUED

SCIENTIFIC NAME	COMMON NAME	FAMILY NAME
<i>Silene scaposa</i> var. <i>scaposa</i>	Scapose catchfly	Caryophyllaceae
<i>Silene spaldingii</i>	Spalding's silene	Caryophyllaceae
<i>Sophora leachiana</i>	Western sophora	Fabaceae
<i>Streptanthus howellii</i>	Howell's streptanthus	Brassicaceae
<i>Sullivantia oregana</i>	Oregon sullivantia	Saxifragaceae
<i>Synthyris missurica</i> ssp. <i>hirsuta</i>	Mountain kittentails	Scrophulariaceae
<i>Tauschia howellii</i>	Howell's tauschia	Apiaceae
<i>Tauschia stricklandii</i>	Strickland's tauschia	Apiaceae
<i>Thelypodium brachycarpum</i>	Short fruited thelypody	Brassicaceae
<i>Thelypodium eucosmum</i>	Arrowleaf thelypody	Brassicaceae
<i>Thelypodium howellii</i> ssp. <i>spectabilis</i>	Howell's thelypody	Brassicaceae
<i>Thlaspi montanum</i> var. <i>siskiyouense</i>	Siskiyou Mountain's pennycress	Brassicaceae
<i>Trifolium owyheense</i>	Owyhee clover	Fabaceae
<i>Viola lanceolata</i> ssp. <i>occidentalis</i>	Lance leaf violet	Violaceae

FORMAT OF TEXT AND ILLUSTRATIONS

The style of data presentation has been chosen to hopefully give the reader as broad an exposure as possible to each taxon. The amount of information presented for each plant varies dramatically. Many are relatively well documented with respect to distribution, frequency, habitat preference, etc., while others are known from single collections and may not have been seen for the last thirty or forty years or more. Each individual summary contains what are believed to be current facts and comments. The reader should be aware that although every effort was made to portray these taxa as completely and accurately as possible, there are certain to be instances of overlooked information and occasional omissions. It must be realized that this manual is far from the last word on Oregon's threatened and endangered plants, and revisions, updates, and corrections will play crucial roles in its continued usefulness. It has been prepared as a guide, designed to familiarize and inform but with its dynamic nature fully appreciated.

Nomenclature primarily follows Hitchcock & Cronquist (1973) and Peck (1961). Units of measurement are indicated in the metric system and are abbreviated as follows: mm (millimeters), cm (centimeter), dm (decimeter), m (meter), and km (kilometer). Literature citations are scattered throughout the manual to give the reader an idea of where to turn for more information in addition to providing validation for certain points. Together they constitute only a partial bibliography of the many references available.

Heading. The summaries are arranged alphabetically by genus, and by species within each genus. The latin binomial (or trinomial) is written in upper case, followed by the author or authors who first proposed and published the name. Below this the plants common English name is included, in parentheses. The third line of the heading contains the common name of the plant family to which the particular taxon belongs followed paranthetically by its latin designation.

Original Publication. This indicates, in the form of a literature citation, where and when the currently accepted latin name of the taxon was first published.

Synonyms. If a taxon has ever been known by other names, they are included here. Complete synonymy for every plant could not be included because of space limitations, and in these cases only the more common synonyms are included.

Status. This indicates the latest Federal Register citation pertaining to a plant, whether listed, proposed, or under review. For species under review, Category 1 is defined as those plants "for which the (Fish and Wildlife) Service presently has sufficient information on hand to support the biological appropriateness of their being listed as Threatened or Endangered." Category 2 include "Taxa for which information now in the possession of the (Fish and Wildlife) Service indicates the probable appropriateness of listing..."

Description. A morphologic description of the taxon is provided, using technical terminology. It was felt that a technical rather than a simplified description would be the most useful. Any local manual of plant

identification (Hitchcock and Cronquist's *Flora of the Pacific Northwest* is excellent) will contain a botanical glossary which should help in deciphering unfamiliar terms.

Distribution. A brief outline of each taxon's geographic range in Oregon is given here. Distribution outside of the state is briefly indicated. Detailed accounts of distribution are generally not included in order to safeguard populations.

Taxonomic Problems. Plants which are susceptible to hybridization or are perhaps not universally accepted as valid taxa will have their particular problem briefly discussed here.

Look Alikes. Many genera of plants have species very similar in appearance to one another. Differences will be pointed out here; if applicable. Discussion will generally be limited to taxa which have a realistic chance of being located in the geographic range of their threatened or endangered look alike.

Phenology. Months of expected blooming.

Habitat. The information presented here will vary considerably. Most of it has been taken from herbarium label data, botanists' field reports, and field observations by the author. For most plants, elevational range, preferred substrate, and common associate species are indicated.

Land Ownership/Management. Governmental agencies and private landowners responsible for the habitat of individual species are listed. This list may not always be entirely accurate, particularly in southwest Oregon where an especially intricate mosaic of land ownership exists.

Present and Potential Threats. Existing threats to each taxon are indicated and speculation is offered concerning the nature of potential problems.

Management Recommendations. Very general suggestions are given with regard to conservation measures. Little research has been accomplished in the area of threatened and endangered plant management and it is impractical to provide specific recommendations. Management recommendations are entirely those of the author.

Remarks. Final comments, often including historical information. This section will be included when space allows.

Illustration. A line drawing (or drawings) is provided for each taxon, opposite the written summary. Arrows are occasionally used to point out specific morphologic traits.

Distribution Map. A dot map roughly outlining each taxon's geographic range in Oregon is included in each illustration page. Single dots are not necessarily equivalent to individual populations. The dot locations are based on herbarium specimens and, to a lesser extent, sighting reports. Starred locations on the maps are intended to represent sites at which the plants' continued existence has not been verified in recent years. This does *not* mean these sites have been extirpated or the species is thought to be extinct. It has merely not been seen recently. Botanists may or may not have made concerted efforts at relocation and it is likely that a good

number of these populations remain extant. Reports which were from 30 to 40 years old or older were given starred locations.

Illustration Captions. The morphologic features depicted in each Figure are briefly explained and the scale of individual drawings are indicated. If the illustration is published here for the first time, the herbarium specimen it was drawn from is cited by indicating the collector's name and collection number (where applicable) followed by the herbarium in which the sheet is deposited. Herbarium acronyms utilized are as follows: A, Philadelphia Academy of Sciences; DS, Dudley Herbarium, Stanford University; HSC, Humboldt State University; NY, New York Botanical Garden; ORE, University of Oregon; OSC, Oregon State University; PUC, Pacific Union College; SOC, Southern Oregon College; UC, University of California, Berkeley; WILLU, Peck Herbarium of Willamette University (housed at Oregon State University); WS, Washington State University; WTU, University of Washington. A standard literature citation is supplied for line drawings taken from preexisting sources.



TAXA LISTED AND PROPOSED
(under the Endangered Species Act, as amended)

ARABIS MCDONALDIANA Eastwood

(McDonald's rockcress)

Mustard family (Brassicaceae)

ORIGINAL PUBLICATION: Bull. Torrey Club 30:488. 1903.

SYNONYMS: *Arabis blepharophylla* Hooker & Arnott var. *mcdonaldiana* (Eastw.) Jepson (Man. Fl. Pl. Calif. 429. 1925).

STATUS: Listed as Endangered by the U.S. Fish and Wildlife Service (Federal Register 43:44812. September 28, 1978).

DESCRIPTION: Perennial with a branched caudex and several simple stems 5-20 cm high; lower leaves in rosettes, spatulate, 1-2 cm long, 4-7 mm wide, toothed, essentially glabrous, cauline leaves reduced; pedicels 8-10 mm long; sepals dark purple, 5-6 mm long, petals rose or purple, 9-11 mm long; siliques 3-4 cm long (after Munz, 1959).

DISTRIBUTION: Restricted to a single locality in Curry County, Oregon, and in adjacent Del Norte County, California. Also reported from Mendocino County, California (Munz, 1959).

LOOK ALIKES: This species is one of several closely related endemics which have evolved in the Siskiyou Mountains region of southwest Oregon and northwest California. *A. mcdonaldiana* is distinguished by being almost glabrous and possessing spatulate basal leaves 1-2 cm long.

PHENOLOGY: Flowering late April through June.

HABITAT: Preferring serpentine soils, this species is found below 1500 m elevation. It is found in dry, open woods or brushy slopes, with *Sanicula* spp., *Viola* spp., and *Allium* spp.

LAND OWNERSHIP/MANAGEMENT: U.S. Forest Service in Oregon.

PRESENT AND POTENTIAL THREATS: Mining activities and collecting are potential threats.

MANAGEMENT RECOMMENDATIONS: Vigorous searches for additional sites in Oregon and California should be conducted. If any populations are located they should be given protection.

REMARKS: This species was not discovered in Oregon until 1980. It is an attractive plant, as are many of the endemic rockcress species of the Siskiyou Mountains. Taxonomic studies are currently under way to investigate the relationship of the Oregon population to those in California (Hohn, pers. comm.).

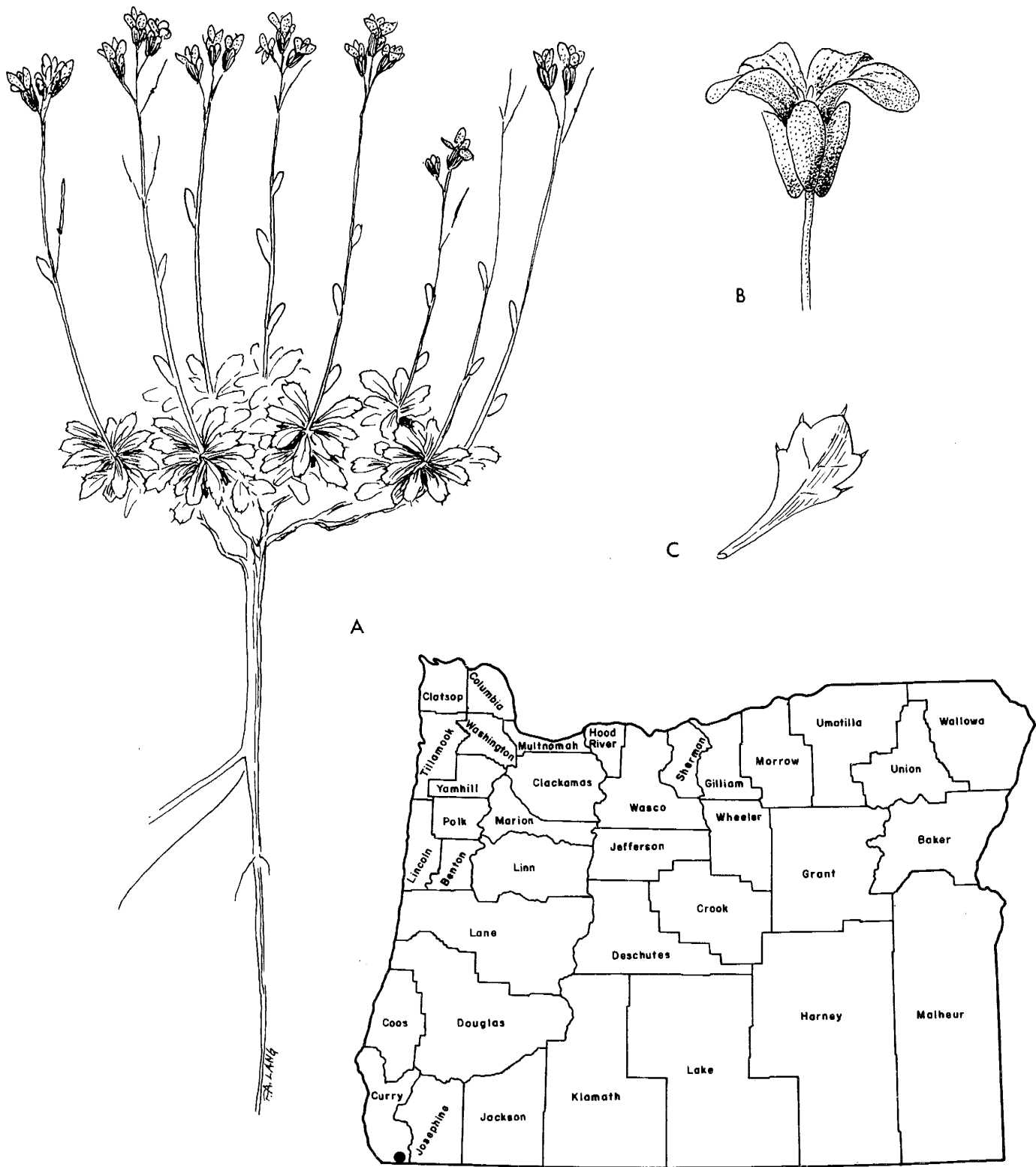


Fig. 1. *Arabis mcdonaldiana*. A: Habit, X 1; B: Flower, X 3; C: Basal leaf, X 2.5 (drawn from Sprecht 831, HSC).

MIRABILIS MACFARLANEI Const. & Roll.

(MacFarlane's four o'clock)

Four o'clock family (Nyctaginaceae)

ORIGINAL PUBLICATION: Proc. Biol. Soc. Wash. 49:148. 1936.

STATUS: Listed as Endangered by the U.S. Fish and Wildlife Service
(Federal Register 44:61910.October 26, 1979).

DESCRIPTION: Perennial herb from a stout, deep seated root; stems freely branched, forming hemispheric clumps 6-12 dm in diameter; leaves opposite, lower orbicular or ovate deltoid, upper narrowly ovate, succulent, nearly sessile; perianth large, magenta, showy; involucre conspicuous, broadly funnelform (after Constance & Rollins, 1936).

DISTRIBUTION: Mid Snake River Canyon of Wallowa County, Oregon and in the lower Salmon River Canyon in Idaho.

PHENOLOGY: Flowering from May to perhaps early June.

HABITAT: MacFarlane's four o'clock prefers steep slopes with sunny exposure at approximately 330-450 m elevation. The substrate is talus loosely covered with soil. Associate species include *Agropyron spicatum*, *Bromus tectorum*, *Balsamorhiza sagittata*, *Phacelia heterophylla*, *Lomatium dissectum*, *Sporobolus cryptandrus*, *Celtis reticulata*, *Phacelia linearis*, and *Cryptantha* spp.

LAND OWNERSHIP/MANAGEMENT: The U.S. Forest Service and Bureau of Land Management (BLM in Idaho) manage the canyon habitat of *M. macfarlanei*.

PRESENT AND POTENTIAL THREATS: Four o'clocks are cultivated as ornamental species. *M. macfarlanei* has very showy flowers and is threatened by collection. This species is also threatened by recreational use in its habitat. It may be affected by a fungal infection and insect predation as well. It may be grazed by native and domestic animals.

MANAGEMENT RECOMMENDATIONS: Future recreational trails and facilities should be routed away from populations likely to be disturbed. Fencing may be required to prevent grazing.

REMARKS: Extensive searches over the last several years have located only four populations of this species, most of which have but a few plants. Only two of these populations are in Oregon. This is the second listed plant species from Oregon and is possibly on the verge of extinction. Cooperative efforts by government agencies in Oregon and Idaho are underway to assure prudent management of remaining sites. This is one of our most beautiful native plants.

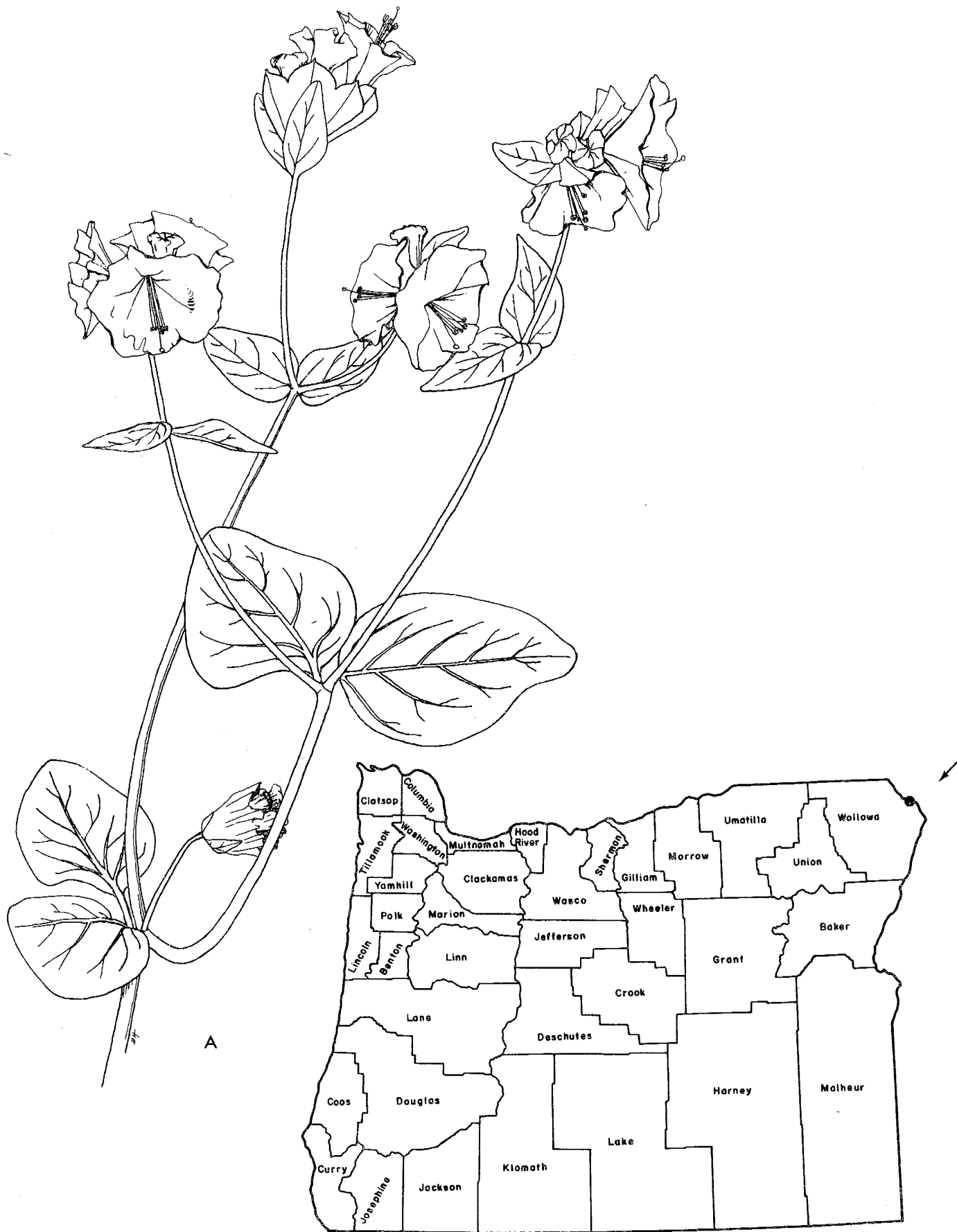


Fig. 2. *Mirabilis macfarlanei*. A: Habit (upper portion of plant), X 1 (drawn from plants in the field and photographs).

STEPHANOMERIA MALHEURENSIS Gottl.

(Malheur wire lettuce)

Composite family (Asteraceae)

ORIGINAL PUBLICATION: Madrono 25:44-46. 1978.

STATUS: Proposed as Endangered, U.S. Fish and Wildlife Service
(Federal Register 35:72234-72237. October 31, 1980).

DESCRIPTION: Annual, up to 50 cm tall with a basal rosette of glabrous leaves; stem single, much branched, with scale like leaves; heads numerous, clustered or single on short peduncles; florets five to eleven per head, the ligules pink, white, or rarely orange yellow (after Gottlieb, 1978).

DISTRIBUTION: Endemic to a very small area south of Burns, in Harney County, Oregon.

LOOK ALIKES: *Stephanomeria malheurensis* has recently evolved from *S. exigua* ssp. *coronaria*. These two species grow sympatrically and are very similar. The most useful distinguishing character is the longer achenes of *S. malheurensis*, averaging 3.3-3.8 mm long.

PHENOLOGY: Malheur wire lettuce blooms in July and August.

HABITAT: Found only on the top of a broad hill above surrounding flats. The soil is derived from volcanic tuff layered with thin crusts of limestone. The vegetation is dominated by *Artemisia tridentata*, *Chrysothamnus nauseosus*, *C. viscidiflorus*, *Bromus tectorum*, and *Salsola kali*.

LAND OWNERSHIP/MANAGEMENT: Administered by the Bureau of Land Management.

PRESENT AND POTENTIAL THREATS: Zeolite mining claims have been staked on this plant's habitat. Competition from associated annuals is heavy.

MANAGEMENT RECOMMENDATIONS: The Bureau of Land Management has fenced off the only known site for *S. malheurensis* and declared the habitat a Scientific Study Area. This area should be withdrawn from mineral entry. Ecological studies should be continued to determine the status of the population.

REMARKS: *Stephanomeria malheurensis* presents a rare opportunity to study the evolutionary process of an evolving species. Dr. Leslie Gottlieb, of the University of California, has carried out extensive research on the systematics of this species and its relatives. This is reportedly a plant whose population size fluctuates greatly from year to year, apparently greatly affected by precipitation levels. *S. malheurensis* maintains its taxonomic distinction by having evolved an inbreeding mode of reproduction, genetically isolating it from its parent which is an outcrosser.

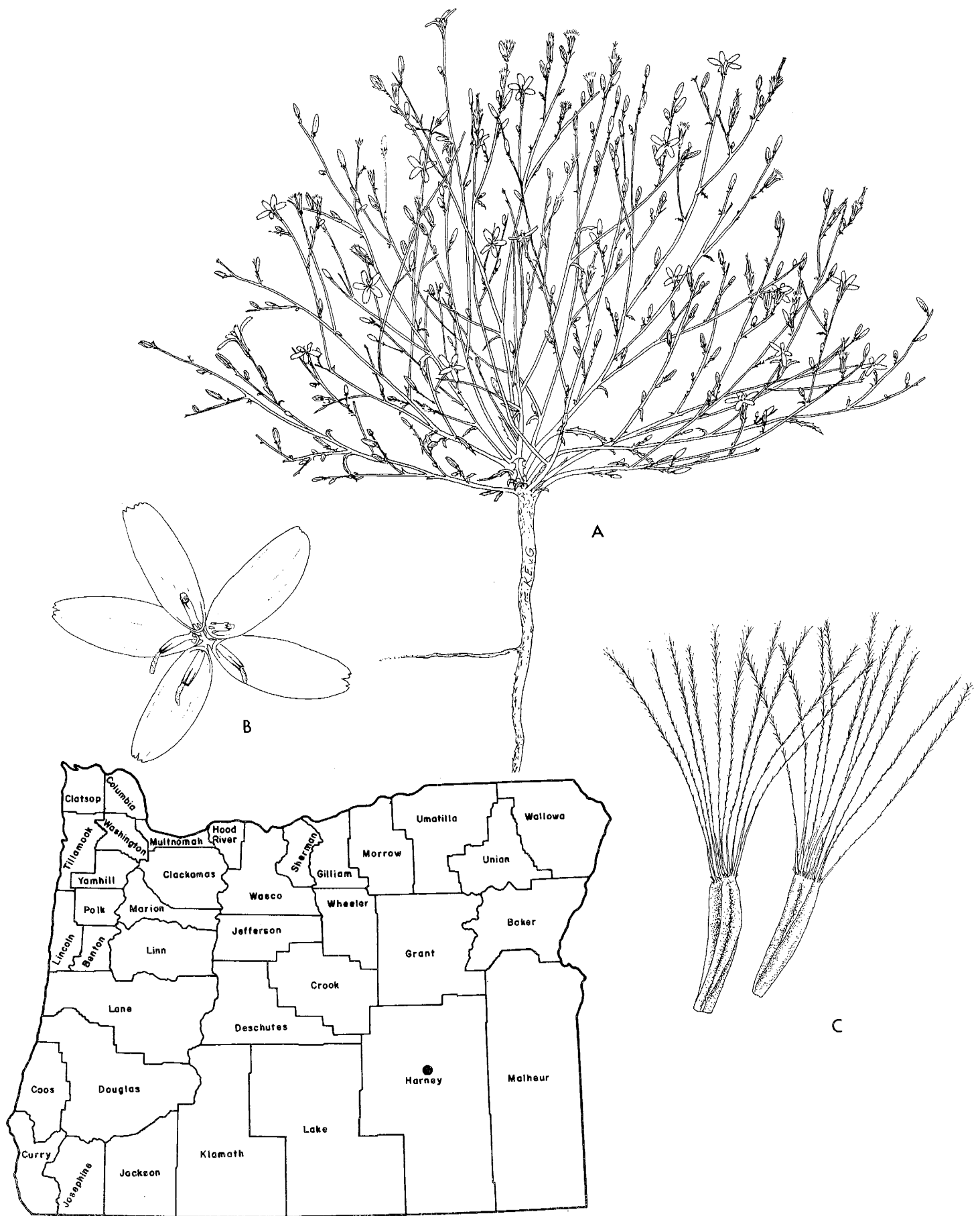


Fig. 3. *Stephanomeria malheurensis*. A: Habit, X 0.3; B: Flower head, X 2.5; C: Achenes and pappus, X 7 (drawn from Gottlieb & Chambers 3572, OSC).

TAXA UNDER REVIEW

AGASTACHE CUSICKII Heller

(Cusick's giant hyssop)

Mint family (Lamiaceae)

ORIGINAL PUBLICATION: Muhlenbergia 1:32. 1900.

SYNONYMS: *Lophanthus cusickii* Greenman (Erythea 7:119. 1899).
Agastache cusickii var. *parva* Cronquist (Madrono 7:81. 1943).

STATUS: Candidate species for federal listing, Category 2, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Stems less than 5 dm tall, arising from a woody rootstock, tufted, puberulent throughout; leaf blades 1.5-2.5 cm long, 1.15 cm broad, mostly acute, serrate or crenate, puberulent; inflorescence compact, 3-5 cm long; calyces rose, thin, puberulent, the tubes 6-6.5 mm long, the teeth 4.5-5.5 mm long, acuminate, thin and scarious, subequal; corollas pallid (pinkish), the tubes about 9 mm long; nutlets 1.5-2 mm long (after Lint & Epling, 1945).

DISTRIBUTION: *Agastache cusickii* is found in Harney and Malheur counties, Oregon, and at scattered locations in the mountains of central Idaho, northern Nevada, and possibly northeastern California.

TAXONOMIC PROBLEMS: Specimens from Oregon have been considered a distinct taxon (var. *parva*). Current taxonomic treatments do not recognize this separation.

LOOK ALIKES: The small leaf blades (less than 2.5 cm) and diminutive stature of *A. cusickii* (generally less than 5.0 dm) distinguish it from *A. urticifolia*. The two taxa may occasionally be sympatric.

PHENOLOGY: Flowering is from June to August.

HABITAT: Found on dry slopes at mid to upper elevations, usually on loose, rocky substrate. Associates include *Artemisia* spp., *Penstemon* spp., and *Festuca* spp.

LAND OWNERSHIP/MANAGEMENT: This plant's habitat is managed by the Bureau of Land Management in Oregon.

PRESENT AND POTENTIAL THREATS: There probably are few current threats to this species in Oregon, except perhaps grazing and chance encounters by recreationists. This species may have rock garden possibilities.

MANAGEMENT RECOMMENDATIONS: Limit road building or other activities designed to enhance the recreation potential of *A. cusickii*'s mountain habitat to sites to reduce damage to this and other rare taxa would be minimal.

REMARKS: *Agastache cusickii* is found in Oregon primarily on Steens Mountain (Harney County) where recreational activities are increasing at a rapid rate.



Fig. 4. *Agastache cusickii*. A: Habit, X 0.8; B: Flower (calyx and corolla), X 4; C: Calyx cut away, exposing nutlets, X 5 (drawn from Cusick 2001, ORE).

AGROSTIS MICROPHYLLA Steud. VAR. HENDERSONII Beetle

(Henderson's bentgrass)

Grass family (Poaceae)

ORIGINAL PUBLICATION: Bull. Torrey Club 72:547. 1945.

SYNONYMS: *Agrostis hendersonii* Hitchc. (Journ. Wash. Acad. Sciences 20: 381-382. 1930).

STATUS: Candidate species for federal listing, Category 2, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: A small delicate tufted annual, with several slender culms 7-12 cm tall; ligule membranous, acute, 2-3 mm long; leaf blades typically flat, glabrous, 1-4 cm long; panicle condensed with short branches; spikelets purplish tinged, straw colored in age, 7-8 mm long; glumes subequal; lemma about 3-4 mm long, with tufts of hair at the base and two setaceous teeth at the apex, awn arising from the middle of the back, about 10 mm long (after Carlbom, 1966).

DISTRIBUTION: This endemic is thus far known only from Jackson County, in southwestern Oregon, and nearby northern California.

LOOK ALIKES: This differs from typical *A. microphylla* by the longer awns (to 10 mm long on lemma) and the conspicuously tufted lemma base.

PHENOLOGY: Scarcely documented, but apparently flowering in April, May, and perhaps June.

HABITAT: Reported from damp sites near vernal pools in lower valleys. Probably associated with other ephemeral species.

LAND OWNERSHIP/MANAGEMENT: Unknown at this time.

PRESENT AND POTENTIAL THREATS: The destruction of vernal pools will eliminate habitat for this taxon. Impacts from grazing and logging should be considered.

MANAGEMENT RECOMMENDATIONS: Field searches for *A. microphylla* var. *hendersonii* should intensify in southwest Oregon. Populations located would probably merit immediate protection.

REMARKS: This grass apparently has very strict ecological requirements. There are few known collections and only one from Oregon, the holotype of 1930. Despite the paucity of available specimens, some botanists feel this is better treated at the specific level.



Fig. 5. *Agrostis microphylla* var. *hendersonii*. A: Habit, X 1.5; B: Spikelet, with long awns indicated, X 8 (drawn from Henderson s.n., ORE).

ALLIUM PLEIANTHUM Wats.

(Many flowered onion)

Lily family (Liliaceae)

ORIGINAL PUBLICATION: Proc. Amer. Acad. 14:233. 1879.

STATUS: Candidate species for federal listing, Category 2, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Bulb obliquely ovoid, outer coats grayish or brownish, inner coats white or pink, both without reticulations; leaves two, flat, sickle-shaped, 3-7 mm broad, longer than scape, deciduous at maturity; scape flat with two bracts, 5-9 cm tall; umbel 17-25 flowered; pedicels two to three times as long as perianth, perianth segments pale pink to lavender or white, 10-12 mm long, acute, lanceolate, widely spreading; stamens 3/4 as long as perianth segments; anthers yellow or purple; ovary strongly crested but capsule less so; seeds dull black (after Ownbey, 1969; Mingrone, 1968).

DISTRIBUTION: This onion is restricted to the John Day Valley of Wheeler and Morrow counties, Oregon.

TAXONOMIC PROBLEMS: Certain forms of *A. tolmiei* var. *tolmiei* have been collected and misidentified as *A. pleianthum*.

LOOK ALIKES: *Allium tolmiei* var. *tolmiei* has an essentially crestless ovary while that of *A. pleianthum* is obviously crested. These taxa may be further differentiated by the orientation of the bulb, which is erect in the former and horizontal in the latter (Cal Burt, pers. comm.).

PHENOLOGY: This species flowers in April and May.

HABITAT: Hilly sites and flats with scanty vegetative cover, in heavy clay soils. Occurring at lower elevations, often with *Poa sandbergii* and *Bromus tectorum*.

LAND OWNERSHIP/MANAGEMENT: Bureau of Land Management, Oregon State Parks, and private.

PRESENT AND POTENTIAL THREATS: Populations nated because of grazing. Offroad vehicle activities may likewise prove to be a great threat as human populations in the region expand.

MANAGEMENT RECOMMENDATIONS: The distribution and abundance of this species, the range of impacting threats, and its tolerance to disturbance need to be further assessed. Fencing remaining populations may be a necessary alternative to the problems posed by overgrazing and vehicular destruction.

REMARKS: Recent work has uncovered very few new populations, although potential habitat reportedly exists in adjacent counties. The plants may be locally common under favorable conditions.

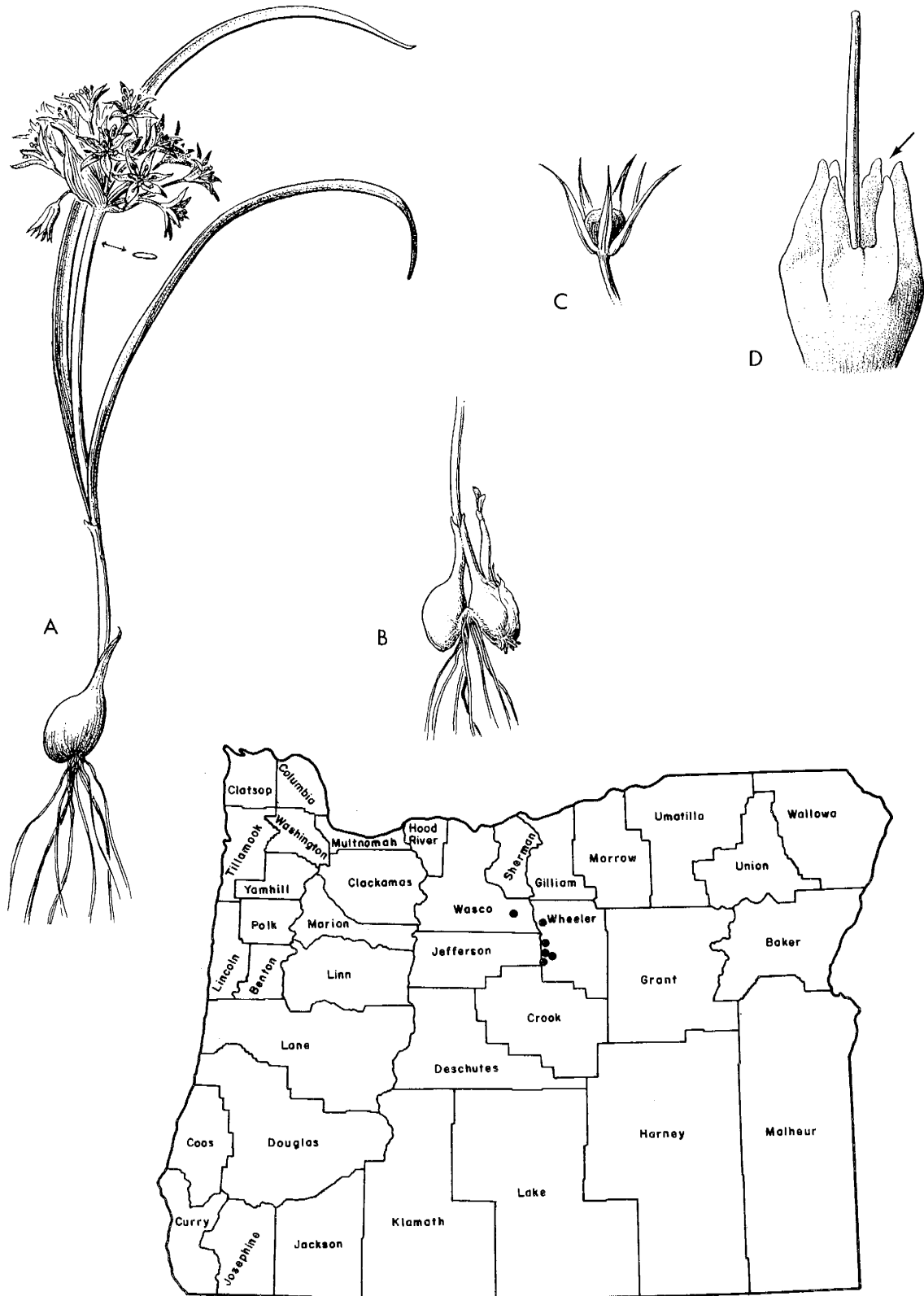


Fig. 6. *Allium pleianthum*. A: Habit, X 0.8; B: Bulbs, horizontally oriented, X 0.7; C: Perianth segments enclosing developing capsule, X 12; D: Ovary, indicating crests, X 6 (drawings taken from Hitchcock et al., 1969).

ALLIUM ROBINSONII Henderson

(Robinson's onion)

Lily family (Liliaceae)

ORIGINAL PUBLICATION: Rhodora 32:22. 1930.

STATUS: Candidate species for federal listing, Category 2; United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Bulb ovoid, outer coats grayish to brownish, inner coats white, both mostly without reticulations; leaves two, flat, sickle-shaped, 1-2 mm broad, twice as long as scape or longer, deciduous at maturity; scape 3-7 cm tall, flattened; inflorescence with two bracts; umbel 5-25 flowered; pedicels slightly shorter than perianth, perianth segments 7-9 mm long, oblong, obtuse, white to pale pink with pink or red midribs; stamens 1/2 to 3/4 as long as perianth segments; anthers reddish or purple; ovary distinctly crested but capsule less so; seeds dull black (after Ownbey, 1969; Mingrone, 1968).

DISTRIBUTION: This species is found in the Columbia River Valley near Vantage, Washington to the John Day River. It is historically known from Morrow, Sherman, and Umatilla counties in Oregon.

LOOK ALIKES: *Allium robinsonii* may be distinguished from the closely related *A. brandegei* by its obtuse corolla segments and larger bulbs without special reticulations, and from *A. parvum* by its two edged stem, narrower leaves, and conspicuously crested ovary (Henderson, 1930).

PHENOLOGY: *Allium robinsonii* flowers in April and May.

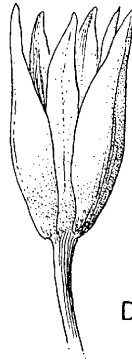
HABITAT: This onion frequents sandy to gravelly substrates and rocky sagebrush slopes. Many sites seem to have subsurface water during much of the growing season.

LAND OWNERSHIP/MANAGEMENT: Probably private in Oregon, although any populations occurring on the islands of the Columbia River would be under the jurisdiction of the Bureau of Land Management.

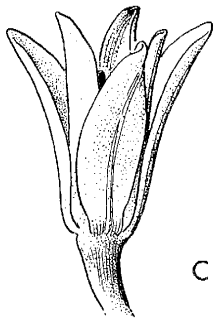
PRESENT AND POTENTIAL THREATS: Habitat for this species was flooded by the John Day Dam. The proposed Ben Franklin Dam on the Columbia is a serious potential threat. Grazing is probably both a direct and indirect cause of *A. robinsonii*'s decline, by actual consumption of the plants as well as habitat alteration.

MANAGEMENT RECOMMENDATIONS: Preserves for this and other rare species of the Columbia River region of eastern Oregon need to be established.

REMARKS: Renewed efforts at locating *A. robinsonii* have met with some success in the state of Washington, where it has recently been discovered in several counties.



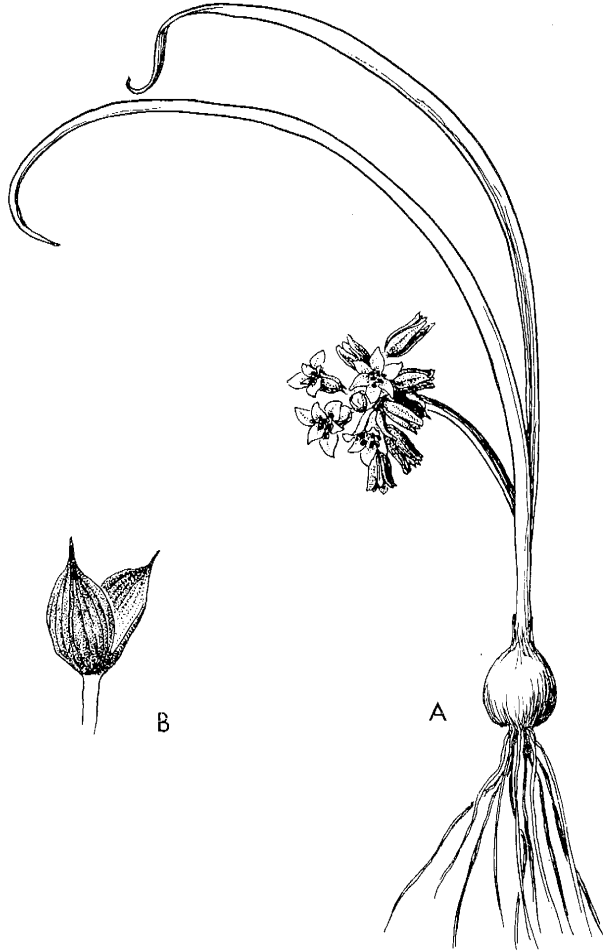
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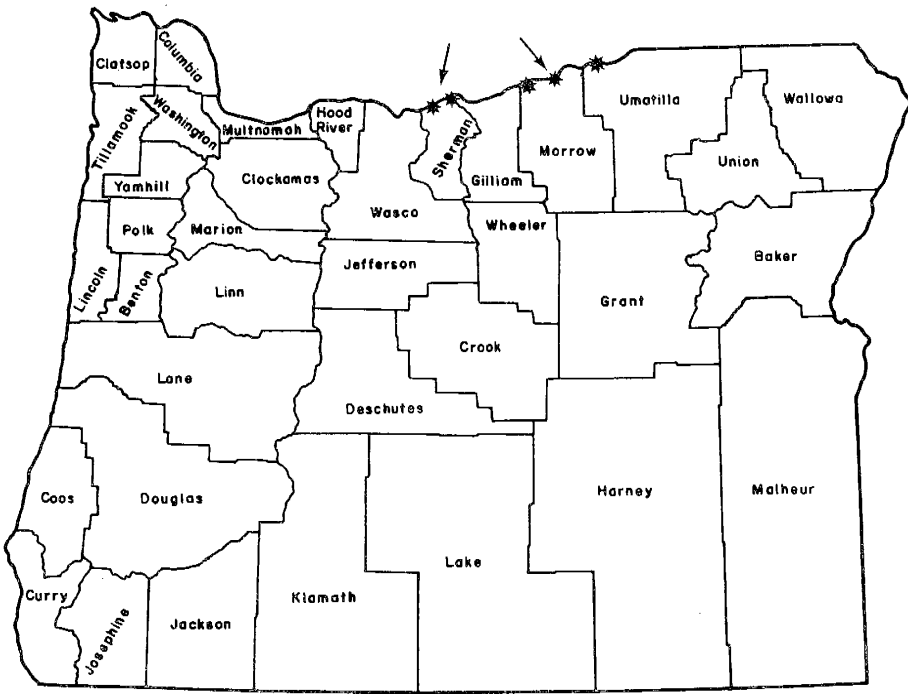


Fig. 7. *Allium robinsonii*. A: Habit, X 0.6; B: Inflorescence bracts, X 1; C: Flower, X 2; D: Flower, perianth persisting in fruit, X 2 (drawings taken from Hitchcock et al., 1969).

AMSINCKIA CARINATA Nels. & Macbr.

(Malheur Valley fiddleneck)

Borage family (Boraginaceae)

ORIGINAL PUBLICATION: Bot. Gaz. 62:145-146. 1916.

STATUS: Candidate species for federal listing, Category 1, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Erect, bristly annual herb, 1-3 dm tall; leaves pustulate hairy, middle and upper ones lanceolate to narrowly ovate, 4-8 cm long; inflorescence a coiled cyme; calyx of unequal sepals, bristly, 5-6 mm, to 16 mm in fruit; corolla deep yellow or orange, 10-11 mm long; nutlets lustrous, smooth, very dark gray with a few darker markings, not less than 5 mm long, the angles obtuse (almost rounded), the back somewhat concave but with raised, rounded ridge, ventral surface sharply keeled (after Suksdorf, 1931; nutlet morphology after Nelson & Macbride, 1916).

DISTRIBUTION: Known only from the Malheur Valley, in northern Malheur County, Oregon.

LOOK ALIKES: The smooth, lustrous nutlets of *A. carinata* distinguish it from other Northwest fiddlenecks, the fruit of which are dull and roughened.

PHENOLOGY: The only known collection was recorded in early June, in flower and fruit.

HABITAT: Reported from rocky soil (argillaceous?) at an elevation of a little over 300 m. Associated vegetation is not known, but probably includes *Artemisia* spp., *Poa sandbergii*, and *Mimulus cusickii*.

LAND OWNERSHIP/MANAGEMENT: Unknown, but probably private, possibly Bureau of Land Management.

PRESENT AND POTENTIAL THREATS: Grazing, agriculture, range improvements, and general surface disturbances would be potentially threatening to this restricted species, if it still exists.

MANAGEMENT RECOMMENDATIONS: Continue to inventory likely habitat for remaining populations. Any plants located should be afforded swift protection if at all possible.

REMARKS: This species is known only from the 1896 type collection. Recent attempts at relocating it have been fruitless. This plant may be edaphically restricted to argillaceous soils, but this is merely speculation. According to Nelson & Macbride (1916), the closest relatives of *A. carinata* are found near the San Francisco Bay area. They thought it remarkable to find *A. carinata* so far to the north, considering its taxonomic affinities.

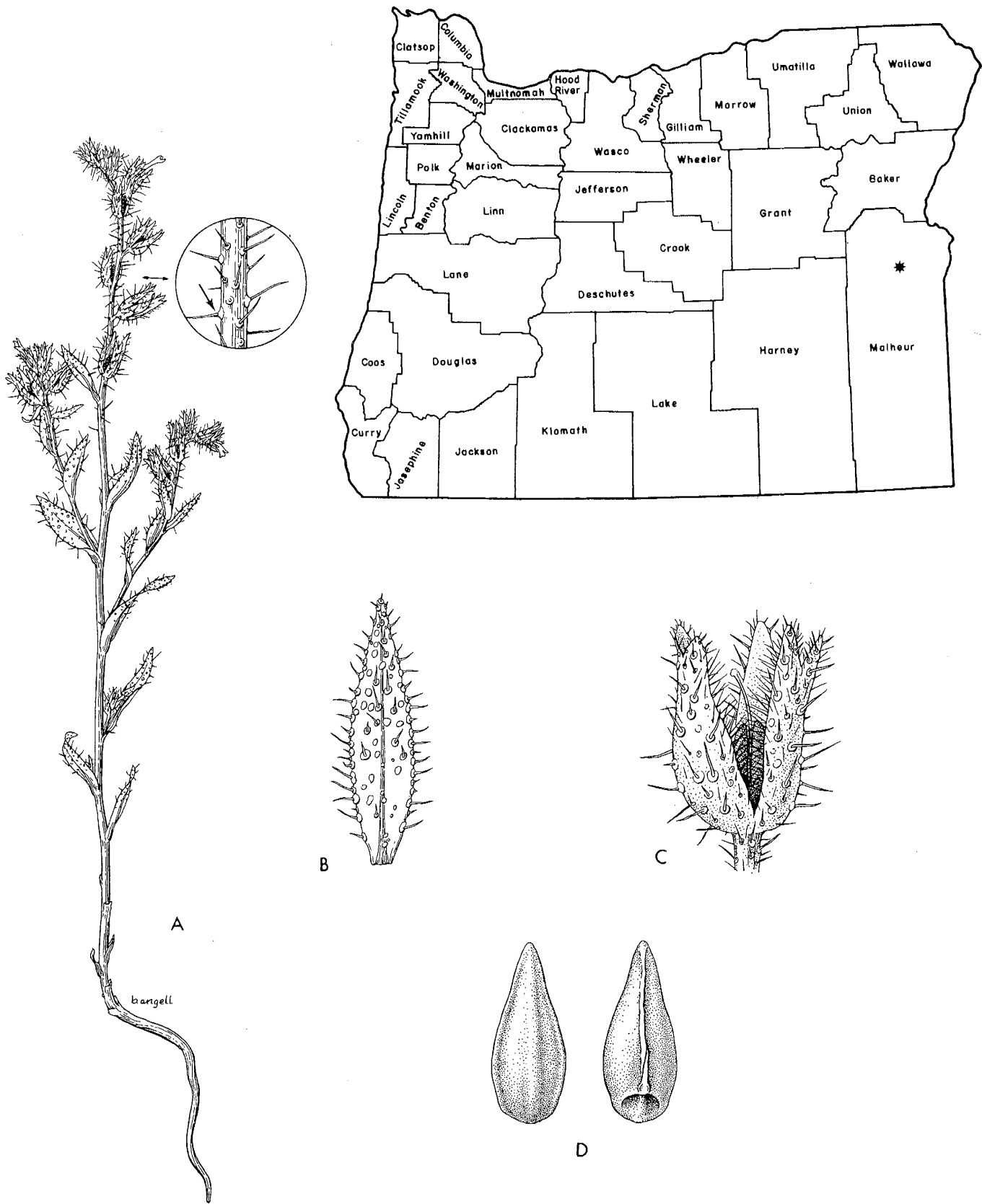


Fig. 8. *Amsinckia carinata*. A: Habit, X 0.8, with inset showing pustulate stem hairs, X 6; B: Upper stem leaf, X 3; C: Calyx, with fused sepals indicated and developing nutlets within; D: Dorsal and ventral views of nutlets (drawn from Leiberg 2234 [isotype], NY).

ANEMONE OREGANA Gray var. FELIX (Peck) Hitchc.

(Bog anemone)

Buttercup family (Ranunculaceae)

ORIGINAL PUBLICATION: Vasc. Pls. Pac. Northw. 2:329. 1964.

SYNONYMS: *Anemone felix* Peck (Torreya 32:149. 1932).

STATUS: Candidate species for federal listing, Category 2, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Erect perennial herb, with simple horizontal rootstocks often covered with dark, brown or blackish scales; stem 8-30 cm, sparsely villous; leaves all trifoliolate (occasionally appearing five foliate); sepals five to seven, very unequal, white within, often marked with purple on margins or medially on back; stamens 60-75 (from Peck, 1961).

DISTRIBUTION: This taxon exhibits a bipartite distribution pattern, restricted to coastal Lincoln County, Oregon and Grays Harbor County, Washington.

LOOK ALIKES: According to Peck (1932) variety *felix* differs from typical *A. oregana* by the black, very scaly rootstock, spreading hairs, and the large rose purple tinged sepals. The sympatric *A. deltoidea* has simple involucre leaves.

PHENOLOGY: Flowering occurs from March to June.

HABITAT: *Anemone oregana* var. *felix* is found in sphagnum bogs or marshes at low elevations. Associated species include *Epilobium angustifolium*, *Caltha biflora*, *Erythronium oregonum*, and *Scirpus americana*.

LAND OWNERSHIP/MANAGEMENT: Bureau of Land Management, possibly U.S. Forest Service, and private.

PRESENT AND POTENTIAL THREATS: Logging constitutes a major threat to this plant. Any activity which would cause the moist environment required by this variety to dry up would be threatening.

MANAGEMENT RECOMMENDATIONS: Likely bog sites within areas of potential timber harvest should continue to be checked for the presence of this plant. Known populations should be monitored on a regular basis and local disturbances closely regulated.

REMARKS: This plant is very rare and ecologically restricted to a vulnerable habitat type. It was only recently rediscovered in Oregon. There have been many historical collections of the var. *felix* reported in western Oregon, but the vast majority of these were incorrectly identified.

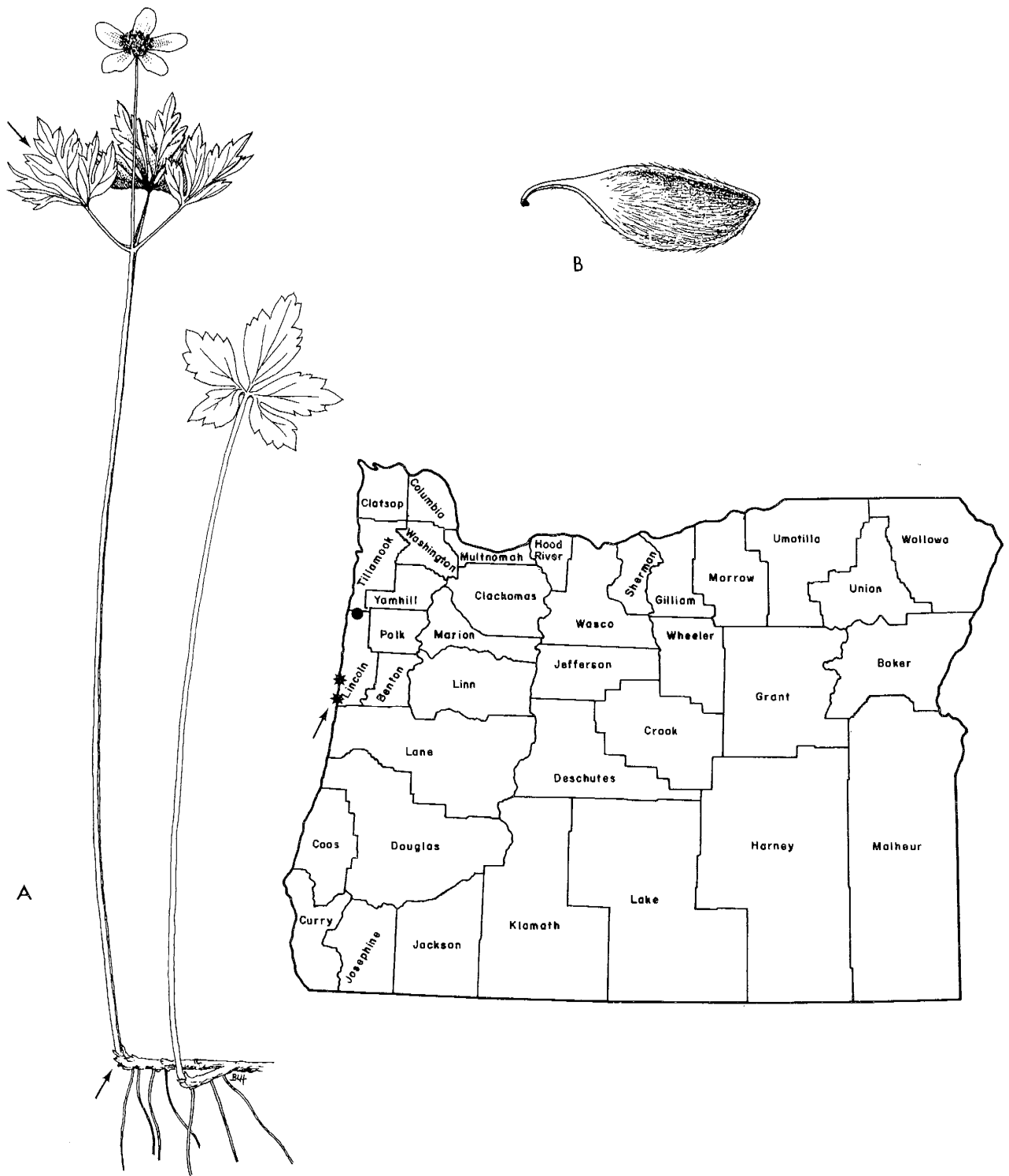


Fig. 9. *Anemone oregana* var. *felix*. A: Habit, indicating scaly rootstock and dissected involucral leaves, X 0.8; B: Achene, X 10 (drawn from Peck 16325, OSC).

ARABIS ACULEOLATA Greene

(Waldo rockcress)

Mustard family (Brassicaceae)

ORIGINAL PUBLICATION: Leafl. Bot. Observ. 2:69-70. 1910.

STATUS: Candidate species for federal listing, Category 2, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Perennial with slender rootstalk, stems few to several, hirsute throughout with large simple or forked hairs; basal leaves in small rosulate tuft, 1-4 cm long, 5-10 mm broad; cauline leaves sessile, entire to few toothed, 5-15 mm long, 3-6 mm broad; racemes short, few flowered; calyx purple, 4-9 mm long; petals purple, 10-20 mm long; nectar glands well developed at base of short stamens; fruit erect, 4-6 cm long, 1.5 mm wide, attenuate at apex (after Abrams, 1944).

DISTRIBUTION: In Oregon, this species is found in Curry and Josephine counties. It is also known from adjacent Del Norte County, California.

LOOK ALIKES: *Arabis aculeolata* is distinguished from *A. oregana* by its shorter several branched stem, smaller basal leaves, and simple or at most forked pubescence. Also, *A. aculeolata* differs from *A. modesta* by its simple or forked pubescence as opposed to stellate hairs.

PHENOLOGY: This species blooms from April to June.

HABITAT: Occurring on dry, gravelly peridotite-serpentine soils. Associated species are reported to include *Calocedrus decurrens*, *Pinus ponderosa*, *P. jeffreyi*, *Pseudotsuga menziesii*, *Ceanothus cuneatus*, and *Arctostaphylos viscida*.

LAND OWNERSHIP/MANAGEMENT: Primarily occurring on Bureau of Land Management and U.S. Forest Service lands, *A. aculeolata* may be found on scattered private holdings as well.

PRESENT AND POTENTIAL THREATS: The most serious threat is posed by the mining of serpentine outcrops containing nickel and other exploitable minerals.

MANAGEMENT RECOMMENDATIONS: Ideally, mining activities should be restricted to sites with the poorest botanical value. Where such a compromise is impossible, the activities of local operations may be mitigated so as to leave individual populations of this and other endemics intact within mining zones. Studies to determine the re-establishment capabilities of this and other serpentine endemics of the immediate area would be of great value.

REMARKS: Although this species has been reported as locally common within its limited geographic range, it is closely associated with serpentine substrate which, due to its commercial mineral content, could mean increased vulnerability.

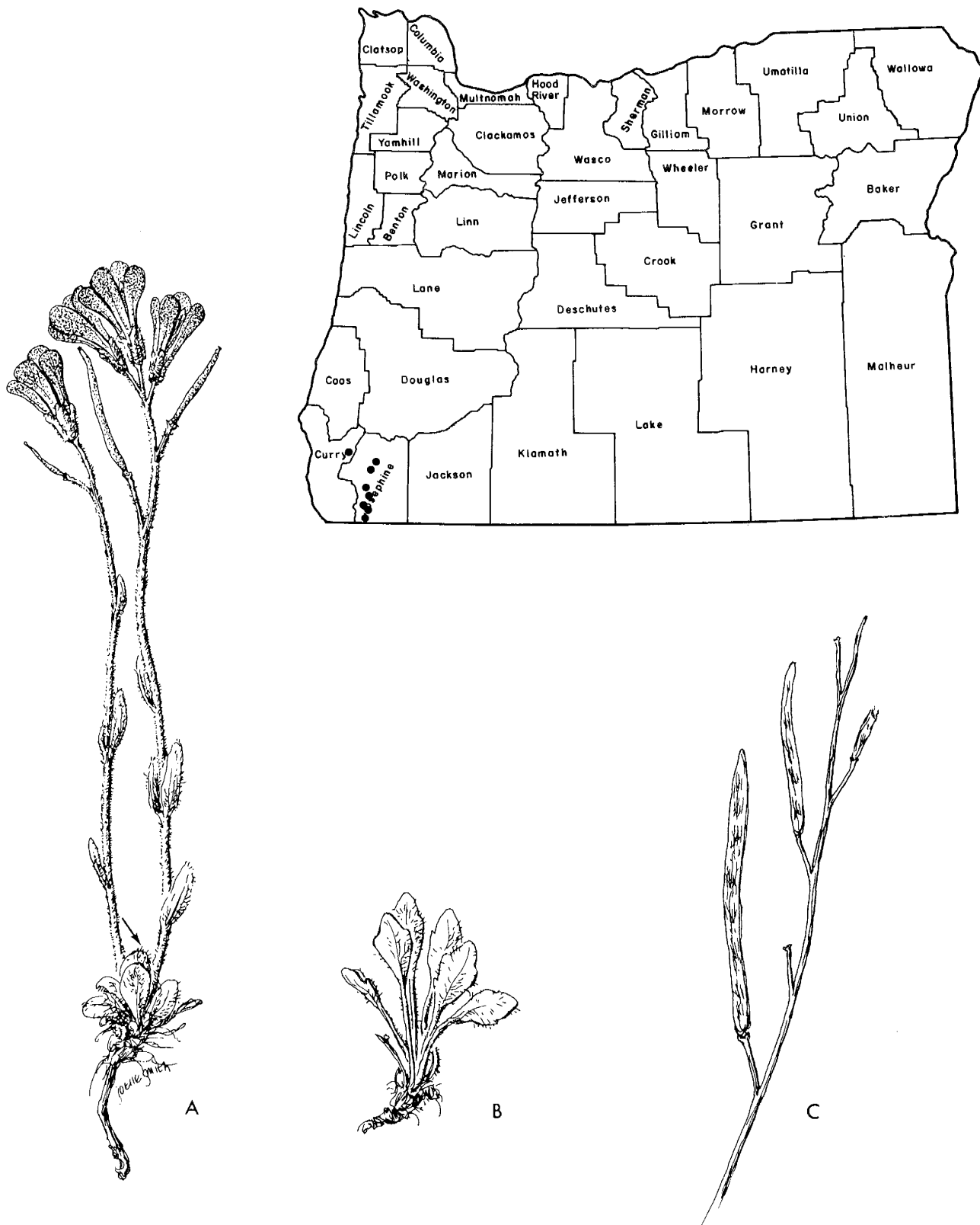


Fig. 10. *Arabis aculeolata*. A: Habit, indicating simple pubescence, X 1; B: Basal leaves varying towards a slightly toothed condition, X 1; C: Fruit (siliques), X 1.2 (drawn from Ross 1110, OSC).

ARABIS KOEHLERI Howell var. KOEHLERI

(Koehler's rockcress)

Mustard family (Brassicaceae)

ORIGINAL PUBLICATION: Fl. N.W. Am. 44. 1897.

SYNONYMS: *Arabis arbuscula* Greene (Leafl. Bot. Obs. 2:77. 1910).

STATUS: Candidate species for federal listing, Category 1, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Branched woody shrub, 5-30 cm tall; basal leaves numerous, linear, acute, entire, stellate pubescent; cauline leaves few, remote, auriculate-clasping, glabrous; sepals purplish, nonsaccate; flowers few; petals purple, 7-10 mm, siliques sessile, 5-9 cm long, 1.5-2 mm wide, only slightly curved, glabrous; seeds orbicular, narrowly winged, 1.5 mm broad, uniseriate (after Rollins, 1941; Siddall & Chambers, 1978).

DISTRIBUTION: This rockcress is endemic to the Umpqua River drainage of Douglas County, Oregon.

LOOK ALIKES: Other similar appearing Oregon species of *Arabis* occur farther south, but apparently do not occur within the small range of *A. koehleri* var. *koehleri* and therefore should not constitute an identification problem.

PHENOLOGY: Flowering and fruiting primarily from April to June.

HABITAT: This taxon prefers rocky bluffs and cliffs between ca. 225 and 380 m. Associated species are reported to include *Lilium washingtonianum*, *Delphinium trollifolium*, *Pityrogramma triangularis*, and *Sedum* sp.

LAND OWNERSHIP/MANAGEMENT: The U.S. Forest Service, private landowners, and the City of Roseburg have responsibility for the known locations.

PRESENT AND POTENTIAL THREATS: Road construction, railroad operations, grazing by goats, and herbicide drift are, or have been, known to impact this plant.

MANAGEMENT RECOMMENDATIONS: This is a narrowly restricted taxon which needs strict protection and management consideration on federal land. Ecological studies may be of benefit in determining if it could reestablish on sites where it has been extirpated.

REMARKS: The ability of *A. koehleri* var. *koehleri* to effectually return after disturbance appears minimal. The few known populations are small and the plants scattered, suggesting that very specialized requirements must be met to facilitate reproduction.

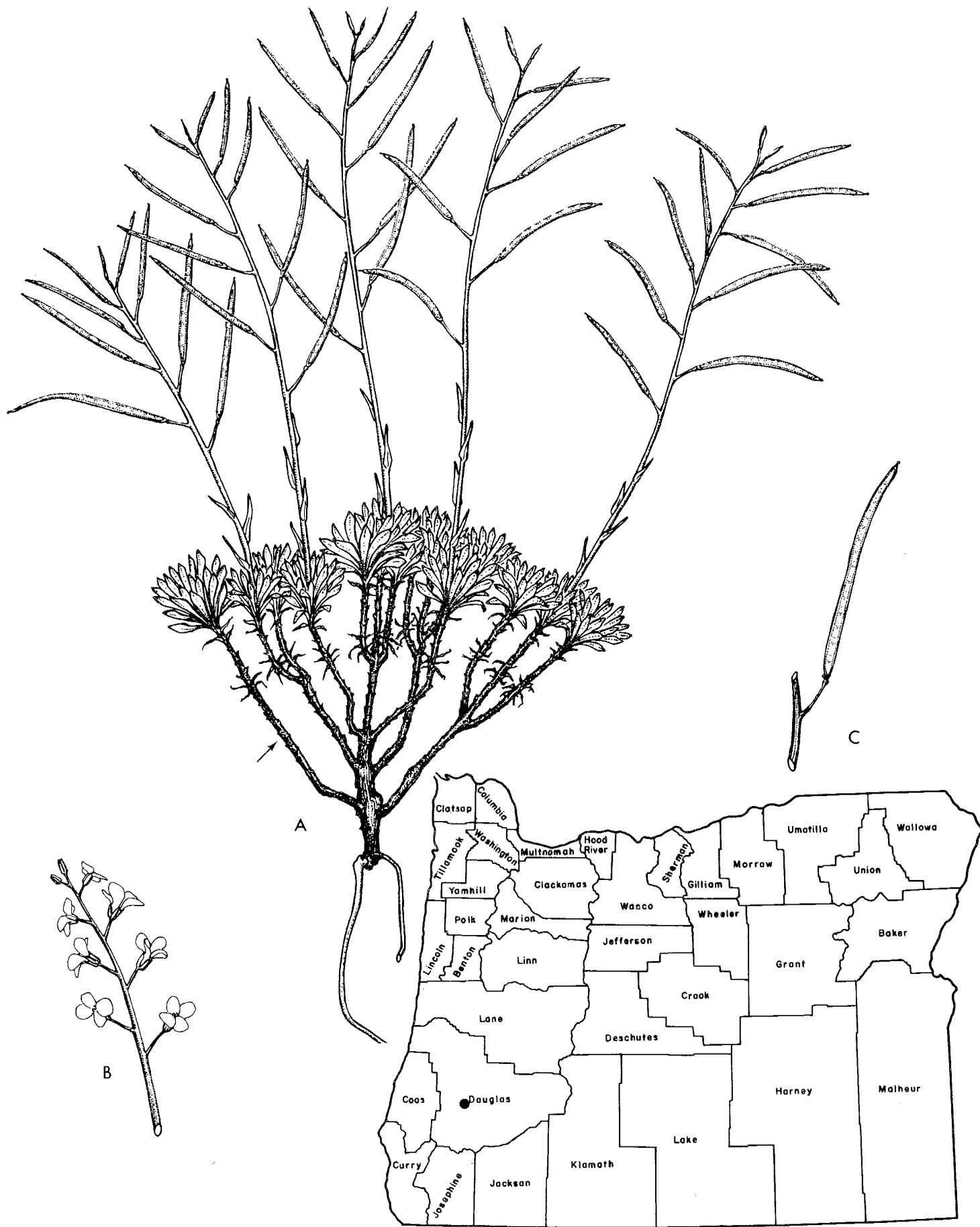


Fig. 11. *Arabis koehleri* var. *koehleri*. A: Habit, indicating woody base, X 0.7; B: Flowering raceme, X 0.8; C: Silique, X 1 (drawn from Fosback s.n., OSC).

ARABIS KOEHLERI Howell VAR. STIPITATA Rollins

(Koehler's rockcress)

Mustard family (Brassicaceae)

ORIGINAL PUBLICATION: Rhodora 43:426. 1941.

STATUS: Candidate species for federal listing, Category 2, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Dwarf, freely branched shrub with a strongly developed woody stem; vegetative parts 8-20 cm high, flowering branches arising from the summits of leafy shoots of the previous year; leaves many, narrowly oblanceolate, entire or several toothed; flowering branches 7-15 cm high; flowers few, long pedicelled, bright purplish red; siliques distinctly short stipitate, style nearly 1 mm long (after Rollins, 1941).

DISTRIBUTION: This taxon occurs in Curry and Josephine counties, Oregon.

LOOK ALIKES: The variety *stipitata* may be distinguished from other varieties of *A. koehleri* by its numerous crowded cauline leaves, broader basal leaves, and rather strongly recurved, stoutly stipitate siliques (Rollins, 1941). *A. koehleri* var. *stipitata* may be distinguished from the related *A. breweri* by its fine, truly stellate pubescence upon the basal and lower cauline leaves, and by the glabrous upper stems and pedicels.

PHENOLOGY: Flowering occurs in April and May.

HABITAT: This plant is restricted to serpentine soils. Major associates include *Arctostaphylos* spp., *Ceanothus prostratus*, *C. cuneatus*, *Pinus ponderosa*, and *Libocedrus decurrens*.

LAND OWNERSHIP/MANAGEMENT: U.S. Forest Service.

PRESENT AND POTENTIAL THREATS: Habitat destruction resulting from mineral exploration and possible mining of serpentine deposits.

MANAGEMENT RECOMMENDATIONS: Populations of this and other rare species of the area should be protected and monitored. Inventory work should continue to accurately determine the number of extant populations.

REMARKS: *Arabis koehleri* var. *stipitata* is another of the unique serpentine endemics of the Siskiyou Mountains. *Arabis* is highly speciated in this area, being represented in part by a series of specialized forms including this taxon. Preservation of these taxa is essential if evolutionary studies of the genus is to continue. Aside from their roles as research subjects, these attractive plants rank high in aesthetic value.



Fig. 12. *Arabis koehleri* var. *stipitata*. A: Habit, indicating glabrous upper stem, X 1; B: Fruiting raceme, indicating short stipe of fruit, X 1.5 (drawn from Crosby 1122, OSC).

ARABIS MODESTA Rollins

(Modest rockcress)

Mustard family (Brassicaceae)

ORIGINAL PUBLICATION: Rhodora 43:350-352. 1941.

STATUS: Candidate species for federal listing, Category 2, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Perennial, 2-5 dm high, pubescent throughout with appressed stellate hairs; basal leaves numerous, petiolate, 2-6 cm long, obovate, purplish beneath; cauline leaves 1-2.5 cm long, narrowly oblong, sessile but not clasping; racemes becoming elongate, sparse; sepals oblong, purplish, the outer pair saccate; petals 12-15 mm long, purple, the claw white; siliques 3-4.5 cm long, glabrous (after Rollins, 1941; Peck, 1961).

DISTRIBUTION: Known from Josephine County, Oregon; scattered in northwest California.

TAXONOMIC PROBLEMS: This species may hybridize with *A. oregana* (Rollins, 1973).

LOOK ALIKES: *Arabis modesta* differs from *A. oregana* in pubescence, the former having small uniform, four parted hairs, the latter possessing large forked or several branched hairs of varying sizes. The stem of *A. modesta* is glabrous, that of *A. oregana* at least somewhat pubescent. Other look alike include *A. mcdonaldiana* which is essentially glabrous, and *A. aculeolata* which has simple leaf hairs (Rollins, 1941; 1973).

PHENOLOGY: *Arabis modesta* blooms in April and May.

HABITAT: This *Arabis* is adapted to dry, serpentine soils, occurring with species of *Arctostaphylos*, *Mimulus*, and *Eriogonum*. Found on exposed slopes between altitudes of ca. 150 and 450 m.

LAND OWNERSHIP/MANAGEMENT: Administered by the Bureau of Land Management.

PRESENT AND POTENTIAL THREATS: Recreational activities, herbicide applications, trail work, and collecting are all reported as threats.

MANAGEMENT RECOMMENDATIONS: Strict regulation of this species' habitat along the Rogue River is desperately needed. Herbicide spraying, even if indirect, should be eliminated if there is any remote chance of drift. Recreational pressures are increasing and should be controlled.

REMARKS: This species, as well as several other uniquely adapted endemic rockcress of southwestern Oregon and northern California, is of great biosystematic interest. The complex is a fascinating product of rapid evolution, and the relationship of these taxa to each other and remaining elements of the genus is poorly understood.



Fig. 13. *Arabis modesta*. A: Habit, X 0.5; B: Basal leaf, with inset showing appressed stellate hairs, X 0.8; C: Fruit (silique), X 1.2 (drawn from Crosby 1113, OSC).

ARABIS SERPENTINICOLA Rollins

(Serpentine rockcress)

Mustard family (Brassicaceae)

ORIGINAL PUBLICATION: Contr. Gray Herb. 204:150-151. 1973.

STATUS: Candidate species for federal listing, Category 2, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Perennial, glabrous throughout, stems simple, erect, 1.5-3 dm high; basal leaves in a dense flat rosette, short petiolate, broadly obovate, 1.5-2.5 cm long; cauline leaves two to five, sessile, not auriculate, 3-6 mm long; inflorescences racemose, elongating in fruit; sepals dark purple, erect, oblong, 4.5-5.5 mm long; petals spatulate, light purple, 12-15 mm long (after Rollins, 1973).

DISTRIBUTION: Historically reported from Curry County, Oregon. Known today from a limited area in Siskiyou County in northern California.

LOOK ALIKES: This is the only entirely glabrous purple flowered *Arabis* of this area. It is similar to *A. aculeolata*, which is always hirsute. The nearly glabrous *A. mcdonaldiana* differs in its winged seeds (wingless in *A. serpentinicola*) and is typically less than 1.5 dm tall.

PHENOLOGY: Flowering in June and July.

HABITAT: To be expected from steep serpentine ridges or rocky meadows above ca. 1500 m. Label data from the few collections report plants from "seepage areas" as well as "dry" sites.

LAND OWNERSHIP/MANAGEMENT: U.S. Forest Service.

PRESENT AND POTENTIAL THREATS: Current threats may include collecting. The potential threats are more ominous, centered chiefly around the mineral richness of the serpentine habitat and the probability of eventual surface mining.

MANAGEMENT RECOMMENDATIONS: Additional field work is needed to confirm the existence of *A. serpentinicola* in Oregon. All populations should receive high priority in land management decisions.

REMARKS: There is only a single collection of this species from Oregon, recorded in 1932. *A. serpentinicola* is a member of the complex mentioned under *A. modesta* and is consequently of taxonomic interest.

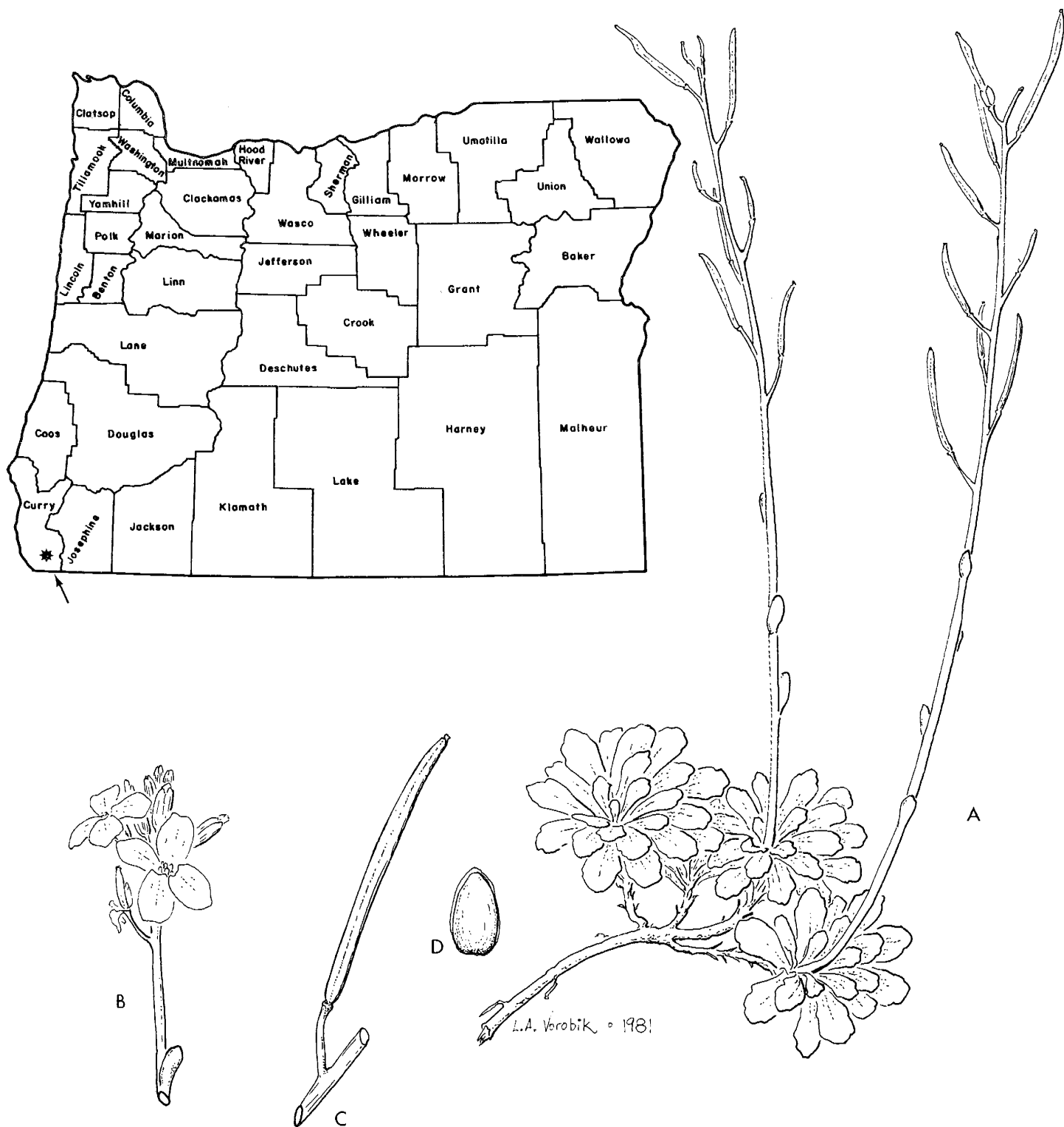


Fig. 14. *Arabis serpenticola*. A: Habit, X 1; B: Flowering raceme, X 1.5; C: Fruit (silique), X 2; D: Seed, X 10 (drawn from Muth s.n., PUC).

ARABIS SUFFRUTESCENS Wats. var. HORIZONTALIS (Greene) Rollins

(Crater Lake rockcress)

Mustard family (Brassicaceae)

ORIGINAL PUBLICATION: Research Studies, State College of Washington. IV. 1:50. 1936.

SYNONYMS: *Arabis horizontalis* Greene (Leafl. Bot. Obs. 2:74. 1910).

STATUS: Candidate species for federal listing, Category 2, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Suffruticose perennial from a widely branching caudex, simple or branched above, pubescent below; (1-) 2-5 dm high; basal leaves linear to oblanceolate, acute to obtuse, densely pubescent; 1-4 cm long; cauline leaves few, sessile, auriculate, lanceolate to narrowly obovate, 1-3 cm long; sepals oblong to slightly broader, glabrous, 3.5-4.5 mm long; petals spatulate, rose to purplish, 6-8 mm long, 2.5-3 mm wide; pedicels slender, horizontal to strictly reflexed, 4-10 mm long; siliques horizontal, glabrous, acuminate, 4-7 cm long, 3-6 mm wide; seeds orbicular, widely winged (after Rollins, 1941).

DISTRIBUTION: This variety is restricted to a limited area around Crater Lake, in Klamath County, Oregon.

LOOK ALIKES: *Arabis suffrutescens* is recognized by its relatively broad, more or less reflexed fruit (to 4 mm wide) with winged seeds. Variety *horizontalis* is infraspecifically differentiated by its "lower stature, ...slender stems, shorter pedicels, horizontally spreading, smaller (fruit) and rather densely pubescent basal leaves" (Rollins, 1941).

PHENOLOGY: Crater Lake rockcress flowers and fruits in June and July.

HABITAT: Occurs on dry, rocky (pumice) or sandy slopes, from middle elevations up. Typically in sparse pine or hemlock forest, with *Vaccinium* sp., *Penstemon* spp., and *Erysimum* sp.

LAND OWNERSHIP/MANAGEMENT: U.S. Forest Service and National Park Service.

PRESENT AND POTENTIAL THREATS: Unknown at this time, although logging adjacent to Crater Lake National Park and intense human visitation within the park are certainly potential threats.

MANAGEMENT RECOMMENDATIONS: Continue efforts to relocate this plant. Populations discovered should be considered carefully in the management of local recreational and timber resources.

REMARKS: Although apparently not collected since 1951, this taxon was reported as "frequent" on earlier collection labels. It probably remains extant, at least within the national park boundaries, but this assumption awaits verification.



Fig. 15. *Arabis suffrutescens* var. *horizontalis*. A: Fruiting habit, X 0.7; B: Upper portion of flowering raceme, X 0.8 (drawn from Wynd 2250, ORE).

ARCTOSTAPHYLOS HISPIDULA Howell

(Howell's manzanita)

Heath family (Ericaceae)

ORIGINAL PUBLICATION: Fl. N. W. Am. 415. 1901.

SYNONYMS: *Arctostaphylos viscosissima* Peck (Torreya 32:151. 1932).
Arctostaphylos stanfordiana Parry ssp. *hispidula* (Howell) Adams (Study of genus *Arctostaphylos*. p. 19. 1940).

STATUS: Candidate species for federal listing, Category 2, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Erect, straight branching shrub, 1 to 2 m high; branchlets slender, dark, clothed with a close viscid puberulence and conspicuous glandular hairs; leaves somewhat scabrous with scattered glandular hairs, elliptic, 3-3.5 cm long, 1.5 cm wide, glandular petioles 5-7 mm long; inflorescence ample, loose, with slender, somewhat glandular hairy rachises; pedicels glabrous, slender, 5-6 mm long; corolla white or pink, 5 mm long; fruit globose, glabrous (after Adams, 1940).

DISTRIBUTION: Endemic to southwest Oregon, in Josephine and Curry counties, as well as adjacent northern California.

LOOK ALIKES: There are several species of *Arctostaphylos* in southwest Oregon. Howell's manzanita is reportedly distinguished by its highly branched habit, rather narrow leaves, and the extreme glandular pubescence of the new growth.

PHENOLOGY: Flowering and fruiting from late March to August.

HABITAT: To be expected in sparse forest or shrub communities with *Arctostaphylos canescens*, often recorded from southern exposures. Ranging from very low elevations to perhaps 1100 m, according to label information.

LAND OWNERSHIP/MANAGEMENT: U.S. Forest Service and private landowners.

PRESENT AND POTENTIAL THREATS: Logging and potential mining are primary threats. According to Adams (1940), this species is eliminated by fire.

MANAGEMENT RECOMMENDATIONS: While this species may not occur directly within commercially timbered areas, resultant supporting road systems may pose conflicts and require careful design. The same holds true for mineral exploration.

REMARKS: There are very few recent sightings of this shrub. Many species of *Arctostaphylos* crown sprout after fires and are in fact stimulated by burning. It may be useful to find out exactly to what degree *A. hispidula* is negatively affected by fire.

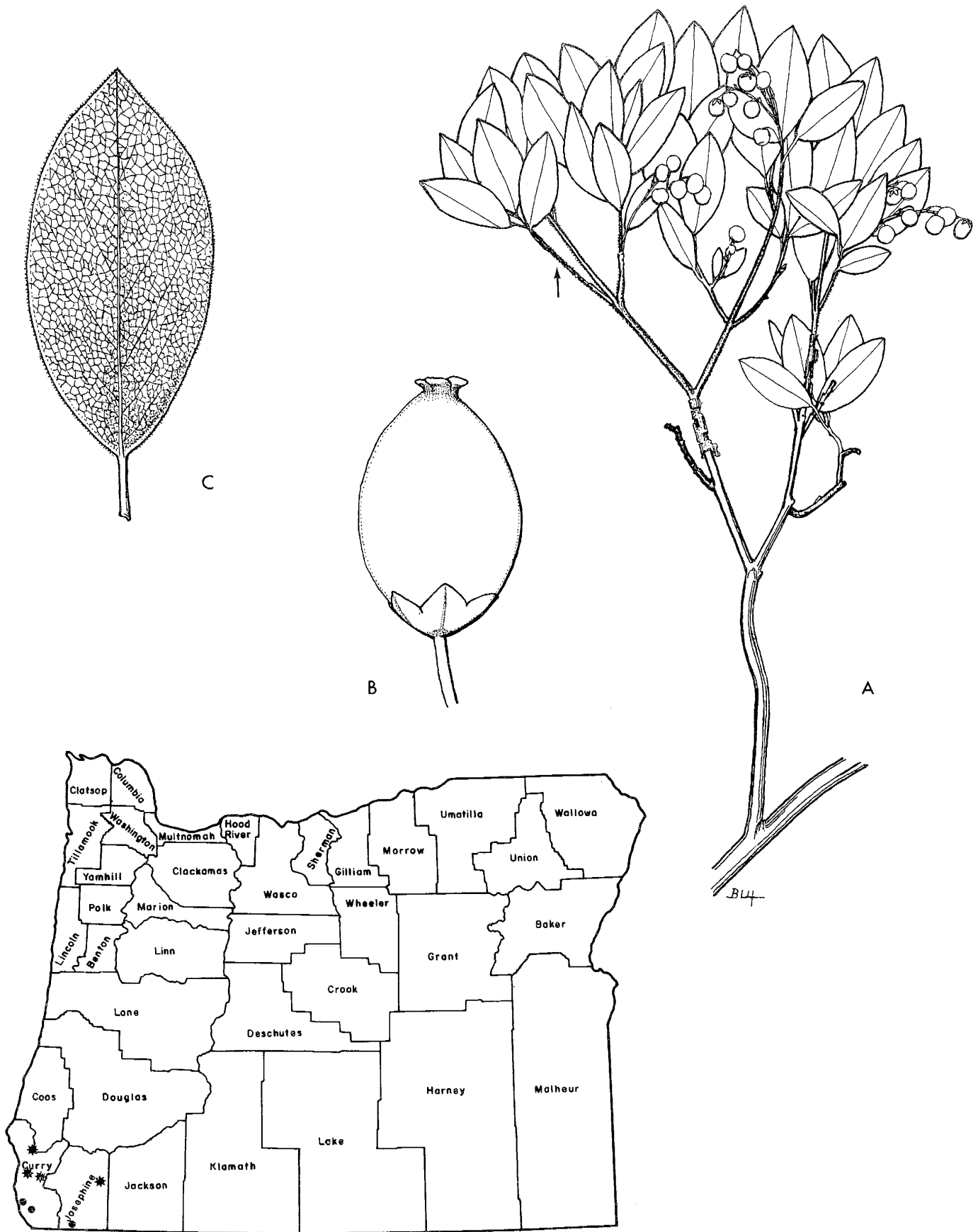


Fig. 16. *Arctostaphylos hispidula*. A: Habit of upper branch, indicating glandular pubescent new growth, X 0.6; B: Flower, X 5; C: Leaf, X 2 (drawn from Gottlieb s.n., ORE and Stansell s.n., ORE).

ARENARIA FRANKLINII Doug. ex Hood VAR. THOMPSONII Peck

(Franklin's sandwort)

Pink family (Caryophyllaceae)

ORIGINAL PUBLICATION: *Torreyia* 32:149. 1932.

STATUS: Candidate species for federal listing, Category 1, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Shrubby perennial growing in dense, low tufts with numerous spreading or prostrate stems, covered with withering but persistent glabrous leaves; flowering stems erect, 3-10 cm tall, with numerous overlapping cauline leaves; flowers in headlike cymes, pedicels 1-4 mm long; sepals 5-8 mm long, only slightly longer than petals; petals white, narrowly spatulate oblanceolate; stamens inserted at edge of prominent disc; styles three; capsule dehiscent by six teeth (after Hitchcock, 1964).

DISTRIBUTION: Endemic to lands adjacent to the Columbia River in Gilliam, Morrow, and possibly Wasco counties, Oregon.

TAXONOMIC PROBLEMS: Many specimens of *A. franklinii* in the herbaria searched were not identified to variety or were misidentified.

LOOK ALIKES: The variety *thompsonii* may be distinguished from var. *franklinii* by its shorter sepals (only slightly longer than the petals), less congested cymes, and longer pedicels.

PHENOLOGY: This taxon flowers in May and June.

HABITAT: *Arenaria franklinii* var. *thompsonii* has been collected in dry, sandy soil at lower elevations where it probably associates with *Agropyron spicatum* and *Artemisia* spp.

LAND OWNERSHIP/MANAGEMENT: Any remaining populations are probably on private tracts, although the Bureau of Land Management retains scattered acreage in the area.

PRESENT AND POTENTIAL THREATS: The general region is agriculturally developed and grazing is locally widespread and heavy.

MANAGEMENT RECOMMENDATIONS: Extant populations must be relocated and land ownership determined prior to any meaningful recommendations.

REMARKS: There is little reliable information available on this plant. The last collection was recorded in 1955. Sporadic sightings have been reported since, but there have been no known verifications. Because of the agricultural conversion of much of this region botanical reconnaissance has been limited in recent years.

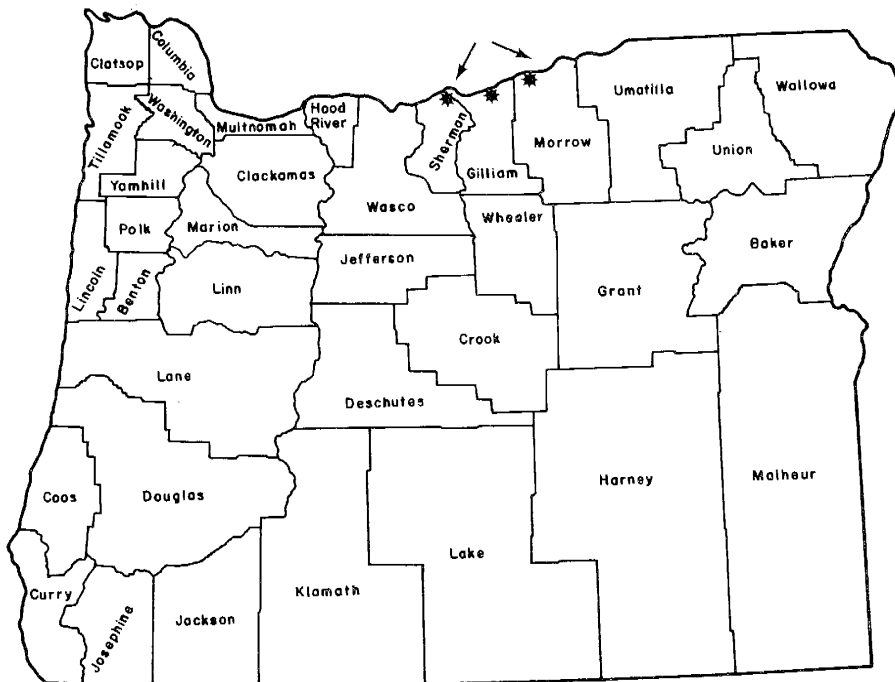


Fig. 17. *Arenaria franklinii* var. *thompsonii*. A: Habit, X 1; B: Flower, with petals emerging, X 6; C: Inflorescence, petals fully emerged, X 1.3 (drawn from Sprague s.n., OSC).

ARNICA VISCOSA Gray

(Sticky arnica)

Composite family (Asteraceae)

ORIGINAL PUBLICATION: Proc. Amer. Acad. 13:374. 1878.

SYNONYMS: *Raillardella paniculata* Greene (Erythea 3:48. 1895).
Chrysopsis shastensis Jepson (Man. Fl. Pl. Calif. p. 1037. 1925).

STATUS: Candidate species for federal listing, Category 2, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Perennial with numerous freely branching stems, 20-50 cm tall; plants copiously covered with long stalked glands and having a light spicy aroma; leaves opposite, without petioles, more or less oval, 2-5.5 cm long, 1-2 cm wide; flower heads several or many, involucre glandular hairy; flowers yellow; pappus white or creamy, of many slender barbellate bristles (after Ferris, 1960; Horner, 1976).

DISTRIBUTION: The range of *A. viscosa* is intermittent, occurring north from Mount Shasta to the southern Oregon Cascades. It is found in Oregon in Deschutes, Douglas, and Klamath counties.

PHENOLOGY: This species flowers in August.

HABITAT: *Arnica viscosa* inhabits scree, talus gullies, and slopes with seasonal water runoff, above and at the limit of tree growth. Associated species include *Picea breweriana*, *Pinus monticola*, *Tsuga mertensiana*, *Penstemon* spp., and *Carex breweri* at reported elevations of 1700 to 2800 m.

LAND OWNERSHIP/MANAGEMENT: U.S. Forest Service and the National Park Service.

PRESENT AND POTENTIAL THREATS: This species is said to possess a poor ability to establish seedlings (Horner, 1976). Hiking, skiing, ski run maintenance, and mining may prove to have negative impacts.

MANAGEMENT RECOMMENDATIONS: Inventory of likely habitat in the southern Cascades would be desirable. Future trail and ski run sites should be surveyed for *A. viscosa* in likely areas and mitigating measures initiated where conflicts arise.

REMARKS: This species was originally found in two widely disjunct areas, the Three Sisters-Crater Lake area in Oregon and the Trinity Alps-Mount Shasta area in California. It would not seem unreasonable to assume that additional sites may be found at stations such as the recently discovered Douglas County location. Populations near Three Sisters are thriving, according to recent reports. Despite being in the Three Sisters Wilderness Area, these populations may be jeopardized by future pumice mining.

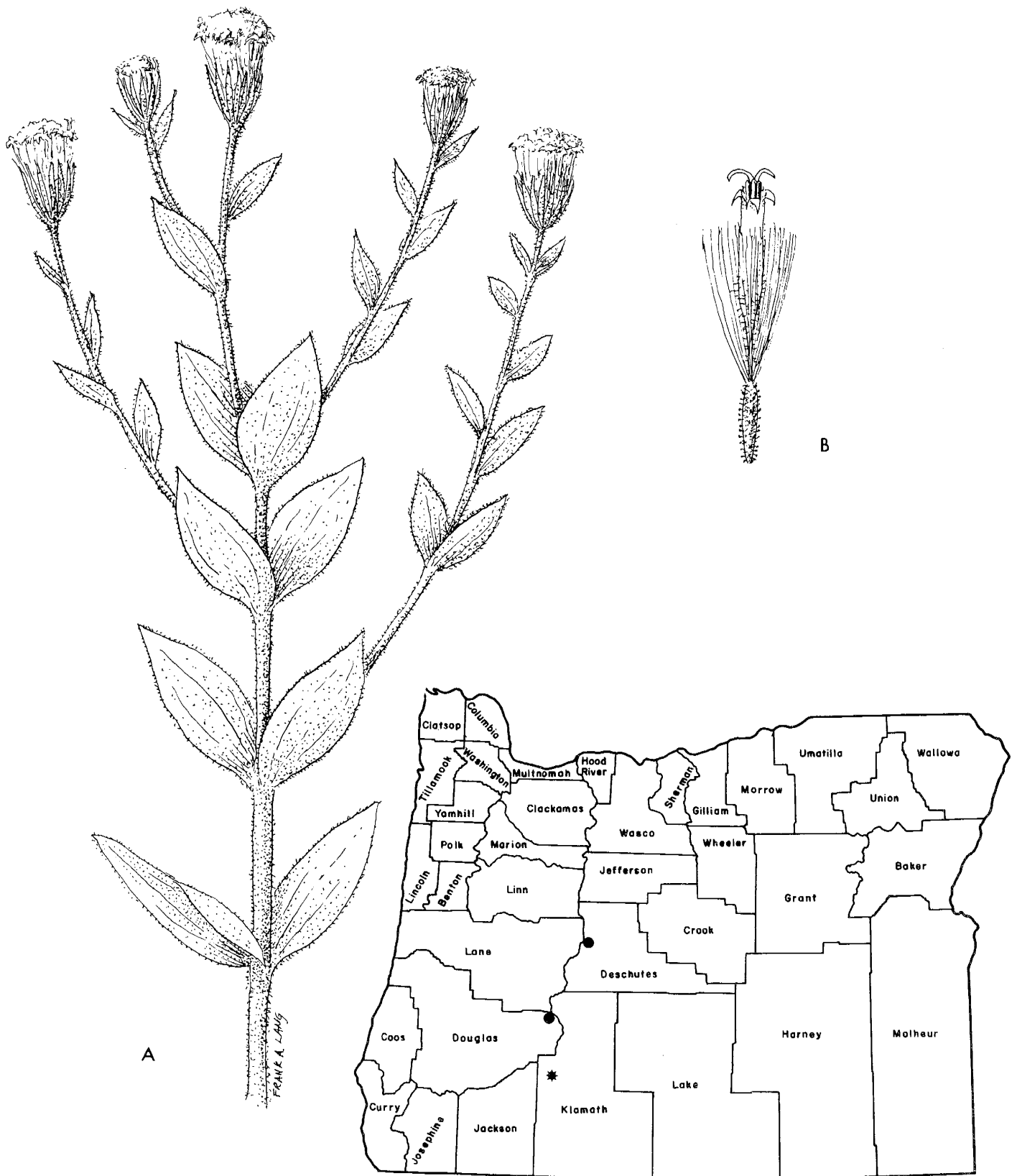


Fig. 18. *Arnica viscosa*. A: Habit, upper portion of stem, X 0.8; B: Floret, X 3 (redrawn from Ferris [1960], plate 5736).

ASTER CURTUS Cronquist

(White top aster)

Composite family (Asteraceae)

ORIGINAL PUBLICATION: Vascular Plants of the Pacific Northwest 5:80. 1955.

SYNONYMS: *Sericocarpus rigidus* Lindl. (Fl. Bor. Amer. 2:14. 1834).
Sericocarpus rigidus var. *laevicaulis* Nutt. (Trans. Am. Phil. Soc. II 7:302. 1840).

STATUS: Candidate species for federal listing, Category 1, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Perennial from slender creeping rhizome, 1-3 dm tall, usually simple and unbranched up to a close terminal cluster of heads, glabrous except for scabrous-ciliolate margins of leaves; leaves 2.5-3.5 cm long; heads ca. 10mm or less long; rays few, from one to three, whitish, typically two, 1-3 mm long, shorter than pappus; disc flowers few, pale yellow with purple anthers (after Cronquist, 1955).

DISTRIBUTION: From the Willamette Valley, Oregon to the Puget Trough and southern Vancouver Island, British Columbia. Currently known in Oregon only in Lane County, near Eugene.

PHENOLOGY: *Aster curtus* appears late in the season, flowering in August and September.

HABITAT: *Aster curtus* grows in undisturbed natural prairie at low elevations, from about 55 to 75 m. All sites are on relatively level ground and are usually gravelly and moist. Associated species include *Viola adunca*, *Potentilla* sp., *Prunella vulgaris*, *Deschampsia cespitosa*, *Aster chilensis* spp. *hallii*, and *Lomatium bradshawii*.

LAND OWNERSHIP/MANAGEMENT: Private and possibly U.S. Fish and Wildlife.

PRESENT AND POTENTIAL THREATS: Urban pressures from the city of Eugene, agriculture, and overcollecting are immediate threats.

MANAGEMENT RECOMMENDATIONS: Exclosures may be necessary to prevent the extermination of this species in Oregon. Careful examination of potential habitat is necessary when searching for this plant since it is rather inconspicuous and occurs in herbaceous communities of substantial cover.

REMARKS: This species is currently known from very few populations throughout its range, where it grows in some of the last areas of undisturbed prairie in the Willamette Valley-Puget Trough. Potential sites exist near Corvallis in Benton County, but recent searches here have been unsuccessful.

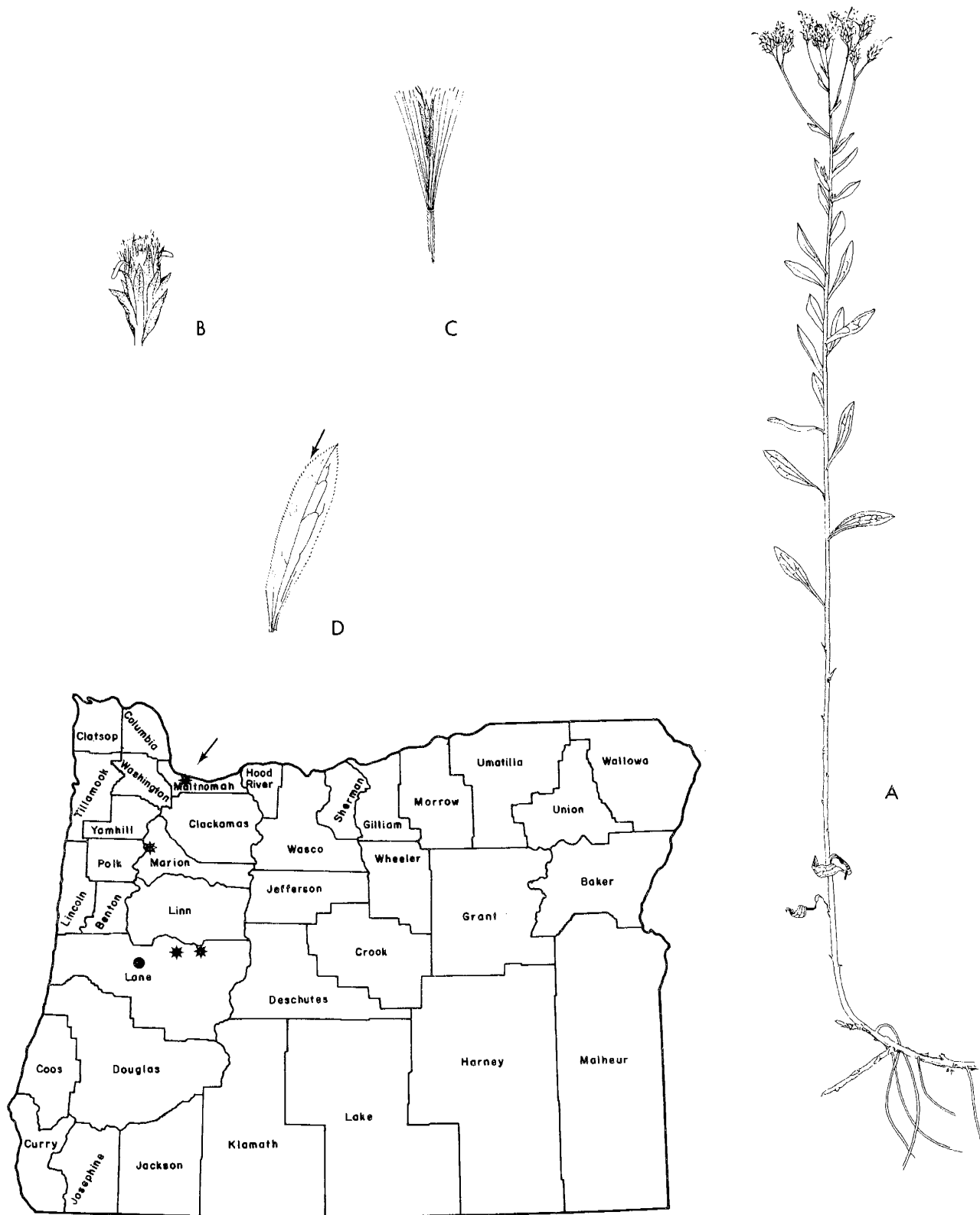


Fig. 19. *Aster curtus*. A: Habit, X 0.7; B: Flower head, X 2; C: Disc floret, X 4; D: Stem (cauline) leaf, indicating scabrous-ciliolate margin, X 1 (drawn from Piper s.n., WS).

ASTER GORMANII (Piper) Blake

(Gorman's Aster)

Composite family (Asteraceae)

ORIGINAL PUBLICATION: Rhodora 30:228. 1928.

SYNONYMS: *Eucephalus gormanii* Piper (Proc. Biol. Soc. Wash. 29:101. 1916).

STATUS: Candidate species for federal listing, Category 2, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Rhizomatous perennial, 10-30 cm tall; leaves glandular, lower leaves scale like, others crowded, sessile, 1.5-3 cm long, 3-10 mm wide; flowering heads typically solitary or several, bracts arranged in a tight spiral, green tipped and sharp pointed; rays eight to thirteen, white, pink or purple, about one cm long; pappus double, the outer of short bristles (after Cronquist, 1955; Thompson, 1977).

DISTRIBUTION: *Aster gormanii* occurs in the Cascades of Clackamas, Jefferson, Linn, and Marion counties, Oregon, particularly on Mount Jefferson.

TAXONOMIC PROBLEMS: *Aster gormanii* has been treated as a subspecies of *A. paucicapitatus* (Hickman, 1968).

LOOK ALIKES: *Aster gormanii* hybridizes with the more widespread *A. ledophyllus*, from which it may be distinguished by its glandular or glandular hairy, but not cottony, leaf pubescence (Thompson, 1977).

PHENOLOGY: This species blooms from July to September.

HABITAT: Occurring on gravelly scree and talus slopes in open, exposed areas from ca. 1400 to 1830 m. Associated species include *Abies procera*, *Tsuga mertensiana*, *Comandra umbellata*, *Arctostaphylos nevadensis*, and *Juniperus communis*.

LAND OWNERSHIP/MANAGEMENT: Bureau of Land Management and U.S. Forest Service.

PRESENT AND POTENTIAL THREATS: Logging, gravel operations, road building, trail maintenance, and recreational activities occur in this plant's habitat.

MANAGEMENT RECOMMENDATIONS: It may be necessary to reroute current trails in the Cascades where they are currently too close to existing populations.

REMARKS: Populations at the higher elevational limits are probably not threatened.

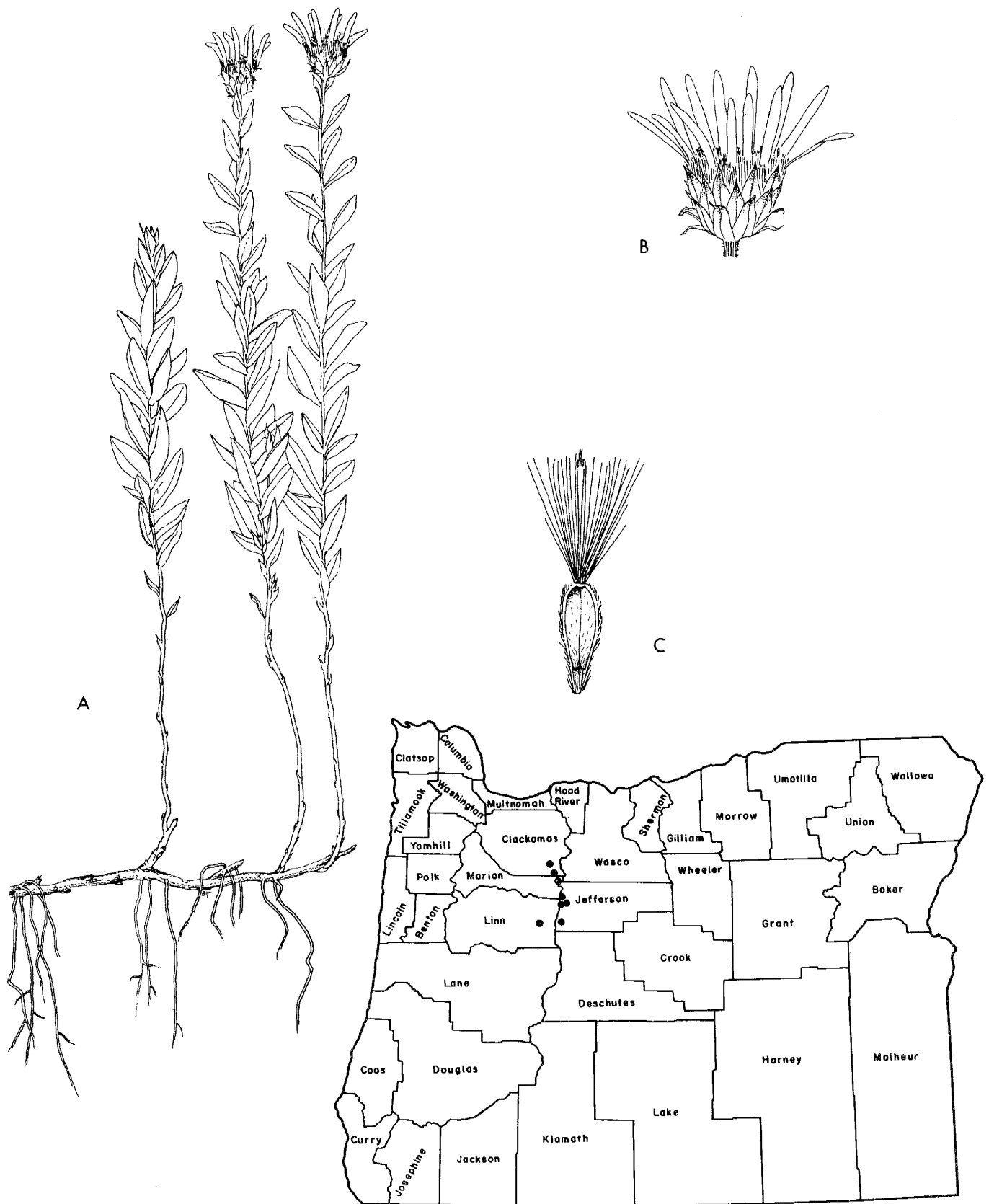


Fig. 20. *Aster gormanii*. A: Habit, X 0.8; B: Flower head, X 1.7; C: Disc floret, achene, and pappus, X 5 (drawn from Urban 5118, ORE).

ASTER PALUDICOLA Piper

(Western bog aster)

Composite family (Asteraceae)

ORIGINAL PUBLICATION: Contr. U.S. Nat. Herb. 16:210. 1913.

STATUS: Candidate species for federal listing, Category 2, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Glabrous perennial, stems slender, 6-8 dm tall; leaves linear lanceolate, sessile, entire and acute, 8-12 cm long, 5-7 mm wide; inflorescence a loose cyme, heads few; involucre 6-8 mm high, with 20-25 loose, glabrous bracts; rays violet, ca. 8 mm long; pappus sordid; achenes canescent (after Piper, 1913).

TAXONOMIC PROBLEMS: *Aster paludicola* is a dubious species closely related to *A. occidentalis*. The few known collections of this taxon have been subjected to considerable taxonomic scrutiny and controversy, some botanists feeling it best treated as an ecotype of *A. occidentalis* and unworthy of recognition, while others claim it is indeed a separate and recognizable entity.

LOOK ALIKES: Said to differ from *A. occidentalis* by virtue of being glabrous throughout and having fewer (13 or less) ray flowers.

PHENOLOGY: Western bog aster flowers from May to July.

HABITAT: Restricted to serpentine-influenced *Darlingtonia* bogs, with *Viola lanceolata* ssp. *occidentalis*, *Lilium* spp., and *Mimulus guttatus*, at lower to moderate elevations.

LAND OWNERSHIP/MANAGEMENT: Found on private, Bureau of Land Management, and U.S. Forest Service lands.

PRESENT AND POTENTIAL THREATS: This plant is threatened by increasing strip mining and bog drainage on private land.

MANAGEMENT RECOMMENDATIONS: Regulate local mining and other surface disturbances in order to preserve essential habitat.

REMARKS: There are few recent sightings of *A. paludicola*. At least two are known to be currently threatened by nearby mining. Additional collections are needed to help in clarifying the questionable taxonomic position of this species. Until such material becomes available for study *A. paludicola* should probably be considered as a taxon of low listing priority.



Fig. 21. *Aster paludicola*. A: Habit, X 0.2; B: Habit, upper stem leaves and inflorescence stalk, X 1.2; C: Disc floret, achene, and pappus, X 5 (redrawn from Ferris [1960], plate 5536).

ASTER VIALIS (Bradshaw) Blake

(Wayside aster)

Composite family (Asteraceae)

ORIGINAL PUBLICATION: Rhodora 30:228. 1928.

SYNONYMS: *Eucephalus vitalis* Bradshaw (Torreya 20:122-123. 1921).
Sericocarpus sipei Henderson (Madrono 2:105 1933).

STATUS: Candidate species for federal listing, Category 1, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Perennial, 6-12 dm tall; lower leaves scale like, upper elliptic or broadly lanceolate, sessile, entire or with a few teeth, 5-9 cm long, 1.5-3 cm wide, glandular beneath; heads several to many in a leafy bracteate inflorescence, bracts sharp pointed and somewhat keeled; no ray flowers, disc flowers yellow; pappus with a few outer bristles (after Cronquist, 1955).

DISTRIBUTION: Southern Willamette Valley of Douglas and Lane counties, Oregon.

TAXONOMIC PROBLEMS: Thompson (1977) considers *A. vialis* intermediate between *A. engelmannii* Gray and *A. brickelliioides*. He feels it is best placed as a variety of *A. engelmannii*.

LOOK ALIKES: *Aster vialis* may be distinguished from *A. brickelliioides* by its larger heads (5 mm or greater). Many of the taller asters are quite similar and a reliable key is often the only adequate means of separation.

PHENOLOGY: *Aster vialis* is in flower from July to early August.

HABITAT: Woodlands, with *Pseudotsuga menziesii*, *Castanopsis chrysophylla*, and *Arbutus menziesii*.

LAND OWNERSHIP/MANAGEMENT: Occurs on private and perhaps also Bureau of Land Management property.

PRESENT AND POTENTIAL THREATS: Increasing urbanization and agricultural development are primary threats.

MANAGEMENT RECOMMENDATIONS: Until its rediscovery in 1980, the most recent collection of this species was recorded in 1933. Field searching should continue to determine if there are any extensive populations.

REMARKS: The ecologic requirements of *A. vialis* are apparently the principle factor affecting its restricted range. Whether this species is very sensitive to disturbance, simply rare to begin with, or a combination of both is not entirely clear.

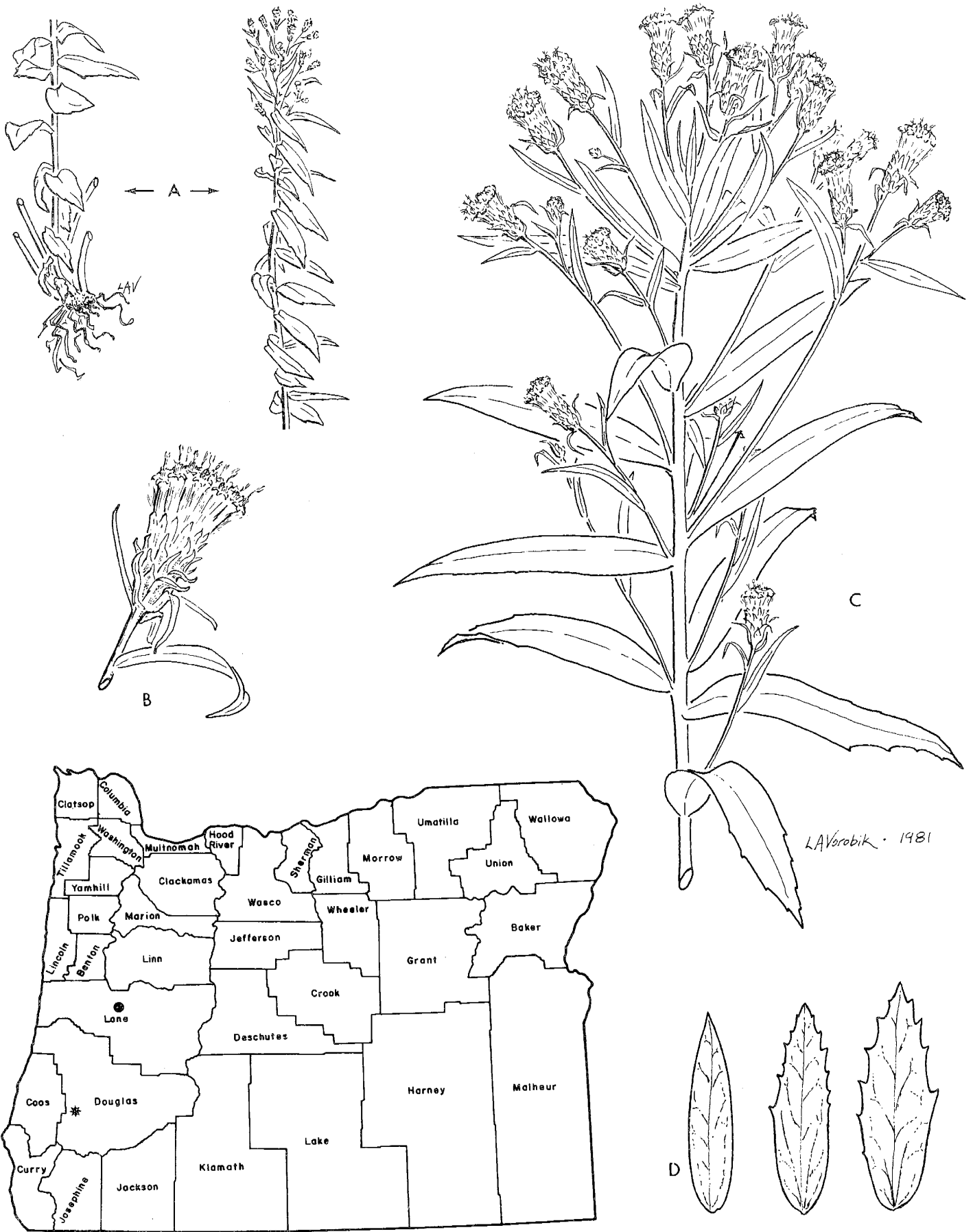


Fig. 22. *Aster vialis*. A: Habit (lower and upper stem divided), X 0.5; B: Flower head with leafy bracts, X 4; C: Inflorescence and upper stem leaves, X 1; D: Variation of leaf and bract margins, X 0.5 (drawn from fresh specimen).

ASTRAGALUS APPLLEGATII Peck

(Applegate milkvetch)

Pea family (Fabaceae)

ORIGINAL PUBLICATION: Proc. Biol. Soc. Wash. 49:111. 1936.

STATUS: Candidate species for federal listing, Category 1, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Slender perennial, stems 3-4 dm long; leaves 3.5-7 cm long with 7-11 leaflets; racemes 8-20 mm long, 10-18 flowered; flowers early spreading and ultimately declined, axis elongating to 3-7 cm in fruit; calyx hairy; petals whitish, to 7 mm long, the keel tip faintly lilac tinged; pod widely spreading or declined, stipitate, body 8-11 mm long, 2.4-8 mm in diameter, straight or nearly so; valves green or faintly purple speckled or mottled, dehiscence starting at top of pod and continuing downward; ovules eight to ten (after Barneby, 1964).

DISTRIBUTION: This species is apparently restricted to an area near Klamath Falls in Klamath County, Oregon, and possibly in adjacent Siskiyou County, California.

TAXONOMIC PROBLEMS: None indicated, although the exact taxonomic position of a species known from such limited material (see Remarks) is always open to further research.

LOOK ALIKES: The only other *Astragalus* occurring in the same moist habitat type of this species is *Astragalus lemmonii*. *A. lemmonii* differs from *A. applegatii* in its flowers which are arranged in short crowded racemes on peduncles paired in all or most axils, and its fully bilocular, sessile, grooved pod (Barneby, 1964).

PHENOLOGY: Reportedly flowering from June to early August.

HABITAT: Meadows and moist ground along wayside ditches at about 1250 m, according to label data.

LAND OWNERSHIP/MANAGEMENT: Unknown, possibly U.S. Fish and Wildlife Service.

PRESENT AND POTENTIAL THREATS: Flooding and agriculture.

MANAGEMENT RECOMMENDATIONS: Field searches should be conducted to determine if any populations of this species are extant. Essential habitat will need to be assessed should any be discovered.

REMARKS: This species is represented by only two collections, the most recent taken in 1931.



Fig. 23. *Astragalus applegatii*. A: Habit, X 0.5; B: Pod, indicating stipitate base, X 7 (drawn from Peck 16784 [holotype], WILLU).

ASTRAGALUS COLLINUS Dougl. ex Hook. VAR. LAURENTII (Rydb.) Barneby

(Lawrence's milkvetch)

Pea family (Fabaceae)

ORIGINAL PUBLICATION: American Midland Naturalist 55:487. 1956.

SYNONYMS: *Homalobus laurentii* Rydb. (Bull. Torr. Club 51:15. 1924).
Astragalus laurentii (Rydb.) Peck (Man. Pl. Ore. 443. 1940; Madrono
6:134. 1941).

STATUS: Candidate species for federal listing, Category 2, United States
Fish and Wildlife Service (Federal Register 45:82480-82569. December
15, 1980).

DESCRIPTION: Stems clustered, erect or decumbent at base, with short
crisp pubescence, 2-4 dm high; leaves 3-5 cm long, the leaflets
11-17, linear to cuneate, 6-10 mm long, woolly pubescent; peduncles
longer than the leaves; racemes many flowered; calyx about 10 mm long,
woolly pubescent; corolla cream or yellowish, about 15 mm long; pods
reflexed, the stipe 5-7 mm long, the body 10-13 mm, villous (after
Peck, 1961).

DISTRIBUTION: Endemic to the Columbia Plateau, in Gilliam, Morrow, and
Umatilla counties, Oregon, and possibly Sherman County as well.

LOOK ALIKES: *Astragalus collinus* is similar to the hairier *A. curvicaupus*,
separated further by Barneby (1964) by the impressed pod reticulation of
the former, elevated in the latter. *A. collinus* var. *laurentii* has a
"plumper ... and shorter" pod than that of var. *collinus*, but Barneby
(1964) admits that these two varieties as well as *A. curvicaupus* may
intergrade to some extent.

PHENOLOGY: Flowering and fruiting from May to August.

HABITAT: Occurring on dry slopes, in sandy or rocky substrates, at
elevations ranging from ca. 600 to 1100 m. Associates include *Agropyron*
spicatum, *Poa sandbergii*, *Festuca idahoensis*, and *Bromus tectorum*.

LAND OWNERSHIP/MANAGEMENT: Mostly private, with scattered Bureau of Land
Management parcels.

PRESENT AND POTENTIAL THREATS: Much of the Columbia Plateau is intensely
farmed, and what is too rocky for farming is heavily grazed. This plant
may suffer from the competitive pressure of introduced weeds.

MANAGEMENT RECOMMENDATIONS: Known populations should be sheltered from
agricultural disturbances if possible.

REMARKS: There are very few extant sites remaining for this milkvetch.

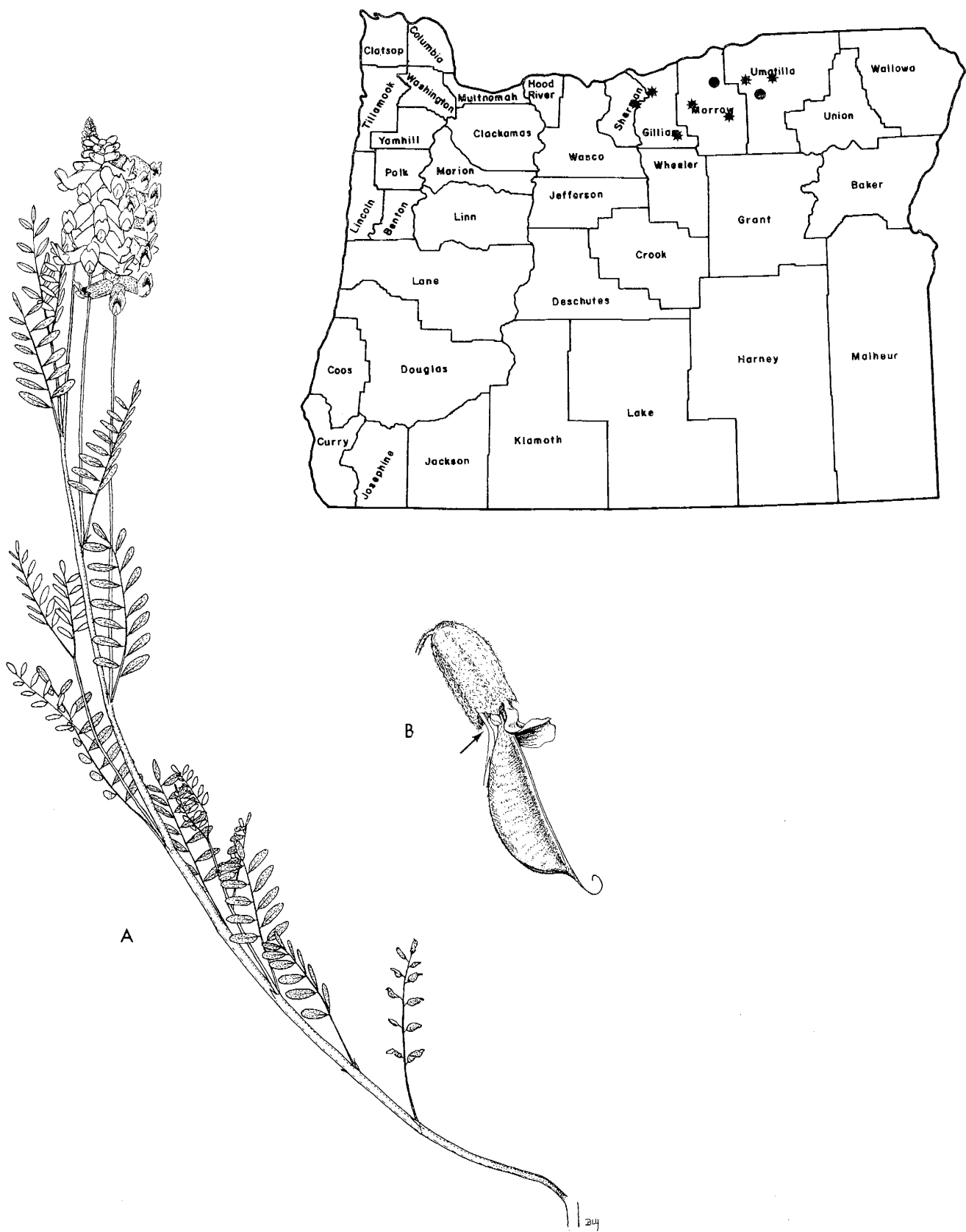


Fig. 24. *Astragalus collinus* var. *laurentii*. A: Habit, single branch from base, X 0.7; B: Pod (stipe hidden by calyx), X 3 (drawn from Lawrence 744, ORE).

ASTRAGALUS HOODIANUS Howell

(Hood River milkvetch)

Pea family (Fabaceae)

ORIGINAL PUBLICATION: Erythea 5:111. 1893.

SYNONYMS: *Phaca hoodianus* (Howell) Piper (Contr. U.S. Nat. Herb. 11 [Fl. Wash.]:373. 1906).

Cnemidophacos hoodianus (Howell) Rydb. (N. Amer. Fl. 24:285. 1929).

Astragalus reventus Gray var. *hoodianus* (Howell) Peck (Man. Pl. Ore. 444. 1940).

STATUS: Candidate species for federal listing, Category 2, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Stems closely clustered on a much branched woody base, 1-2 dm high exclusive of the peduncles, pilose; leaves erect, 1-2 dm long, the leaflets 21-35, linear or narrowly oblong, 8-15 mm long; peduncles equalling or surpassing the leaves, stout and rigid, 6-15 flowered, the flowers nodding; calyx pubescent, 8-10 mm long, the teeth half as long as the tube; corolla white or tinged with greenish yellow, about 2 cm long; pods, without the beak, 2-3 cm long (after Peck, 1961).

DISTRIBUTION: The Hood River milkvetch is endemic to hills near the Columbia River in Wasco and Hood River counties, Oregon, and Klickitat County, Washington.

LOOK ALIKES: Similar to *A. conjunctus*, but more robust and "copiously pilosulous" (softly hairy) which according to Barneby (1964) "provides an easily observed criterion at all stages of growth". *A. conjunctus* also has purple flowers as opposed to the cream or yellow of *A. hoodianus*.

PHENOLOGY: *Astragalus hoodianus* flowers from March to June.

HABITAT: Dry hillsides in gravelly or rocky soils, usually at altitudes below 180 m. Described as occurring in "bunchgrass rangeland."

LAND OWNERSHIP/MANAGEMENT: Private, with perhaps some local municipally owned lands near The Dalles and Hood River.

PRESENT AND POTENTIAL THREATS: Urbanization, agriculture, grazing, and offroad vehicles.

MANAGEMENT RECOMMENDATIONS: Continued inventory and monitoring (particularly with respect to grazing) is suggested.

REMARKS: Described from early collections as "plentiful", there are very few extant sites known today. This is a conspicuous milkvetch, not easily overlooked.

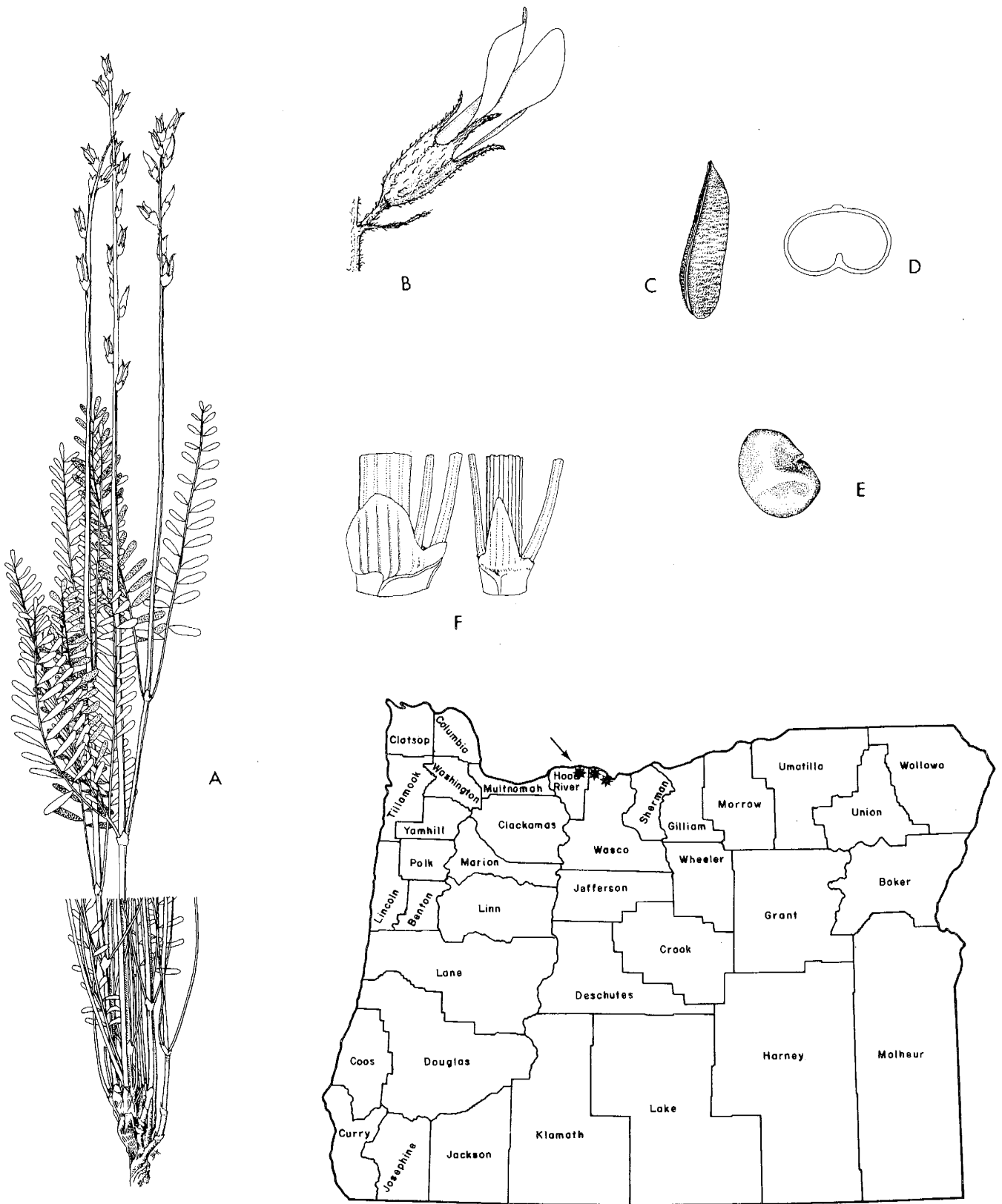


Fig. 25. *Astragalus hoodianus*. A: Habit, partially cut away, X 0.3; B: Flower, X 2; C: Pod, X 1; D: Pod cross section, X 2; E: Seed, X 8; F: Partially connate stipules, X 2.5 (drawn from Lawrence 99, OSC).

ASTRAGALUS KENTROPHYTA Gray VAR. DOUGLASII Barneby

(Douglas' thistle milkvetch)

Pea family (Fabaceae)

ORIGINAL PUBLICATION: Mem. New York Bot. Garden 13:364-365. 1964.

STATUS: Candidate species for federal listing, Category 1, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Prostrate, densely matted perennial; short stems covered with short grayish hairs, becoming woody toward base, about 16 cm long; leaves with five to seven linear leaflets (5-12 mm long), becoming prickly, covered with short grayish appressed hairs; small whitish flowers born in leaf axils, singly or in twos or threes; calyx 4.7-5.2 mm long with spiny teeth; pods two seeded, slightly incurved, 5-5.5 mm long (after Barneby, 1964).

DISTRIBUTION: Near the "big bend" of the Columbia River, in the vicinity of Walla Walla, Washington and extreme northern Umatilla County, Oregon.

TAXONOMIC PROBLEMS: This taxon, last collected in 1883, was described as a new entity by Barneby (1964) since it did not "fit ... into any previously recognized variety of *A. kentrophyta*."

PHENOLOGY: Presumably flowering late spring to summer.

HABITAT: Probably on sandy ground with scant vegetation. Barneby (1964) suggests it may occur on dunes or eroded riverbanks at low elevations, while Hitchcock & Cronquist (1973) state it is restricted to sagebrush desert foothills.

LAND OWNERSHIP/MANAGEMENT: Unknown, probably Bureau of Land Management or private.

PRESENT AND POTENTIAL THREATS: Expanding agricultural development poses the greatest threat to remaining potential habitat.

MANAGEMENT RECOMMENDATIONS: Additional field searching is needed to locate extant populations of this species. Any populations found on federal land should be given management consideration.

REMARKS: This taxon is known from only three collections. The data on the herbarium labels gives no exact localities, and populations may have been inundated by Columbia River dam projects. The area encompassing its range is poorly botanized today.



Fig. 26. *Astragalus kentrophyta* var. *douglasii*. A: Habit of branch indicating axillary flowering, with inset showing stiff hairs, X 1; B: Compound leaf, indicating prickly leaflet tips, X 3; C: Flower, X 9; D: Pod, X 11 (drawn from Brandegee & Tweedy 734 [holotype], NY).

ASTRAGALUS MULFORDAE Jones

(Mulford's milkvetch)

Pea family (Fabaceae)

ORIGINAL PUBLICATION: Contr. West. Bot. 8:18. 1898.

SYNONYMS: *Onix mulfordae* Rydb. (Bull. Torrey Club 40:51. 1913).

STATUS: Candidate species for federal listing, Category 1, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Perennial with long taproot and freely branched crown, stems slender, 3-20 cm long; leaves 4-10 cm long; leaflets 11-23, linear to elliptic, 3-8 mm long; racemes 5-20 flowered; corollas spreading to ascending, white to whitish, drying yellow, often bluish lined or tinged, 5-9 mm long; calyx 2.8-5 mm long, teeth narrow, 0.8-2 mm long; pod with slender stipe, membranaceous, 8-15 mm long, beaked, upper suture prominent (after Barneby, 1964).

DISTRIBUTION: Near the Snake River and on the Snake River Plain in northeastern Malheur County, Oregon, and adjacent western Idaho.

LOOK ALIKES: *Astragalus mulfordae* may be distinguished from other local *Astragalus* by its small white flowers, connate lower stipules which form a sheath, and the pendulous, stipitate, three faced pod. The similar appearing *A. oniciformis* differs noticeably in its more dense and loose pubescence and lack of connate stipules (Barneby, 1964), but presently these taxa are not quite sympatric.

PHENOLOGY: *Astragalus mulfordae* blooms from May to June.

HABITAT: This plant prefers old river deposits, sandy places near rivers, sandy bluffs, and dunelike talus in the foothills at approximately 670 to 850 m (Packard, 1977), presumably with *Artemisia* spp.

LAND OWNERSHIP/MANAGEMENT: Bureau of Land Management and private.

PRESENT AND POTENTIAL THREATS: Urbanization and grazing are of prime concern, particularly habitat conversion incurred by the latter activity.

MANAGEMENT RECOMMENDATIONS: Essential habitat determinations are needed concerning known sites.

REMARKS: *Astragalus mulfordae* is known from few localities, the majority in Idaho. Packard (1977) comments that "it has a fairly broad range but is very infrequent." This infrequent taxon occurs in areas which have been historically overgrazed.

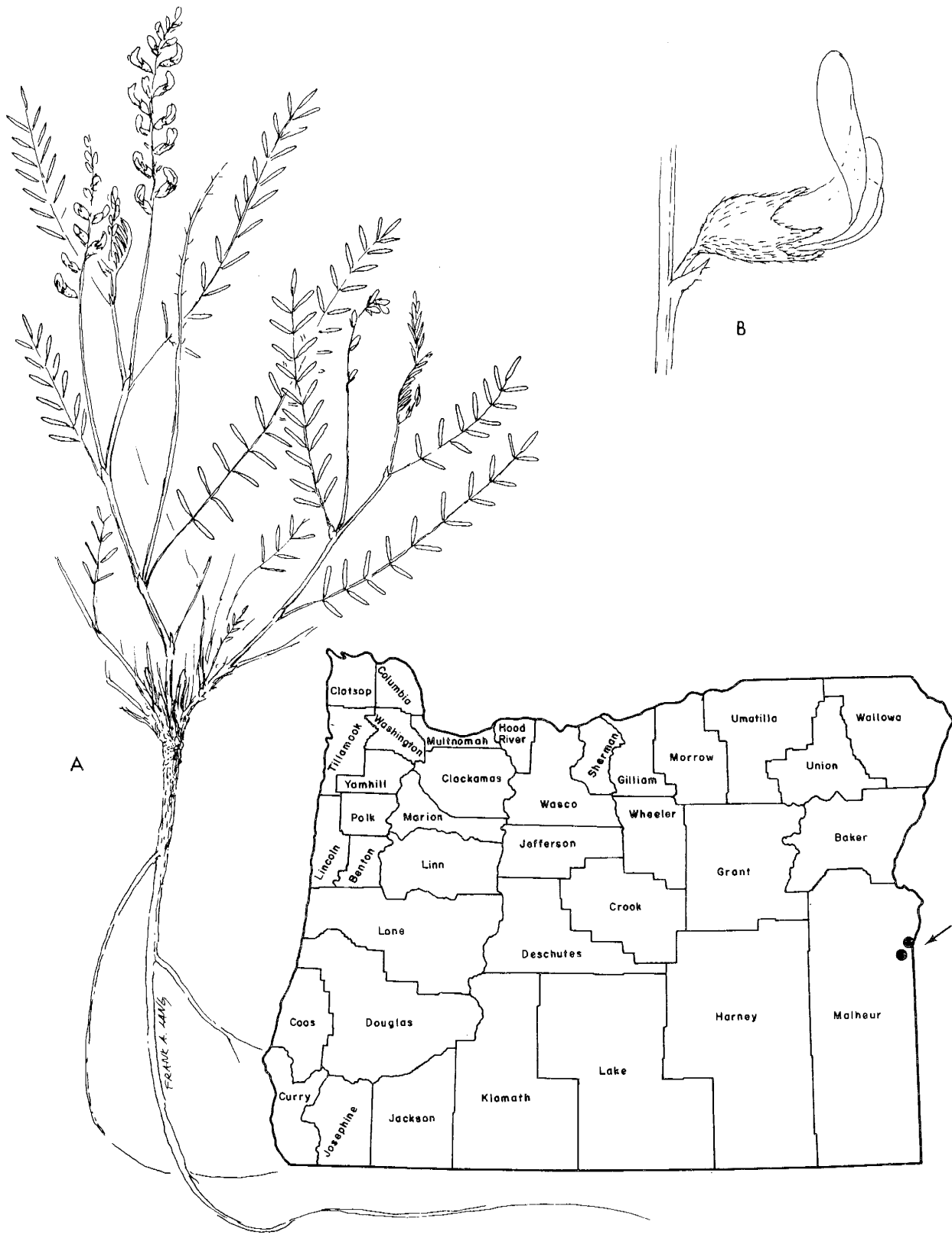


Fig. 27. *Astragalus mulfordae*. A: Habit, X 0.8; B: Flower, X 6 (drawn from Peck 21231, WILLU).

ASTRAGALUS PECKII Piper

(Peck's milkvetch)

Pea family (Fabaceae)

ORIGINAL PUBLICATION: Proc. Biol. Soc. Wash. 37:92. 1924.

STATUS: Candidate species for federal listing, Category 2, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Perennial, branched, ca. 1-6 dm long, herbage minutely pubescent, branches erect or somewhat prostrate; leaves pinnate with leaflets acutish, mostly folded, 2-6 mm long, terminal leaflet rudimentary; inflorescence axillary, shorter than the leaves, about six flowered; corolla cream, 6-7 mm long; calyx puberulent with somewhat appressed hairs; pods sessile, oblong linear, compressed, 4-8 mm long (after Kennison & Meinke, unpub.).

DISTRIBUTION: Endemic to central Oregon on the east flank of the Cascades, in Deschutes, Klamath, and Crook counties.

LOOK ALIKES: This is a rather unique milkvetch, distinguished by its lax habit, numerous small flowers, tiny three angled pods, and stiffly sharp, basally persisting petioles.

PHENOLOGY: *Astragalus peckii* flowers from June to early August.

HABITAT: Occurring in very dry sites, on loose, sandy soil or pumice at elevations from ca. 900-1100 m. Often found in or along dry watercourses. Typically in the juniper-sagebrush association or with scattered lodgepole pine, occasionally on barren flats. Associates include *Purshia tridentata*, *Mimulus nanus*, *Astragalus purshii*, *Penstemon humilus*, and *Leptodactylon pungens*.

LAND OWNERSHIP/MANAGEMENT: Mostly on private land, with some U.S. Forest Service and possibly State lands involved.

PRESENT AND POTENTIAL THREATS: Increasing urban pressures from the Bend and Sisters areas, agriculture, logging, and intensifying offroad vehicle activities are major threats.

MANAGEMENT RECOMMENDATIONS: The sites where this species occurs on federal land should be extended careful consideration in management schemes, since most known populations are in the hands of private enterprisers. Monitoring is recommended, particularly to observe disturbance tolerances.

REMARKS: *Astragalus peckii* was rediscovered in 1980 after eluding botanists for 30 years. It is locally common at a few localities. Nevertheless, it is definitely threatened by a host of activities. The largest population occurs at the bottom of a dried reservoir.

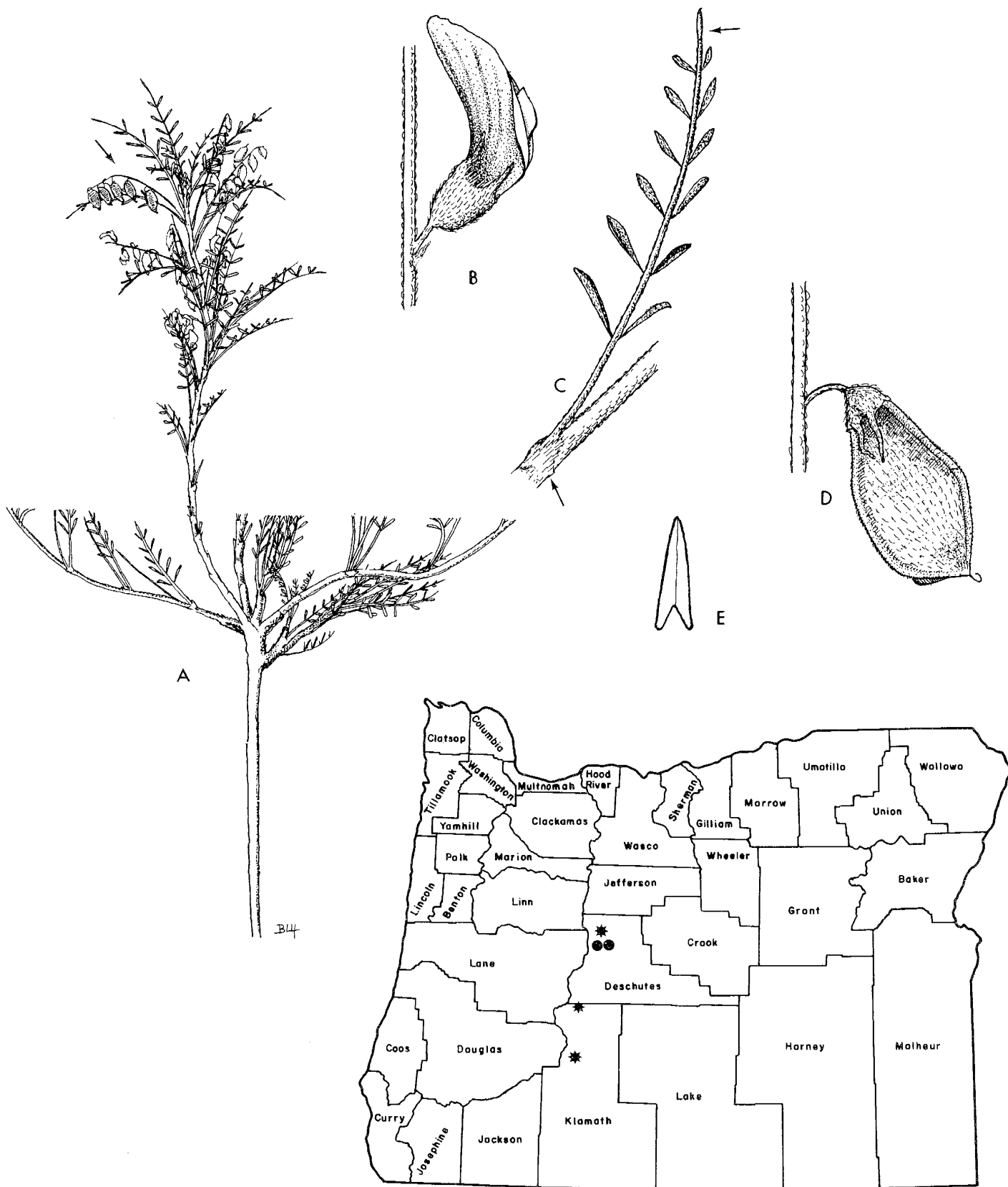


Fig. 28. *Astragalus peckii*. A: Habit, partially cut away, showing leafy inflorescences, X 0.8; B: Flower, X 6; C: Leaflet, indicating connate stipule and rudimentary terminal leaflet, X 5; D: Three angled pod, X 8; E: Pod cross section, X 8 (drawn from Cusick 2818, ORE).

ASTRAGALUS ROBBINSII (Oakes) Gray VAR. ALPINIFORMIS (Rydb.) Barneby

(Robbin's milkvetch)

Pea family (Fabaceae)

ORIGINAL PUBLICATION: Vascular Plants of the Pacific Northwest 3:258. 1961.

SYNONYMS: *Atelophragma alpiniforme* Rydb. (Bull. Torr. Club 55:129. 1928).
Astragalus alpinus L. var. *alpiniformis* (Rydb.) Peck (A Manual of the Higher Plants of Oregon. 1941).
Astragalus alpiniformis Rydb. (A Manual of the Higher Plants of Oregon, 2nd Ed. 1961).

STATUS: Candidate species for federal listing, Category 1, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Perennial herb from a taproot, sparsely strigillose to glabrate, stems decumbent based, 2-6 dm long; leaves 6-12 cm long; leaflets 7-19, 5-12 mm long, thin and succulent; racemes loosely ten to thirty flowered; flowers 6-10 mm long, purplish, calyx 1/2-2/3 the length of the corolla; stipe 1.2-2 mm; pod spreading to reflexed, 8-11 mm long, 4-5 mm wide, ovules 3-6 (after Hitchcock, 1961; Barneby, 1964).

DISTRIBUTION: Restricted to drainages of the north slope of the Wallowa Mountains, Wallowa County, Oregon.

LOOK ALIKES: This is extremely similar, morphologically and ecologically, to *A. alpinus* with which it commonly associates. *A. alpinus* differs primarily in its lack of an above ground stem origin (Hitchcock & Cronquist, 1973), a difficult and somewhat arbitrary distinguishing field character, especially if the observer is not familiar with these plants in the field. The problem is compounded by the habitat, which is subject to flash floods. Plants partially buried by sediment are particularly easy to pass over as *A. alpinus*.

PHENOLOGY: Flowering from June through August.

HABITAT: Occurring on brushy stream banks and gravel bars from 1280 upward to about 2150 m. In its riparian habitat it is sometimes subjected to flooding. Rarely it is found on open flats in the forest near streams. Associates include *Astragalus alpinus*, *Oxytropis viscida*, *Hedysarum boreale*, and *Androsace septentrionalis*.

LAND OWNERSHIP/MANAGEMENT: U.S. Forest Service.

PRESENT AND POTENTIAL THREATS: Primary threats are severe flooding and recreational activities (especially pack trains).

MANAGEMENT RECOMMENDATIONS: Regulate the use of Hurricane Creek Trail (leading into the Eagle Cap Wilderness Area) to lessen the impact on the habitat of this and other sensitive taxa occurring in the area.

REMARKS: This plant was rediscovered in 1979 after a 33 year collection void.



Fig. 29. *Astragalus robbinsii* var. *alpiniformis*. A: Habit, indicating zone of stem origin, X 0.7; B: Pod, stipe hidden by calyx, X 1.3 (drawn from Cusick 2303, WS).

ASTRAGALUS SOLITARIUS Peck

(Solitary milkvetch)

Pea family (Fabaceae)

ORIGINAL PUBLICATION: Leaf1. West. Bot. 4:181-182. 1945.

STATUS: Candidate species for federal listing, Category 2, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Slender, wiry perennial; stems few, up to 5 dm, leafless at base; leaves 2-7 cm long with 5-9 leaflets, 3-15 mm long, mostly pubescent on both sides; racemes loosely three to thirty flowered; calyx 2.6-3.2 mm long with white or partly black hairs; petals pale lilac drying yellowish white; pod pendulous, stipitate, body narrowly oblong or lance oblong in profile, 1-2.5 cm long, 3-5 mm in diameter, valves often faintly purple mottled, becoming papery (after Barneby, 1964).

DISTRIBUTION: *Astragalus solitarius* is found in southern Harney and Malheur counties in southeast Oregon and in adjacent Humboldt County, Nevada.

LOOK ALIKES: *Astragalus solitarius* resembles *A. filipes*. The former may be distinguished by its flexuous stems which are unusually tall for their diameter, the few and narrow leaflets, and the distinct tiny flowers.

PHENOLOGY: The species blooms from May to early July.

HABITAT: *Astragalus solitarius* frequents the stiff clays of valley floors and mesas, usually in close association with *Artemisia arbuscula* and *Sarcobatus vermiculatus* (Barneby, 1964), between 1150 and 1450 m.

LAND OWNERSHIP/MANAGEMENT: The habitat of this milkvetch is administered by the Bureau of Land Management and private landowners.

PRESENT AND POTENTIAL THREATS: Mining and offroad vehicles are immediate threats, as well as grazing and rangeland improvements.

MANAGEMENT RECOMMENDATIONS: Protect populations from adverse affects of surface mining wherever possible and monitor offroad traffic.

REMARKS: Packard (1978) comments: "In spite of the fair sized range of (*A. solitarius*), its frequency is low and pod set is poor." This species is usually found tangled and climbing amongst stiff shrubs. This is perhaps an evolutionary adaptation which enabled it to escape native grazing animals, and which now affords it some protection from domestic stock. There are numerous recent records of this species and its sensitive status is questionable.

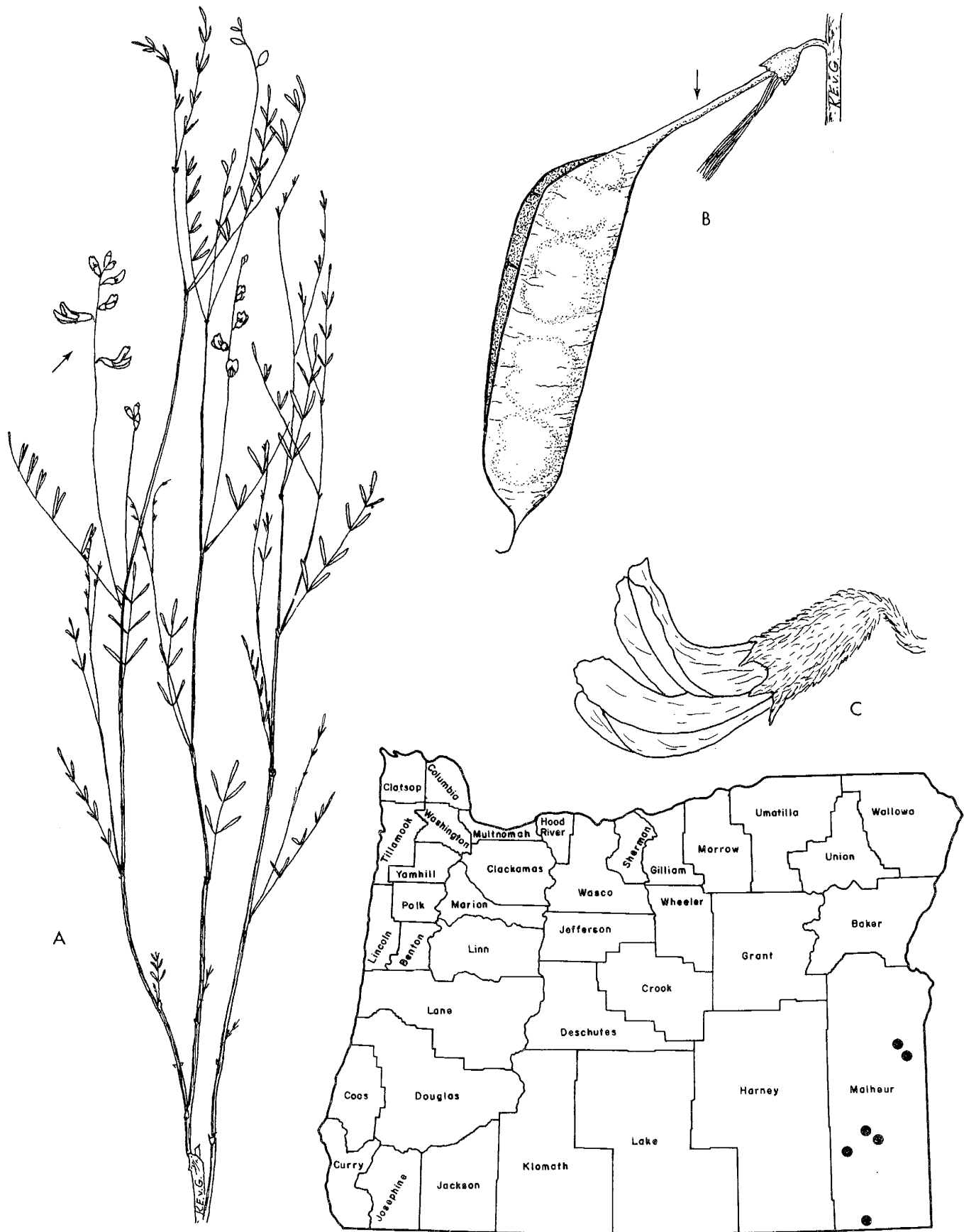


Fig. 30. *Astragalus solitarius*. A: Habit, illustrating loose racemes, X 0.5; B: Pod, stipe exposed, X 5; C: Flower, X 9 (drawn from Peck 25723, WILLU).

ASTRAGALUS STERILIS Barneby

(Sterile milkvetch)

Pea family (Fabaceae)

ORIGINAL PUBLICATION: Leaflet. West. Bot. 5:193-195. 1949.

STATUS: Candidate species for federal listing, Category 1, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Dwarf, wiry perennial, 7-15 cm tall; stems one to few, arising from creeping rhizomes lacking stipular sheaths; leaves compound, 2-9 cm long with six to ten scattered linear leaflets 1-5 mm long; racemes loosely two to five flowered; calyx 3.5-4 mm long, becoming papery; petals yellowish-white, fading yellowish; pod pendulous on a 3 mm stipe, balloon-like, purple mottled (after Barneby, 1964).

DISTRIBUTION: This plant is distributed along the Owyhee River in Malheur County, Oregon and adjacent Owyhee County, Idaho.

LOOK ALIKES: *Astragalus sterilis* is closely related to *A. cusickii* and may be distinguished from it by its low, freely branching growth and fewer flowered racemes (Barneby, 1964).

PHENOLOGY: *Astragalus sterilis* typically flowers in June and July.

HABITAT: Dry gravelly and sandy clay bluffs and knolls nearly bare of other vegetation, in soils of basaltic origin at 1250 to 1300 m. Associates are primarily *Artemisia tridentata*, *Poa sandbergii*, and shrubby members of the Chenopodiaceae (Packard, 1978; Barneby, 1964).

LAND OWNERSHIP/MANAGEMENT: Bureau of Land Management, Bureau of Reclamation, Oregon State Parks, and private.

PRESENT AND POTENTIAL THREATS: Offroad vehicle use, range improvement programs involving seeding and spraying for brush control, and mining.

MANAGEMENT RECOMMENDATIONS: The elimination of spraying where the species occurs is recommended. Plans to minimize the conflict between off-road vehicle enthusiasts and essential habitat need to be pursued.

REMARKS: This herb has a narrow range (approximately 30 by 15 miles) and is strictly confined to one vulnerable habitat, being infrequent even there (Packard, 1978). The substrate on which it exists is particularly susceptible to disturbance. It is doubtful that *A. sterilis* is able to reestablish populations at other than a slow and limited pace.

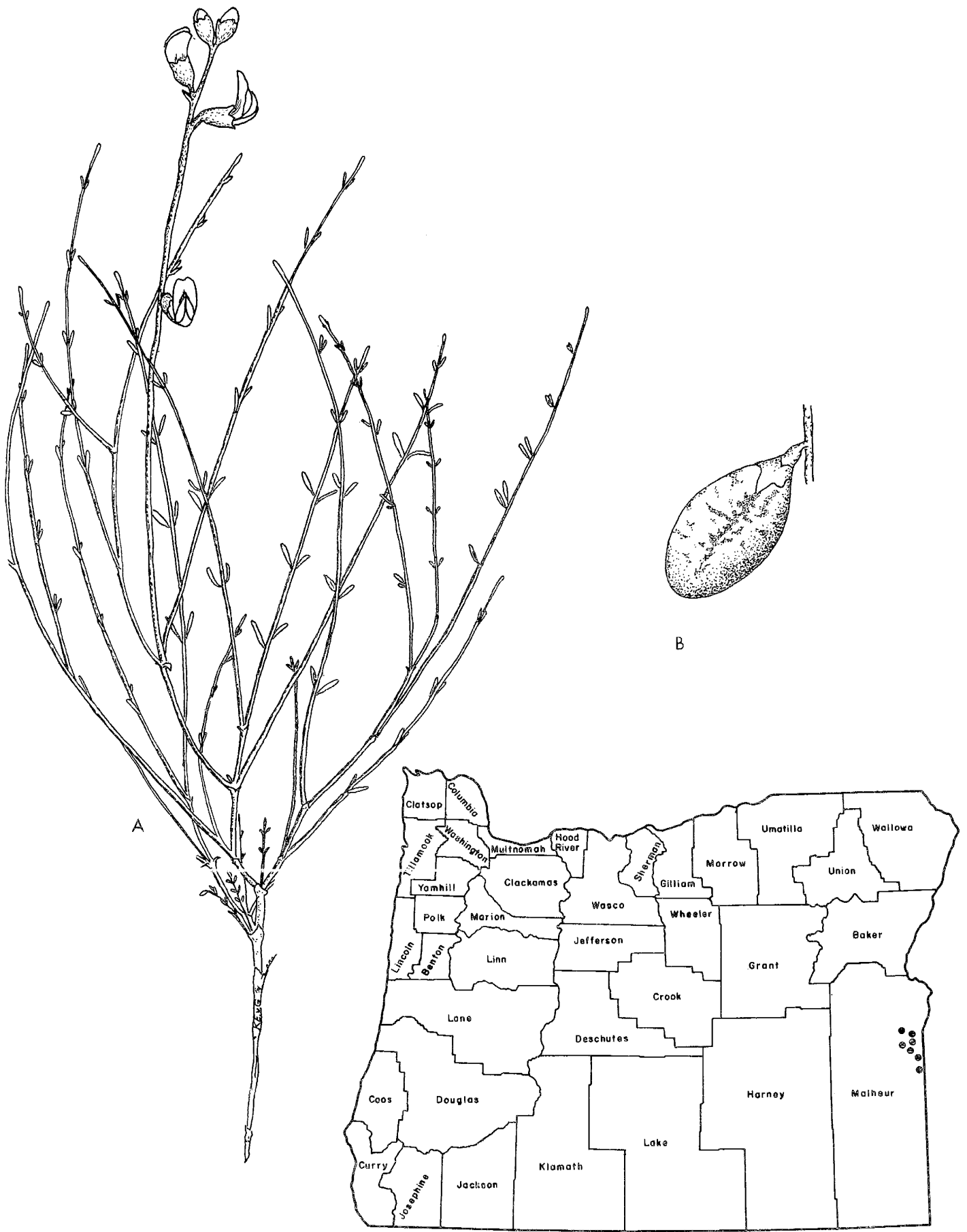


Fig. 31. *Astragalus sterilis*. A: Habit, X 1.3; B: Pod, X 1.6 (drawn from Ripley & Barneby 9415 [isotype], WILLU).

ASTRAGALUS TEGETARIOIDES Jones

(Deschutes milkvetch)

Pea family (Fabaceae)

ORIGINAL PUBLICATION: Contr. West. Bot. 10:66. 1902.

STATUS: Candidate species for federal listing, Category 2, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Prostrate, delicate perennial, the many stems arising from a tough caudex, freely branching at the lower nodes, forming mats 1-3 dm in diameter, the herbage with fine, curly hairs; leaves 1-3.5 cm long, with (5) 7-11 obovate cuneate, flat or loosely folded leaflets 1.5-5 mm long; racemes loosely (2) 3-6 (7) flowered; calyx 2.8-3.6 mm long, with spreading or curly white hairs; flowers whitish, 3.5-5.2 mm long; pod spreading or declined, ovoid, 3.5-4 mm long; seeds generally two or three (after Barneby, 1964).

DISTRIBUTION: In eastern Oregon, from disjunct sites in northern Harney and eastern Deschutes counties; recently recorded from northeastern California.

LOOK ALIKES: The prostrate habit and tiny flowers and fruit should serve to distinguish this milkvetch from other local *Astragalus* species.

PHENOLOGY: *Astragalus tegetarioides* flowers in June and July.

HABITAT: This species occurs in dry pine forests, usually in gravelly, open areas. It is to be expected at mid elevations, from ca. 1500 to 1750 m. Associated species include *Artemisia tridentata*, *A. arbuscula*, *Sitanion hystrix*, *Epilobium paniculatum*, and *Eriophyllum lanatum*.

LAND OWNERSHIP/MANAGEMENT: The Oregon Department of Transportation and U.S. Forest Service.

PRESENT AND POTENTIAL THREATS: Forest management practices which discourage natural wildfires may be suppressing this taxon.

MANAGEMENT RECOMMENDATIONS: Further inventory of historical sites and likely habitat in intervening areas would be useful. The ecology of this milkvetch may depend to an extent on disturbance provided by forest or brush fires. Additional field observations may provide clues to the puzzling ecologic questions surrounding this plant.

REMARKS: Gruber et al. (1979) suggests that *A. tegetarioides* "may be an early seral species in the pine forest, appearing in openings made by fire." Although currently known from only three widely separated locations, it grows "vigorously" on roadcuts and along roadsides in Harney County. This species' spotty geographic range may eventually be explained in part by subtle edaphic specificities.

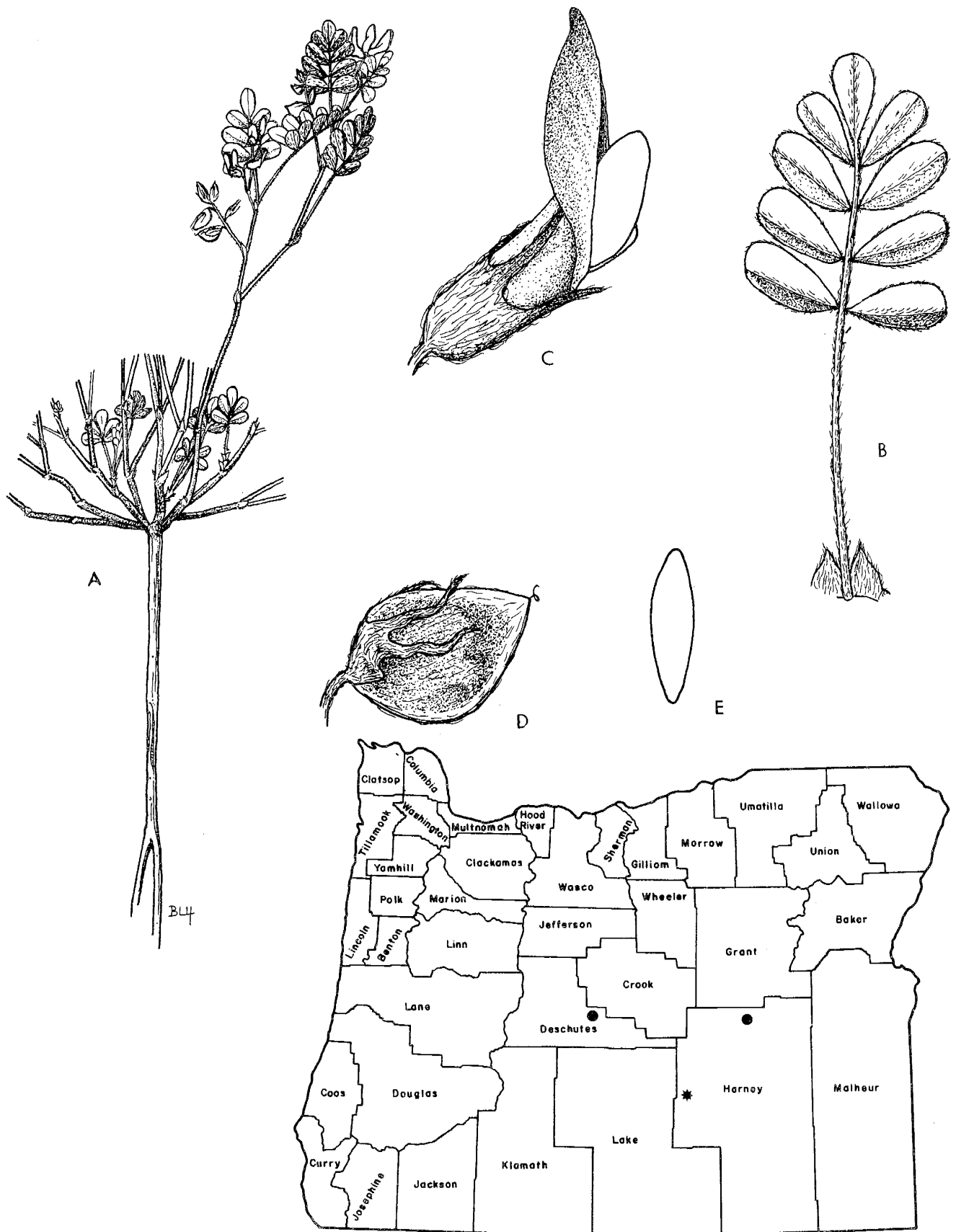


Fig. 32. *Astragalus tegetarioides*. A: Habit, partially cut away (branch actually prostrate and not ascending), X 1; B: Leaf, X 5; C: Flower, X 12; D: Pod, X 10; E: Pod cross section, X 10 (drawn from Nelson & Nelson 5988, HSC).

ASTRAGALUS TWEEDYI Canby

(Tweedy's milkvetch)

Pea family (Fabaceae)

ORIGINAL PUBLICATION: Bot. Gaz. 15:150. 1890.

SYNONYMS: *Phaca tweedyi* Piper (Contr. U.S. Nat. Herb. 11:371. 1906).
Homalobus tweedyi Rydb. (Bull. Torrey Club 51:14. 1924).

STATUS: Candidate species for federal listing, Category 2, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Slender perennial herb, 3-4 dm high, canescent puberulent throughout, branched above; leaves 5-8 cm long, the 13-19 leaflets linear or narrowly oblong, 12-15 mm long, obtuse or retuse; peduncles stout, longer than the leaves; racemes dense, 3-4 cm long; calyx 7-9 mm long, cylindrical; corolla ochroleucous, 15 mm long; pods oblong, 12-16 mm long, nearly glabrous, erect, on long slender stipes (after Peck, 1961).

DISTRIBUTION: Endemic to the Columbia Basin, from Wasco, Sherman, and Gilliam counties, Oregon, northwards to Yakima County, Washington.

LOOK ALIKES: Quite similar to *A. collinus*, the latter distinguished by its declining flowers and pendulous pods.

PHENOLOGY: Flowering from May to July.

HABITAT: Dry, more or less rocky hillsides and meadows, from less than 100 to ca. 800 m altitudes. Mostly in the sagebrush-bunchgrass associations, with *Bromus tectorum*, *Lomatium* spp., *Agropyron spicatum*, *Poa sandbergii*, *Crepis* spp, and *Artemisia tridentata*.

LAND OWNERSHIP/MANAGEMENT: Occurring on private and possibly Bureau of Land Management land.

PRESENT AND POTENTIAL THREATS: Utilization of native vegetation for grazing, urbanization, agricultural conversion, and recreation have taken a great toll on the habitat available to this and other Columbia Basin endemics. These threats continue mostly unabated.

MANAGEMENT RECOMMENDATIONS: Intensive searches for additional populations of *A. tweedyi* are needed. Preservation of adequate habitat is vital.

REMARKS: Native grasslands in central and eastern Oregon are scarce and considered by botanists and ecologists familiar with the region as endangered habitats. *A. tweedyi* is one of several rare native plants dependent upon this habitat.

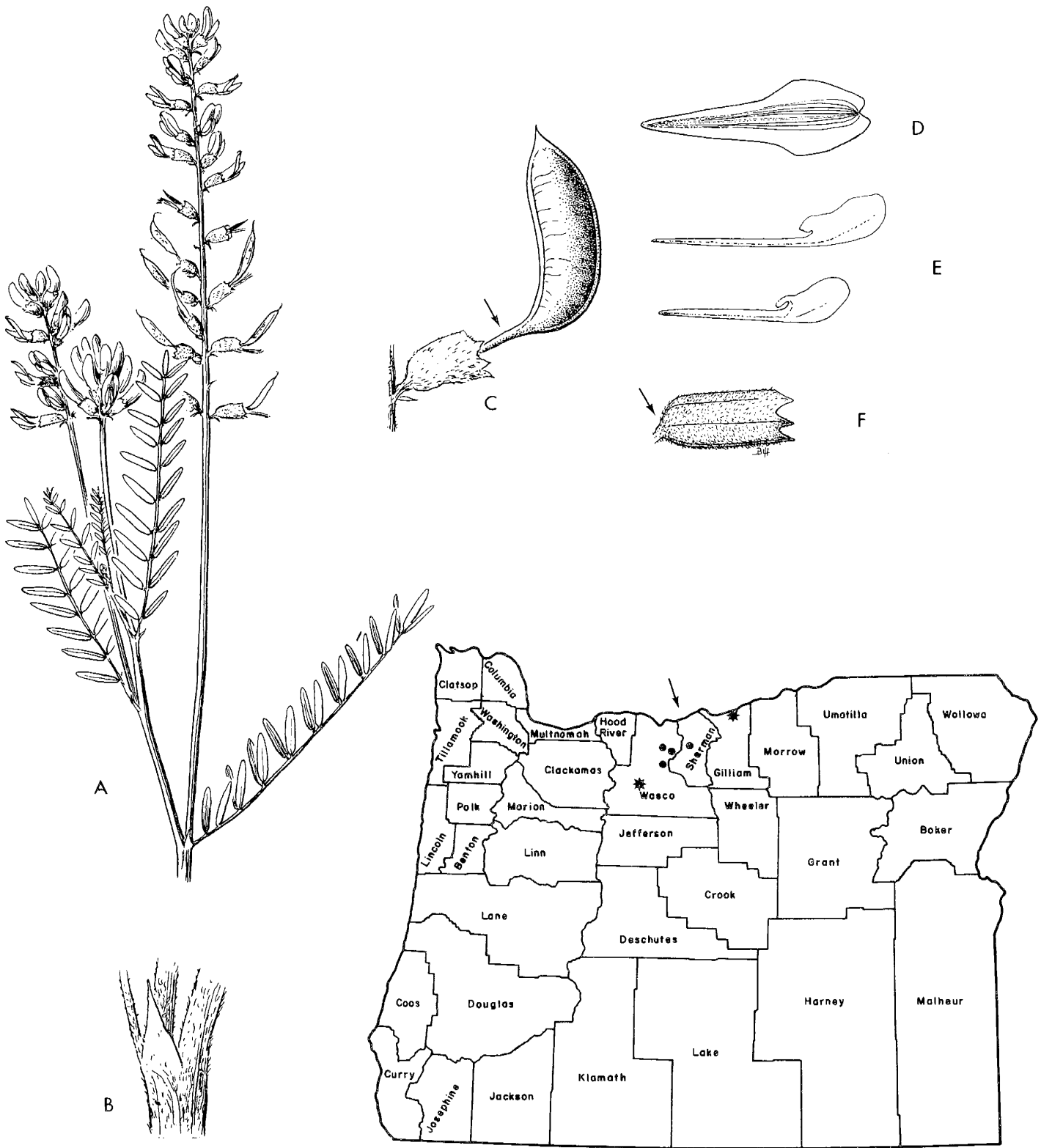


Fig. 33. *Astragalus tweedyi*. A: Habit, upper stem, X 0.7; B: Stipule, X 3; C: Upturned pod, with stipe indicated, X 3.5 (drawings taken from Hitchcock et al., 1961); D,E: Banner and wing petals, respectively, X 1.5; F: Calyx, illustrating asymmetric base, X 3 (drawn from Peck 27886, WILLU).

ASTRAGALUS TYGHENSIS Peck

(Tygh Valley milkvetch)

Pea family (Fabaceae)

ORIGINAL PUBLICATION: Proc. Biol. Soc. Wash. 49:110. 1936.

SYNONYMS: *Astragalus spaldingii* Gray var. *tyghensis* (Peck) Hitch. (Univ. Wash. Pub. Biol. 17:262. 1961).

STATUS: Candidate species for federal listing, Category 1, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Perennial from a thick, woody taproot, densely villous tomentose throughout; stems several or numerous, 1.5-5.5 dm long, prostrate or weakly ascending; leaves 5-14 cm long, the uppermost subsessile, with (7) 15-21 oval obovate, flat leaflets 6-17 mm long; racemes (10) 20-40 flowered, the flowers crowded into a dense head; calyx 6.6-7.8 mm long, with the teeth enclosing the small pod; flowers pale yellow, pubescent dorsally above the middle, 7-12 mm long; pod horizontal or declined, 4.5-6 mm long, 3 mm in diameter; seeds ca. eight (after Barneby, 1964).

DISTRIBUTION: *Astragalus tyghensis* is known only from the Tygh Valley, in eastern Wasco County, Oregon.

LOOK ALIKES: *Astragalus spaldingii* could be mistaken for *A. tyghensis*. These barely allopatric taxa possess strikingly similar inflorescences and vegetative morphologies, but *A. spaldingii* has distinctly white as opposed to yellowish flowers.

PHENOLOGY: The Tygh Valley milkvetch blooms from May to early July.

HABITAT: Occurring in dry, rocky soils with a thin overlying sandy layer. Inhabiting the sagebrush-bunchgrass communities, today largely clinging to roadsides and other still undeveloped sites. Associates include *Bromus tectorum*, *Alyssum alyssoides*, *Astragalus purshii*, and *Sanguisorba occidentalis*.

LAND OWNERSHIP/MANAGEMENT: Local road maintenance agencies and private ranches.

PRESENT AND POTENTIAL THREATS: This endemic surely faces stiff competition from aggressive rangeland weeds and may be having difficulty establishing seedlings. Roadwork and spraying are threats as well. The closely related *A. spaldingii* is eaten by livestock (Barneby, 1964).

MANAGEMENT RECOMMENDATIONS: Locating sites for this taxon on public land, where it could be sheltered from grazing should be a high priority. Its ability to survive on altered range sites needs determination.

REMARKS: Insects have been noted consuming the leaves of *A. tyghensis*. This does not appear to have an adverse impact on reproduction, however, since flowering and seed dispersal mostly take place prior to the destruction of foliage.



Fig. 34. *Astragalus tyghensis*. A: Habit, showing tough, woody base, X 0.7; B: Stipule, X 3; C: Flower, X 2.8; D: Pod enclosed in calyx, X 2.8 (drawn from Ripley & Barneby 10826, ORE).

BALSAMORHIZA ROSEA Nels. & Macbr.

(Rosey balsamroot)

Composite family (Asteraceae)

ORIGINAL PUBLICATION: Bot. Gaz. 56:478. 1913.

SYNONYMS: *Balsamorhiza hookeri* var. *rosea* Sharp (Ann. Mo. Bot. Gard. 22: 130. 1935).

STATUS: Candidate species for federal listing, Category 2, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Hairy perennial from a thickened taproot, 0.6-3 dm tall; leaves petiolate, mostly basal, the blade deltoid and crenate or pinnatifid, 3-20 cm long, 1-10 cm wide; heads small, rays 1-2.5 cm long, but up to 1 cm broad, usually ten to sixteen, yellowish but turning rose in age (after Cronquist, 1955).

DISTRIBUTION: Occurring at a single locality in northern Umatilla County, Oregon, and in neighboring Yakima, Benton, Walla Walla, and Spokane counties, Washington.

TAXONOMIC PROBLEMS: This taxon may hybridize with other members of the genus where their ranges overlap.

LOOK ALIKES: The roseate petals of this balsamroot and its small stature are distinctive.

PHENOLOGY: *Balsamorhiza rosea* flowers mostly in April and May.

HABITAT: On thin soiled, rocky ridges at lower to mid elevations, surrounded by bunchgrass prairie or scattered woodland. Associate species include *Poa sandbergii*, *Eriogonum thymoides*, *Eriophyllum lanatum*, and *Bromus tectorum*.

LAND OWNERSHIP/MANAGEMENT: Private, State of Washington, and possibly Bureau of Land Management.

PRESENT AND POTENTIAL THREATS: Road building, offroad vehicles, and construction of communication transmission facilities (in Washington) are potential threats.

MANAGEMENT RECOMMENDATIONS: Searches for additional Oregon populations would be desirable.

REMARKS: This species was first located in Oregon in 1980. Little is known about its occurrence here. Because of its preference for rocky soil, *B. rosea* has not yet been adversely impacted by industrial and agricultural development in Washington.

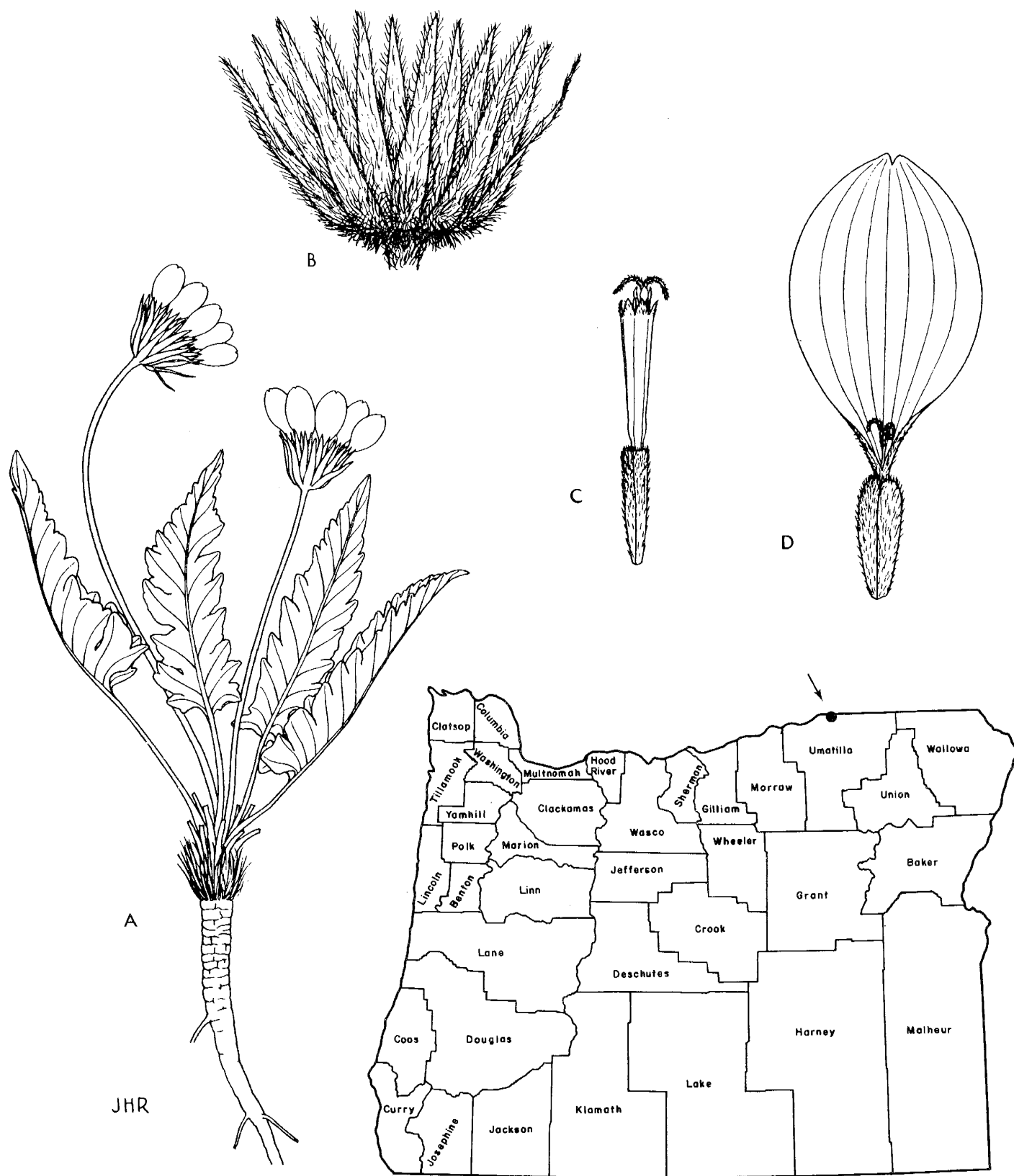


Fig. 35. *Balsamorhiza rosea*. A: Habit, X 0.8; B: Involucral bracts, X 2; C: Disc floret, X 2.5; D: Ray floret, X 3.5 (drawings taken from Hitchcock et al., 1955).

BENSONIELLA OREGONA (Abrams & Bacigalupi) Morton

(Bensoniella)

Saxifrage family (Saxifragaceae)

ORIGINAL PUBLICATION: Leaf1. West. Bot. 10:181. 1965.

SYNONYMS: *Bensonia oregona* Abrams & Bacigalupi (Contr. Dudley Herb. 1:95. 1929).

STATUS: Candidate species for federal listing, Category 1, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Perennial with slender branching scaly rootstalks; leaves all basal, petioles slender, 3-7 cm long, sparsely villous with elongated brownish hairs, leaf blades cordate, 2.5-4.5 cm long and about as broad, 7 lobed, the lobes crenately toothed; flowering stalk 20 cm high, slender, sparsely pilose; raceme rather densely fifteen to twenty flowered; pedicels scarcely 1 mm long, with a minute trifid bractlet adnate to the base; hypanthium free from the ovary, creamy white like the sepals, 2 mm broad; sepals 2 mm long; petals filiform, broadest at the middle; stamens 3 mm long; styles nearly as long as the stamens (after Abrams & Bacigalupi, 1929).

DISTRIBUTION: Found in the Siskiyou Mountains of Curry and Josephine counties in southwest Oregon and disjunct in Humboldt County, California.

LOOK ALIKES: *Bensoniella* is a monotypic genus that is closely related to the genera *Ozomelis* and *Mitella*. It is differentiated from them by its entirely free hypanthium and elongated styles and filaments.

PHENOLOGY: *Bensoniella* flowers in June and July.

HABITAT: At the edges of bogs, meadows, and springs in mixed coniferous forest zones, in damp but well drained soils from approximately 1070 to 1520 m, with *Ribes* spp., *Pedicularis* spp., and *Carex* spp.

LAND OWNERSHIP/MANAGEMENT: U.S. Forest Service.

PRESENT AND POTENTIAL THREATS: Logging practices are potential threats, particularly spraying designed to kill broadleaved plant species. Populations adjacent to roads are vulnerable to road widening.

MANAGEMENT RECOMMENDATIONS: Tolerance to disturbance needs to be determined. Herbicide applications should be curtailed in areas likely to harbor populations of *B. oregona*. This necessitates surveys by botanists and foresters to ensure that spraying will occur on a selective basis for the good of both resources.

REMARKS: Recent searches have increased the number of known populations of *B. oregana* in Oregon.

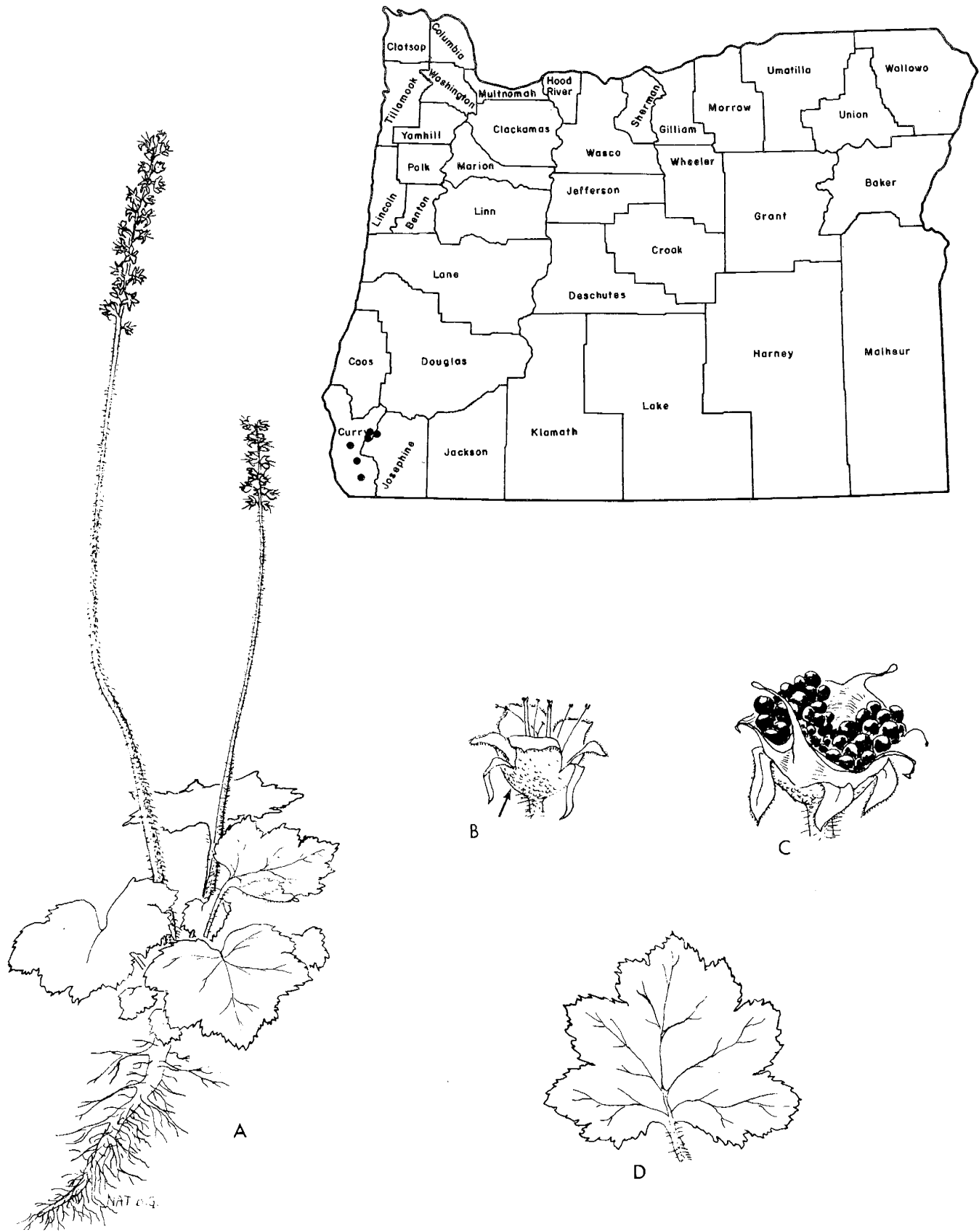


Fig. 36. *Bensoniella oregana*. A: Habit, X 0.8; B: Flower, indicating hypanthium, X 4; C: Ruptured capsule, exposing seeds, X 6; D: Leaf, X 1 (drawn from Stansell s.n., OSC).

BOTRYCHIUM PUMICOLA Colv.

(Pumice grapefern)

Adder's tongue family (Ophioglossaceae)

ORIGINAL PUBLICATION: Our Native Ferns, 6th ed., p. 69. 1900.

STATUS: Candidate species for federal listing, Category 1, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Stem stout and fleshy, about 10 cm tall, bud glabrous; both fertile and sterile segments erect in bud; leaf bases from past years remain as a conspicuous sheath around the lower half of the plant; sterile blade sessile, leathery, approximately 3 cm long and usually ternately divided; stalk of fertile segment very short; spike compact, paniculate (after Taylor, 1970).

DISTRIBUTION: Occurring in the Paulina Mountains and the Crater Lake area of Oregon; also on Mount Shasta, California.

PHENOLOGY: Specimens with fertile fronds occur from July to September.

HABITAT: *Botrychium pumicola* inhabits fine pumice gravel without humus at high elevations, above 2400 m. In winter the sites are covered with up to ten feet of snow which, upon melting away, leaves the soil extremely dry during July and August. Associated species include *Carex breweri* and *Eriogonum* spp.

LAND OWNERSHIP/MANAGEMENT: The National Park Service and U.S. Forest Service.

PRESENT AND POTENTIAL THREATS: Fern collecting and habitat disruption by recreational use are major problems. Large numbers of individuals have been taken over the years, as evidenced by herbarium sheets with 20 or more specimens each.

MANAGEMENT RECOMMENDATIONS: Discourage collecting and recreational use of the fragile habitat.

REMARKS: This distinctive species is recommended for listing as endangered and immediate protection. The National Park Service needs to devise a plan for management and protection of this taxon which unfortunately shares its scenic habitat near Crater Lake with a multitude of human visitors. This is certainly one of the rarest and most unusual ferns in North America.



Fig. 37. *Botrychium pumicola*. A: Habit, showing fertile frond, X 1.2 (drawn from Detling 226, ORE).

CALOCHORTUS GREENEI Wats.

(Green's mariposa lily)

Lily family (Liliaceae)

ORIGINAL PUBLICATION: Proc. Amer. Acad. 14:264. 1879.

STATUS: Candidate species for federal listing, Category 1, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Stem stout, usually branched, 10-30 cm high; basal leaf ca. 2 dm long; one to five flowers; sepals ovate, 2.5-3 cm long, greenish with purplish tinge, glabrous or hairy at base; petals 3-4 cm long, purplish or lilac, barred with yellow, densely hairy on lower part of petal with yellow hairs, gland with broad scale; anthers obtuse, 8-12 mm long; capsule 2-2.5 cm long (after Munz, 1959).

DISTRIBUTION: Known from Jackson County, Oregon and Siskiyou County, California.

LOOK ALIKES: *Calochortus greenei* may be distinguished from the similar *C. longebarbatus* by its anthers which are nearly as long as the filaments. See following discussion of *C. howellii* as well.

PHENOLOGY: This mariposa lily flowers from May to July.

HABITAT: *Calochortus greenei* inhabits clay soil of chaparral areas, around dry thickets and on rocky slopes. Associated species include *Amelanchier pallida*, *Quercus vaccinifolia*, *Q. breweri*, *Phlox diffusa*, *Arctostaphylos nevadensis*, *Thlaspi montanum*, and *Spiraea densiflora*.

LAND OWNERSHIP/MANAGEMENT: Bureau of Land Management, U.S. Forest Service, and probably some private.

PRESENT AND POTENTIAL THREATS: This plant seems to be very palatable to cattle and wildlife. *Calochortus* is attractive to collectors for horticultural purposes. One population is reported to be heavily impacted by bulb collectors (Seevers, 1978).

MANAGEMENT RECOMMENDATIONS: Prevent grazing in areas where this species occurs. Protect locality information to inhibit horticultural exploitation.

REMARKS: The few populations of this species in Oregon are small and widely scattered. Seevers (1978) comments that "the palatability of this species would seem to be one of the limiting factors in the size of the population." The genus *Calochortus* is covered by the "Oregon Wildflower Law" (ORS 564.020), but the protective provisions of this legislation are ineffective.

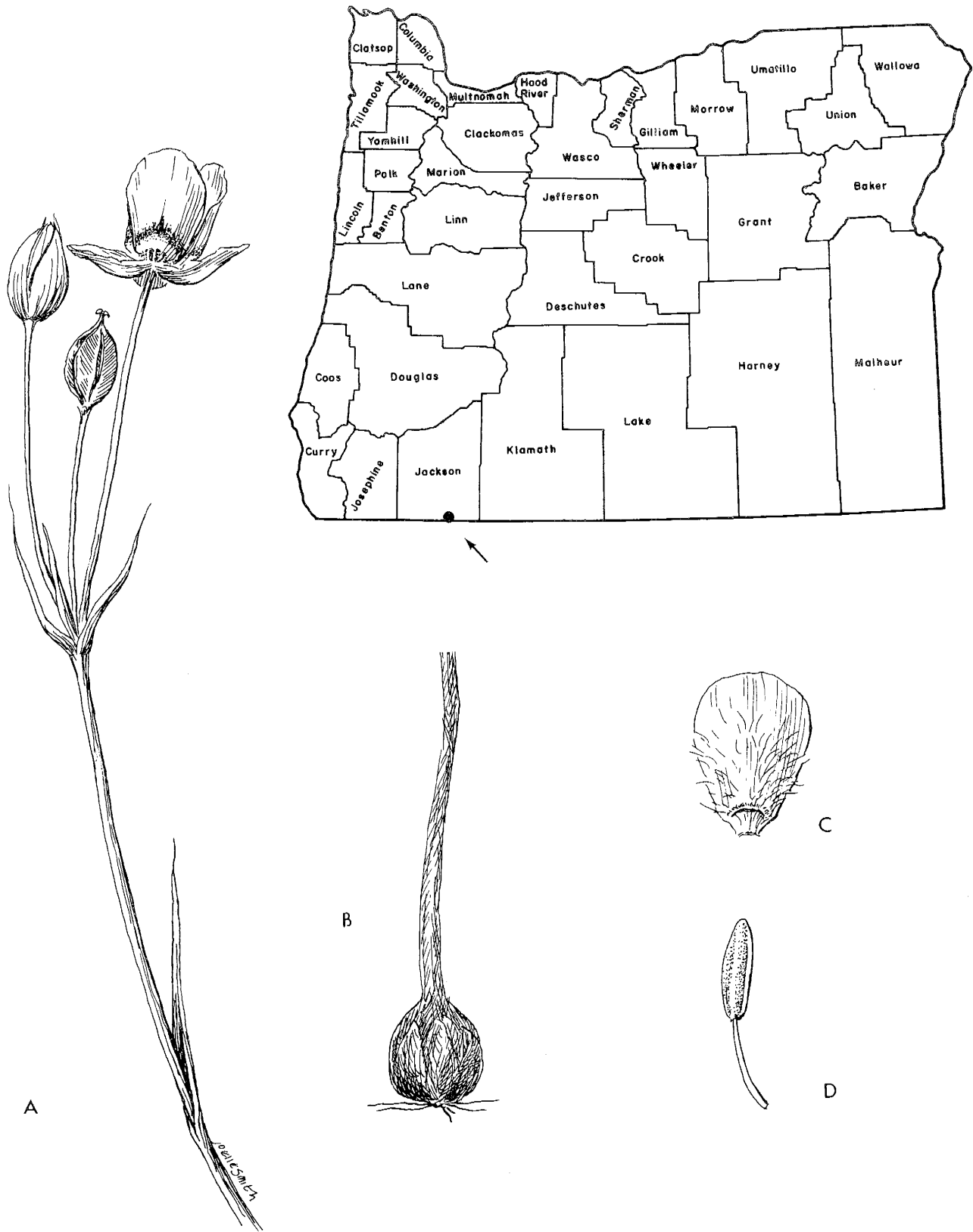


Fig. 38. *Calochortus greenei*. A: Habit, upper stem, X 0.7; B: Habit, bulb, X 1; C: Petal, X 1; D: Stamen, showing size relationship between filament and anther, X 1.3 (drawn from Chambers 4335, OSC).

CALOCHORTUS HOWELLII Wats.

(Howell's mariposa lily)

Lily family (Liliaceae)

ORIGINAL PUBLICATION: Proc. Am. Acad. 23:266. 1888.

STATUS: Candidate species for federal listing, Category 1, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Slender, erect perennial from a bulb, stems ca. 3-4 dm high; leaf solitary, occasionally surpassing the inflorescence, 5-10 mm wide, dorsally hairy; flowers one or two, on erect pedicels 5-10 cm long, broadly campanulate; sepals 16-20 mm long, acuminate; petals creamy or greenish, apex erose, with a few hairs, ca. 2.5 cm long (after Peck, 1961).

DISTRIBUTION: Known from Douglas and Josephine counties, in southwestern Oregon, possibly in Jackson County as well.

LOOK ALIKES: The petals of the similar *C. greenii* are purplish tinged and yellow at the base, and those of *C. indecorus* are essentially glabrous.

PHENOLOGY: *Calochortus howellii* blooms mainly from May to July.

HABITAT: This mariposa lily is restricted to serpentine outcrops at lower or middle elevations, often on brush covered slopes or in scattered woods. Associated species include *Sanicula* spp., *Ceanothus* spp., and *Arctostaphylos* spp.

LAND OWNERSHIP/MANAGEMENT: U.S. Forest Service, private, and Bureau of Land Management.

PRESENT AND POTENTIAL THREATS: Mining of the mineral rich serpentine substrate, grazing, and horticultural collecting pose serious potential threats to this taxon.

MANAGEMENT RECOMMENDATIONS: Areas containing populations of *C. howellii* should be carefully evaluated with respect to grazing activities. Protection from future surface mining will be essential.

REMARKS: This beautiful Oregon endemic is sought by collectors. Its populations have been seriously depleted. According to Ownbey (1940) *C. howellii* is not very closely related to other members of the genus. It belongs to a section with other uncommon species, however, and research exploring this group's systematic and ecologic relationships may prove useful in deciphering the causes of specific rarity.

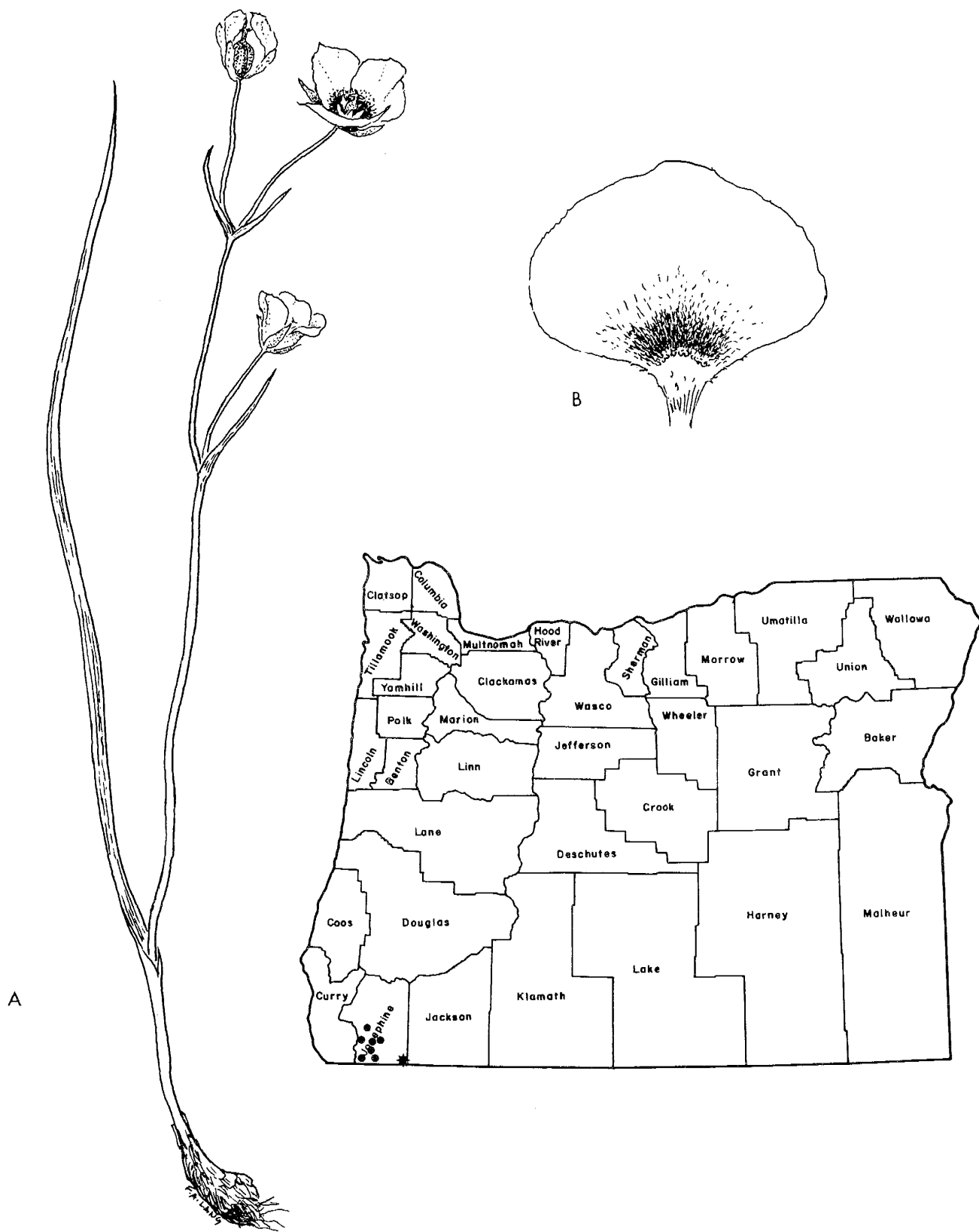


Fig. 39. *Calochortus howellii*. A: Habit, X 0.5; B: Petal, X 1.8 (drawn from White & Lillico 16, ORE).

CALOCHORTUS INDECORUS Ownb. & Peck

(Plain mariposa lily)

Lily family (Liliaceae)

ORIGINAL PUBLICATION: Leaf1. West. Bot. 7:190-2. 1954.

STATUS: Candidate species for federal listing, Category 1, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Bulb ovoid, with thick, dark coat, 2-2.5 cm long; stem stout, not bulbiferous, 8-12 cm; basal leaf 2-2.5 dm long, single cauline leaf closely subtending inflorescence; umbels commonly two or three flowered, with occasionally a third umbel on slender stalk from basal leaf; sepals broadly lanceolate, somewhat shorter than petals and without distinctive coloring; petals bright lavender, without hairs except for a small area above the gland; capsule ovoid, 1.5-2 cm long, narrowly three winged, nodding (after Peck, 1954).

DISTRIBUTION: Josephine County, Oregon, where known only from Sexton Mountain.

LOOK ALIKES: Closely related to *C. uniflorus* from which it differs in the absence of basal bulblets and the much greater length of the stem, which is moderately stout and usually erect (Peck, 1954).

PHENOLOGY: *Calochortus indecorus* is known to flower in May.

HABITAT: Probably moist, rocky serpentine slopes and flats. Dominant species in the general area where *C. indecorus* may have been collected include *Pinus jeffreyi*, *Ceanothus cuneatus*, *Arctostaphylos viscida*, *Rhododendron occidentale*, and various grasses (Siddall, 1978).

LAND OWNERSHIP/MANAGEMENT: Bureau of Land Management and private.

PRESENT AND POTENTIAL THREATS: Due to their beauty, *Calochortus* species are often collected. Vegetation on Sexton Mountain is also impacted by grazing and the development of farmland and pastures.

MANAGEMENT RECOMMENDATIONS: Efforts should be continued to relocate this species. Located sites should be immediately protected.

REMARKS: The only known collection of *C. indecorus* is from 1948.

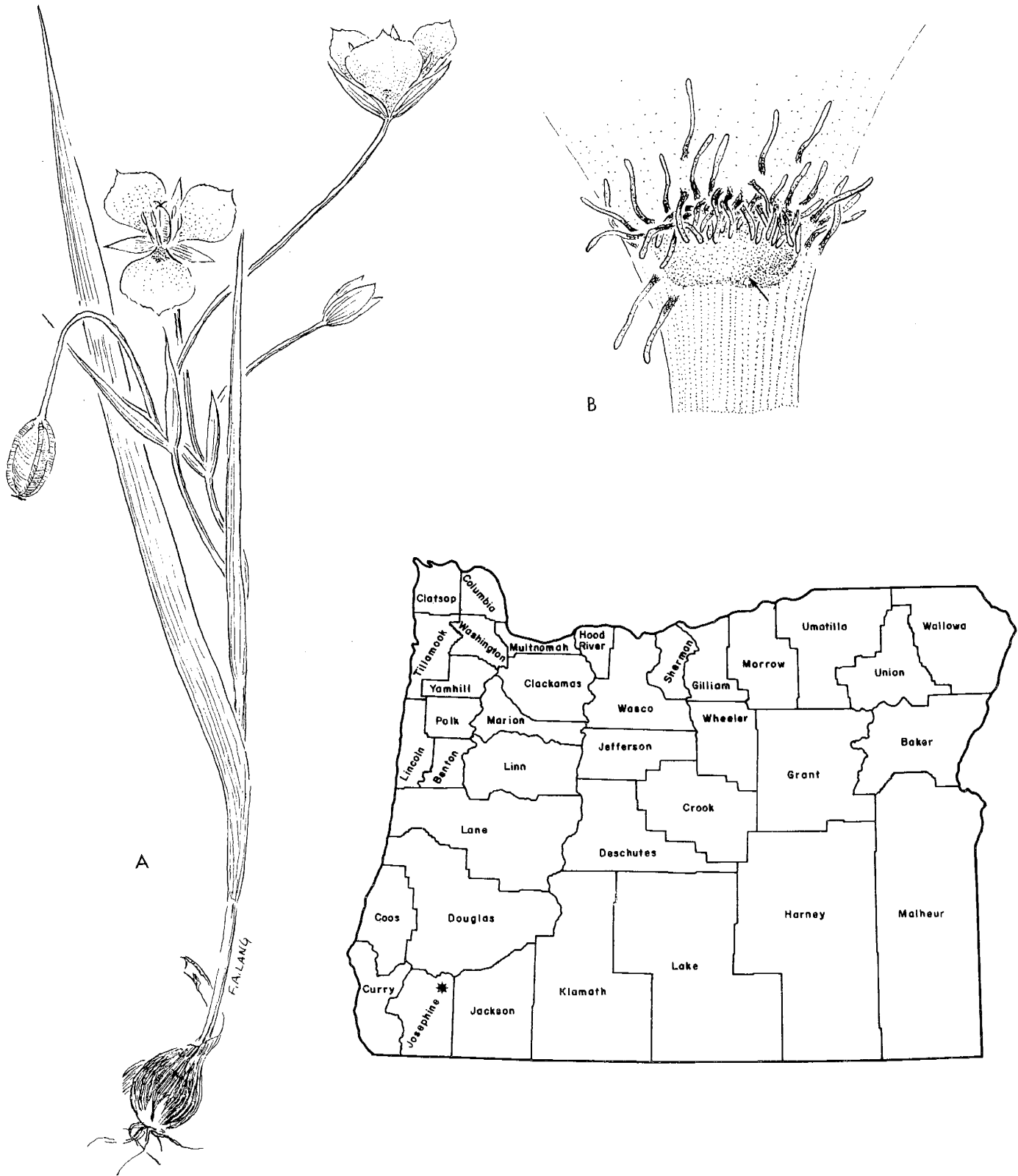


Fig. 40. *Calochortus indecorus*. A: Habit, X 1; B: Magnification of lower portion of petal, with gland indicated, X 8 (drawn from Peck 24790 [holotype], WILLU).

CALOCHORTUS LONGEBARBATUS Wats. VAR. LONGEBARBATUS

(Long bearded mariposa lily)

Lily family (Liliaceae)

ORIGINAL PUBLICATION: Proc. Am. Acad. 17:381. 1882.

STATUS: Candidate species for federal listing, Category 2, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Erect perennial from a small bulb, ca. 1-3 dm tall, with a bulblet in the axil of the lower cauline leaf; cauline leaf 2-3 dm long; bracts two, opposite, narrowly lanceolate, 2-6 cm long; flowers pinkish, with a dark purple band above the glands, acuminate, sepals glabrous, 2-3 cm long; petals broad, 3-4 cm long, narrowed at the base, with a few hairs above the gland (after Ownbey, 1969).

DISTRIBUTION: Scattered from Washington (Yakima County) south to California. Occurring sporadically in Oregon along the east base of the Cascades.

LOOK ALIKES: This may be distinguished from other *Calochortus* species in its range by its sparsely hairy, unblotched petals, bulblets on the lower stem, and densely yellow hairy petal glands. The variety *peckii* is distinguished from var. *longebarbatus* by its campanulate corollas.

PHENOLOGY: Flowering in June and July.

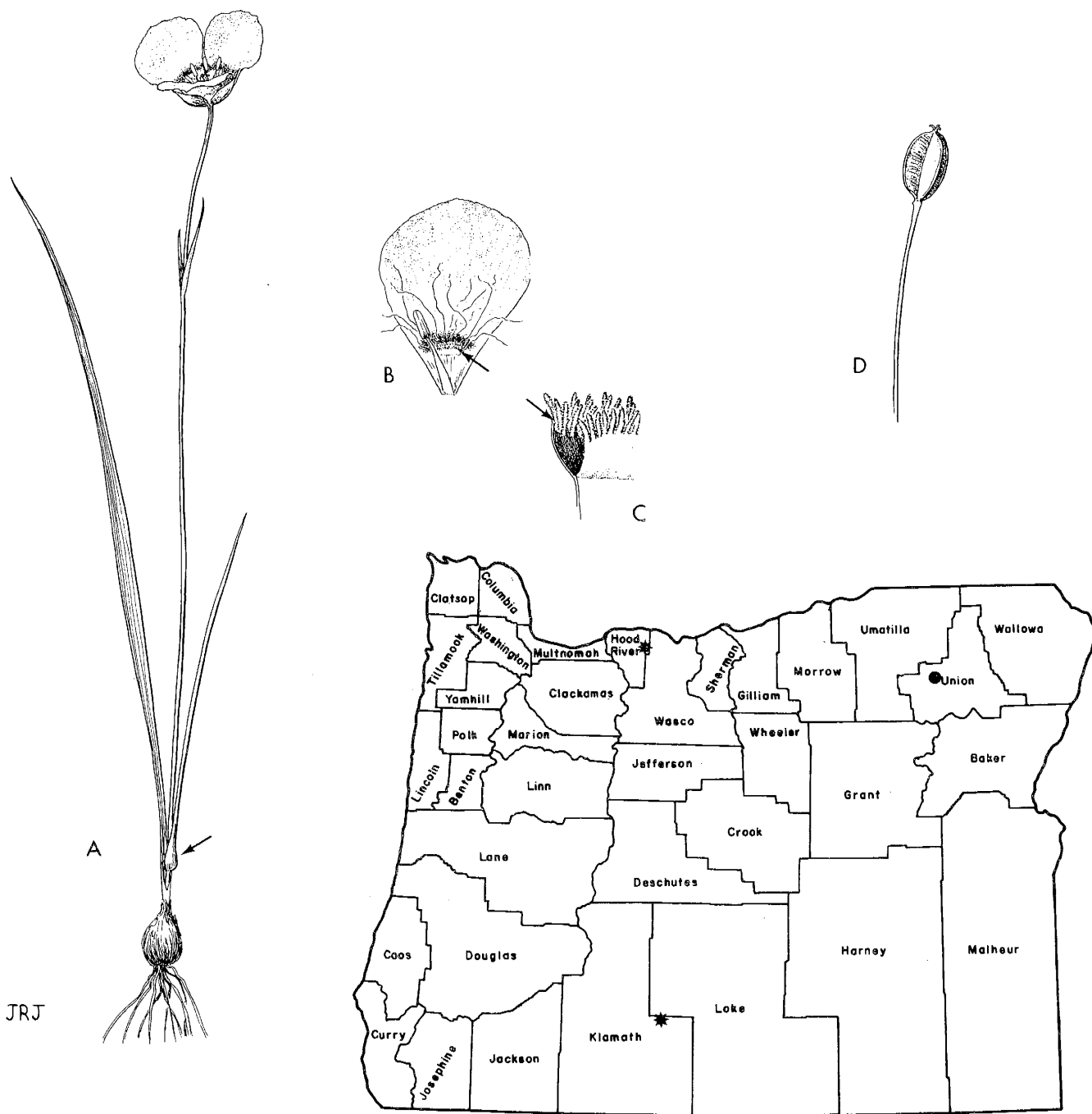
HABITAT: Fairly dry to moist meadows or swales, in open situations. Associated with grasses such as *Festuca* spp., *Agrostis* spp., and *Poa* spp. Surrounding communities are often dominated by sagebrush.

LAND OWNERSHIP/MANAGEMENT: Private, and probably U.S. Forest Service and State of Oregon, possibly Bureau of Land Management.

PRESENT AND POTENTIAL THREATS: Collecting, grazing, and logging activities are potential threats.

MANAGEMENT RECOMMENDATIONS: Grazing and logging should be monitored for possible conflicts.

REMARKS: Although this species has a fairly broad range, it is seldom encountered. Its very spotty distribution suggests that it may be a relict, however, its wide range of occurrence is unlike any other known relict species. There is a recent report of this taxon being located in Union County, in northeastern Oregon. This would be the first report in Oregon from an area away from the immediate vicinity of the Cascades.



JRJ

Fig. 41. *Calochortus longebarbatus* var. *longebarbatus*. A: Habit, with axillary bulblet indicated, X 0.7; B: Petal with attached stamen, X 1; C: Close-up of fringed gland, X 10; D: Capsule, X 0.7 (drawings taken from Hitchcock et al., 1969).

CALOCHORTUS LONGEBARBATUS Wats. VAR. PECKII Ownbey

(Peck's mariposa lily)
Lily family (Liliaceae)

ORIGINAL PUBLICATION: Bot. Gaz. 104:556. 1943.

STATUS: Candidate species for federal listing, Category 2, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: See preceding discussion of *C. longebarbatus* var. *longebarbatus*. The var. *peckii* differs solely in its obviously broad based flowers which are cup shaped or campanulate (after Ownbey, 1969).

DISTRIBUTION: Endemic to the Ochoco Mountains, in Crook and Wheeler counties, Oregon.

LOOK ALIKES: This variety is distinguished from the var. *longebarbatus* by its cup or bell shaped flowers, and its distinct range in east central Oregon. *C. eurycarpus* is similar as well, but lacks bulblets.

PHENOLOGY: This taxon blooms in June and July.

HABITAT: Found in seasonally moist meadows at middle elevations, in or near *Pinus ponderosa* forests. Associated species include *Penstemon procerus*, *Carex* spp., *Achillea lanulosa*, and *Lomatium* spp.

LAND OWNERSHIP/MANAGEMENT: U.S. Forest Service.

PRESENT AND POTENTIAL THREATS: Grazing, logging, horticultural and botanical collecting, and offroad vehicles.

MANAGEMENT RECOMMENDATIONS: Monitor known populations and evaluate effects of current land management policies. Additional populations should be sought and protected.

REMARKS: There have been a few recent collections and sightings of this plant, slightly expanding its known range. Ownbey (1969) reports that it is a sterile triploid. Its geographic range, disjunct to the east from that of the typical variety of the species, has apparently been a prime factor in justifying varietal distinction. The distinguishing morphologic characters are weak despite the difference in ploidy level.

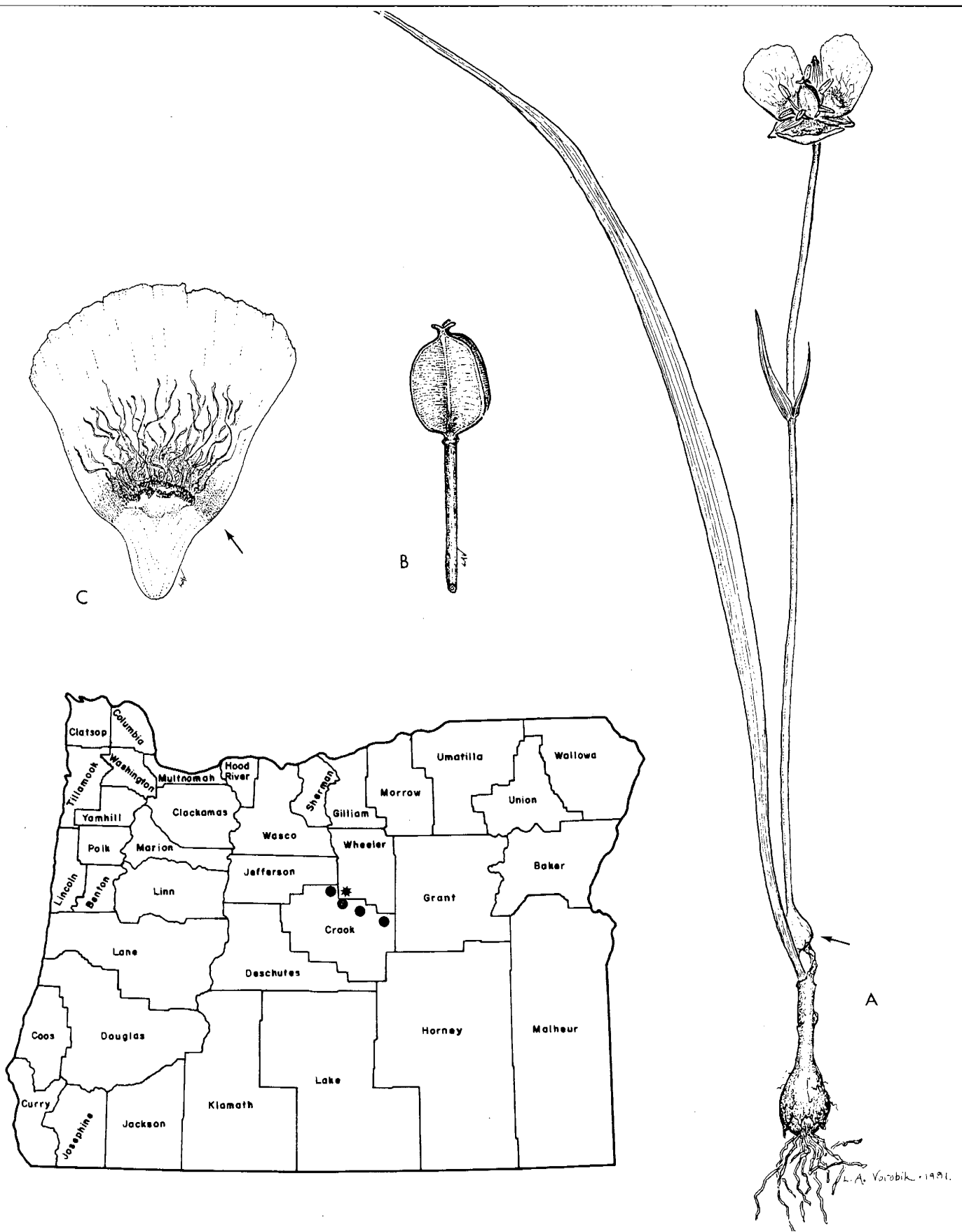


Fig. 42. *Calochortus longebarbatus* var. *peckii*. A: Habit, with axillary bulblet indicated, X 1; B: Mature capsule, X 1; Petal, broad basal portion indicated, X 4 (drawn from Ownbey 1800, ORE).

CAMASSIA CUSICKII Wats.

(Cusick's camas)

Lily family (Liliaceae)

ORIGINAL PUBLICATION: Proc. Amer. Acad. 22:479. 1887.

SYNONYMS: *Quamasia cusickii* Cov. (Proc. Biol. Soc. Wash. 11:64. 1897).

STATUS: Candidate species for federal listing, Category 2, United States Fish and Wildlife Service (Federal Register 45:82480-82560. December 15, 1980).

DESCRIPTION: Perennial with large clustered bulbs which are mucilaginous and ill smelling; leaves 6-12, basal, mostly 30-50 cm long, 10-50 mm broad; scapes 4-8 dm tall; racemes nearly as long, very densely flowered, flowers light blue, anthers yellow; capsule 15-20 mm long (after Hitchcock, 1969).

DISTRIBUTION: *Camassia cusickii* is endemic to the south and east flanks of the Wallowa Mountains of Baker and Wallowa counties, Oregon. It has also been reported from adjacent Idaho in Adams and Washington counties.

TAXONOMIC PROBLEMS. This species may hybridize with *C. quamash* where their ranges overlap, and intermediate specimens are not infrequent.

LOOK ALIKES: This species is closely related to *C. quamash*. Hitchcock (1969) remarks that the bulbs of *C. cusickii* are remarkably distinctive, being several times larger than those of other *Camassia* and occurring in small clusters joined by fleshy rhizomes. It also differs from *C. quamash* in its more numerous leaves.

PHENOLOGY: Flowering from late April to July.

HABITAT: This species occurs at low to mid elevations on steep, rocky hillsides and ridgetops in moist soils, usually along or near creeks. It often is found in sagebrush scrub and among scattered ponderosa pine. Associated species include *Penstemon deustus*, *Arabis holboellii*, *Saxifraga oregana*, *Viola purpurea*, *Lathyrus pauciflorus*, *Mimulus guttatus*, *Rhus radicans*, *Lithophragma tenella*, and *Tonella floribunda*.

LAND OWNERSHIP/MANAGEMENT: *Camassia cusickii* is found on Bureau of Land Management and U.S. Forest Service property and a small amount of private land.

PRESENT AND POTENTIAL THREATS: Horses and cattle frequently eat species of *Camassia*. Evidence of grazing on this species by domestic and native animals has been observed. The majority of the populations are easily accessible to collectors due to their close proximity to roads and recreation areas. This species may have horticultural possibilities.

MANAGEMENT RECOMMENDATIONS: Grazing should not be permitted where this species occurs until after July. The soils are easily disturbed by trampling, especially in the early season when moist.

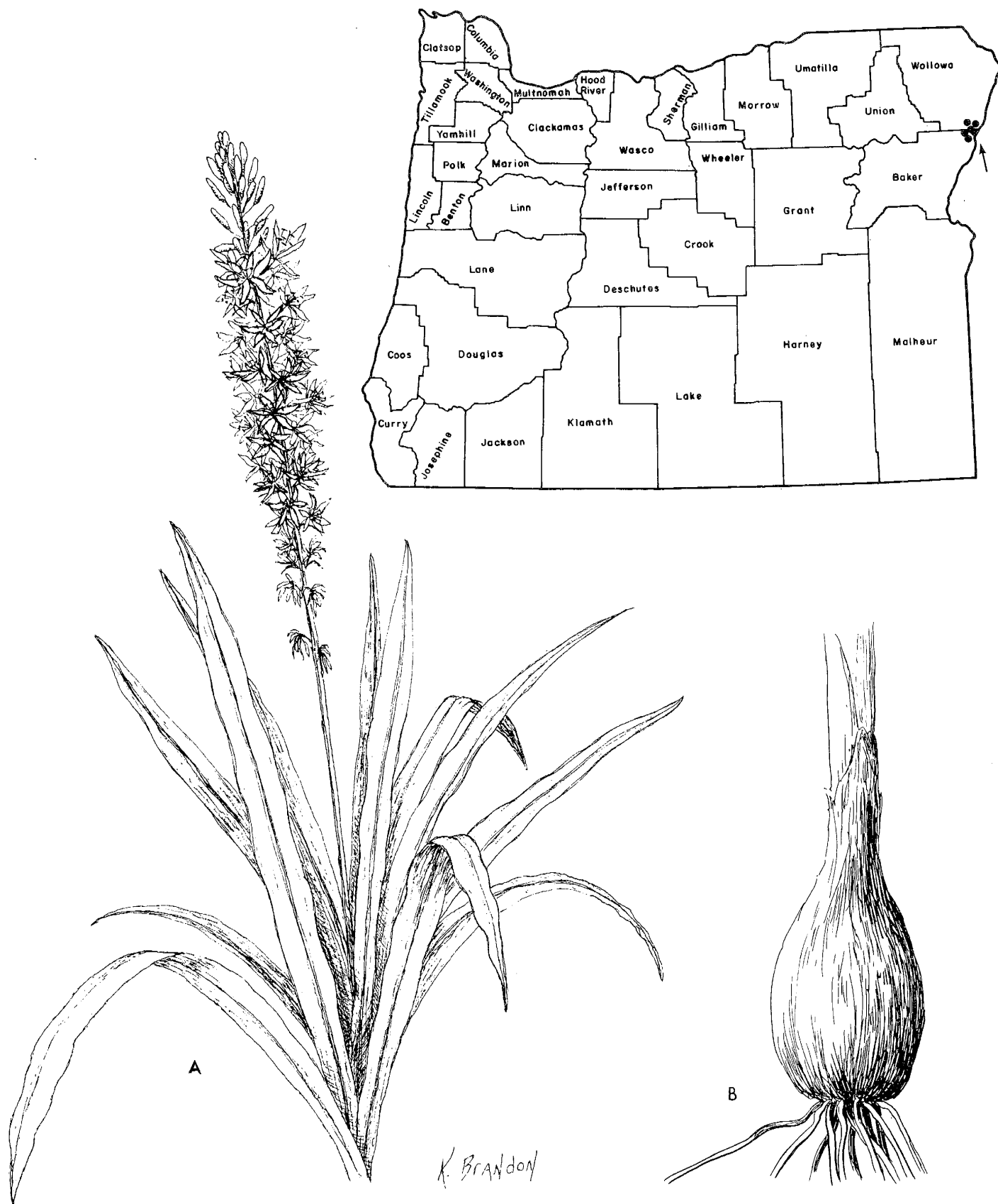


Fig. 43. *Camassia cusickii*. A: Habit, X 0.2 (drawn from Meinke s.n., ORE); B: Bulb, X 1 (drawing from Hitchcock et al., 1969).

CARDAMINE PATTERSONII Henderson

(Saddle Mountain bittercress)

Mustard family (Brassicaceae)

ORIGINAL PUBLICATION: Rhodora 32:25. 1930.

STATUS: Candidate species for federal listing, Category 1, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Taprooted annual or short lived perennial, with simple or basally branching stems 10-20 cm tall; basal leaves several, pinnate, with three to five ovate to obovate leaflets, 3-20 mm long, entire to apically three lobed, reduced upward to ultimately simple bracts; racemes lax; sepals purplish, 2 mm long; petals pink or rose, about 5 mm long; siliques 2.5-3.5 cm long, about 1.5 mm broad; style slender, 2-3 mm long (after Hitchcock, 1964; Henderson, 1930).

DISTRIBUTION: This rare bittercress is endemic to the Coastal Range mountains of Clatsop County, Oregon.

LOOK ALIKES: *Cardamine pattersonii* may be distinguished from similar species of the genus by its bracteate racemes and its lack of tubers or stout rhizomes.

PHENOLOGY: This species flowers in May and June.

HABITAT: Found on moss mats over bare rocks with ephemerals such as *Orthocarpus pusillus*, *Lotus micranthus*, *Epilobium minutum*, *Microsteris gracilis*, and *Collinsia parviflora*; also on grassy balds, and in gravel of small creeks. Protected from high summer temperatures by shaded north slopes with summer ocean fogs (Chambers, 1973), *C. pattersonii* inhabits elevations of ca. 840-960 m.

LAND OWNERSHIP/MANAGEMENT: The habitat of this plant is managed by the State of Oregon, private concerns, and possibly the U.S. Forest Service.

PRESENT AND POTENTIAL THREATS: Increased recreational use of the fragile habitat and logging activities are factors leading to this species' decline.

MANAGEMENT RECOMMENDATIONS: Survey potential logging and recreation sites for likely habitat. Rerouting trails away from known sites may prove only a temporary solution since population boundaries of short-lived species may vary significantly from year to year.

REMARKS: Presently known from only a few localities in the Coastal Range, more populations of *C. pattersonii* may be found as this rugged terrain is fully explored. The species should be expected in nearby Tillamook County.

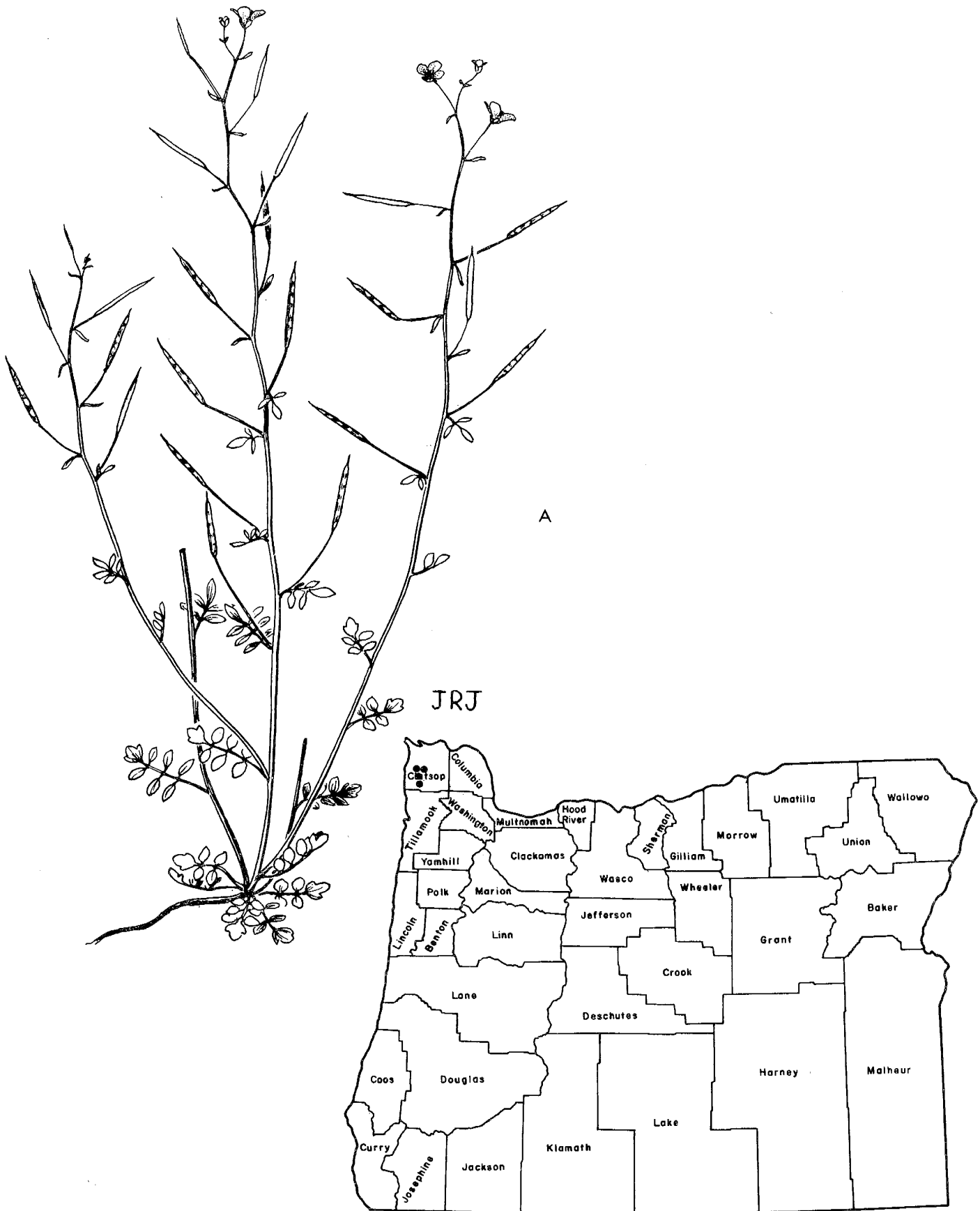


Fig. 44. *Cardamine pattersonii*. A: Habit, X 1 (drawing taken from Hitchcock et al., 1964).

CASTILLEJA CHLOROTICA Piper

(Green tinged indian paintbrush)

Figwort family (Scrophulariaceae)

ORIGINAL PUBLICATION: Proc. Biol. Soc. Wash. 33:104-105. 1920.

STATUS: Candidate species for federal listing, Category 1, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Perennial herb from woody caudex; stems 10-35 cm long, glandular pubescent and often viscid villose; leaves short, 1.5-3.5 cm long, both leaves and bracts glandular pubescent, sometimes villous, lower leaves linear to linear lanceolate, entire, upper leaves broader, usually with a pair of lateral lobes; inflorescence short, inconspicuously colored, most of color from the calyx and galea margins; bracts distally yellowish green, some with a purple tint; calyx 17-21.5 mm long, yellowish green, to pink, orange, or reddish, primary calyx lobes 1/2 the calyx length; galea 7-9 mm, dorsally bent forward from about the middle, light green, its lateral margins broad, brightly colored, pink or yellow through pink-orange to magenta; lower lip dark green with very short teeth (after Holmgren, 1971).

DISTRIBUTION: On Pine Mountain and in the Cascades of Deschutes, Klamath, and Lake counties, Oregon.

PHENOLOGY: Flowering from late June through early August.

HABITAT: *Castilleja chlorotica* occurs primarily between 1900 and 2500 m, in loose, sandy soils. Associated species include *Penstemon davidsonii*, *Artemisia tridentata*, and *Heuchera cylindrica*; often in pine woods.

LAND OWNERSHIP/MANAGEMENT: U.S. Forest Service.

PRESENT AND POTENTIAL THREATS: Recreational use, grazing (on Pine Mountain), and possible mining activities.

MANAGEMENT RECOMMENDATIONS: Trails and other recreation facilities should be routed away from this species, where possible, and serious efforts initiated to locate additional populations.

REMARKS: Holmgren (1971) commented "from the nature of their locally restricted and disjunct distribution, these populations may be relics of a formerly broader distribution. It may be, however, that intervening sites have not yet been discovered, since this region of Oregon has hardly been botanized." The recently discovered sites on Pine Mountain seem to have substantiated this theory. A number of the plants found in this large population exceeded the morphologic limits set down by Holmgren (1971) with respect to overall plant size.

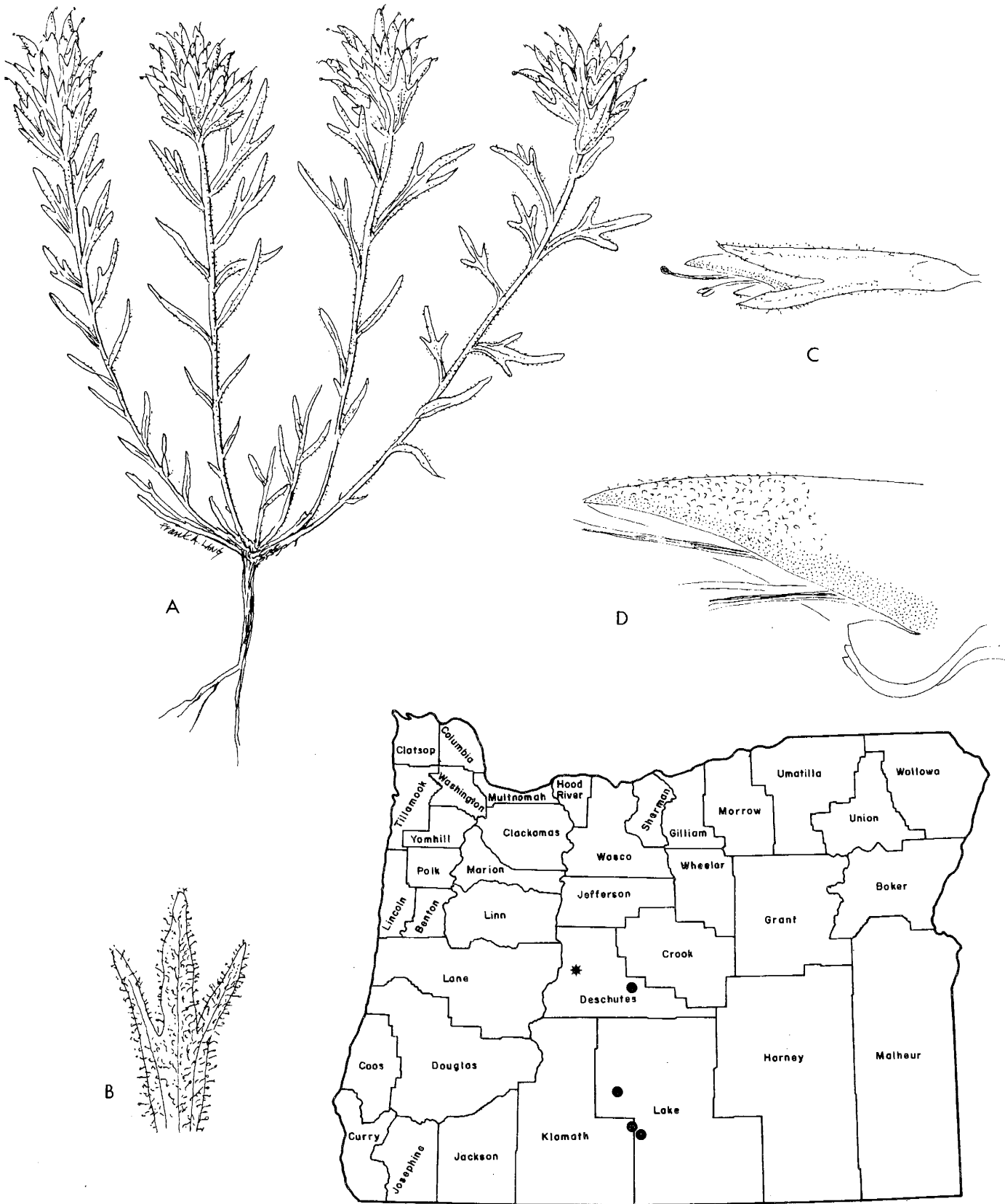


Fig. 45. *Castilleja chlorotica*. A: Habit, X 0.6; B: Flower bract, X 2; C: Flower, X 2; D: Upper lip (galea) of corolla, X 6 (drawn from Crosby 688, OSC).

CASTILLEJA FRATERNA Greenman

(Fraternal paintbrush)

Figwort family (Scrophulariaceae)

ORIGINAL PUBLICATION: Bot. Gaz. 48:147. 1909.

STATUS: Candidate species for federal listing, Category 2, United States Fish and Wildlife Service (Federal Register 45:82480-82569, December 15, 1980).

DESCRIPTION: Perennial with many clustered stems, 10-15 cm tall, viscid villous; lower leaves linear lanceolate, upper leaves may have a pair of short lobes; bracts inconspicuously greenish or red tipped; calyx bright red, divided 1/2 its length, the lateral divisions with short rounded lobes; corolla 20-30 mm long, tube more than twice the length of galea, galea lobes and margins bright red (after Ownbey, 1959; Greenman, 1909).

DISTRIBUTION: In the Eagle Cap Wilderness Area in the Wallowa Mountains, apparently restricted to Wallowa County, Oregon.

LOOK ALIKES: *Castilleja fraterna* is closely related to *C. chrysantha*, both of which are found in the high Wallowas. *C. fraterna* may be distinguished by its longer corolla, brighter red bracts and calyces, and less pubescent stems and leaves. *C. rustica*, which may be found also with *C. fraterna*, differs in its shorter calyx (12-23 mm), usually yellowish bracts, and generally taller habit (Ownbey, 1959).

PHENOLOGY: The fraternal paintbrush flowers in late July and August.

HABITAT: This plant inhabits damp alpine meadows, slopes, and exposed talus where it may grow among dwarf willow mats, at elevations between 2100 and 2900 m.

LAND OWNERSHIP/MANAGEMENT: The Eagle Cap Wilderness is administered by the U.S. Forest Service.

PRESENT AND POTENTIAL THREATS: Probably few, although recreational activities could conceivably pose hazards via removal by collectors and backpackers. Trail construction could also be a potential hazard.

MANAGEMENT RECOMMENDATIONS: The number of populations and the present and potential threats (if any) need to be ascertained.

REMARKS: First collected in 1905, this species has been encountered by very few botanists. Little data is available concerning population size and vigor. This is a striking plant for an alpine *Castilleja*, with unusually long and brightly colored flowers. The role of this adaptation in the plant's pollination strategy provides for an interesting study.

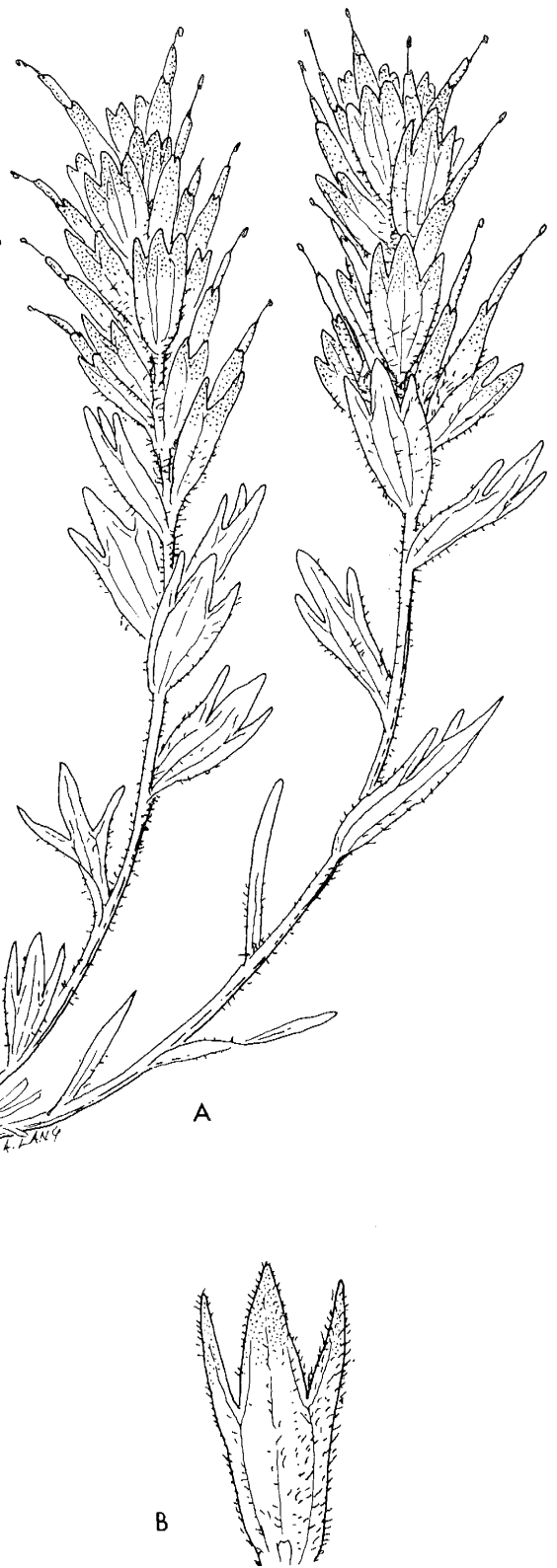
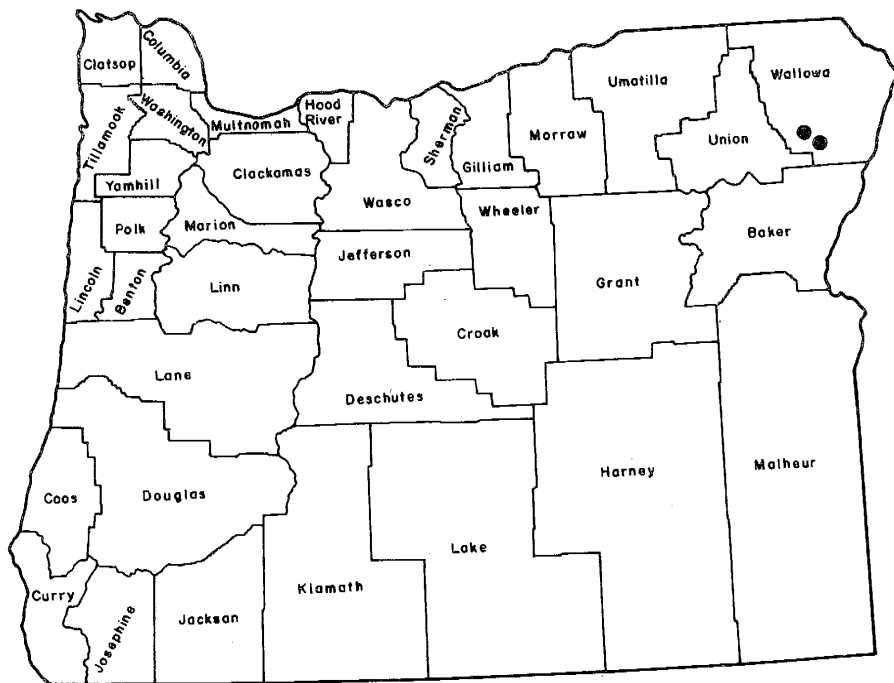


Fig. 46. *Castilleja fraterna*. A: Habit, X 1; B: Floral bract, X 2; C: Flower, showing lateral slit of calyx, X 2.5; D: Pouched lower corolla lip, X 7 (drawn from Holmgren & Reveal 2967, OSC).

CASTILLEJA GLANDULIFERA Pennell

(Glandular indian paintbrush)

Figwort family (Scrophulariaceae)

ORIGINAL PUBLICATION: Notulae Naturae 74:8-9. 1941.

STATUS: Candidate species for federal listing, Category 2, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Sub-erect perennial herb with several clustered stems, mostly branched, 12-30 cm high, glandular pubescent; leaves 20-45 mm long, entire to three or five parted; bracts showy, greenish yellow to reddish; calyx 17-22 mm long; galea 8-12 mm long; flowers inconspicuous greenish or dull red, corolla 20-26 mm; capsules 8-10 mm long, broadly ovoid (after Holmgren, 1968).

DISTRIBUTION: This taxon is restricted to the Blue and Strawberry Mountains of Baker, Grant, Umatilla, and Union counties, Oregon.

TAXONOMIC PROBLEMS: Various authors have treated *C. glandulifera* differently, now considered to be restricted to the Blue Mountain system. The most recent treatment by Holmgren (1971) segregates *C. viscidula* (from the Wallawas south to Nevada) and *C. chlorotica* (from the Cascades) from what had been previously a complex covered nomenclaturally solely by *C. glandulifera*.

LOOK ALIKES: *Castilleja glandulifera* has recently been observed to be sympatric with *C. rhexifolia* and *C. rustica*. *Castilleja rhexifolia* is purplish bracted and *C. rustica* is not glandular.

PHENOLOGY: This species flowers from late June to August.

HABITAT: Occurring from 2300 to 2650 m on dry, gravelly or sandy slopes and ridges, usually on southern and eastern exposures of well drained substrates. Associated species include *Abies lasiocarpa*, *Pinus albicaulis*, *Eriogonum flavum* var. *piperi*, *Artemisia tridentata*, *Cercocarpus ledifolius*, *Ribes montigenum*, and *Spraguea umbellata*.

LAND OWNERSHIP/MANAGEMENT: The higher altitudes of the Blue Mountains are managed by the Bureau of Land Management and the U.S. Forest Service.

PRESENT AND POTENTIAL THREATS: Impacts from recreational use of habitat, such as expansion of the ski slopes at Anthony Lakes.

MANAGEMENT RECOMMENDATIONS: Consider this species in any future expansion of Anthony Lakes ski facilities.

REMARKS: *Castilleja glandulifera* is locally plentiful and tolerates limited disturbance. There are probably enough populations of this taxon to negate its consideration for threatened or endangered listing.

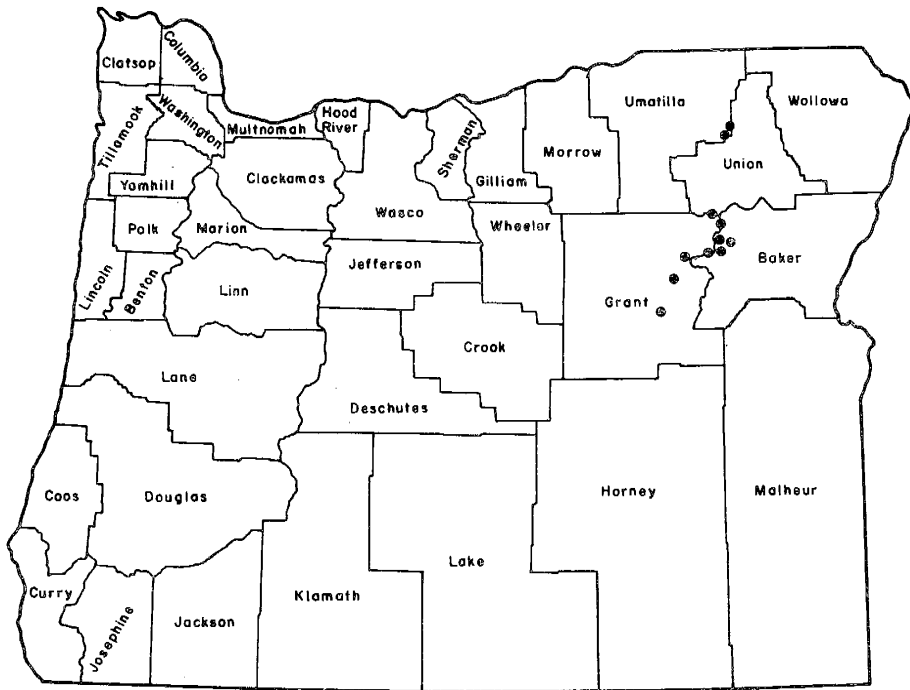


Fig. 47. *Castilleja glandulifera*. A: Habit, X 1; B: Flowers, X 2; C: Floral bract, X 2 (drawn from Henderson 5672, ORE).

CASTILLEJA LEVISECTA Greenm.

(Golden paintbrush)

Figwort family (Scrophulariaceae)

ORIGINAL PUBLICATION: Bot. Gaz. 25:268. 1898.

STATUS: Candidate species for federal listing, Category 1, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Many stemmed from a perennial base, stems 1.5 to 3 dm high, usually unbranched above, covered with a soft pilose pubescence; leaves oblong lanceolate, 2.5 to 4 cm long, pubescent upon either surface, the upper dilated and shallowly lobed toward the apex with one to three pairs of lobes on either side; inflorescence rather densely spicate or subracemose; bracts yellow, rather broad, lobed at the apex; calyx 15 to 18 mm long, nearly equally cut before and behind, externally pubescent; corolla 2 cm or more long; galea 6 to 9 mm long, the lip one-third as long as the galea, shortly and obtusely 3 lobed; capsule glabrous, 8 to 10 cm long, usually covered by the persistent pubescent calyx (after Greenman, 1898).

DISTRIBUTION: This species occurs in the Willamette Valley of Oregon, from Linn County north through the Puget Trough of Washington and also on Vancouver Island, British Columbia.

LOOK ALIKES: All other species of *Castilleja* in the range of this taxon are red bracted.

PHENOLOGY: Flowering from April to early September.

HABITAT: Prefers gravelly prairies at low elevations, generally where damp in the winter but not from standing water. Associated species include *Sidalcea campestris*, *Camassia* spp., *Potentilla* spp., *Delphinium pavonaceum*, *Aster hallii*, and *Deschampsia cespitosa*.

LAND OWNERSHIP/MANAGEMENT: Unknown in Oregon, possibly U.S. Fish and Wildlife Service or private.

PRESENT AND POTENTIAL THREATS: Urbanization, agriculture, and other activities which destroy or alter the native prairie communities are imminent threats.

MANAGEMENT RECOMMENDATIONS: Attempts should be continued to relocate *C. levisecta* in Oregon.

REMARKS: Efforts to relocate this plant in the Willamette Valley have been unsuccessful. Not seen in Oregon for over 40 years, it is known to tenuously persist in Washington. The valley habitat of *C. levisecta* is at a premium and crucially endangered.

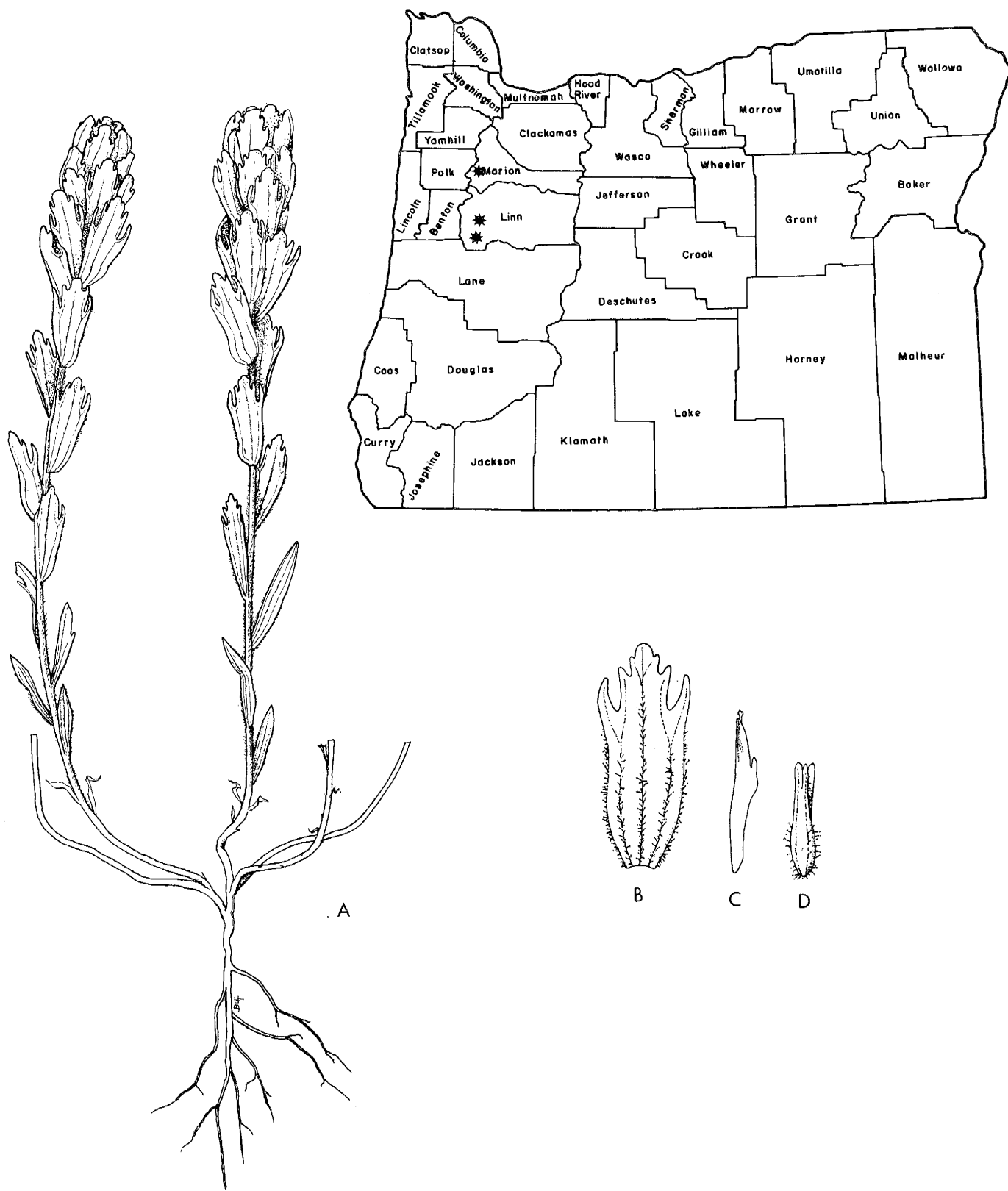


Fig. 48. *Castilleja levisecta*. A: Habit, X 0.7; B: Floral bract, X 1.2; C: Corolla, X 1; D: Calyx (in fruit), X 1 (drawn from Anderson 611, WS).

CASTILLEJA STEENENSIS Pennell

(Steens indian paintbrush)
Figwort family (Scrophulariaceae)

ORIGINAL PUBLICATION: Notulae Naturae 74:4-5. 1941.

STATUS: Candidate species for federal listing, Category 2, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Perennial with stems 25-30 cm tall, finely pubescent; leaves linear lanceolate, 4-6 cm long, with one or two pairs of lobes; bracts and calyces yellowish; bracts shorter and wider than leaves, with one or two pairs of lobes; calyx 20 mm long, cleft, each division with two lobes; corolla 23 mm long, galea 7 mm long, attenuate, green, lower lip with a greenish pouch (after Pennell, 1941a).

DISTRIBUTION: *Castilleja steenensis* is a Steens Mountain endemic of south central Harney County.

TAXONOMIC PROBLEMS: There are questions regarding the validity of this species, but until published information clarifying the situation becomes available current treatments are followed.

LOOK ALIKES: Pennell (1941) distinguished *C. steenensis* from related paintbrushes by its short hairs, finer pubescence of the stem, and the galea which distinctly exceeds the lower corolla lip. This has a much lower stature than other *Castilleja* spp. of the immediate area.

PHENOLOGY: Flowering from May to July.

HABITAT: This taxon occurs on rocky, dry, windswept basaltic ridges with *Draba sphaeroides* var. *cusickii*, *Aster alpigenus*, *Artemisia* spp., *Trisetum spicatum*, and *Astragalus whitneyi*. The elevation of this habitat is generally above 2650 m.

LAND OWNERSHIP/MANAGEMENT: Steens Mountain is administered by the Bureau of Land Management with the exception of a few private parcels of land.

PRESENT AND POTENTIAL THREATS: Offroad vehicle activity and the impact grazing animals impart on Steens Mountain are possibly beginning to adversely affect local endemic plant taxa.

MANAGEMENT RECOMMENDATIONS: Exclusion of grazing on the higher portions of Steens Mountain would benefit not only this species but the entire ecosystem. Recreational use of Steens Mountain has increased dramatically over the last several years, resulting in the inevitable environmental damage. Stricter guidelines defining such activities may be required in the future.

REMARKS: This species is locally common. It is rather inconspicuous, however, and does not visually dominate its habitat as do other paintbrushes.

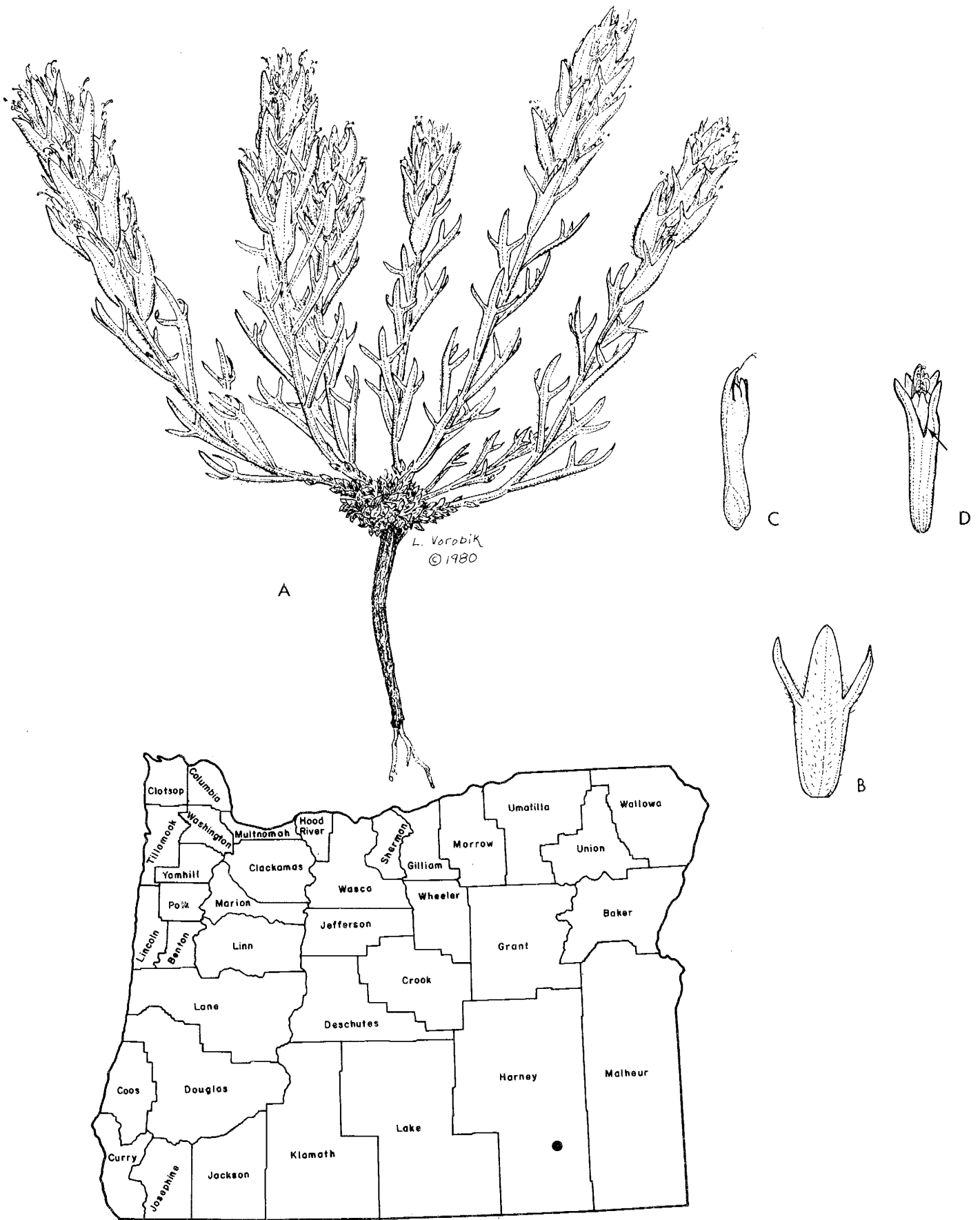


Fig. 49. *Castilleja steenensis*. A: Habit, showing woody base, X 1; B: Floral bract, X 2; C: Corolla, X 1.5; D: Flower, showing calyx slit, X 1.5 (drawn from Chambers 3345, OSC, and Holmgren & Reveal 2879, OSC).

CASTILLEJA XANTHOTRICHA Pennell
(Yellow hairy indian paintbrush)
Figwort family (Scrophulariaceae)

ORIGINAL PUBLICATION: Notulae Naturae 74:5-6. 1941.

STATUS: Candidate species for federal listing, Category 1, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Perennial herb with clustered stems, mostly unbranched, 10-25 cm high, pubescent, with some hairs gland tipped; leaves 20-45 mm long, entire; bracts creamy yellow to sometimes slightly pinkish; calyx 15-27 mm long, cleft, with each division two lobed, same color as bract tips; corolla 21-29 mm long, galea 1/4 to 1/3 the corolla length, lips and margins of the galea pinkish, purplish, whitish or yellowish (after Holmgren, 1968).

DISTRIBUTION: Restricted to the John Day River drainage of Jefferson, Wasco, and Wheeler counties, Oregon.

PHENOLOGY: This plant blooms from April to July.

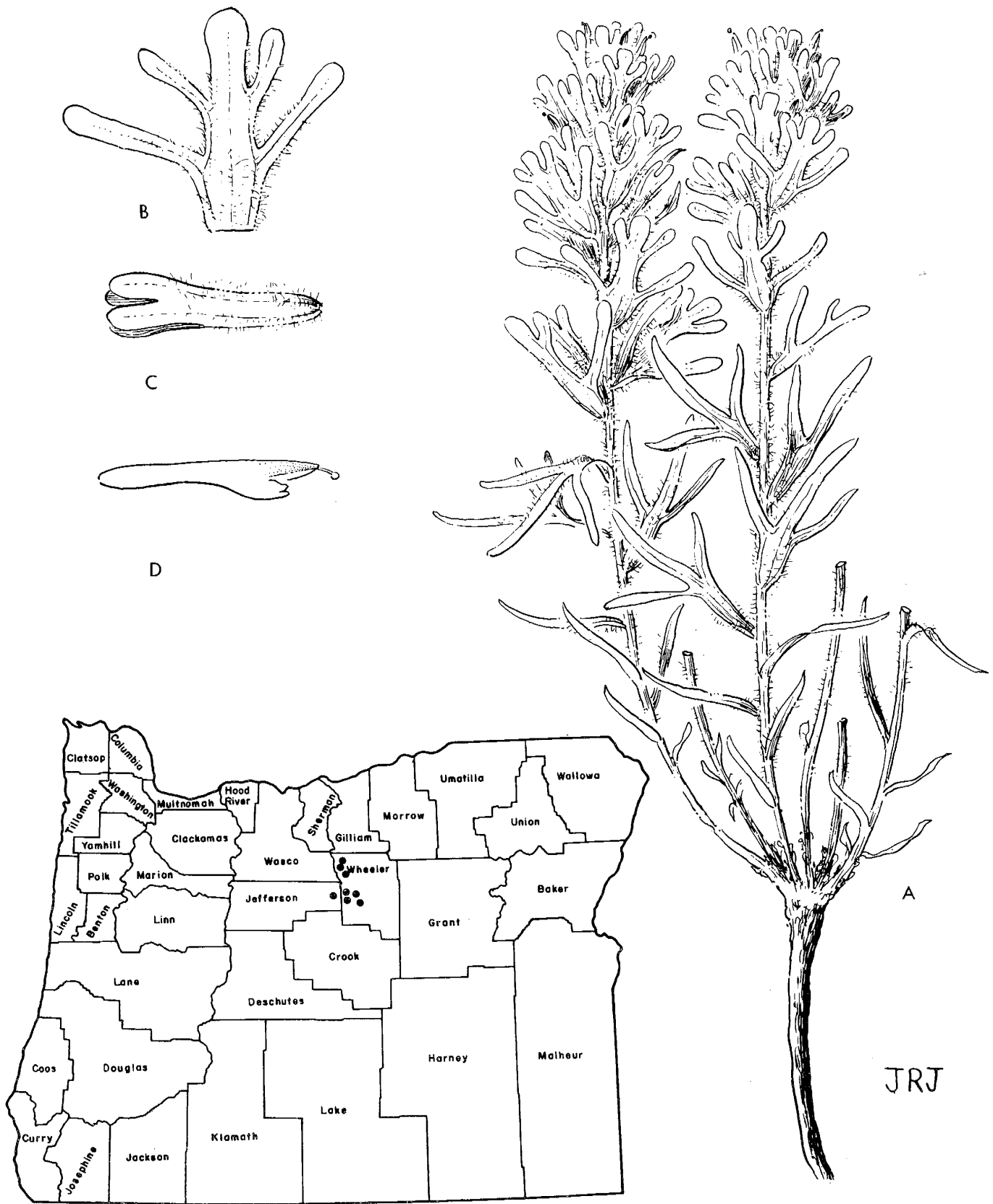
HABITAT: *Castilleja xanthotricha* inhabits rocky slopes, sagebrush flats, and bunchgrass communities, on typically barren sites from 475 to 800 m.

LAND OWNERSHIP/MANAGEMENT: Administered by the Bureau of Land Management and private landowners.

PRESENT AND POTENTIAL THREATS: Grazing, road construction, and mining activities are all potentially harmful to this taxon.

MANAGEMENT RECOMMENDATIONS: Sites which support this and other John Day Valley endemics need to be set aside for preservation. The habitat here is particularly vulnerable to disturbance.

REMARKS: Crosby (1977) comments "this species is scattered throughout the John Day River Valley but is found only on sites of better range condition. Although restricted in its range, the populations of *C. xanthotricha* seem to be stable and in some areas may be increasing due to the decline of sheep." Other botanists have expressed concern for the species because of its fragile, easily disturbed habitat, which recovers very slowly.



JRJ

Fig. 50. *Castilleja xanthotricha*. A: Habit, X 1; B: Floral bract, X 2; C: Calyx, X 2; D: Corolla, indicating short galea, X 1.8 (drawings taken from Hitchcock et al., 1959).

CHAENACTIS NEVII Gray

(John Day chaenactis)

Composite family (Asteraceae)

ORIGINAL PUBLICATION: Proc. Amer. Acad. 19:30. 1883.

STATUS: Candidate species for federal listing, Category 1, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Annual, densely glandular puberulent, 10-30 cm tall; leaves pinnatilobate or pinnatifid, lower leaves 4.5 cm long or less, upper leaves reduced; flowers bright yellow, terminating the branches, involucre 6-7 mm high, flowers rayless; pappus of ten minute vestigial scales (after Ferris, 1960).

DISTRIBUTION: Endemic to the John Day Valley of Grant, Wasco, and Wheeler counties, Oregon.

PHENOLOGY: *Chaenactis nevi* blooms from May to June.

HABITAT: This annual frequents red and gray clay outcrops between 335 and 800 m, in association with *Cleome platycarpa* on mostly otherwise barren outcroppings. Other occasional associates include *Bromus tectorum*, *Chrysothamnus nauseosus*, *Phacelia lutea*, and *Artemisia tridentata*.

LAND OWNERSHIP/MANAGEMENT: The Bureau of Land Management, State of Oregon, and private owners utilize this plant's habitat.

PRESENT AND POTENTIAL THREATS: Highway maintenance and possibly grazing are primary concerns.

MANAGEMENT RECOMMENDATIONS: The range of this species should be determined in non-drought years to better evaluate its status. The fragile soil types required by *C. nevi* should be partially exempted from grazing.

REMARKS: Crosby (1977) indicates that in drought years few plants of this species are seen. In years with normal moisture, however, it appears to be locally abundant. The threat of grazing may be overestimated since this is an annual. Its ability to compete with prolific invaders such as *Bromus tectorum*, however, may be a critical problem and thus an indirect result of overgrazing (a practice which encourages the establishment of *Bromus*). The edaphic specialization of *C. nevi* may protect it at least partially, since many other species, including invading weeds, cannot fully adapt to the harsh conditions. This is the only yellow flowered member of the genus in Oregon.

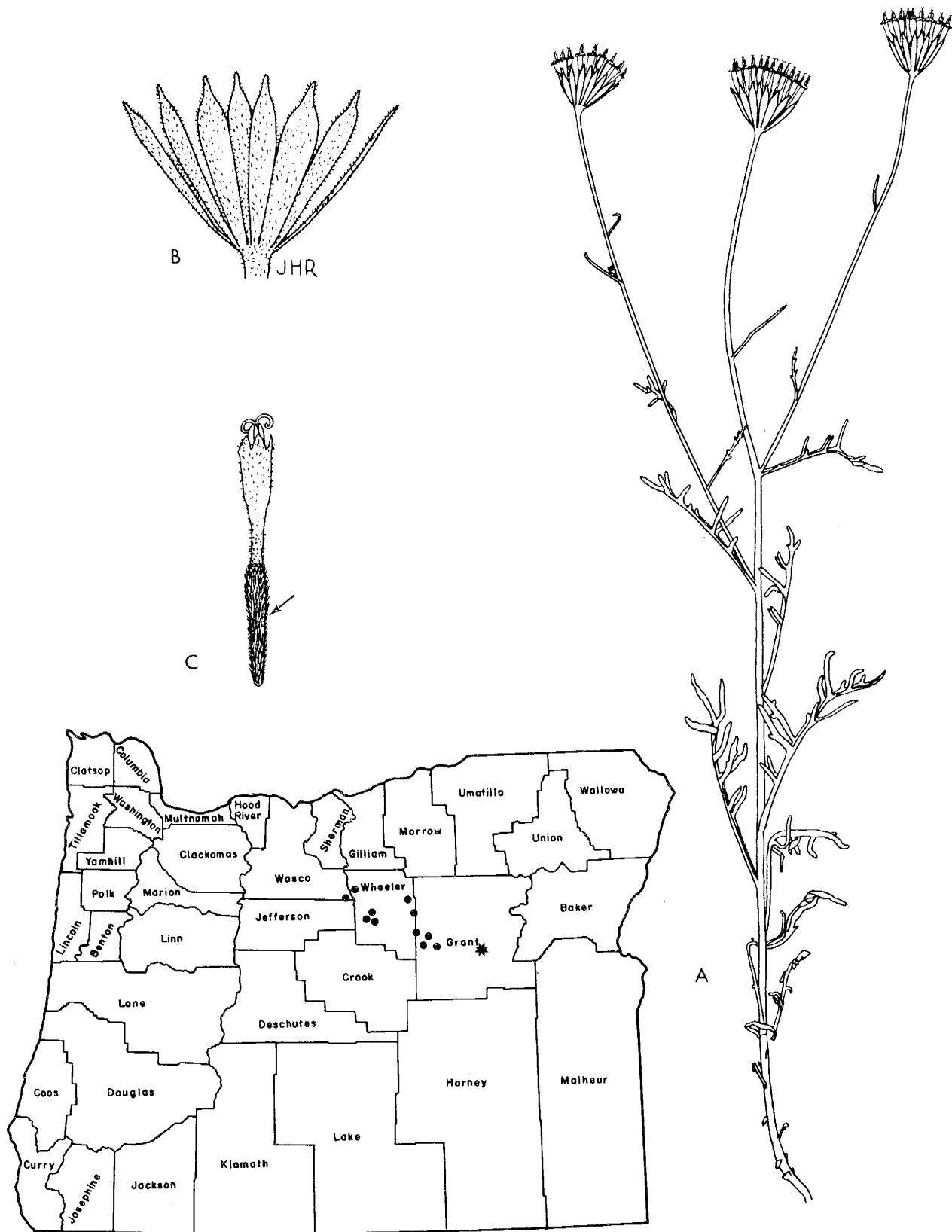


Fig. 51. *Chaenactis nevii*. A: Habit, X 1; B: Involucre (floral bracts), X 5; C: Floret, illustrating hairy achene, X 3.5 (drawings taken from Hitchcock et al., 1955).

CIRSIUM CILIOLATUM (Henderson) J.T. Howell

(Ciliate or Ashland thistle)

Composite family (Asteraceae)

ORIGINAL PUBLICATION: Leaf1. West. Bot. 9:9. 1959.

SYNONYMS: *Cirsium undulatum* var. *ciliolatum* Henderson (Bull. Torrey Club 27:348. 1900).

Carduus ciliolatus Heller (Muhlenbergia 1:5. 1900).

Cirsium howellii Petrak (Beih. Bot. Centr. 35:486-487. 1917).

STATUS: Candidate species for federal listing, Category 1, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Perennial rhizomatous herb with erect stems up to 2 m tall, pubescence cobwebby; basal leaves few, lower cauline leaves up to 25 cm long, 10 cm wide, pinnately parted in lobed division, ciliate, each division tipped with a short, weak spine, with petiole like base or sessile by a broadened base with spinulose wings, upper leaves shorter and under the heads, bract like; heads 3-4 cm long, involucral bracts numerous with ciliolate margins, the tips ending in a short, stiff spine; corollas yellowish white, becoming brownish; achenes brown, 5-6 mm long; pappus whitish (after Howell, 1960).

DISTRIBUTION: The Ashland thistle is found in southern Jackson County, Oregon and immediately adjacent northern California.

TAXONOMIC PROBLEMS: Howell (1960) notes that "in the mountains between Ashland and Klamath Falls, *C. ciliolatum* intergrades with *C. cymosum*. Plants similar in appearance to some of these (hybrids) occur occasionally in the range of *C. cymosum* in the North Coast Range in California." Like many of the thistles, *C. ciliolatum* is rarely collected. Its range, therefore, is imperfectly known.

LOOK ALIKES: *Cirsium ciliolatum* is tall (to 2 m), has entirely arachnoid pubescence, and whitish flowers, a combination of characters which theoretically (if not satisfactorily) sets it apart from other thistles of the area.

PHENOLOGY: This species flowers from June to August.

HABITAT: Apparently rocky slopes or grassy fields, according to label information.

LAND OWNERSHIP/MANAGEMENT: Possibly U.S. Forest Service in Oregon.

PRESENT AND POTENTIAL THREATS: Herbicide application.

MANAGEMENT RECOMMENDATIONS: Many thistle species thrive in disturbed areas. The effects of disturbance on *C. ciliolatum* need to be determined (one collection is labelled as from a "roadcut"). Its geographic range and number of populations need to be assessed.



Fig. 52. *Cirsium ciliolatum*. A: Habit, upper portion of plant, X 0.5, B: Lower stem leaf, X 1; C: Involucral tip (floral bract), illustrating conspicuous dorsal ridge, X 3 (drawn from Howell 28779, UC).

COLLOMIA MACROCALYX Leib. ex Brand.

(Bristle flowered collomia)

Phlox family (Polemoniaceae)

ORIGINAL PUBLICATION: Fedde Rep. Sp. Nov. 17:317. 1921.

STATUS: Candidate species for federal listing, Category 1, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Erect annual, up to 10 cm tall, minutely pubescent below, rough to the touch, stems branched when well developed; stems and branches terminating in dense, leafy bracteate flower clusters; leaves entire, few below the inflorescence, bracts linear, 1-3 cm long, 1-2 mm wide; calyx teeth narrow, 5-11 mm long in fruit; corolla blue (purplish when dry), about 1 cm long; stamens somewhat unequally inserted in throat on short (less than 1 mm) filaments; each locule with one seed (after Cronquist, 1959).

DISTRIBUTION: Historically known from disjunct sites in Baker, Wheeler, Crook, Gilliam, Wasco, and southern Malheur counties, Oregon.

LOOK ALIKES: *Collomia macrocalyx* may be confused with the more widespread *C. linearis*. *Collomia linearis* differs in having many larger, more linear shaped cauline leaves, fewer and shorter inflorescence bracts, a pink or bluish to white corolla, and more unequally inserted stamens.

PHENOLOGY: Flowering from late May to early June.

HABITAT: Known from undisturbed, dry, open rocky slopes and ridges at mid elevations. This species grows in areas with sparse vegetation. Occasional associates include *Juniperus occidentalis*, *Pinus ponderosa*, *Purshia tridentata*, *Chrysothamnus nauseosus*, *Ribes cereum*, *Blepharipappus scaber*, *Erigeron chrysopsidis*, *Astragalus whitneyi*, and *Lomatium* spp.

LAND OWNERSHIP/MANAGEMENT: Currently poorly known, but apparently includes U.S. Forest Service, private, and Bureau of Land Management lands.

PRESENT AND POTENTIAL THREATS: Offroad vehicles, mining for gravel, road building, grazing, and other types of surface destruction. The existence of this species is apparently usually tied to pristine sites.

MANAGEMENT RECOMMENDATIONS: Additional inventory work is essential in understanding more about the peculiar disjunct distribution of this species.

REMARKS: "The very few widely disjunct sites for this species, and its occurrences only in undisturbed habitat would seem to indicate the species was at one time more common and that the present sites are relic populations of a formerly widespread species (Packard, 1977)." This is an interesting member of the genus in that many other annual *Collomia* react favorably to disturbance. There have recently been a few collections from central Oregon.



Fig. 53. *Collomia macrocalyx*. A: Habit, X 12 ; B: Corolla dissected, showing insertion of stamens, X 4; C: Flower, emphasizing narrow calyx lobes (drawn from Joyal s.n., OSC).

COLLOMIA MAZAMA Coville

(Mount Mazama collomia)

Phlox family (Polemoniaceae)

ORIGINAL PUBLICATION: Proc. Biol. Soc. Wash. 11:35-36. 1897.

SYNONYMS: *Gilia mazama* Nelson & Macbride (Bot. Gaz. 61:34. 1916).

STATUS: Candidate species for federal listing, Category 1, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Perennial with few to many stems from a slender taproot, 15-30 cm high, simple with a few branches toward the tip, glandular hairy, strongly scented; leaves 3-5 cm long, coarsely toothed above, entire below; flowers in dense clusters; calyx campanulate, 8-10 mm long; corolla funnelform, 10-15 mm long, deep blue, violet, pinkish, lavender, or bright purple, lobes 5 mm long; anthers and stigma exserted (after Peck, 1961).

DISTRIBUTION: Restricted to Douglas, Jackson, and Klamath counties, Oregon, mostly in the vicinity of Crater Lake and near the Rogue-Umpqua divide.

LOOK ALIKES: Coville (1897) remarked that this *Collomia* is remarkable for its perennial habit and the deep violet blue color of its flowers. *C. mazama* may be confused with *C. debilis*, a perennial which may also have blue or lavender flowers. *C. mazama* may be distinguished by its erect stems and its shorter corolla.

PHENOLOGY: This species flowers from July through August.

HABITAT: Alpine meadows and slopes and dry rocky places in black hemlock, fir, or lodgepole pine forests, at elevations between 900 and 1850 m.

LAND OWNERSHIP/MANAGEMENT: The U.S. Forest Service and the National Park Service.

PRESENT AND POTENTIAL THREATS: Recreational use of the species' habitat is a potential, but probably minimal, threat.

MANAGEMENT RECOMMENDATIONS: The current range, abundance, and tolerance to disturbance need to be determined for the species as well as the documentation of any threat.

REMARKS: Recent collections of *C. mazama* are few, although there have been several unvouchered sightings. It is probable that this species is not especially uncommon at higher elevations in its geographic range.



Fig. 54. *Collomia mazama*. A: Habit, X 0.7; B: Corolla dissected, showing stamen insertion, X 2; C: Flower, X 2 (drawn from Coville & Leiberg 3040, ORE).

CORDYLANTHUS MARITIMUS Nutt. ex Benth. SSP. PALUSTRIS
(Behr) Chuang & Heckard

(Saltmarsh birdsbeak)

Figwort family (Scrophulariaceae)

ORIGINAL PUBLICATION: Brittonia 25:135-158. 1973.

SYNONYMS: *Chloropyron palustre* Behr (Proc. Calif. Acad. Sci. 1:61. 1855).

STATUS: Candidate species for federal listing, Category 1, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Annual 10-30 cm tall, unbranched or sparingly branched; herbage grayish green or glaucous, often purplish tinged, villous or glabrescent; leaves oblong to oblong lanceolate, 1-2.5 cm long, 3-7 mm broad; inflorescence of dense spikes; floral bracts oblong, with a pair of short teeth near apex; corolla 1.8-2.5 cm long, lower lip and pouch suffused with pinkish or purplish red, the galea pale cream to white; seeds 2-3 mm long, ten to twenty per capsule (after Chuang & Heckard, 1973).

DISTRIBUTION: Restricted in Oregon to coastal sites from Coos and Tillamook Counties. Also reported from several counties in northern California.

LOOK ALIKES: *Cordylanthus maritimus* ssp. *palustris* may be distinguished from the ssp. *canescens* by its floral bracts with a single pair of lobes near the apex and from ssp. *maritimus* by its simple or few branched stem with branches shorter than or equalling the central spike.

PHENOLOGY: This partially parasitic herb flowers from June to October.

HABITAT: An inhabitant of salt marshes along the coast, sometimes found growing just above tidewater in wet areas. Associates include *Salicornia virginica*, *Polygonum paronychia*, and *Cakile edentula*.

LAND OWNERSHIP/MANAGEMENT: The State of Oregon and limited private ownership manage Oregon's coastal areas.

PRESENT AND POTENTIAL THREATS: Draining, filling, and polluting are the major problems facing coastal saltmarsh ecosystems.

MANAGEMENT RECOMMENDATIONS: Immediate protection of local salt marshes is necessary to ensure the survival of this taxon's required habitat. Continued inventory of coastal zones is recommended. Many of the populations in California have been lost, therefore efforts aimed at protecting those remaining few in Oregon are becoming increasingly important.

REMARKS: Chuang & Heckard (1973), comment in their treatment of the taxonomy of *Cordylanthus*, "Plants of specialized and limited habitats such as marshes, and saline and alkaline areas are particularly vulnerable to man's activities that destroy and alter the environment of native plants".

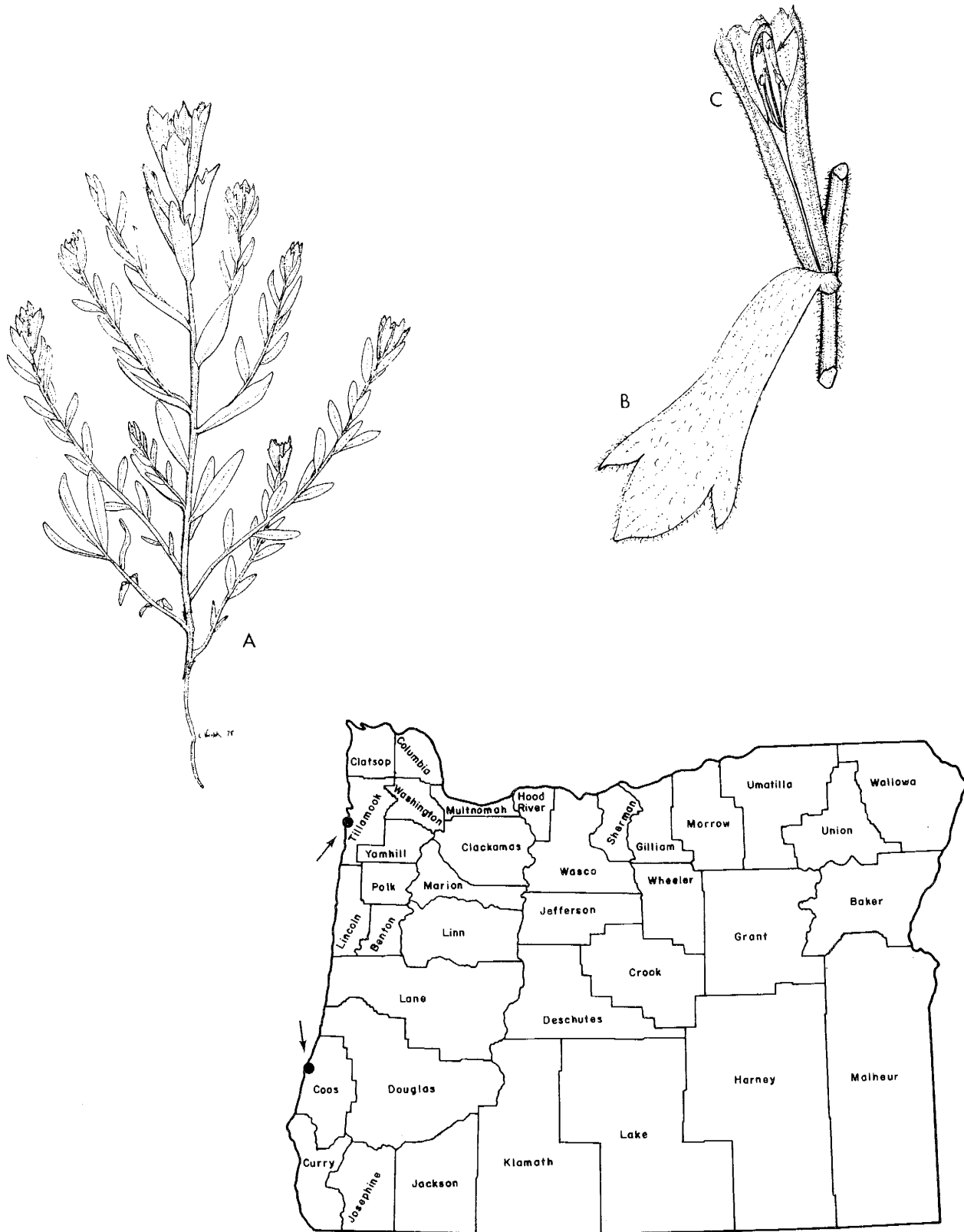


Fig. 55. *Cordylanthus maritimus* ssp. *palustris*. A: Habit, X 0.5; B,C: Floral bract, attached at the base of flower (corolla tucked into enveloping calyx indicated), X 2 (drawn from Henderson 11779, ORE).

CORYDALIS AQUAE-GELIDAE Peck & Wilson

(Clackamas corydalis)

Fumitory family (Fumariaceae)

ORIGINAL PUBLICATION: Leaf1. West. Bot. 8:39-40. 1956.

STATUS: Candidate species for federal listing, Category 1, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Moisture loving perennial, in large dense or rather loose clusters from deep seated rootstocks producing stolons; stems erect, 3-11 dm high, simple or sometimes two to four branched from near the base; basal and lower cauline leaves about equalling the stem, the petiole as long as or somewhat shorter than the blade, the latter pinnately four divided or parted, the ultimate series numerous, 8-15 mm long, the ultimate segments of the upper cauline leaves only 3-7 mm long; raceme terminal; flowers numerous, up to forty, corolla bright rose lavender, the petals 10-12 mm long, the upper petal of the outer pair with a prominently keeled hood (after Peck, 1956).

DISTRIBUTION: Endemic to the low mountains of Clackamas and Multnomah counties, Oregon, and Skamania County, Washington.

LOOK ALIKES: *Corydalis scouleri* occurs in the range of *C. aquae-gelidae* but it has fewer flowered racemes, a corolla 20-30 mm long, and ultimate leaf segments which are 20-80 mm long.

PHENOLOGY: This species flowers from June to September.

HABITAT: In shallow water or mud at the margins of shaded cold springs and streams, from 240-1220 m. Associated species include *Athyrium felix-femina*, *Dicentra formosa*, *Habenaria* spp., and *Rubus spectabilis*.

LAND OWNERSHIP/MANAGEMENT: The habitat of this plant is managed by the U.S. Forest Service, the State of Oregon, and private landowners.

PRESENT AND POTENTIAL THREATS: Threats include the destruction of habitat from logging, road construction, roadside spraying, and severe fluctuations of the water level on the Clackamas River.

MANAGEMENT RECOMMENDATIONS: Overstory in the streamside habitat of *C. aquae-gelidae* should not be removed. Significant or rapid changes in water level should be prevented during the flowering season, so reproduction of the populations along larger streams or rivers is not impaired. Allowance should be made for any populations found along roadsides or other spray zones.

REMARKS: Only a few populations of this plant are known. Most of these have been discovered since this species was proposed as Endangered in 1976. The total range requires further investigation. It is curious that this beautiful species is so poorly known (not even described until 1956), considering its close proximity to population centers.

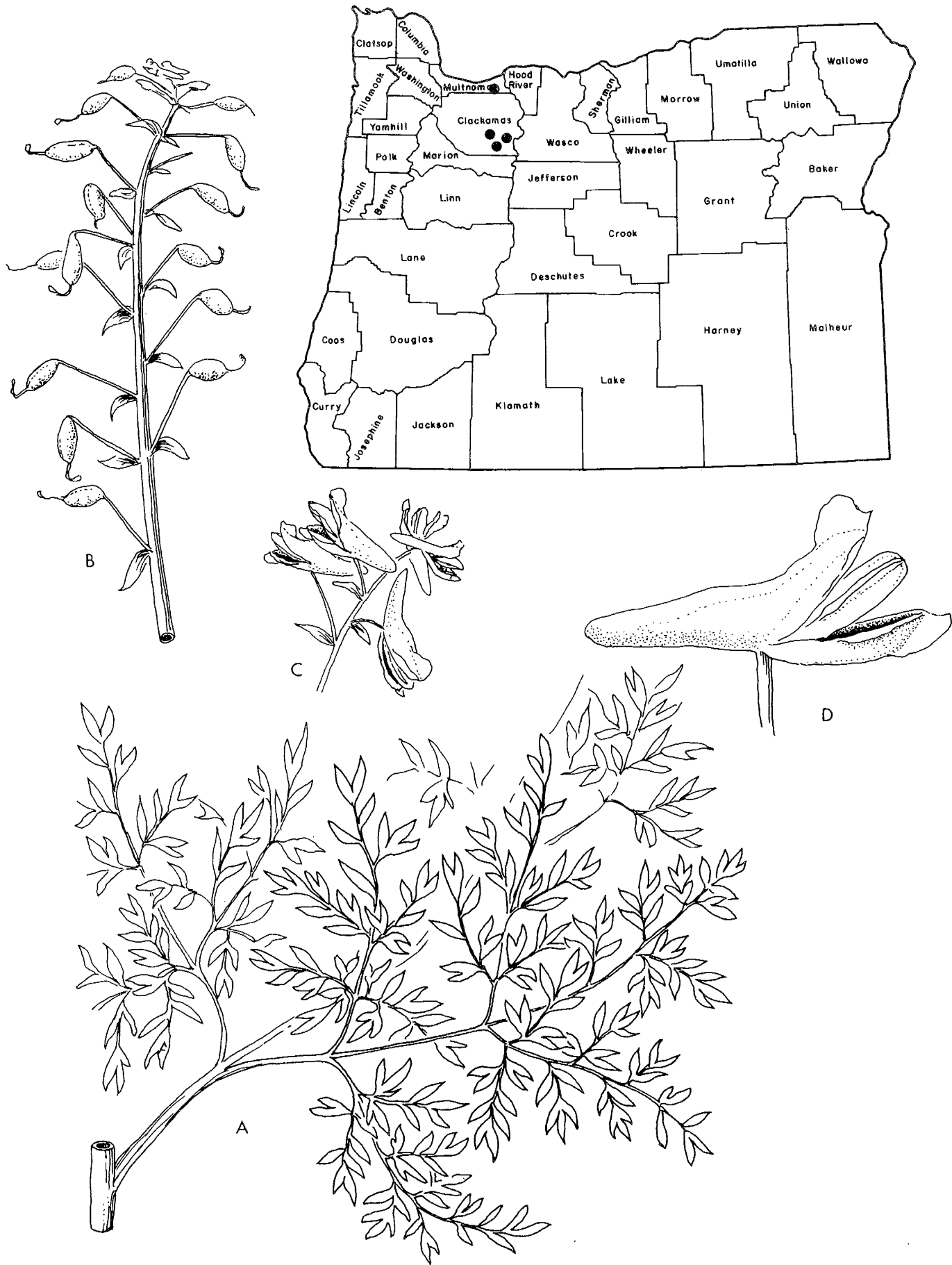


Fig. 56. *Corydalis aquae-gelidae*. A: Cauline leaf, X 1; B: Fruiting raceme, X 1; C: Flowers, X 2; D: Flower, close-up, X 6 (drawings taken from Hitchcock et al., 1964).

CRYPTANTHA THOMPSONII Johnston

(Thompson's cryptantha)

Borage family (Boraginaceae)

ORIGINAL PUBLICATION: Contr. Arnold Arb. 3:88. 1932.

SYNONYMS: *Oreocarya thompsonii* (Johnston) Abrams (Illustrated Flora of the Pacific States 3:600. 1951).

STATUS: Candidate species for federal listing, Category 1, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Perennial with several or many stems 1-3 dm tall, from a stout taproot and branching caudex; herbage more or less bristly, the bristles spreading above, often appressed below; basal leaves tufted, oblanceolate, with a relatively elongate blade and short petiole, the better developed ones mostly 4-7 cm long (petiole included) and 5-10 mm wide, cauline leaves narrower and sessile, but often fairly well developed and elongate; spikes aggregated into a terminal inflorescence; corolla white, 4-8 mm wide; nutlets lance-ovate, 4 mm long, somewhat roughened dorsally, smooth ventrally, the scar evidently open for most of its length (after Cronquist, 1959).

DISTRIBUTION: Recently found in the Wallowa Mountains of Baker County, Oregon. Previously known from Chelan and Kittitas counties, in the Wenatchee Mountains of central Washington.

LOOK ALIKES: *Cryptantha thompsonii* should not be confused with anything other than perhaps *C. nubigena*, from which it differs in height (usually greater than 1.5 dm as compared to less than 1.5 dm) and characters of the fruit. *C. nubigena* has a closed attachment scar the full length of the nutlet, while *C. thompsonii* exhibits an open scar for most of its length.

PHENOLOGY: Flowering from June to early August.

HABITAT: *Cryptantha thompsonii* prefers rocky ground, especially talus slopes, particularly on serpentine in Washington. In the southern Wallowas of Baker County, *C. thompsonii* grows on granitic talus on south aspects within a subalpine forest mosaic, associated with *Sedum lanceolatum* var. *rupicolum*, *Aspidotis densa*, *Pinus albicaulis*, *Abies lasiocarpa*, *Castilleja viscidula*, and *Arenaria aculeata* at mid to upper elevations.

LAND OWNERSHIP/MANAGEMENT: U.S. Forest Service.

PRESENT AND POTENTIAL THREATS: Hikers and Forest Service crews involved in trail work.

MANAGEMENT RECOMMENDATIONS: Additional field work in this area of the Wallowas is needed. Also, U.S. Forest Service personnel working in the area should be made aware of this population and take precautionary measures to avoid it when maintaining trails.

REMARKS: This species was first collected in Oregon in 1978 (Meinke, 1980).

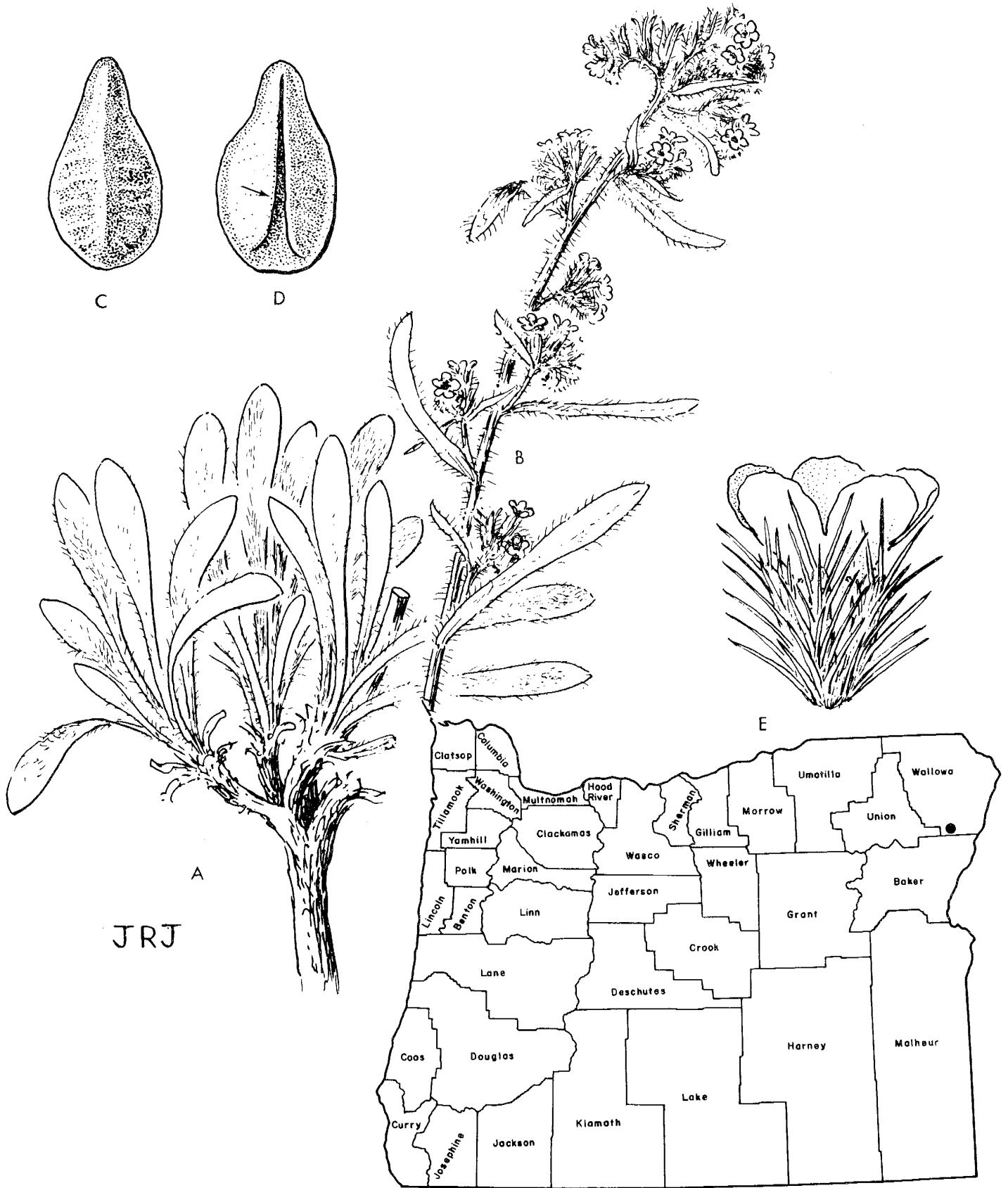


Fig. 57. *Cryptantha thompsonii*. A,B: Habit, basal portion of plant and flowering stem, X 1; C: Nutlet, dorsal side, X 10; D: Nutlet, ventral side, depicting open scar, X 10; E: Flower, X 8 (drawings taken from Hitchcock et al., 1959).

CYPRIPEDIUM MONTANUM

(Mountain lady's slipper)

Orchid family (Orchidaceae)

ORIGINAL PUBLICATION: Gen. & Sp. Orch. 528. 1840.

SYNONYMS: *Cypripedium montanum* Stein (Orchideenbuch 179. 1892).
Cypripedium occidentale Wats. (Proc. Am. Acad. 11:147. 1876).

STATUS: Candidate species for federal listing, Category 2, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Erect perennial from spreading roots, ca. 2-6 dm tall, sparsely glandular; leaves broadly elliptic, 5-15 cm long, up to 7 cm broad; flowers one to three, subtended by a leafy bract; sepals twisted, brownish or purple, 4-5 cm long; petals to 6.5 cm long, lower lip obovoid and pouched, white, streaked with purple (after Hitchcock, 1969).

DISTRIBUTION: Widespread in northwestern North America, and known at one time or another from nearly every county in Oregon.

LOOK ALIKES: The color and size of the flowers readily distinguish this beautiful orchid.

PHENOLOGY: Flowering from May through July.

HABITAT: Dry to fairly moist woods, in partial shade or rarely in the open, typically at lower to middle elevations. Occurring with numerous associates, depending on locality, but often including *Corallorhiza* spp., *Arnica* spp., *Erythronium* spp., *Vaccinium* spp., and *Pyrola* spp.

LAND OWNERSHIP/MANAGEMENT: In Oregon private interests, Bureau of Land Management, U.S. Forest Service, U.S. Fish and Wildlife Service, and the State of Oregon all manage potential habitat.

PRESENT AND POTENTIAL THREATS: Logging, horticultural collecting, and occasional grazing have been demonstrated to be detrimental.

MANAGEMENT RECOMMENDATIONS: Consider locality information to be sensitive to thwart collecting, and evaluate effects of logging.

REMARKS: This showy plant is commonest in Oregon in the northeast. It has been observed here tolerating limited logging disturbance. It does not occur strictly in old growth stands, as has been often assumed, but may be found to a lesser degree in older second growth as well. It is not known if this indicates lengthy tolerance to the effects of logging or is rather the result of limited reestablishment. One would suspect the former. It should be pointed out that the distribution map for *C. montanum* is only a cursory representation of the many historical locations on record.



Fig. 58. *Cypripedium montanum*. A: Habit (note twisted sepals), X 0.6 (drawing taken from Hitchcock et al., 1969).

DARLINGTONIA CALIFORNICA Torrey

(California pitcher plant)

Pitcher plant family (Sarraceniaceae)

ORIGINAL PUBLICATION: Smiths. Contrib. Know. 6:3-7. 1825.

SYNONYMS: *Chrysamphora californica* Greene (Pittonia 2:191. 1891).

STATUS: Candidate species for federal listing, Category 2, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: A unique carnivorous plant with greenish yellow leaves, 20-50 cm long with a curved hood, often purplish, with a divided appendage; flowers nodding, sepals yellowish green, petals dark reddish purple; capsule rounded, 2-3 cm long (after Hitchcock, 1964).

DISTRIBUTION: *Darlingtonia* inhabits the immediate coast and coastal mountains of southern Oregon and northern California. It is known from Coos, Curry, Douglas, Josephine, Lane, Lincoln, and Tillamook counties in Oregon. The species is disjunct in the Sierra Nevada of California in addition to its coastal distribution.

HABITAT: Wet meadows and boggy seeps in waterlogged acid soils low in nitrogen. Usually found on serpentine or periodotite soil bases in redwood, douglas fir, yellow pine, or red fir forest communities, from sea level to ca. 2200 m. Associated species include *Cypripedium californicum*, *Viola lanceolata* ssp. *occidentalis*, *Gentiana bisetata*, *Ledum glandulosum* ssp. *columbianum*, *Narthecium californicum*, and *Tolfieldia glutinosa* ssp. *occidentalis*.

LAND OWNERSHIP/MANAGEMENT: *Darlingtonia* habitat in Oregon is managed by the U.S. Forest Service and Bureau of Land Management and also occurs on private property.

PRESENT AND POTENTIAL THREATS: Collecting for horticultural purposes, disruption of habitat due to activities of offroad vehicles, mining, logging, housing development, road construction, and the draining of wetlands are all predominant threats.

MANAGEMENT RECOMMENDATIONS: As *Darlingtonia* populations are destroyed through development of private lands, it will become increasingly important to conserve populations on public lands. Locality information should be protected to prevent removal of this species for horticultural purposes. This is vital when dealing with commercially exploitable taxa.

REMARKS: This species is most closely related to the *Sarracenias* of the southeastern United States. The wide disjunction between these two genera raises interesting evolutionary and ecological questions. This plant, although still locally common, is being given special review consideration because of the combination of rather intense potential threats, particularly that of rampant and thoughtless collecting. The populations may very likely decrease dramatically in the years ahead.



JRJ

Fig. 59. *Darlingtonia californica*. A: Habit, basal leaves, indicating divided appendage, X 0.5; B: Habit, flowering scape, X 0.5 (drawings from Hitchcock et al., 1964).

DELPHINIUM LEUCOPHAEUM Greene

(Pale larkspur)

Buttercup family (Ranunculaceae)

ORIGINAL PUBLICATION: Erythea 3:118. 1895.

SYNONYMS: *Delphinium nuttallii* var. *leucophaeum* Davis, (Minn. Bot. Stud. 2:450. 1900).
Delphinastrum leucophaeum Nieuwl. (Am. Midl. Nat. 3:172. 1914).
Delphinium menziesii var. *ochroleucum* Nutt. (in T. & G. Fl. N. Am. 1:31. 1838).
Delphinium willametense Suksd. (Deuts. Bot. Monats. 16:210. 1898).

STATUS: Candidate species for federal listing, Category 1, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Slender perennial from cluster of tubers, usually 20 to 60 cm tall; numerous leaves evenly distributed on stem, long petioled, leaf blades lobed; inflorescence a raceme with six to thirty flowers, not glandular; sepals white to cream, sometimes slightly greenish blue on back; lower petals white or faintly bluish tinged, upper petals bluish to lavender tipped; follicles 8-12 mm long (after Hitchcock, 1964).

DISTRIBUTION: The pale larkspur is restricted to the northern Willamette Valley, and possibly adjacent Washington. It is most likely to be encountered in Clackamas or Multnomah counties.

TAXONOMIC PROBLEMS: *Delphinium leucophaeum* is reported to hybridize with *D. pavonaceum* and *D. menziesii*. Abrams (1944) considered *D. leucophaeum* possibly only a color form of *D. nuttallii*.

LOOK ALIKES: *Delphinium leucophaeum* may be distinguished from the closely related *D. pavonaceum* by its shorter habit and smaller, non-glandular flower parts. *D. leucophaeum* differs from *D. menziesii* in its essentially white as opposed to bluish sepals.

PHENOLOGY: Flowering in *D. leucophaeum* is from May to July.

HABITAT: This species inhabits dry bluffs, fields, and especially rocky (basaltic) ledges. Associates include shrubby genera such as *Holodiscus*, *Philadelphus*, *Symphoricarpos*, *Rhus*, and *Quercus*, and numerous herbaceous species.

LAND OWNERSHIP/MANAGEMENT: Private.

PRESENT AND POTENTIAL THREATS: Urban expansion, agricultural development, use of agricultural herbicides, and herbicide use by road maintenance crews are imminent threats.

MANAGEMENT RECOMMENDATIONS: The current geographic range and the number and location of remaining populations need to be determined.

REMARKS: The few known sites for this taxon occur very near Portland.

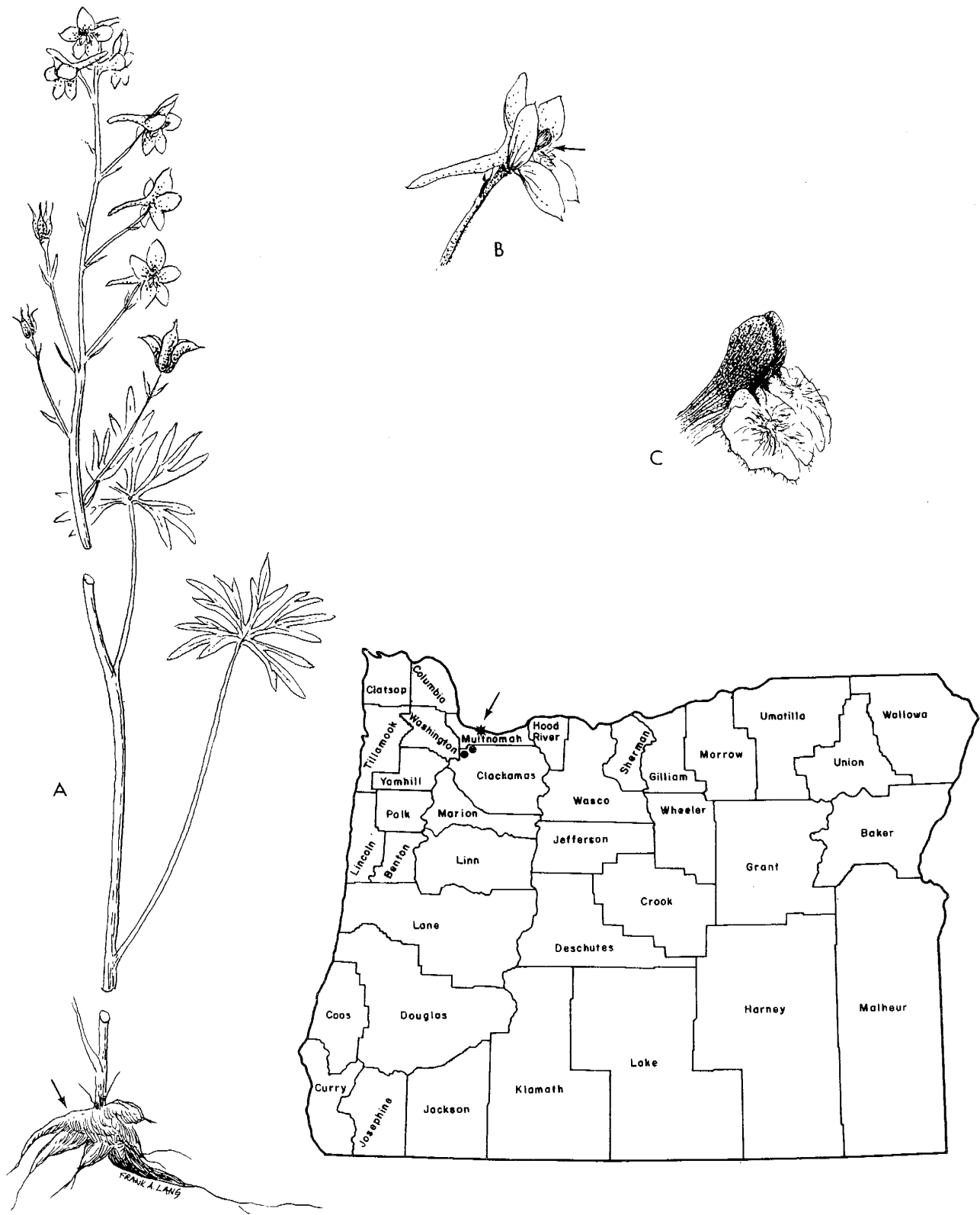


Fig. 60. *Delphinium leucophaeum*. A: Habit, illustrating tuberous root system, X 0.6; B: Flower, location of petals indicated, X 1; C: Petals, X 2.5 (drawn from Hitchcock 19328, UC).

DELPHINIUM PAVONACEUM Ewan

(Peacock larkspur)

Buttercup family (Ranunculaceae)

ORIGINAL PUBLICATION: U. Colo. Stud. Ser. D 2:110. 1945.

STATUS: Candidate species for federal listing, Category 1, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Leafy, erect perennial, 3 to 9 dm tall from a cluster of globose tubers; leaves mostly cauline, becoming bractlike above, the lowest leaves with petioles up to 22 cm, leaves deeply cleft; raceme pyramidal, lower pedicels much longer than upper with large leaf-like bracts in the axils; several to many showy flowers, sepals cream to white; upper petals dark blue distally, lower petals blue toward the base (after Ewan, 1945).

DISTRIBUTION: This is an endemic of the middle Willamette Valley of Oregon, primarily found in Benton, Marion, and Polk counties.

TAXONOMIC PROBLEMS: Hybridization is known to occur between the closely related *D. leucophaeum* and *D. pavonaceum*, as well as between these two species and *D. menziesii*. Ewan (1945) suggests that *D. pavonaceum* may represent a hybrid derivative of *D. leucophaeum* and *D. menziesii*.

LOOK ALIKES: See summary for *D. leucophaeum*.

PHENOLOGY: This larkspur blooms from April through June.

HABITAT: *Delphinium pavonaceum* inhabits dry roadsides and well drained areas of native prairie. Associated species include *Potentilla gracilis*, *Deschampsia cespitosa*, *Poa pratensis*, and *Rosa* sp.

LAND OWNERSHIP/MANAGEMENT: Habitat for *D. pavonaceum* is managed by the U.S. Fish and Wildlife Service, the State of Oregon, and private landowners.

PRESENT AND POTENTIAL THREATS: Activities hazardous to this plant include urban expansion, agricultural development, use of agricultural herbicides, and herbicide use by road maintenance crews. The latter threat is particularly ominous, since *D. pavonaceum* has essentially taken a final stand along roadside fence rows and ditches where vestiges of native plant communities remain.

MANAGEMENT RECOMMENDATIONS: The U.S. Fish and Wildlife Service's Willamette Valley Refuges harbor the finest remaining populations of this species. Their efforts at maintaining its habitat in an undisturbed state will be very important in its perpetuation.

REMARKS: This species is locally common near Corvallis.

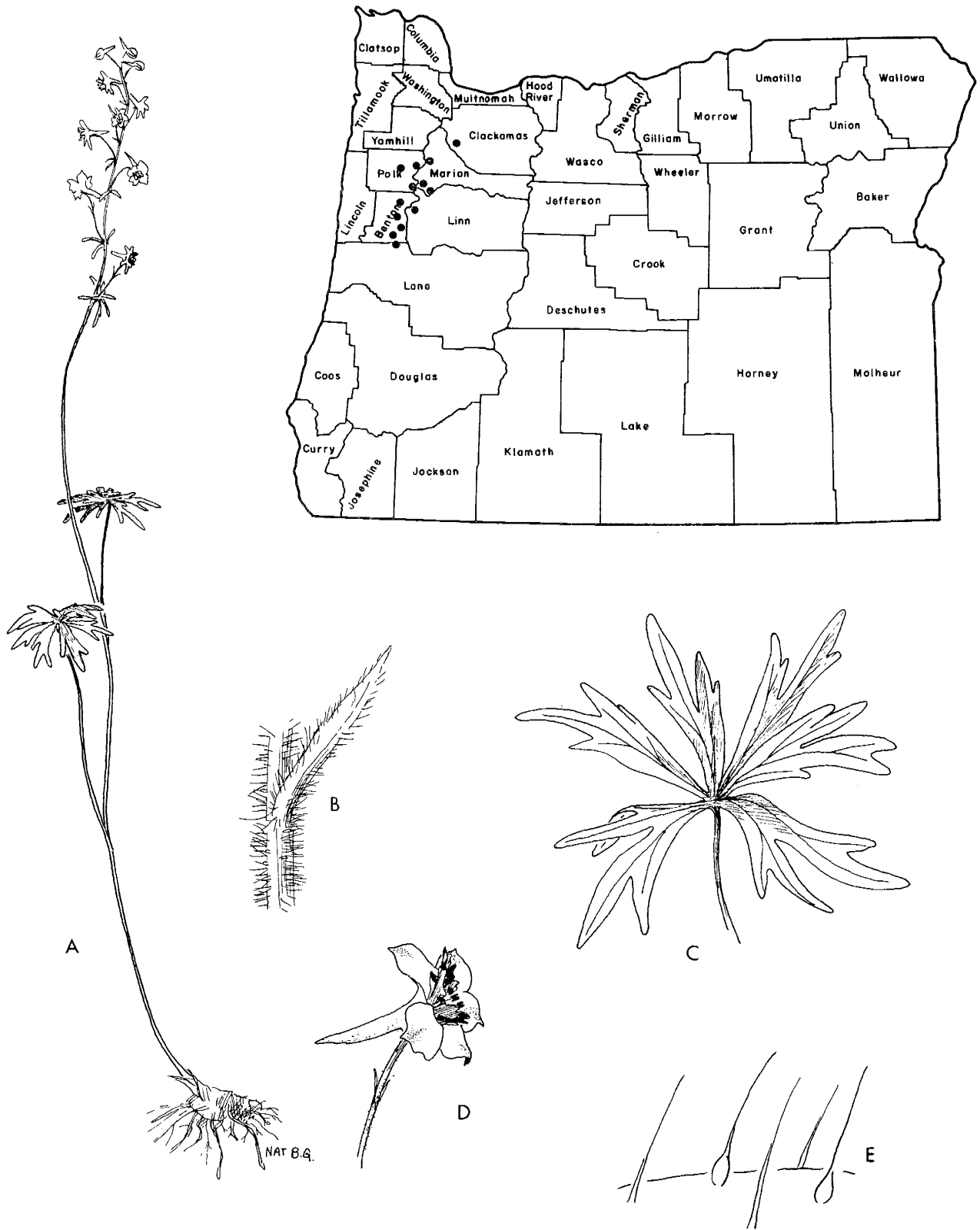


Fig. 61. *Delphinium pavonaceum*. A: Habit, X 0.4; B: Upper inflorescence bract, X 2; C: Stem leaf, X 1; D: Flower, X 1; E: Glandular hairs of inflorescence, X 25 (drawn from Franklin 855, OSC).

DICENTRA FORMOSA (Andr.) Walp. SSP. OREGANA (Eastw.) Munz

(Pacific bleeding heart)

Fumitory family (Fumariaceae)

ORIGINAL PUBLICATION: *Aliso* 4:91. 1958.

SYNONYMS: *Dicentra oregana* Eastw. (Proc. Calif. Acad. Sci., Series IV, 20:144. 1931).

Dicentra formosa f. *oregana* van Melle (Torreya 41:192. 1941).

STATUS: Candidate species for federal listing, Category 2, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Scapose plants from a fleshy rootstock with stems to ca. 45 cm high; leaves basal, long petioled, glaucous, biternately compound, 20-50 cm long, the ultimate segments oblong, pinnately cleft or incised into divisions 2-5 cm long; flowers several, more or less nodding, in a small panicle; sepals ovate to lanceolate, 3-5 mm long; corolla very shallowly cordate at base, the outer petals ochroleucous, the inner with rose colored tips, ca. 14-18 mm long; seeds ca. 1.5 mm long, shining, black (after Munz, 1959).

DISTRIBUTION: This taxon is found along the west base of the Siskiyou Mountains in Josephine and Curry counties, Oregon and Del Norte County, California.

TAXONOMIC PROBLEMS: There has been question as to whether this is a valid subspecies or simply a color form of *D. formosa*. The most recent monographer of *Dicentra* (Stern, 1961) did not address this color instability question in his treatment, though he did state that pure white flowered forms of ssp. *formosa* are sometimes found in otherwise pink flowered populations well outside the geographic range of ssp. *oregana*. Current workers concur that white color forms and a valid white flowered taxon exist, although probably not sympatrically.

PHENOLOGY: Flowering occurs from April to July.

HABITAT: Pacific bleeding heart grows on gravelly hillsides to loam soils in open woods, occasionally along banks of streams, at 600 to 1200 m. It is restricted to serpentine substrates with little associated vegetation.

LAND OWNERSHIP/MANAGEMENT: The habitat is managed by the U.S. Forest Service and encompasses private lands as well.

PRESENT AND POTENTIAL THREATS: *Dicentra formosa* ssp. *oregana* may be vulnerable to mining (since it is found on nickel rich serpentine soils), roadside maintenance, and overcollection.

MANAGEMENT RECOMMENDATIONS: Continued inventory and study is recommended, particularly concerning the taxonomic questions. The seeds of this taxon are reportedly distributed by ants.

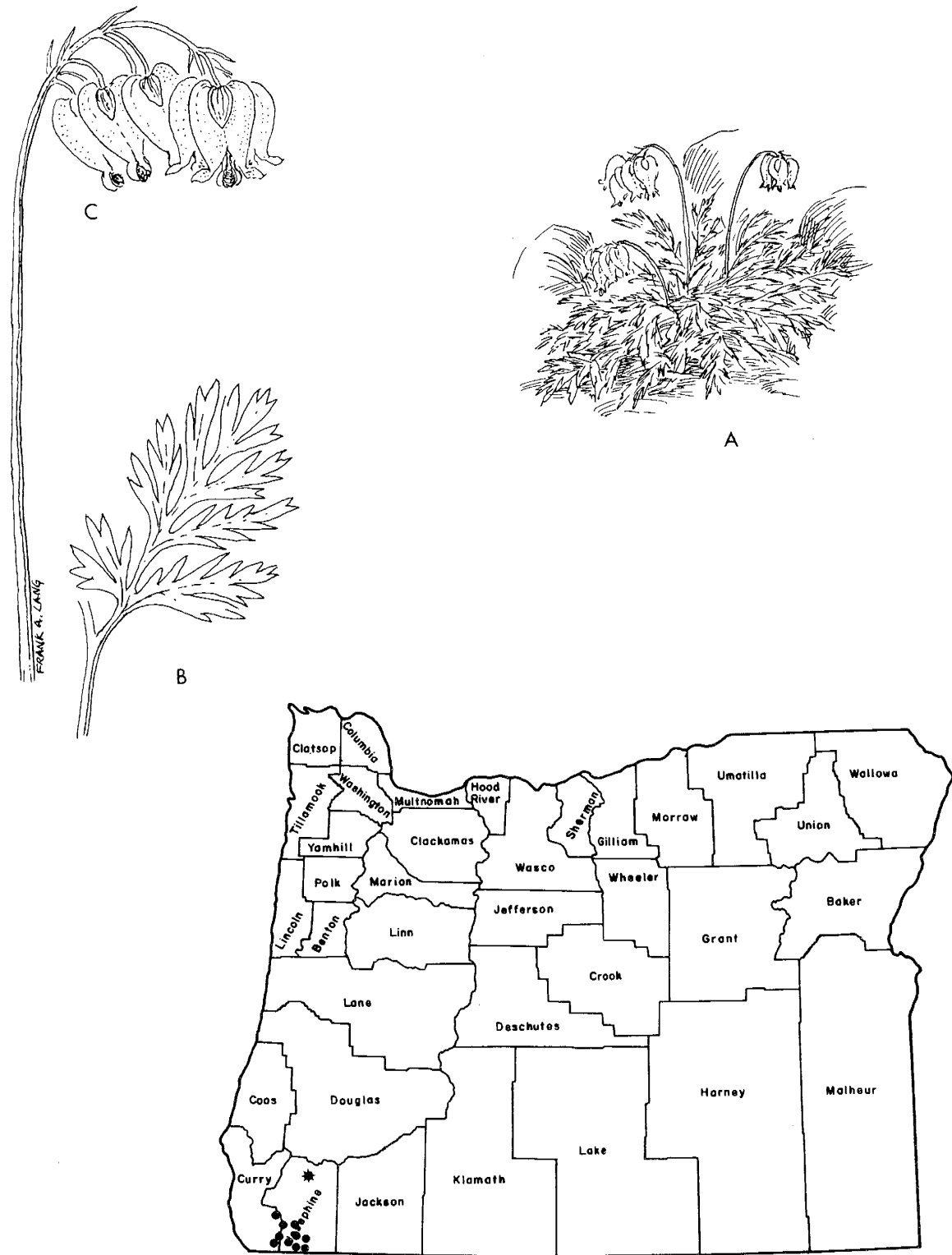


Fig. 62. *Dicentra formosa* ssp. *oregana*. A: Habit, X 0.1; B: Portion of dissected leaf, X 1; C: Flowering stem, X 1 (drawn from Henderson s.n., ORE).

DRABA LEMMONII Wats. VAR. CYCLOMORPHA (Payson) Schulz

(Lemmon's draba)

Mustard family (Brassicaceae)

ORIGINAL PUBLICATION: Pflanzenreich IV, 105, Heft 89:94. 1927.

SYNONYMS: *Draba cyclomorpha* Payson (American Journ. Bot. 4:263. 1917).

STATUS: Candidate species for federal listing, Category 2, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Perennial herb, growing in dense low tufts; leaves ciliate, fleshy, 5-30 mm long, 2-9 mm broad; flowering scapes leafless, 2-12 cm tall; racemes five to twenty flowered; petals yellow, 4-6 mm long; silicles oval to elliptic, glabrous, somewhat twisted (after Hitchcock, 1964).

DISTRIBUTION: This is an endemic subspecies of Wallowa and possibly Baker counties, Oregon, in the Wallowa Mountains.

TAXONOMIC PROBLEMS: *Draba lemmonii* var. *cyclomorpha* differs from var. *lemmonii* primarily in its glabrous silicles and mostly simple hairs. Hitchcock (1941) comments "Were it not for the fact that these glabrous fruited plants have a distinctive northern range, it is doubtful that they should be given as much as a varietal rank, as they have no other character to set them off from the typical variety".

LOOK ALIKES: The relatively large fleshy leaves in combination with yellow flowers help set this apart from other pulvinate perennial *Draba* of eastern Oregon.

PHENOLOGY: This alpine inhabitant blooms from July to early September.

HABITAT: Restricted to high peaks, above 2400 m, on rock ridges, talus slopes, and in crevices. Associates include *Oxyria digyna*, *Saxifraga bronchialis* var. *austrimontana*, *Sedum roseum*, *Smelowskia calycina*, and *Luzula parviflora*.

LAND OWNERSHIP/MANAGEMENT: The high Wallowas are managed entirely by the U.S. Forest Service.

PRESENT AND POTENTIAL THREATS: Collecting and possibly grazing by mountain goats.

MANAGEMENT RECOMMENDATIONS: The abundance of this variety, possible threats impacting it, and its tolerance to disturbance need to be ascertained.

REMARKS: Little is known about this plant, a result of its inaccessible and forboding habitat. It is probably not threatened at this time although its distribution is admittedly very narrow.

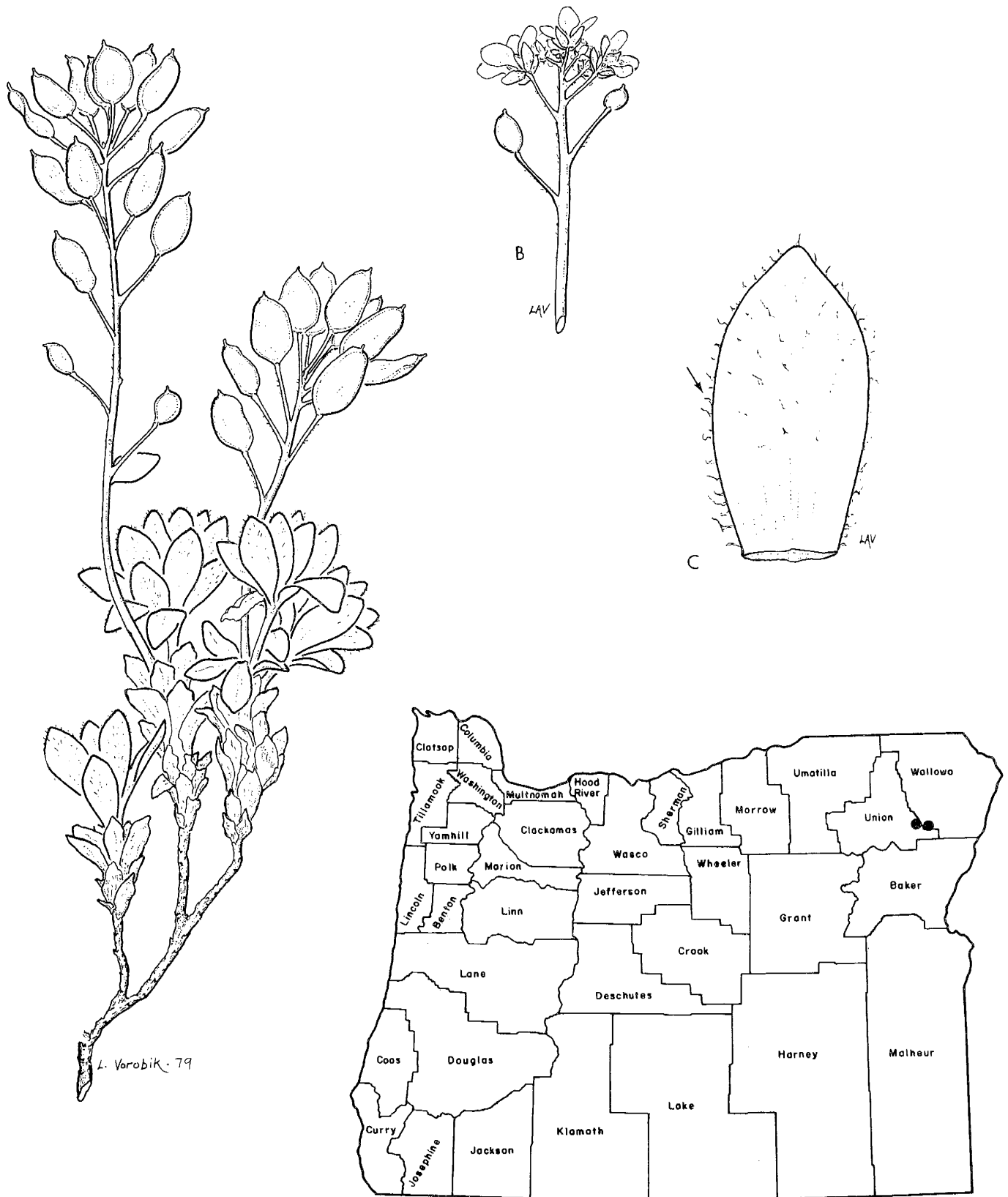


Fig. 63. *Draba lemmonii* var. *cyclomorpha*. A: Habit, in fruit, X 1.5; B: Flowering stem, X 1.5; C: Enlargement of basal leaf illustrating ciliate margins, X 3 (drawn from Mason 1513, ORE).

EPILOBIUM OREGANUM Greene

(Oregon willow herb)

Evening primrose family (Onagraceae)

ORIGINAL PUBLICATION: Pittonia 1:255. 1888.

SYNONYMS: *Epilobium glaucum* Howell (Bull. Torrey Club 15:24. 1888).
Epilobium subcaesium Greene (Pittonia 2:295. 1892).

STATUS: Candidate species for federal listing, Category 2, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Perennial with running rootstocks bearing pink scales; stems 4.5-7.5 dm high, subglabrous; leaves essentially sessile, glaucous, lanceolate, 3-8 cm long, 0.5-1.8 cm wide, serrulate; inflorescence branched; hypanthium 2-2.5 mm long; sepals 4-8 mm long; petals pinkish or purplish, 7-10 mm long; capsule 3-4 cm long, short pedicelled (after Munz, 1965).

DISTRIBUTION: Known from a few scattered sites in Josephine County, Oregon and possibly Douglas County. Also found in northern California in Trinity, Del Norte, and Humboldt counties.

TAXONOMIC PROBLEMS: Several early authors indicated that this might be merely a hybrid, perhaps attempting to account for *E. oreganum*'s scattered and uncommon occurrence.

LOOK ALIKES: The lanceolate leaves and petal length of 7-10 mm separate this taxon from the larger flowered *E. obcordatum* and *E. rigidum*, both of which are also found in southwest Oregon.

PHENOLOGY: Flowering in June and July.

HABITAT: Wet boggy sites at lower elevations, typically with *Mimulus* spp., *Viola* spp., and *Veronica* spp.

LAND OWNERSHIP/MANAGEMENT: Private and U.S. Forest Service, possibly Bureau of Land Management.

PRESENT AND POTENTIAL THREATS: Drainage of bog habitat would be detrimental, as well as mining, urban development, and recreational activities.

MANAGEMENT RECOMMENDATIONS: Prevent drainage or other harmful manipulation of bogs known to harbor populations of *E. oreganum*. Field searching for additional sites would be helpful.

REMARKS: The crossing relationships of this and related taxa are currently being investigated (Hoch & Raven, 1980).

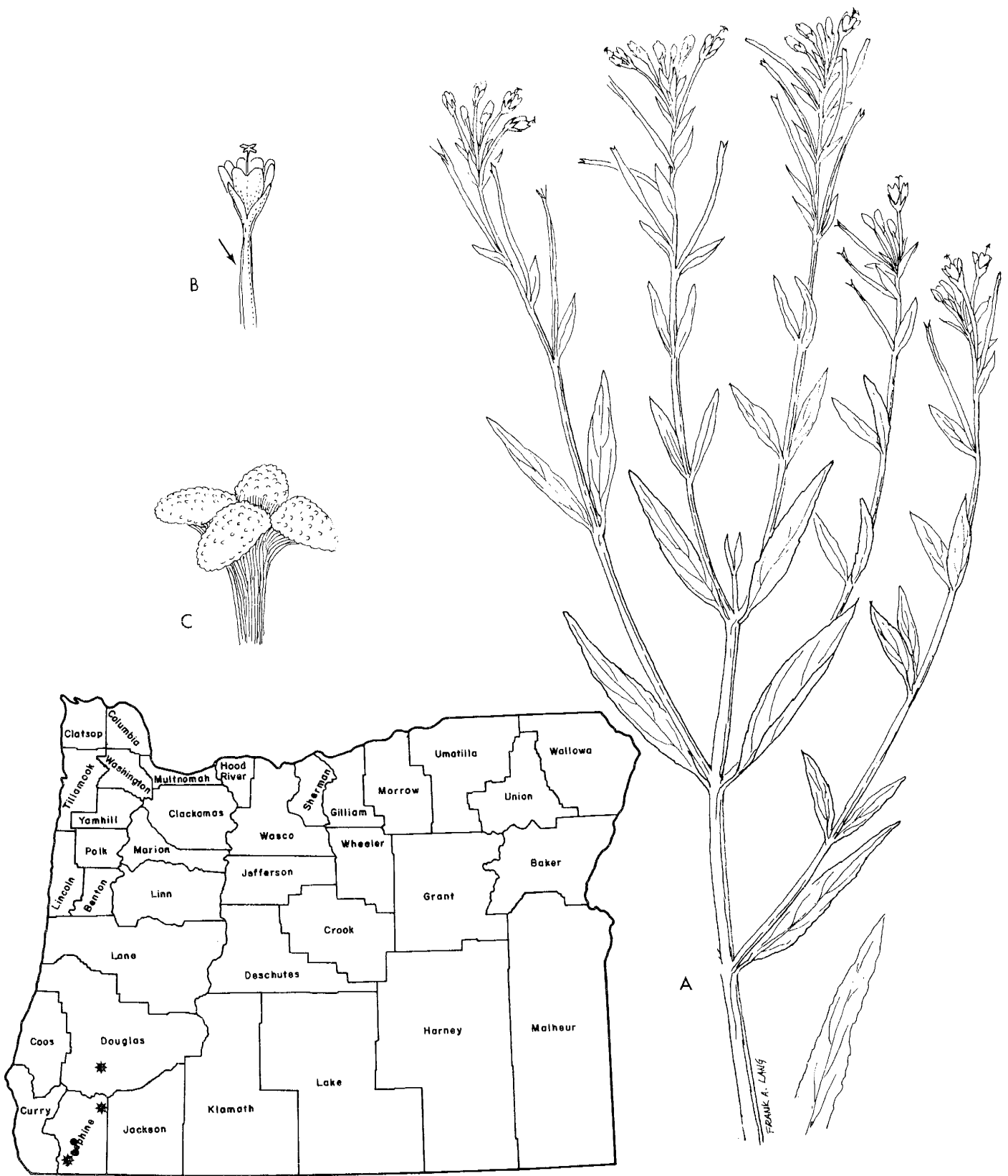


Fig. 64. *Epilobium oreganum*. A: Habit, upper stem, X 0.7; B: Flower and upper half of ovary, X 1.3; C: Lobes of stigma, X 15 (redrawn from Trelease [1891]).

EPILOBIUM SISKIYOUENSE (Munz) Hoch & Raven

(Siskiyou willow herb)

Evening primrose family (Onagraceae)

ORIGINAL PUBLICATION: Madrono 27:146. 1980.

SYNONYMS: *Epilobium obcordatum* Gray var. *laxa* Dempster in Jepson (Fl. Calif. 2:566. 1936).

Epilobium obcordatum Gray ssp. *siskiyouense* Munz (N. Amer. Fl. II. 5:205. 1965).

STATUS: Candidate species for federal listing, Category 2, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Low greenish perennial, from a much branched, woody base, often forming mats; stems 5-15 cm long, glabrous basally, becoming pubescent above, leafy; leaves elliptic to ovate, glabrous, obscurely toothed, 10-22 mm long; flowers few, solitary in upper axils; hypanthium 2-2.5 mm long; sepals 6-9 mm long; petals rose to purple, 1-2 cm long; longer stamens ca. half as long as petals; capsule 2.5-3.5 cm long (after Munz, 1965).

DISTRIBUTION: Restricted to mountains of southern Jackson County, Oregon, and adjacent Siskiyou and Trinity counties, California.

LOOK ALIKES: This species differs from *E. rigidum* by rounded as opposed to acute leaf bases, and from *E. obcordatum* by being greenish rather than glaucous. *E. obcordatum* also has slightly longer stamens and hypanthia.

PHENOLOGY: Flowering from July to September.

HABITAT: Apparently occurring on dry to somewhat moist ridges and flats in subalpine forests or alpine fell-fields, between ca. 1700 and 2500 m.

LAND OWNERSHIP/MANAGEMENT: U.S. Forest Service.

PRESENT AND POTENTIAL THREATS: Mining may pose future problems. There do not seem to be any current threats save chance encounters with hikers.

MANAGEMENT RECOMMENDATIONS: Continue to inventory likely habitat for this species.

REMARKS: The geographic range of *E. siskiyouense* is not well known. If its populations are found to be primarily in remote localities consideration for federal listing may require reevaluation.

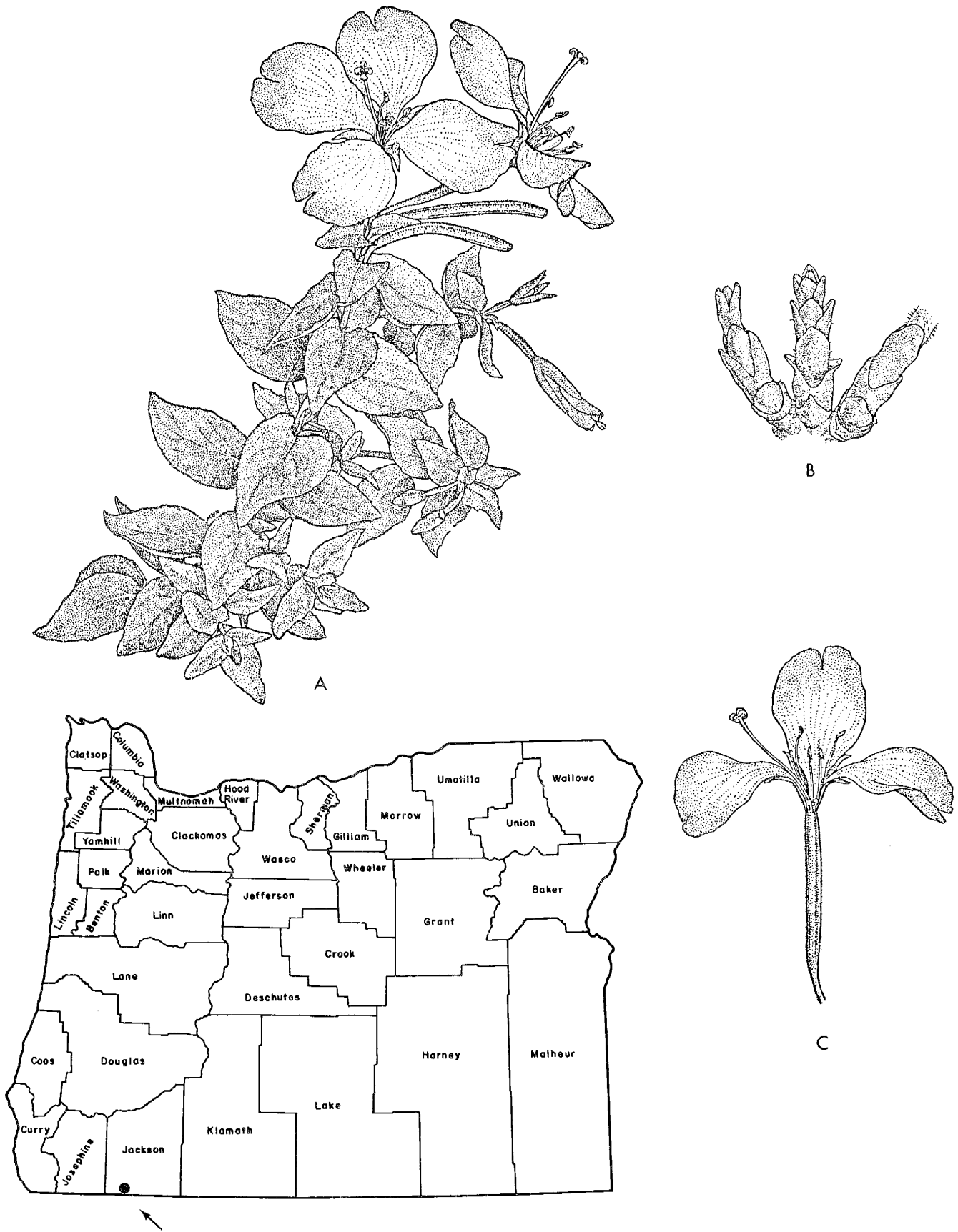


Fig. 65. *Epilobium siskiyouense*. A: Habit, X 1.5; B: Scaly base of plant, X 3.5; C: Flower (minus one petal) with developing ovary, X 1.5 (drawings taken from Hoch & Raven, in prep.).

ERIGERON CHRYSOPSIDIS Gray VAR. BREVIFOLIUS Piper

(Dwarf golden daisy)

Composite family (Asteraceae)

ORIGINAL PUBLICATION: Bull. Torrey Club 27:395. 1900.

STATUS: Candidate species for federal listing, Category 2, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Perennial from a taproot and branched caudex, 3-10 cm high, with partially appressed pubescence; leaves mostly in a basal cluster, linear, 1-3 mm wide, up to 6 cm long; heads solitary, the disk 6-14 mm wide, involucre 3-6 mm high; ray corollas yellow, 6-10 mm long; pappus of slender bristles (after Cronquist, 1955).

DISTRIBUTION: This taxon is endemic to the Wallowa Mountains, in Wallowa, Union, and Baker counties, Oregon.

LOOK ALIKES: Similar to *E. bloomeri* which is usually rayless. Typical *E. chrysopsidis* is found at lower elevations.

PHENOLOGY: This plant blooms in July and August.

HABITAT: Subalpine or alpine slopes and summits, on exposed, windswept sites above 2,000 m elevation. Associated species include *Lomatium cusickii*, *Penstemon procerus*, *Pinus albicaulis*, *Abies lasiocarpa*, and *Lupinus aridus*.

LAND OWNERSHIP/MANAGEMENT: U.S. Forest Service, mostly in the Eagle Cap Wilderness Area.

PRESENT AND POTENTIAL THREATS: Recreational activities are the only conceivable threat.

MANAGEMENT RECOMMENDATIONS: Take care to avoid populations of this and other Wallowa Mountains endemics during trail maintenance and construction.

REMARKS: The inaccessibility of this plant's habitat has contributed to its scientific obscurity. Careful inventory within its range may very well show it to be locally abundant. It has been reported from the top of Mount Howard, a Wallowan peak known to possess a relatively high concentration of local endemics. Plans are underway to construct ski facilities here, but it does not appear that the limited construction which is scheduled will affect this particular taxon.

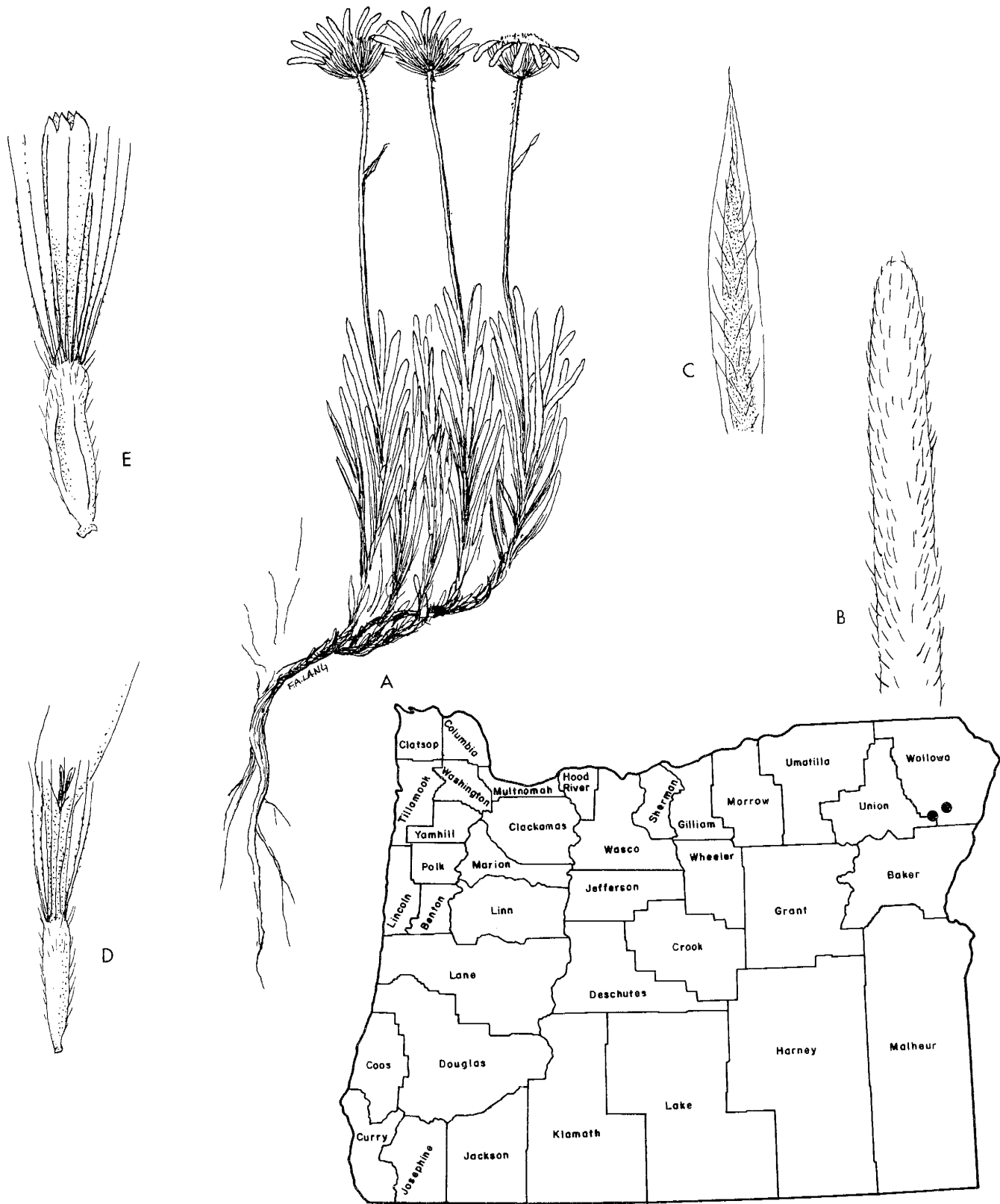


Fig. 66. *Erigeron chrysopsidis* var. *brevifolius*. A: Habit, X 1.2; B: Leaf tip, X 5; C: Floral bract (phyllary) tip, X 15; D: Ray floret (pappus and achene), X 10; E: Disc floret, X 12 (drawn from Mason 1753, ORE).

ERIGERON DECUMBENS Nutt. VAR. DECUMBENS

(Willamette daisy)

Composite family (Asteraceae)

ORIGINAL PUBLICATION: Trans. Am. Phil. Soc. II. 7:309. 1840.

STATUS: Candidate species for federal listing, Category 2, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Taprooted perennial, decumbent, 1.5-7 dm tall, appressed hairy; basal leaves and most of the cauline ones triple nerved, up to 25 cm long and 1 cm wide; heads 1-20, the disk 8-15 mm wide, the involucre 3.5-6 mm high; rays 20-50, blue, 6-12 mm long, 1-2 mm wide; pappus of about 12-16 fragile bristles (after Cronquist, 1955).

DISTRIBUTION: This taxon is distributed in the Willamette Valley, from Clackamas County south to Lane County, Oregon.

LOOK ALIKES: *Erigeron eatonii* is distinguished from *E. decumbens* by its persistent basal tuft of leaves, less pubescence, and generally stouter stems. The blue flowered species of *Aster* in the Willamette Valley are typically more branched or taller than *E. decumbens*.

PHENOLOGY: This taxon blooms in June and early July.

HABITAT: *Erigeron decumbens* prefers heavier soils and is restricted to native prairie grassland. Associated species include *Aster hallii*, *Festuca* sp., *Danthonia* sp., *Rhus diversiloba*, *Hypericum perforatum*, and *Aira caryophyllea*.

LAND OWNERSHIP/MANAGEMENT: U.S. Fish and Wildlife Service and private.

PRESENT AND POTENTIAL THREATS: Agricultural and urban expansion are major factors contributing to the decline of this plant. *E. decumbens* and its habitat could also be threatened by unmonitored burning.

MANAGEMENT RECOMMENDATIONS: The use of fire as a management tool in conserving native western Oregon prairie vegetation needs to be researched. Burning plays a necessary regenerative role in Willamette Valley grassland ecology and its suppression over the years has allowed an unnaturally thick brush buildup. When finally burned, it may yield a fire so hot that it destroys rather than stimulates the regrowth of native vegetation. Without fire, however, overcrowding and competition are the results, with slower but equally catastrophic consequences.

REMARKS: *Erigeron decumbens* is known from only two sites, both discovered in 1980. Both populations are comprised of very few plants. The last collection prior to these was recorded in 1934.



Fig. 67. *Erigeron decumbens* var. *decumbens*. A: Habit, X 0.5; B: Involucral bracts (phyllaries), X 4 (drawn from Gilbert 384, OSC).

ERIGERON DELICATUS Cronq.

(Del Norte daisy)

Composite family (Asteraceae)

ORIGINAL PUBLICATION: Brittonia 6:216. 1947.

STATUS: Candidate species for federal listing, Category 1, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Perennial from little developed caudex, simple stems scarcely clustered, 2.5-3.5 dm high, glabrous below, glandular above; basal leaves oblanceolate, 2-4 cm long, cauline not very reduced; heads one to three; involucre 4-5 mm high; rays numerous, pale blue, 7-10 mm long (after Peck, 1961).

DISTRIBUTION: Endemic to Curry and Josephine counties, Oregon and nearby Del Norte County, California.

TAXONOMIC PROBLEMS: *Erigeron delicatus* is very similar to *E. cervinus*. The two taxa are sympatric and morphologically intermediate specimens are known. This has prompted the suggestion that they may represent a single, somewhat variable species.

LOOK ALIKES: *Erigeron delicatus* may be differentiated from *E. cervinus* by the latter's well developed caudex and fewer cauline leaves (Peck, 1961).

PHENOLOGY: Del Norte daisy blooms from May through August.

HABITAT: Occurring along rocky streamsides and on steep walls, in moist crevices often near seepage. It occurs at lower elevations in coniferous forest, associating with *Boykinia elata*, *Saxifraga* spp., *Mimulus cardinalis*, *Mitella* sp., and *Poa* sp.

LAND OWNERSHIP/MANAGEMENT: Occurring on U.S. Forest Service lands, possibly also on private.

PRESENT AND POTENTIAL THREATS: There is a possibility of dam construction within this species' habitat which would flood populations. There is also potential threat from roadside spraying.

MANAGEMENT RECOMMENDATIONS: This taxon should be considered when spray projects and dam placements are contemplated. Research confirming its relationship to *E. cervinus* would be useful.

REMARKS: *Erigeron cervinus* is also rather rare, although not apparently to the degree of *E. delicatus*. If these species were taxonomically combined (under the epithet *cervinus* which has priority), the necessity for listing would greatly diminish.

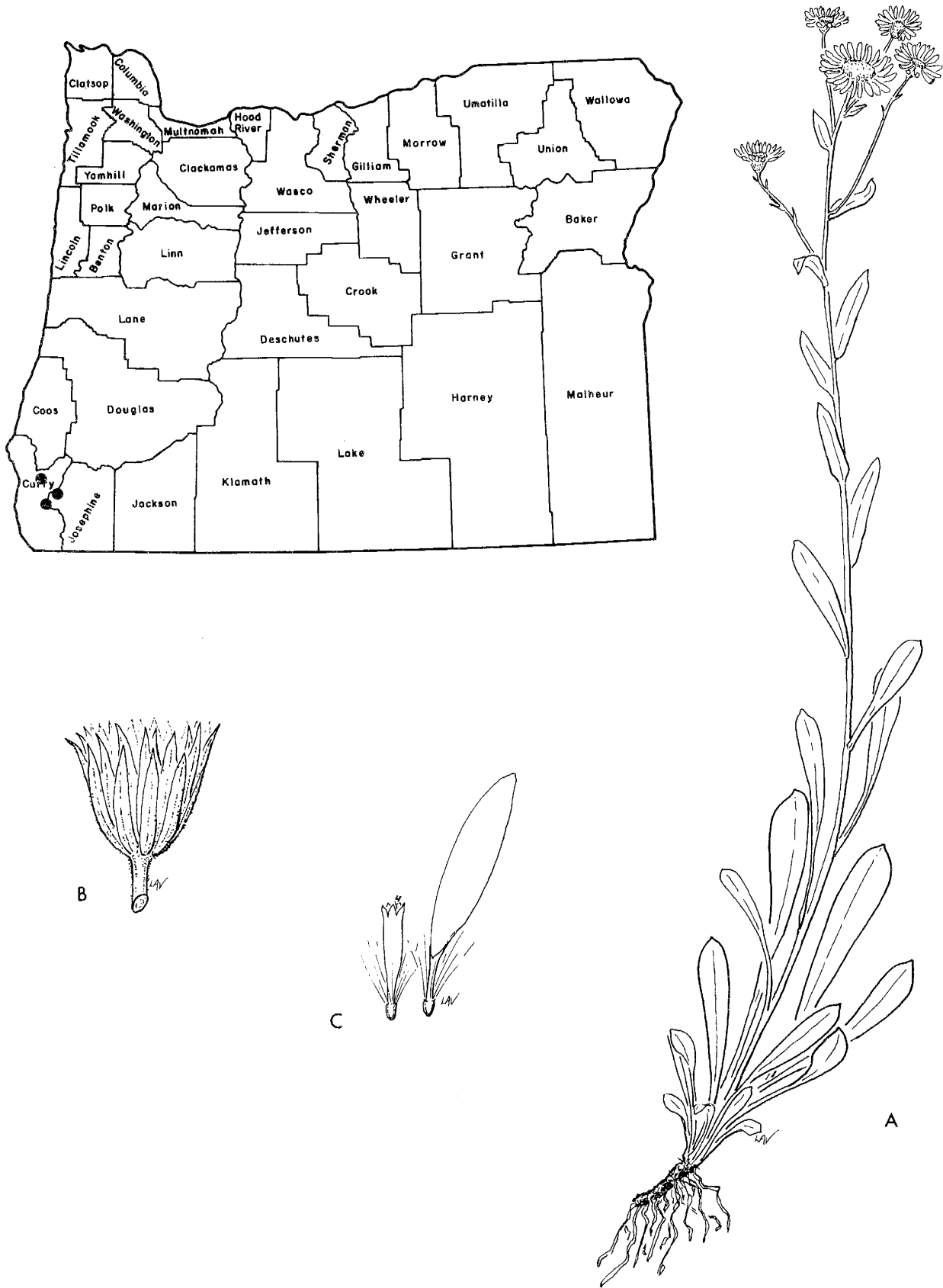


Fig. 68. *Erigeron delicatus*. A: Habit, X 0.8; B: Involucral bracts (phyllaries), X 5; C: Disc and ray florets, X 2.5 (drawn from Abrams 8441 and Leach 3308, ORE).

ERIGERON HOWELLII (Gray) Gray

(Howell's fleabane)

Composite family (Asteraceae)

ORIGINAL PUBLICATION: Synop. Fl. No. Amer. 1:209. 1884.

SYNONYMS: *Erigeron salsuginosus* var. *howellii* Gray (Proc. Amer. Acad. 16: 93. 1880).

STATUS: Candidate species for federal listing, Category 1, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Rhizomatous perennial, 20-50 cm tall, somewhat pubescent under the heads; leaves thin, glabrous, lower leaves with petiole, upper leaves strongly clasping at the base; heads solitary, disc 12-20 mm wide; involucre bracts loose, glandular; rays 30-50, white, disc corollas 4-5 mm long; achenes 5 nerved, pappus of 20-30 bristles (after Cronquist, 1955).

DISTRIBUTION: This is a species of the western Columbia River Gorge, from Multnomah County, Oregon and Skamania County, Washington.

TAXONOMIC PROBLEMS: Cronquist (1955) comments that *E. howellii* is "very closely related to the widespread and variable *E. peregrinus*, but the weak morphological characters are bolstered by the restricted distribution and specialized lowland habitat."

LOOK ALIKES: *Erigeron howellii* may be distinguished from *E. peregrinus* by its longer (4-5 mm) and more flaring disc corollas.

PHENOLOGY: *Erigeron howellii* flowers from May to July.

HABITAT: This species is most likely to be encountered in moist, often rocky places, on protected slopes within mixed coniferous forests at elevations up to 1200 m. Associated species include *Pseudotsuga menziesii*, *Acer glabrum*, *A. macrophyllum*, *Holodiscus discolor*, *Abies procera*, *Tsuga heterophylla*, and *Rubus parviflorus*.

LAND OWNERSHIP/MANAGEMENT: This species occurs mostly on U.S. Forest Service and private property.

PRESENT AND POTENTIAL THREATS: Recreational use in the Columbia Gorge, indiscriminate picking, and any impact reducing the required moisture level of the habitat pose potential problems.

MANAGEMENT RECOMMENDATIONS: The number of extant populations needs to be determined. Routing new trails near existing populations is not advised.

REMARKS: Although only known from a few locations, the threat of any imminent reduction in the size or vigor of the populations appears slight.



JHR

Fig. 69. *Erigeron howellii*. A: Habit, X 1; B: Involucral bracts (phyl-laries), X 3; C: Disc floret, X 3 (drawings taken from Hitchcock et al., 1955).

ERIOGONUM CHRYSOPS Rydberg

(Golden buckwheat)

Buckwheat family (Polygonaceae)

ORIGINAL PUBLICATION: Fl. Rocky Mts. 220, 1917.

SYNONYMS: *Eriogonum ochrocephalum* Watson ssp. *chrysops* (Rydberg) S. Stokes (The genus *Eriogonum* p. 92. 1936).
Eriogonum ovalifolium Nuttall ssp. *chrysops* (Rydberg) S. Stokes (Man. High. Pl. Oreg. p. 277. 1961).
Eriogonum kingii in sensu Peck (Man. High. Pl. Oreg. p. 255. 1941, not *E. kingii* Torr. & Gray).

STATUS: Candidate species for federal listing, Category 1, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Densely caespitose, mat forming perennial, scapes 2-5 cm high, floccose; leaves crowded and clustered, oblanceolate to spatulate, 4-6 mm long, white floccose on both sides; inflorescence ca. 1 cm in diameter; involucre campanulate, 2-2.5 mm long, five lobed, as long as the tube; perianth 2.5-3 mm long, campanulate, lobes cuneate, slightly emarginate, the outer somewhat broader (after Reveal, 1968). It should be pointed out that this description was researched prior to Reveal's recent reinterpretation of *E. chrysops*, and is offered here in lieu of a forthcoming redescription.

DISTRIBUTION: Reveal (pers. comm.) currently believes this taxon is endemic to Steens Mountain, Harney County, Oregon.

TAXONOMIC PROBLEMS: There is apparently a series of species, several yet to be described, which occur in much of the Northwest (particularly in Idaho) which are identifiable as *E. chrysops* using Hitchcock & Cronquist (1973). Reveal is actively working on the resolution of this complex.

PHENOLOGY: This species is assumed to flower in late spring and early summer.

HABITAT: *Eriogonum chrysops* is to be expected at moderate elevations on exposed, rocky ridges perhaps with other species of *Eriogonum*, *Artemisia rigida*, *Poa sandbergii*, and *Erigeron* spp.

LAND OWNERSHIP/MANAGEMENT: Steens Mountain is administered by the Bureau of Land Management.

PRESENT AND POTENTIAL THREATS: As there are no known populations, threats cannot be documented. Grazing would be potentially harmful, as would offroad vehicle traffic.

MANAGEMENT RECOMMENDATIONS: The location of an extant population is the first priority.

REMARKS: There has been only one collection of this taxon, recorded near the turn of the century.

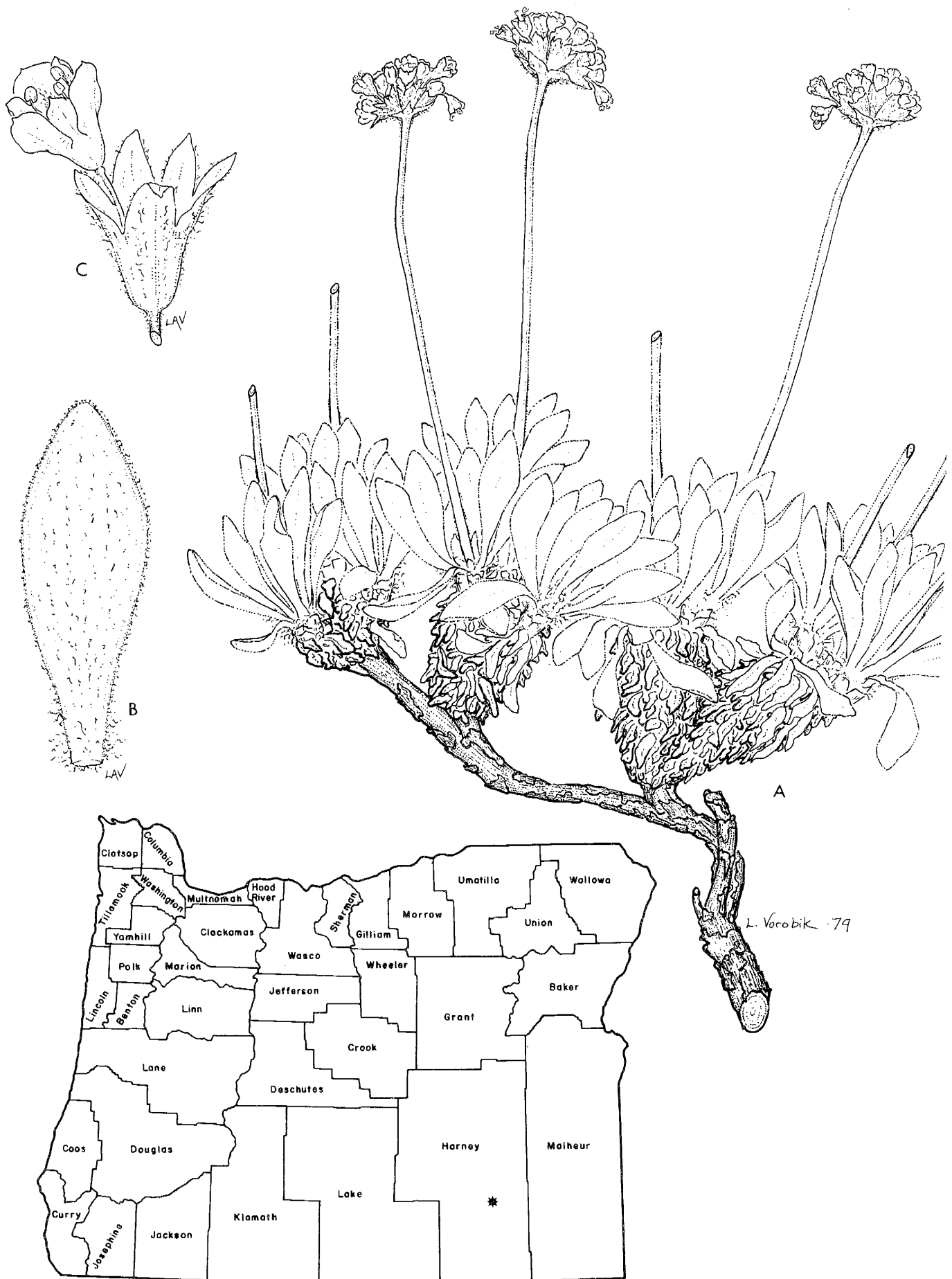


Fig. 70. *Eriogonum chrysops*. A: Habit, X 2; B: Leaf, X 12; C: Involucre with protruding flower, X 6 (drawn from Cusick 2558 [holotype], NY).

ERIOGONUM CROSBYAE Reveal

(Crosby's buckwheat)

Buckwheat family (Polygonaceae)

ORIGINAL PUBLICATION: Brittonia 33:442-444. 1981.

STATUS: Candidate species for federal listing, Category 1, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Low, densely matted herbaceous perennial with a highly branched woody caudex, 1-2.5 dm across; leaves basal, persistent, elliptical, densely white tomentose on both surfaces, blade 0.5-1.5 cm long, petiole 0.3-1 cm long, tomentose; stems scapose, 3-5 cm long, floccose; flowers yellow, congested in a capitate inflorescence, tepals all similar, 1.5-2 mm long, glabrous or minutely glandular within; stamens slightly exerted (after Reveal, 1981).

DISTRIBUTION: *Eriogonum crosbyae* is endemic to a very small section of Lake County, in southeastern Oregon.

LOOK ALIKES: *Eriogonum prociduum* and *E. cusickii* are both superficially similar to *E. crosbyae* and are found in southeast Oregon. The first may be distinguished by its glabrous scapes and the latter by its branched rather than capitate inflorescence.

PHENOLOGY: This species flowers from late May through July or early August.

HABITAT: *Eriogonum crosbyae* frequents rolling hills dominated by *Artemisia tridentata*, on light colored, tuffaceous, sedimentary sandstone from ca. 1660-1690 m. Associate species include *Gilia congesta*, *Lycodesmia spinosa*, *Chrysothamnus nauseosus*, *Phacelia scopulina*, *Sitanion hystrix*, and *Cryptantha watsonii* (Virginia Crosby, pers. comm.).

LAND OWNERSHIP/MANAGEMENT: Bureau of Land Management and State of Oregon.

PRESENT AND POTENTIAL THREATS: According to Crosby (pers. comm.) cattle and rabbits are causing occasional damage to populations. Potential threats include range improvement projects and offroad vehicle traffic.

MANAGEMENT RECOMMENDATIONS: Considering the limited distribution of this plant, caution should be exercised when implementing rangeland projects within its local habitat. Recreational vehicle traffic should be curbed wherever it occurs.

REMARKS: This newly described buckwheat is known from only six sites within 114 acres (Reveal, 1981). Despite its limited frequency, it appears to maintain a vigorous reproductive capacity.

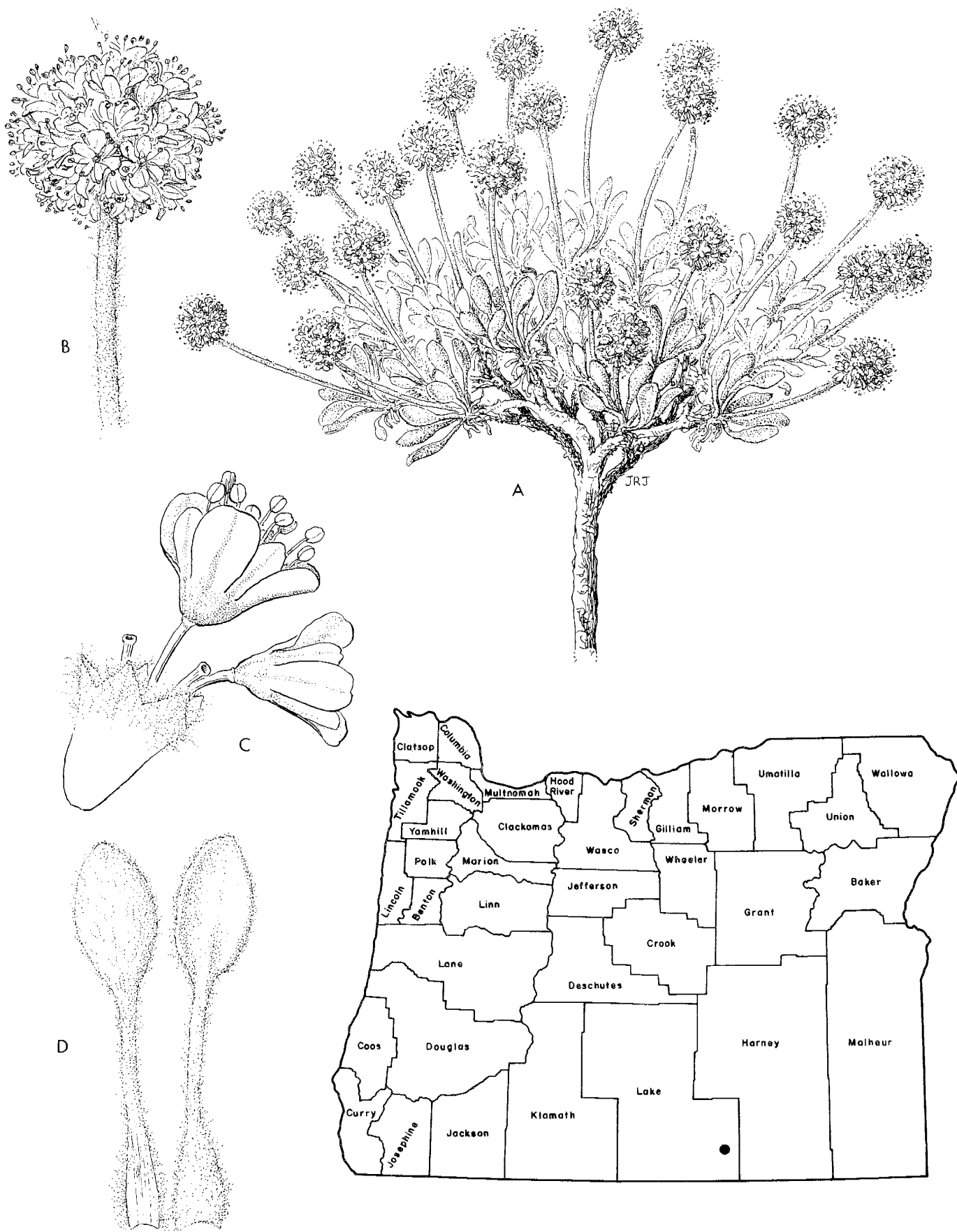


Fig. 71. *Eriogonum crosbyae*. A: Habit, X 1; B: Flowering stem, close-up of inflorescence, X 5; C: Flowers and involucre, X 10; D: Basal leaves, X 2.5 (drawings taken from Reveal, 1981).

ERIOGONUM CUSICKII M.E. Jones

(Cusick's buckwheat)

Buckwheat family (Polygonaceae)

ORIGINAL PUBLICATION: Contr. West. Bot. 11:10. 1903.

SYNONYMS: *E. chrysocephalum* ssp. *cusickii* Stokes (Leafl. West. Bot. 2:46. 1937).

STATUS: Candidate species for federal listing, Category 1, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Pulvinate perennial forming cushions 5-25 cm broad; leaves numerous, narrowly oblanceolate or spatulate, grayish lanate on both surfaces, 10-15 mm long, narrowed to a short, slender petiole; flowering stems leafless, very slender, glabrous, 2-6 cm tall; inflorescence a greatly contracted umbel, one involucre sessile, the other three to seven usually terminal on, and at least equal to, the ray of the peduncle, subtended by three tiny scalelike bracts; involucre turbinate campanulate, about 3 mm long, lobed into usually six triangular, tomentose margined teeth, otherwise glabrous; perianth yellow, glabrous externally, 2.5-3 mm long; flowers mostly imperfect (after Hitchcock, 1964).

DISTRIBUTION: Found only in Deschutes, Harney, and Lake counties in southeastern Oregon. The Deschutes record is doubtful.

LOOK ALIKES: This species is somewhat similar to several other yellow flowered, caespitose buckweats, but is distinguished by its quite diminutive stature in combination with the highly contracted inflorescence.

PHENOLOGY: *Eriogonum cusickii* flowers in June and July.

HABITAT: According to Gruber et al. (1979) *E. cusickii* prefers barren sites (at elevations between 1200 and 1600 m) consisting of "dry soil on welded tuff in open flats." The edaphic conditions required by this species are reported as well defined and very specific. Associates include *Artemisia arbuscula*, *Juniperus occidentalis*, *Bromus tectorum*, *Purshia tridentata*, and *Eriogonum sphaerocephalum*.

LAND OWNERSHIP/MANAGEMENT: Administered by the Bureau of Land Management.

PRESENT AND POTENTIAL THREATS: *Eriogonum cusickii* occurs on range sites which are, as yet, essentially undisturbed. The very few known populations however, are potentially threatened by offroad vehicle use, grazing disturbance, and mining.

MANAGEMENT RECOMMENDATIONS: The Lakeview District of the BLM has prohibited offroad vehicle traffic on its only site for *E. cusickii*. The Burns District is considering similar action to assure the natural quality of the habitat. Withdrawal of grazing leases on these sites is also recommended.

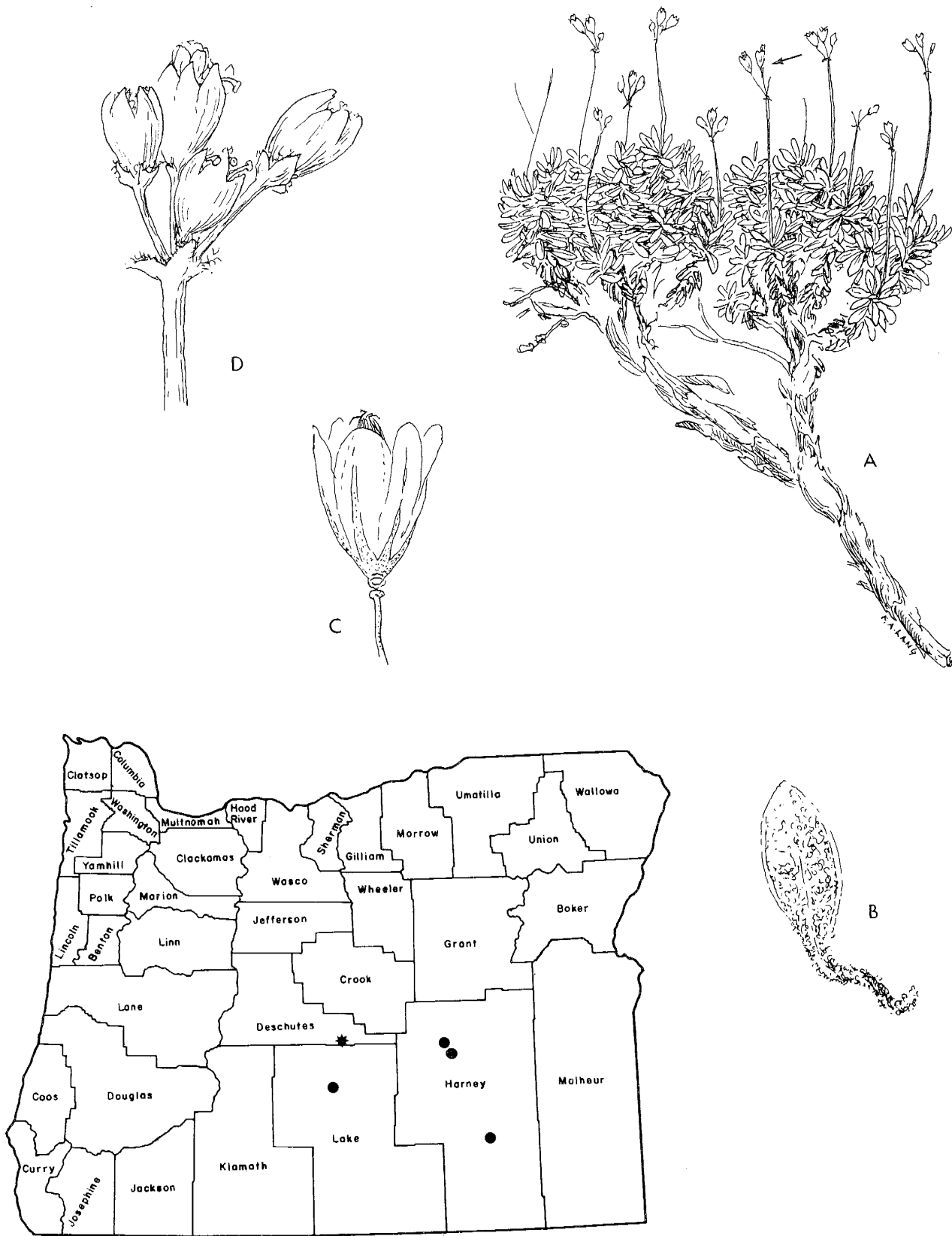


Fig. 72. *Eriogonum cusickii*. A: Habit, (note few flowered umbels), X 1; B: Leaf, X 5; C: Flower, X 12; D: Umbel, X 7 (drawn from Peck 19202, WTU).

ERIOGONUM PENDULUM Wats.

(Waldo eriogonum)

Buckwheat family (Polygonaceae)

ORIGINAL PUBLICATION: Proc. Am. Acad. 23:265-266. 1880.

SYNONYMS: *Eriogonum pendulum* var. *confertum* St. (Genus *Eriogonum*. p. 120. 1936).

STATUS: Candidate species for federal listing, Category 1, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Shrubby based perennial, stems straggling, 1-3 dm long; leaves scattered, white woolly beneath, oblanceolate, acutish, 2.5-7 cm long; peduncles two to four times branched, bracted at the forks; involucre solitary, nodding at first, campanulate, 5 mm high; flowers tomentose, 3 mm long, numerous; floral bracts long (after Peck, 1961).

DISTRIBUTION: Endemic to southern Josephine and central Curry counties, Oregon, extending into adjacent Del Norte County, California.

LOOK ALIKES: This is recognized within its limited geographic range by the initially nodding involucre, basally woody habit, and small, tomentose flowers.

PHENOLOGY: To be expected in flower in July and August.

HABITAT: *Eriogonum pendulum* prefers dry rocky to gravelly loamy soils on banks or open woodland habitats at ca. 300 to 1400 m elevations. Associated taxa include *Pinus* spp., *Arctostaphylos* spp., *Quercus* sp., and *Ceanothus* sp.

LAND OWNERSHIP/MANAGEMENT: Oregon Department of Transportation, U.S. Forest Service, and possibly Bureau of Land Management.

PRESENT AND POTENTIAL THREATS: Threats include mining, road grading and widening, herbicide spraying, and offroad vehicle activity.

MANAGEMENT RECOMMENDATIONS: Recent observations of *E. pendulum* in Curry County, away from the main populations in southern Josephine County, suggest that it may occur in intervening stations throughout this mountainous area. Additional field survey would be useful, including the gathering of ecological data.

REMARKS: Label information from certain collections point out a tolerance to harsh, open sites including roadcuts. This may be a species which historically occurs on naturally eroded or bare habitat. It is not clear to what extent it tolerates sites disturbed by man.

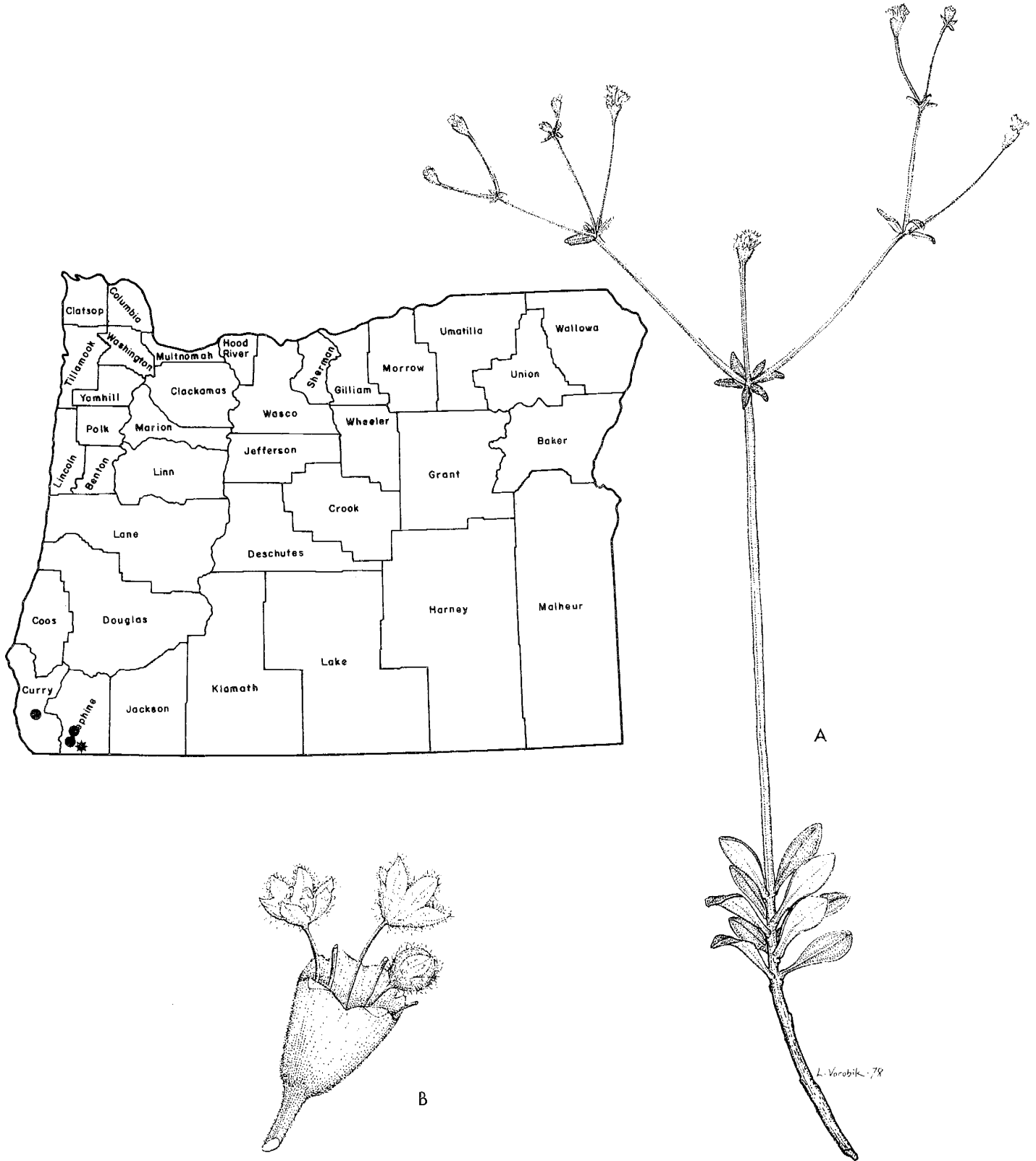


Fig. 73. *Eriogonum pendulum*. A: Habit, X 0.8; B: Involucre, with protruding flowers, X 4 (drawn from Howell 481, ORE).

ERIOGONUM PROCIDUUM Reveal

(Prostrate buckwheat)

Buckwheat family (Polygonaceae)

ORIGINAL PUBLICATION: *Aliso* 7:417-418. 1972.

STATUS: Candidate species for federal listing, Category 1, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Low, matted perennial from a woody caudex; stems scapose, 2-8 cm long; leaves basal, persistent, oblanceolate to spatulate, 4-10 mm long, 2-4 mm wide, white tomentose on both surfaces; inflorescence capitate, heads 1-1.5 cm across; bracts scale like; involucre congested, four to six per head; flowers yellow with reddish brown midribs, 2-2.5 mm long (after Reveal, 1972).

DISTRIBUTION: Scattered throughout southern and northeastern Lake County, Oregon, and northern Modoc County, California.

TAXONOMIC PROBLEMS: This species keys to the related *E. chrysops* in the regional floras.

LOOK ALIKES: *Eriogonum cusickii* differs from *E. prociduum* in its open inflorescence and preference for a more arid, open habitat.

PHENOLOGY: This buckwheat flowers from May to early August.

HABITAT: Found on basalt flows on slopes and hills, typically in pine woodlands with *Artemisia* spp. and *Juniperus osteosperma*. Occasionally on barren volcanic tuff. Apparently occurring at mid elevations, to ca. 1600 m.

LAND OWNERSHIP/MANAGEMENT: Primarily found on U.S. Forest Service and Bureau of Land Management lands, probably to a considerably lesser degree on private.

PRESENT AND POTENTIAL THREATS: Recreational activities (particularly off-road vehicle use), recreational developments, mining, and grazing are potential threats.

MANAGEMENT RECOMMENDATIONS: The ecological requirements of *E. prociduum* should be assessed and considered in local range management. Additional field study may help fill the gaps in its spotty distribution.

REMARKS: This species may be locally common. It must be regarded as vulnerable, however, due to its strict edaphic requirements which severely limit its ability to expand its range. Its tolerance to disturbance for the most part is unknown.

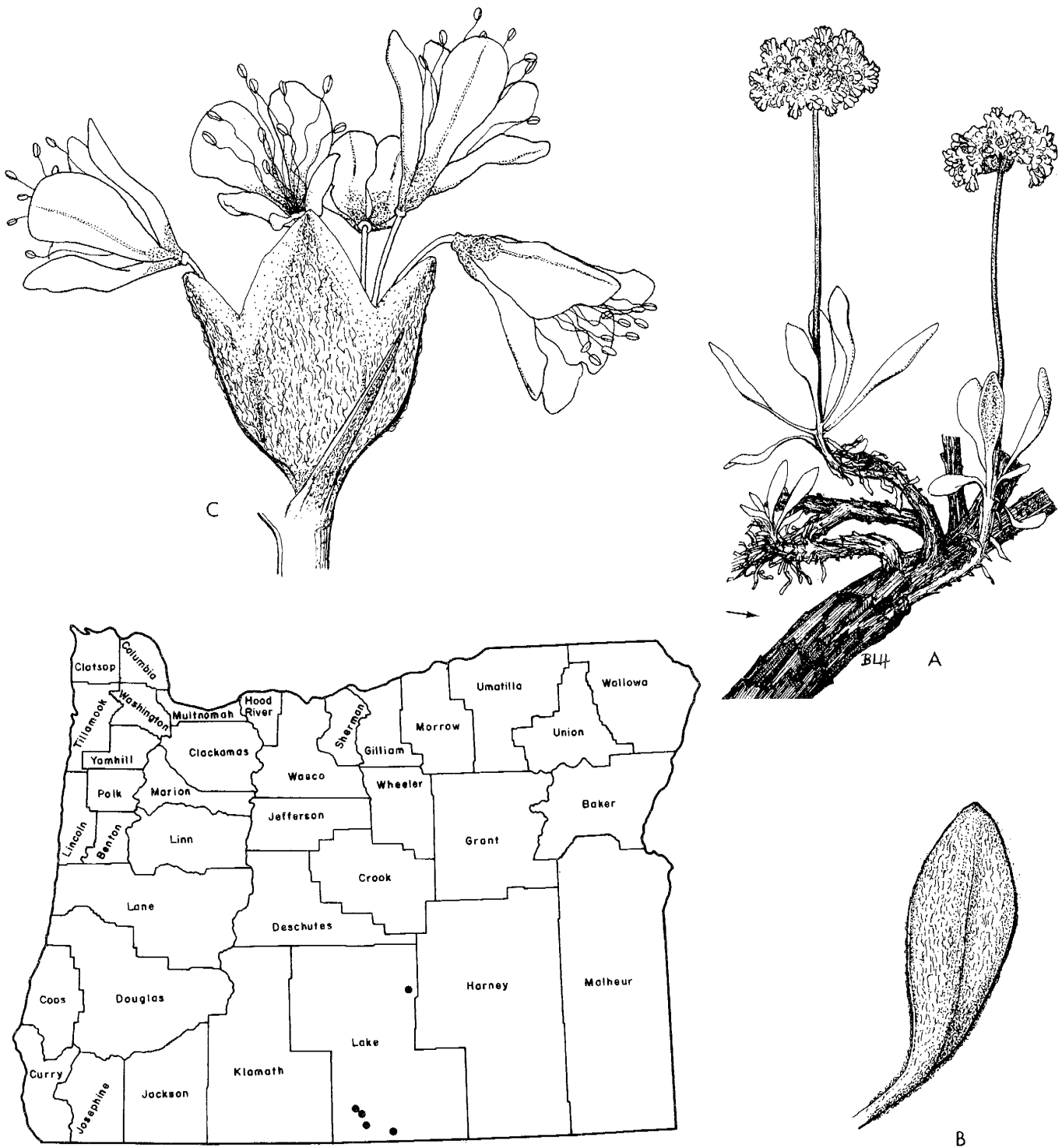


Fig. 74. *Eriogonum prociduum*. A: Habit (note extremely woody base), X 1.2; B: Leaf, X 6; C: Involucre, with protruding flowers, X 13 (drawn from Crosby 2089 and 2131, ORE).

ERIOGONUM SCOPULORUM Reveal

(Cliff eriogonum)

Buckwheat family (Polygonaceae)

ORIGINAL PUBLICATION: *Phytologia* 23:170-171. 1972.

STATUS: Candidate species for federal listing, Category 2, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Low, compact caespitose perennial, forming mats from a woody base, stems 5-7 cm long; leaves mostly basal, oblanceolate to elliptic, 5-10 mm long, 2.5-4 mm wide, white tomentose below, glandular; inflorescence capitate, heads 1-1.5 cm across; bracts five or six, triangular 1.3-1.6 mm long; involucre five to seven per head, teeth five or six, acute, 1-1.5 mm long, mostly glabrous; flowers pale yellow or greenish, pinkish at maturity, 2.5-3.5 mm long (after Reveal, 1972).

DISTRIBUTION: *Eriogonum scopulorum* is restricted to the Wallowa Mountains of Wallowa County in northeastern Oregon.

TAXONOMIC PROBLEMS: This species keys to the related *E. chrysops* in the regional floras (see *E. chrysops* species summary, page 142).

LOOK ALIKES: *Eriogonum scopulorum* may be separated from *E. chrysops* by its glandular scapes and pale yellowish flowers (Reveal, 1972).

PHENOLOGY: Flowering occurs in July and August.

HABITAT: This eriogonum occurs above 2600 m on rocky, alpine slopes or on open, windswept ridges. It is associated with *Cryptantha nubigena*, *Salix* spp., *Lomatium oreganum*, *Lupinus aridis*, and *Smelowskia calycina*.

LAND OWNERSHIP/MANAGEMENT: U.S. Forest Service, entirely within the Eagle Cap Wilderness Area.

PRESENT AND POTENTIAL THREATS: Backpackers and trail work may be potential threats.

MANAGEMENT RECOMMENDATIONS: Survey proposed trail routes for sensitive plant taxa prior to construction.

REMARKS: This recently described species is very poorly known in the field. It is suspected that future field work will show it to be not particularly uncommon in the high Wallowas. Even if it is, tangible threats to its existence appear to be lacking when the extremely remote and rugged habitat is taken into account.

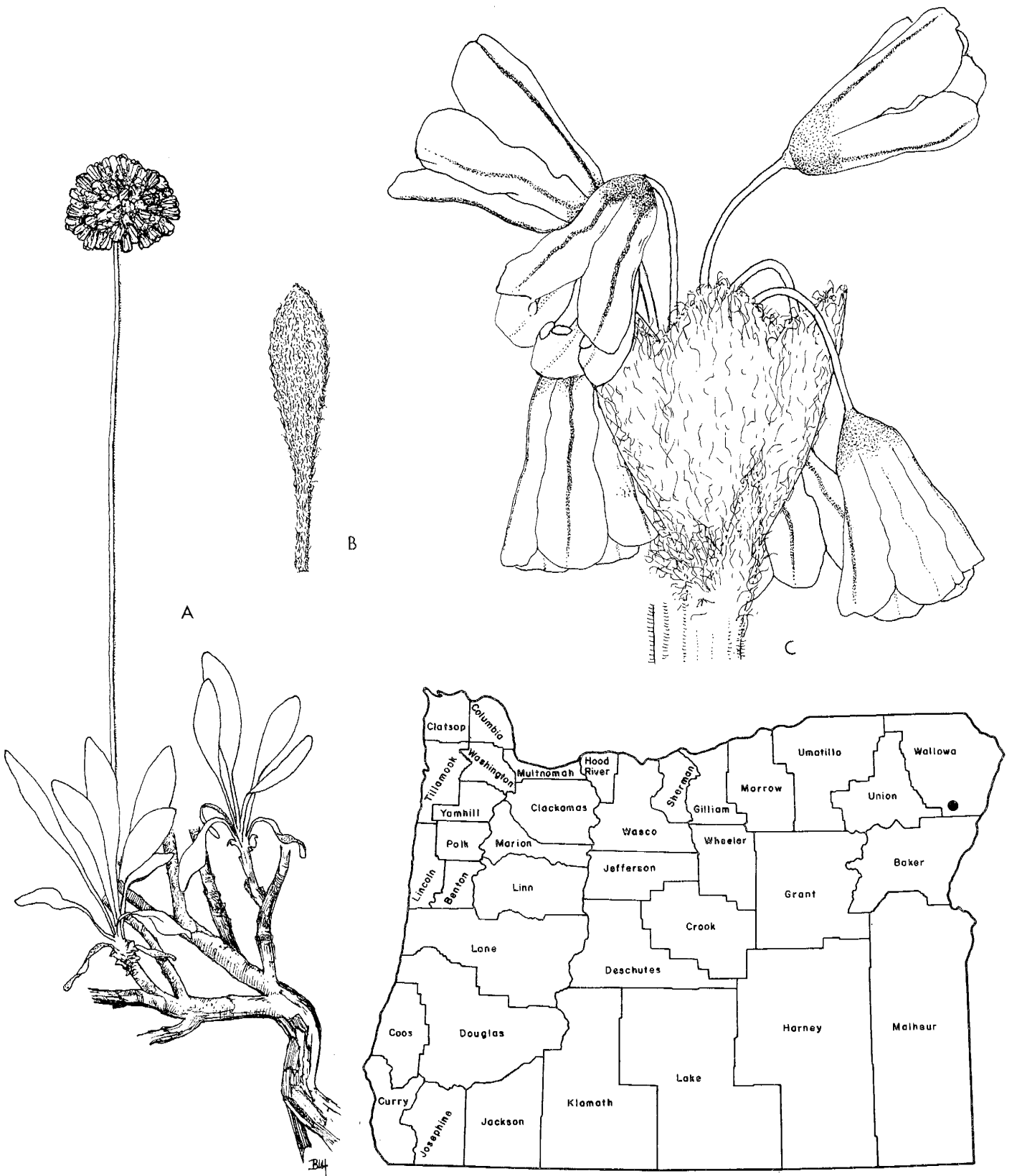


Fig. 75. *Eriogonum scopulorum*. A: Habit, X 2; B: Leaf, X 7; C: Involucre, with protruding flowers, X 14 (drawn from Peck 17990 and 17865, ORE).

FILIPENDULA OCCIDENTALIS (Wats.) Howell

(Queen of the forest)

Rose family (Rosaceae)

ORIGINAL PUBLICATION: Fl. N.W. Am. p. 185. 1898.

SYNONYMS: *Spiraea occidentalis* Wats. (Proc. Amer. Acad. 18:192. 1883).

STATUS: Candidate species for federal listing, Category 2, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Perennial herb, from rhizomes, with erect, mostly simple stems to 2 m tall, glabrous or slightly pubescent; leaves pinnately divided, pubescent, rachis with one to four pairs of small leaflets, terminal leaflet broadly ovate, 8-20 cm broad, five to seven cleft with serrate lobes; flowers numerous in a flat topped panicle; sepals reflexed; petals white, about 6 mm long; achene brownish hairy, with a slender stipe 2-3 mm long, body about 4 mm long, strongly flattened (after Hitchcock, 1961).

DISTRIBUTION: From Onion Mountain and coastal river systems in Clatsop, Polk, and Tillamook counties, Oregon.

PHENOLOGY: *Filipendula occidentalis* blooms from late May to August.

HABITAT: This species is known from north facing banks, usually growing in a narrow zone in rock crevices and seeps just above the high water level. Associates include *Alnus* spp., and various pteridophytes and conifers. On Onion Mountain it is found clinging to rock cliffs in a remnant stand of *Abies amabilis* and *Tsuga heterophylla*.

LAND OWNERSHIP/MANAGEMENT: Bureau of Land Management and U.S. Forest Service.

PRESENT AND POTENTIAL THREATS: Logging and road widening are major threats. This species grows in generally inaccessible areas, but anything changing the flow and thus the water level of the rivers along which it occurs would be detrimental. This species is attractive and may be collected. Hitchcock (1961) states, "this plant seems not to have been introduced into the horticultural trade although it has excellent qualities."

MANAGEMENT RECOMMENDATIONS: Cooney & Nissila (1978) state, "the populations in our area appear stable at this time, mainly because they are in areas which are not . . . subject to human activity. Continued protection should be provided."

REMARKS: The aesthetic value of this species alone is worth the effort of maintaining and protecting the remaining populations. Its isolated populations and fragmented distribution suggest it is a relict, probably more widespread historically.

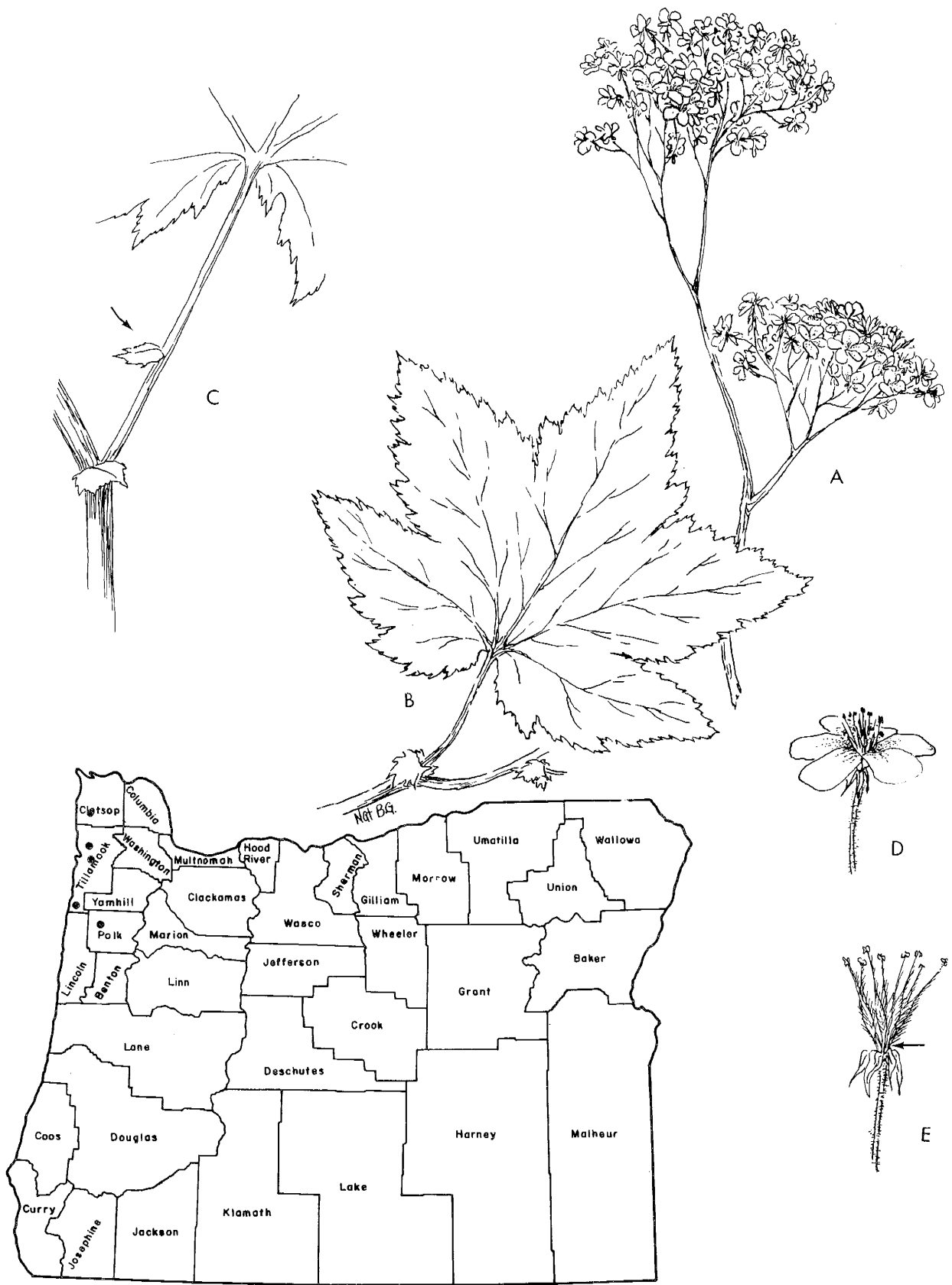


Fig. 76. *Filipendula occidentalis*. A: Habit, flowering stem, X 0.5; B: Leaf, X 0.8; C: Tiny lower leaflet subtending beneath terminal leaflet, X 1; D: Flower, X 2; E: Fruit (achenes), with stipe indicated, X 1.5 (drawn from Chambers 3201, OSC).

FRASERA UMPQUAENSIS Peck & Appleg.

(*Umpqua fraseri*)

Gentian family (Gentianaceae)

ORIGINAL PUBLICATION: Madrono 6:12. 1941.

SYNONYMS: *Swertia umpquaensis* (Peck & Appleg.) St. John (Amer. Midl. Nat. 26:14. 1941).

STATUS: Candidate species for federal listing, Category 2, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Glabrous stem stout, 5-11 dm high; basal leaves oblanceolate to subspatulate, 1.5-2 dm long, petioled; cauline leaves in whorls of three to five, oblong ovate to elliptic, gradually reduced to the stem; panicle dense, 1-2 dm long; pedicels erect, 3-10 mm long; calyx deeply cleft, the segments linear to oblong, 10-12 mm long; corolla scarcely as long, pale yellow green or slightly bluish, each segment with a roundish impressed glandular pit bordered by a fringed broad membrane (after Munz, 1959).

DISTRIBUTION: The *Umpqua fraseri* is known from the mountains of southwest Oregon, in Douglas, Jackson, Lane, Curry, and Josephine counties; also in Trinity County, California.

PHENOLOGY: This is a June and July flowering species.

HABITAT: In mid to upper elevation (1350 to 1950 m) *Abies* dominated forests, generally in damp, shaded situations under the forest canopy, although also occasionally in the open. Additional associates are *Rhododendron* spp., *Trifolium howellii*, *Rudbeckia occidentalis*, *Pteridium aquilinum*, *Pyrola picta*, and *Chimaphila umbellata*.

LAND OWNERSHIP/MANAGEMENT: Land managers in the area are the U.S. Forest Service and Bureau of Land Management, and possibly some private landowners.

PRESENT AND POTENTIAL THREATS: Logging operations are a crucial threat. This species' habitat is considered to occur within a marketable timber type.

MANAGEMENT RECOMMENDATIONS: Detailed surveys of likely habitat are suggested on proposed timber sale sites. Guidelines concerning the location of buffer zones which will provide the adequate moist, shaded habitat should be implemented.

REMARKS: The known populations of *F. umpquaensis* are mostly very small. Although there are several extant populations (some quite recently discovered), these are considered threatened because of their location within a commercially exploitable habitat type and the relatively few individuals which typically comprise them.

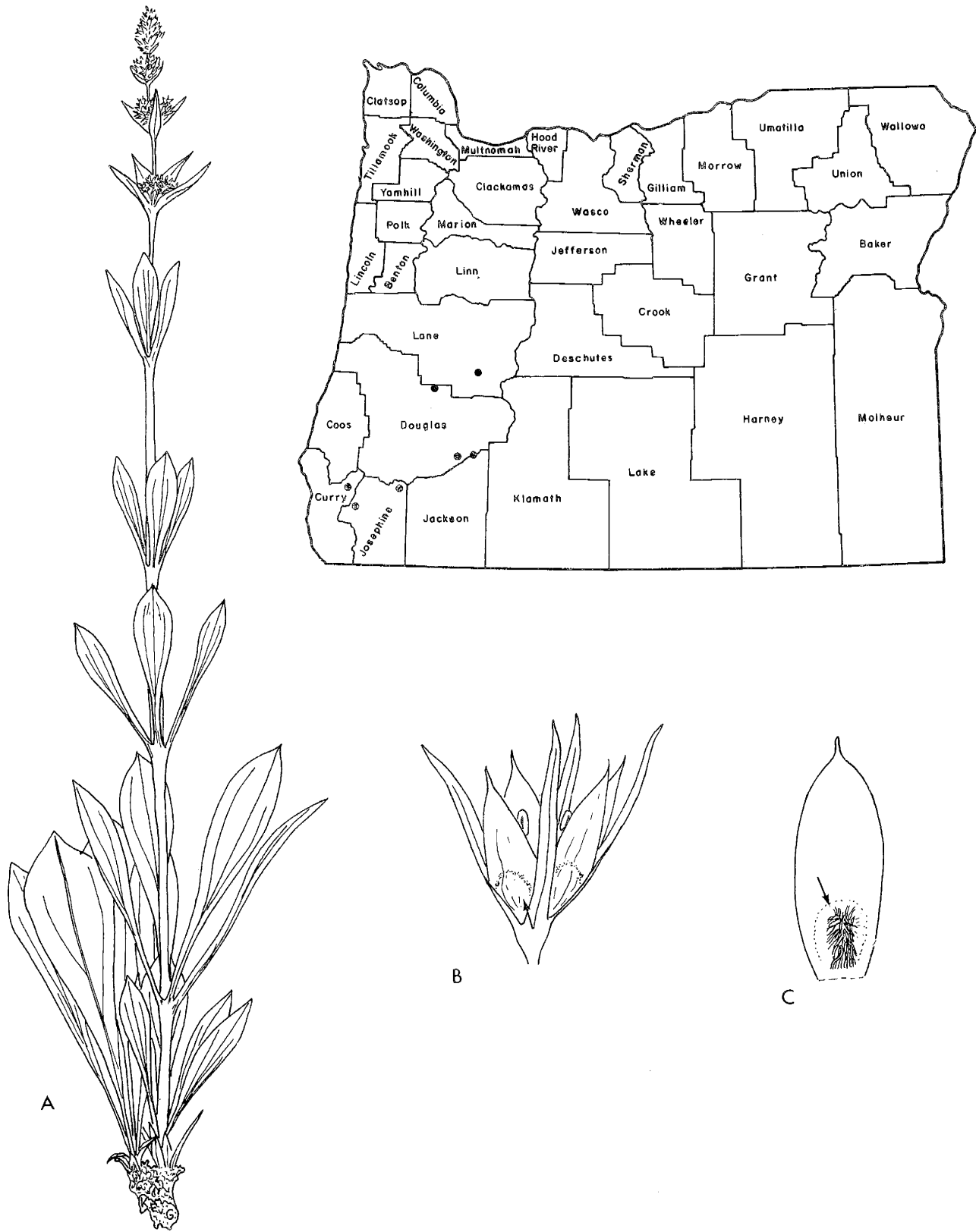


Fig. 77. *Frasera umpquaensis*. A: Habit, X 0.2; B: Flower, with gland indicated, X 3.5; C: Ventral petal face, exposing fringed gland, X 5 (drawn from Mitchell 215, OSC).

FRITILLARIA GENTNERI Gilkey

(Gentner's fritillary)

Lily family (Liliaceae)

ORIGINAL PUBLICATION: Madrono 11:137-141. 1951.

STATUS: Candidate species for federal listing, Category 2, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Perennial from a fleshy bulb, stem robust, ca. 5-7 dm high, glaucous, sometimes purple mottled; leaves lanceolate, sometimes linear, 7-15 cm long, 0.7-1.5 cm wide at base, often whorled; flowers solitary or in bracted racemes, one to five, on long pedicels; corolla campanulate, 3.5-4 cm long, reddish purple with pale yellow streaks (after Gilkey, 1951).

DISTRIBUTION: Known only from scattered localities in southwest Oregon, along the Rogue and Illinois River drainages in Josephine and Jackson counties.

LOOK ALIKES: This species is quite similar to the red flowered *F. recurva*. It differs in its campanulate corolla and comparatively darker red purple petals.

PHENOLOGY: Flowering from April to June.

HABITAT: Occurring in rather dry open woods of fir or oak at lower elevations, with *Brodiaea* spp., *Ceanothus cuneatus*, *Phacelia* spp., *Microseris* spp., and *Erythronium* spp.

LAND OWNERSHIP/MANAGEMENT: U.S. Forest Service, Oregon Department of Transportation, and probably private as well.

PRESENT AND POTENTIAL THREATS: Horticultural collecting, grazing, and logging are potential threats.

MANAGEMENT RECOMMENDATIONS: Since this plant is apparently exploited by collectors, care should be taken to safeguard locality information. Grazing and other land uses should be evaluated with respect to this species.

REMARKS: This is an attractive but unfortunately rare species whose numbers are diminishing (Siddall et al., 1979). According to information given in the original publication, *F. gentneri* may be successfully grown in the garden. Its populations are not numerous and some are located in close proximity to well traveled roadways, making it especially vulnerable. *F. gentneri* was known to local amateur botanists for a number of years prior to its formal recognition as a distinct species. It was confirmed to be a new taxon on the basis of garden specimens (Gilkey, 1951).



Fig. 78. *Fritillaria gentneri*. A: Habit, X 0.5; B: Developing ovary and style, X 2.5; C: Whorled lower stem leaves (drawn from Gilkey s.n. [isotype], OSC).

GENTIANA BISETAEA Howell

(Elegant gentian)

Gentian family (Gentianaceae)

ORIGINAL PUBLICATION: Fl. N.W. Amer. p. 455. 1901.

STATUS: Candidate species for federal listing, Category 1, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Stems several, from a stout root crown, erect or ascending, 20-45 cm high; leaves elliptic oblong to oblong lanceolate, 2.5-6 cm long, the upper pair reduced and not concealing the flower; flowers solitary or sometimes three to four at the summit, sessile to the subtending bracts; calyx tube pale, 8-10 mm long, the lobes 5-8 mm long; corolla blue, funnelform 2.3-3.5 cm long, the lobes 14-16 mm long, acutish at apex; capsule narrowly ellipsoid, stipitate; seeds oblong, broadly winged all around (after Abrams, 1951).

DISTRIBUTION: This is a species endemic to Oregon in Josephine and Curry counties, primarily in the drainages of the Chetco and Illinois Rivers.

LOOK ALIKES: *Gentiana calycosa* and *G. newberryi* are similar to *G. bisetaea* but they are alpine or subalpine species, and neither are found in serpentine bogs. *G. setigera* of northern California is also similar but has broadly ovate leaves, the upper ones concealing the base of the flowers.

PHENOLOGY: *Gentiana bisetaea* blooms from July through September.

HABITAT: The elegant gentian is restricted to serpentine bogs and marshes from about 140 to 1000 m. Associated species include *Darlingtonia californica*, *Schoenolirion bracteosum*, *Lilium pardalinum*, *Rudbeckia californica*, *Rhododendron occidentale*, and *Cypripedium californicum*.

LAND OWNERSHIP/MANAGEMENT: The U.S. Forest Service, Bureau of Land Management, and private individuals are principle landowners in this area.

PRESENT AND POTENTIAL THREATS: The draining of bogs and the collection of *G. bisetaea* for rock gardens have reportedly had moderate impact. Mining claims for nickel, chromite, and cobalt on serpentine bogs pose a serious threat for the future conservation of *G. bisetaea*.

MANAGEMENT RECOMMENDATIONS: The bog and marsh habitats in which *G. bisetaea* occurs need to be left undisturbed. The effects of grazing and other disturbances are unknown and should be investigated.

REMARKS: *Gentiana bisetaea* is aesthetically pleasing and is listed in west coast native plant and seed catalogues. The plant usually grows only as scattered individuals within a particular bog. Jacqueline Greenleaf (pers. comm.) indicates this is probably not as rare as originally believed, however, and that numerous additional sites may yet be uncovered in the Kalmiopsis Wilderness Area.

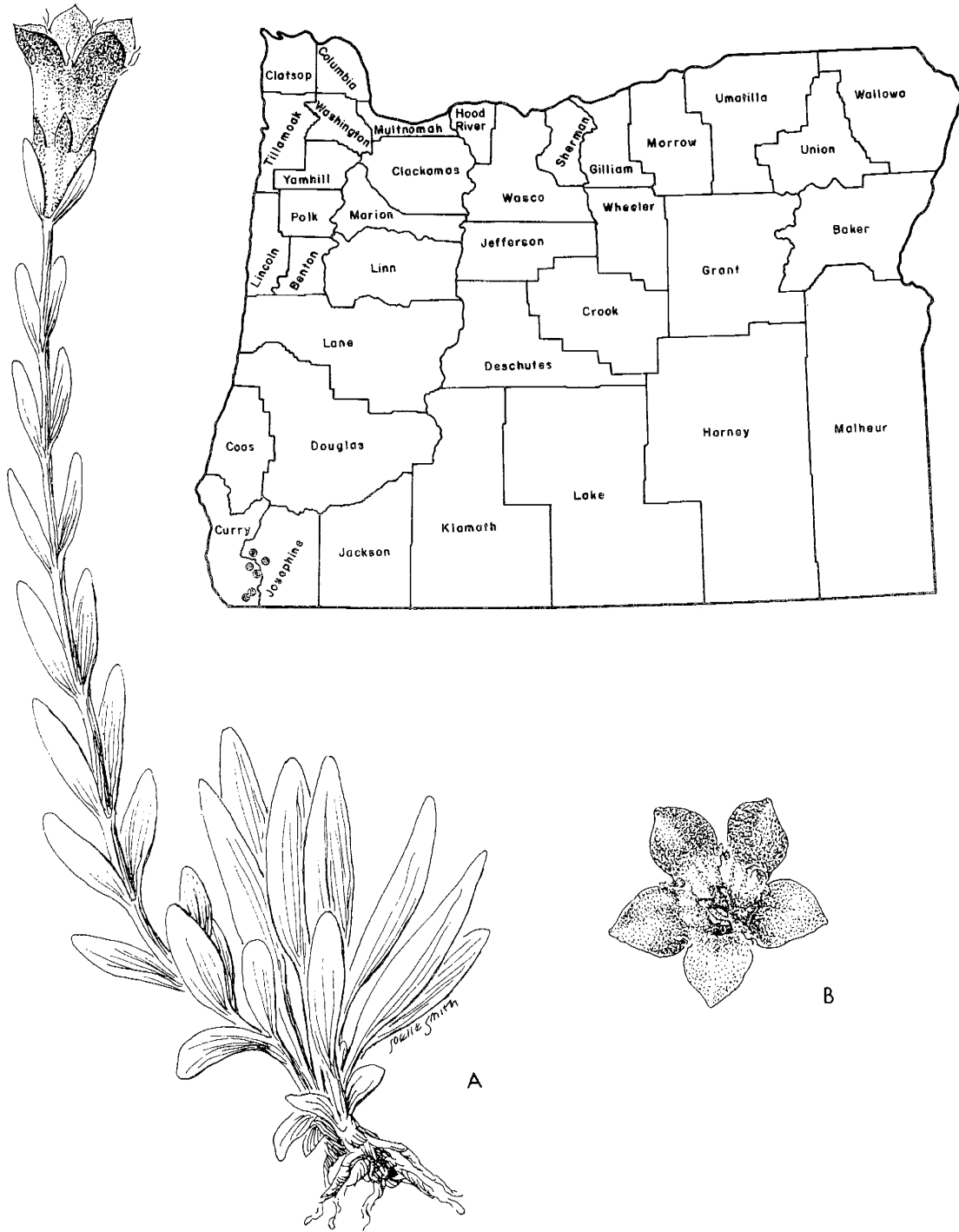


Fig. 79. *Gentiana bisetata*. A: Habit, X 1; B: Frontal view of corolla, X 1 (drawn from Chambers 2974, OSC).

GRATIOLA HETEROSEPALA Mason & Bacig.

(Boggs Lake hedge hyssop)

Figwort family (Scrophulariaceae)

ORIGINAL PUBLICATION: Madrono 12:150. 1954.

STATUS: Candidate species for federal listing, Category 1, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Semi-aquatic annual herb, erect, 2-10 cm high, glabrous below, glandular in inflorescence; lower leaves 1-2 cm long, linear lanceolate, upper leaves rounded and reduced; flowers few, on long pedicels; sepals unequal, upper three partially fused, ca. 4-6 mm long; corolla tubular, white and yellow, 6-8 mm long; capsule pear shaped (after Mason & Bacigalupi, 1954).

DISTRIBUTION: Known from extreme southern Lake County, Oregon, at a single location. Previously thought to be endemic to the Boggs Lake area in Lake County, California.

LOOK ALIKES: This taxon is recognized in our area by the combination of bractless pedicels and yellow and white flowers.

PHENOLOGY: *Gratiola heterosepala* flowers from April to July.

HABITAT: This small plant occurs in semi-aquatic habitats, typically in mud or damp soil at the edge of lakes. It occurs in Oregon at ca. 1700 m altitude with *Marsilea vestita*, *Juncus* spp., and other moisture loving herbs (N. Holmgren, pers. comm.), surrounded by sagebrush flats.

LAND OWNERSHIP/MANAGEMENT: Bureau of Land Management and/or private.

PRESENT AND POTENTIAL THREATS: The only site for this species is heavily disturbed by cattle. It seems, however, that its occurrence in the "pock-marks made by cattle hooves" (Holmgren, pers. comm.) may actually enhance the vigor of the population, the tromping about acting as a seed dispersal mechanism. The only real threat would appear to be any premature drying or draining of its wet habitat prior to blooming and seed set.

MANAGEMENT RECOMMENDATIONS: Observations suggest that this species is thriving, albeit locally. It is recommended that monitoring be initiated in future seasons.

REMARKS: *Gratiola heterosepala* was first discovered in Oregon in 1980. It is biogeographically interesting due to its peculiar disjunction from its only other collection site in north-central California. Its appearance in southeast Oregon may be the result of seed transport on the feet of migrating waterfowl.

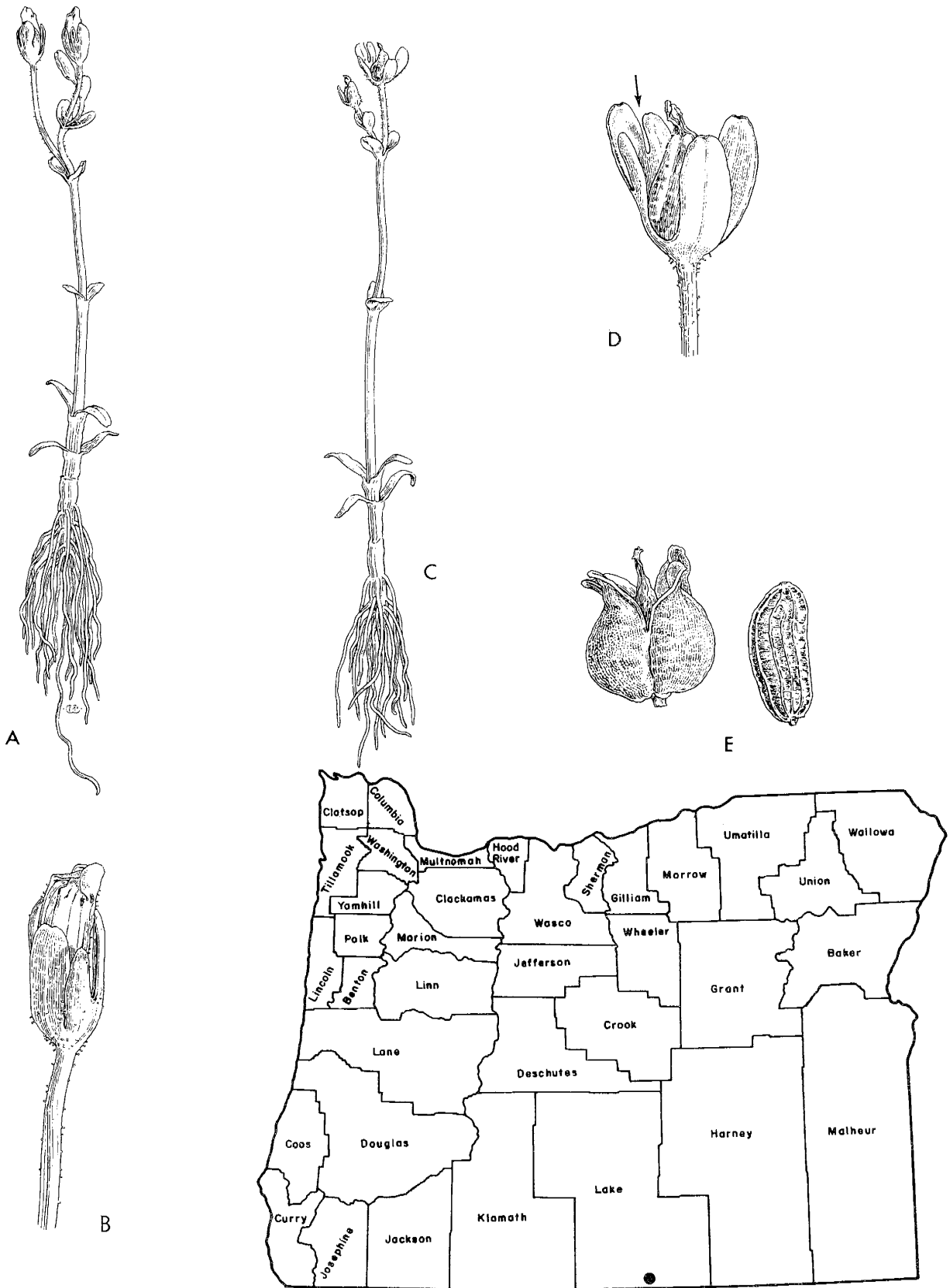


Fig. 80. *Gratiola heterosepala*. A: Flowering habit, X 1.2; B: Flower, X 4; C: Fruiting habit, X 1.2; D: Fruit enclosed by calyx (note uneven lobing), X 4; E: Opened capsule, X 6, and seed, X 40 (drawings taken from Mason, 1969).

HACKELIA CRONQUISTII J.L. Gentry

(Cronquist's stickseed)

Borage family (Boraginaceae)

ORIGINAL PUBLICATION: Madrono 21:490. 1972.

SYNONYMS: *Hackelia patens* var. *semiglabra* Cronq. (Leafl. W. Bot. 10:39-40. 1963).

STATUS: Candidate species for federal listing, Category 1, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Erect perennial, stems 20-65 cm tall, from a taproot and compactly branched caudex; basal leaves with long petioles, narrowly elliptic or lance elliptic, 6-21 cm long, 5-35 mm wide; cauline leaves shorter, narrower, and mostly sessile, progressively smaller upward; bracts small and insignificant in inflorescence; corolla limb white tinged with blue, 8-15 mm wide, tube 2-2.2 mm long, fornicies papillate or papillate puberulent; nutlets 2.5-3.5 mm long (after Gentry, 1972).

DISTRIBUTION: Cronquist's stickseed is endemic to northern Malheur County, Oregon.

LOOK ALIKES: *Hackelia cronquistii* is most closely related to *H. patens* from which it may be distinguished by its stems, which are glabrous below and sparsely strigose above, and its fornicies, which are papillate or papillate puberulent. *H. patens* is strigose both above and below and has villous puberulent fornicies. *H. patens* probably does not occur in Oregon, however, it is found from Montana and Idaho south.

PHENOLOGY: This is a plant which flowers primarily in May.

HABITAT: *Hackelia cronquistii* is found on sandy sagebrush slopes, sometimes on moist slopes in ravines. It is to be expected at elevations between 630 and 750 m.

LAND OWNERSHIP/MANAGEMENT: Bureau of Land Management and possibly private.

PRESENT AND POTENTIAL THREATS: According to Packard (1978) heavy grazing, herbicide use, competition from seedings, and agricultural expansion are hazards.

MANAGEMENT RECOMMENDATIONS: Packard (1978) suggests that light grazing may be beneficial in opening up competing sagebrush. She suggests that part of the *H. cronquistii* populations might be fenced to prevent grazing, and a comparison between grazed and ungrazed areas made. Seeding should never occur in or near any sites containing *H. cronquistii*, as the danger from eradication through competition would be great. Many scarce species which require a delicate ecologic balance are known to fare poorly when subjected to competitive pressure, whether from direct seeding or via indirect means such as the post grazing invasion of cheatgrass. Any populations encountered in future surveys should receive immediate protection.

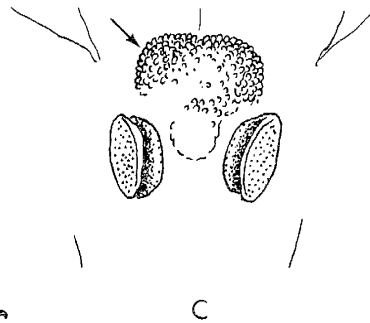
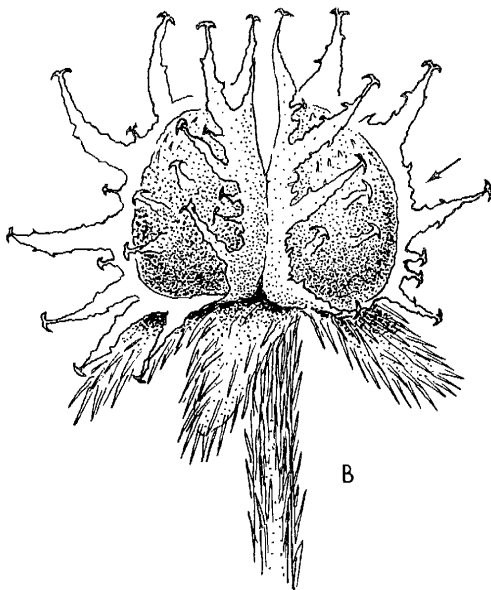
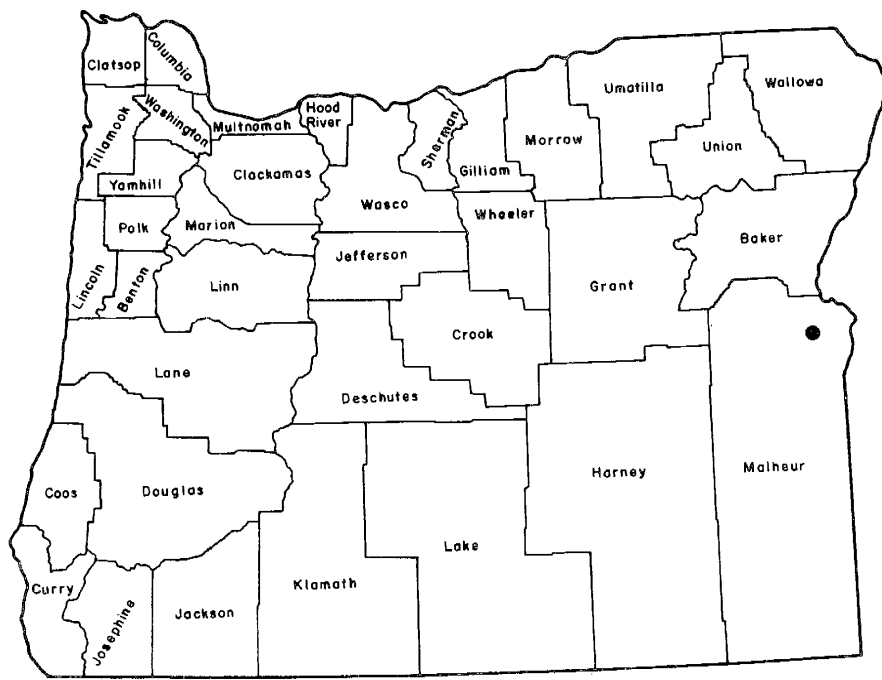


Fig. 81. *Hackelia cronquistii*. A: Habit (note glabrous lower stem), X 0.5; B: Nutlets, illustrating toothed margins, X 8; C: Fornices of corolla, covered with papillae (bumps), X 18 (drawn from Hitchcock 20644, OSC).

HACKELIA OPHIOBIA Carr

(Serpent stickseed)

Borage family (Boraginaceae)

ORIGINAL PUBLICATION: Madrono 22:390-392. 1974.

STATUS: Candidate species for federal listing, Category 1, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Slender perennial, 2-4 dm tall, herbage green; stems few to several, tightly clothed at base with old stems and petioles; basal leaves ovate to oblong, the base truncate to cordate, the petiole 1.5-3 times the blade length; cauline leaves becoming sessile and broadly lanceolate; corolla limb blue with a cream to yellow throat (after Gentry & Carr, 1976).

DISTRIBUTION: Known only from the Owyhee River Canyon of southeastern Malheur County, Oregon and in northwestern Humboldt County, Nevada.

LOOK ALIKES: The basal leaves of *H. ophiobia* are unique among the western North American *Hackelia* species in having a broad, short, truncate to cordate blade and a long slender petiole (Carr, 1974), and should therefore be easily distinguished from any similar taxa.

PHENOLOGY: This species flowers from late May through June.

HABITAT: *Hackelia ophiobia* is found in cracks and crevices of rocky, basalt bluffs and cliffs, and on steep banks of canyons in mostly well shaded sandy talus, at about 1220 to 1420 m. Associates include *Ivesia baileyi*, *Cystopteris fragilis*, and *Artemisia* spp.

LAND OWNERSHIP/MANAGEMENT: Managed by the Bureau of Land Management in Oregon and the U.S. Fish and Wildlife Service in Nevada.

PRESENT AND POTENTIAL THREATS: Probably none currently, except perhaps collecting. Promoted reservoir projects could inundate vital habitat and compromise the perpetuation of the species in Oregon along the Owyhee River.

MANAGEMENT RECOMMENDATIONS: A search for additional populations in the Owyhee Canyon should be made, as well as other local areas exhibiting similar habitat and terrain.

REMARKS: Although only two populations are known, imminent threats from man are not present. Flash flooding in this region has been severe in the past so the potential for extirpation does appear to exist. Protection of rare species from such natural phenomena, however, is probably beyond the scope of current land management technique. Label data from one of the known populations lists *H. ophiobia* as "locally common".

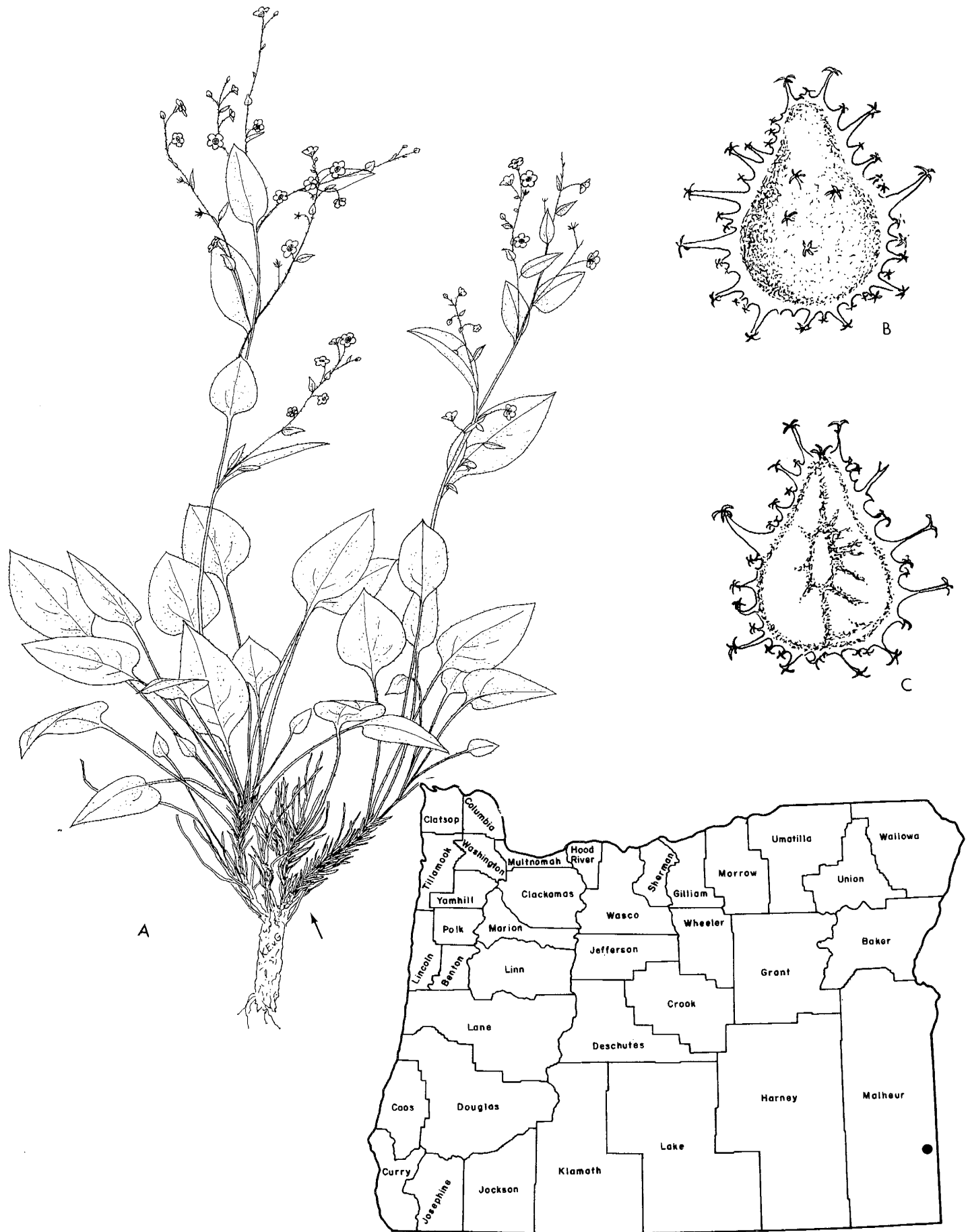


Fig. 82. *Hackelia ophiobia*. A: Habit (note old stem and petiole bases), X 0.6; B: Nutlet, dorsal view, X 15; C: Nutlet, ventral view, X 15 (drawn from Dean 281, OSC).

HAPLOPAPPUS RACEMOSUS (Nutt.) T. & G. SSP. CONGESTUS (Greene) Hall

(Racemed goldenweed)

Composite family (Asteraceae)

ORIGINAL PUBLICATION: Publ. Carnegie Inst. Wash. 389:128. 1928.

SYNONYMS: *Pyrocoma congesta* Greene (Pittonia 3:23. 1898).
Aplopappus racemosus (Nutt.) Torr. var. *congestus* (Greene) Peck (Man. Higher Pls. Oregon. p. 713. 1941).
Pyrocoma racemosa (Nutt.) T. & G. var. *congesta* (Greene) Mayes (Ph.D. Thesis, University of Texas, Austin, Texas. 1976).

STATUS: Candidate species for federal listing, Category 2, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Herbaceous perennial, 1.5-7 dm tall, sparingly branched, glabrous; leaves lanceolate to elliptic, 1-2.5 dm, denticulate, reduced upwards; heads 5-12, racemose; involucre 2-6 mm broad, 5-9 mm high, phyllaries herbaceous, glandular at apex; rays 6-8 mm long, yellow (after Peck, 1961).

DISTRIBUTION: This species is found in southwestern Oregon, in Josephine, Jackson, Curry, and Douglas counties. Found also in Del Norte County, California (Mayes, 1976).

LOOK ALIKES: This is a very variable species. This particular variety is separated by its small involucre (5-9 mm high) and glomerate spicate inflorescence.

PHENOLOGY: Flowering from July to September.

HABITAT: In nonalkaline soils, from dry roadsides to damp hills or even bogs, often in forest openings. Usually at elevations between 250 and 900 m. Associated with *Arbutus menziesii*, *Festuca californica*, *Ceanothus pumilus*, *Pinus* spp., and *Libocedrus decurrens*.

LAND OWNERSHIP/MANAGEMENT: U.S. Forest Service, private, Oregon Department of Transportation, and probably Bureau of Land Management.

PRESENT AND POTENTIAL THREATS: Mining, grazing, and recreational development are potential threats.

MANAGEMENT RECOMMENDATIONS: The tolerance of this taxon to disturbance is unknown and needs study. Other members of this genus are often little affected by moderate habitat alterations. Populations need protection and subsequent monitoring.

REMARKS: This plant is reported to be locally common in a few areas. Although it is a taxon with a rather restricted distribution, it may not be as sensitive as some of the other local endemics of the region. Further field work is required to substantiate this assumption, however.

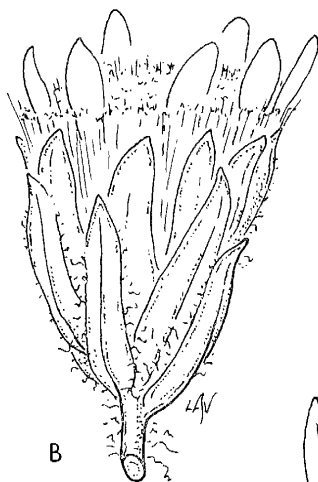
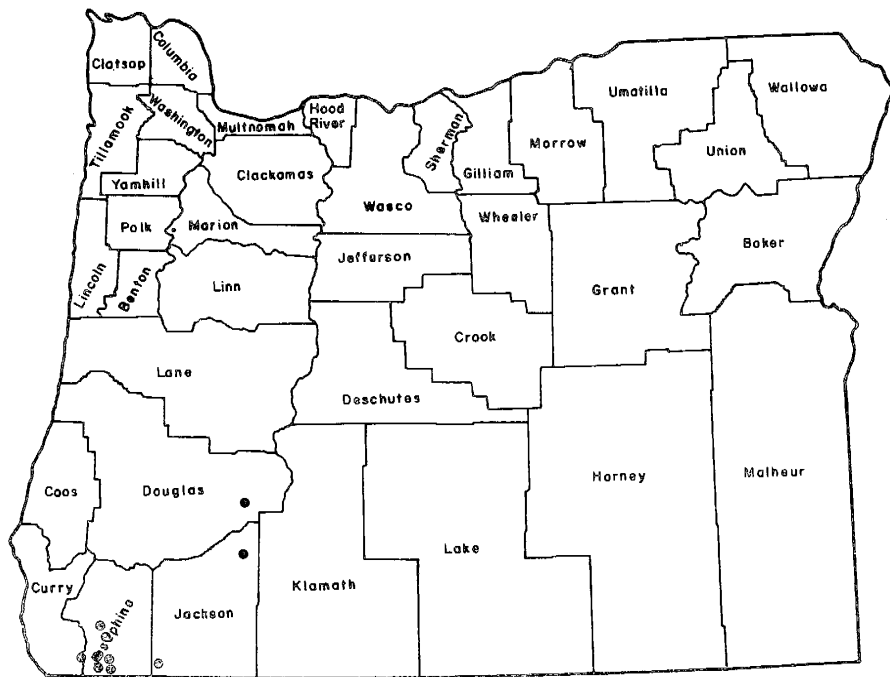


Fig. 83. *Haplopappus racemosus* ssp. *congestus*. A: Habit, X 0.7; B: Flower head, X 6 (drawn from Cusick 2939, ORE).

HAPLOPAPPUS RADIATUS (Nutt.) Cronq.

(Snake River goldenweed)

Composite family (Asteraceae)

ORIGINAL PUBLICATION: Vasc. Pl. Pac. Northw. 5:223. 1955.

SYNONYMS: *Pyrocoma radiata* Nutt. (Trans. Am. Phil. Soc. II 7:333. 1840).
Haplopappus carthamoides var. *maximus* Gray (Syn. Fl. 12:126. 1884).
Haplopappus carthamoides ssp. *maximus* Hall (Carn. Inst. Wash. Publ. 389:102. 1928).

STATUS: Candidate species for federal listing, Category 1, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Herbaceous perennial from a woody taproot, mostly glabrous throughout, 3-10 dm tall; basal leaves broadly elliptic, 5-20 cm wide, 15-50 cm long; cauline leaves numerous, usually sessile with clasping base, toothed, 3-12 cm long, 1-6 cm wide; heads one to twelve, usually in corymbose inflorescence, 3-5 cm wide; bracts pale margined, loose; ray and disc florets yellow, ray florets 17-50, disc florets numerous, 80-100 or more; achenes elongate, pappus of about 40-60 rigid, unequal brownish bristles (after Cronquist, 1955; Mayes, 1976; Meinke, unpub.).

DISTRIBUTION: Endemic to the lower confines of the Snake River Canyon and adjacent slopes of Baker and perhaps Malheur counties, Oregon. Small populations are reported to persist across the river in Washington County, Idaho.

LOOK ALIKES: *Haplopappus radiatus* is most closely related to *H. carthamoides* from which it can be distinguished by its glabrous stems and much wider basal leaves and heads.

PHENOLOGY: This species blooms in June and July (rarely to September).

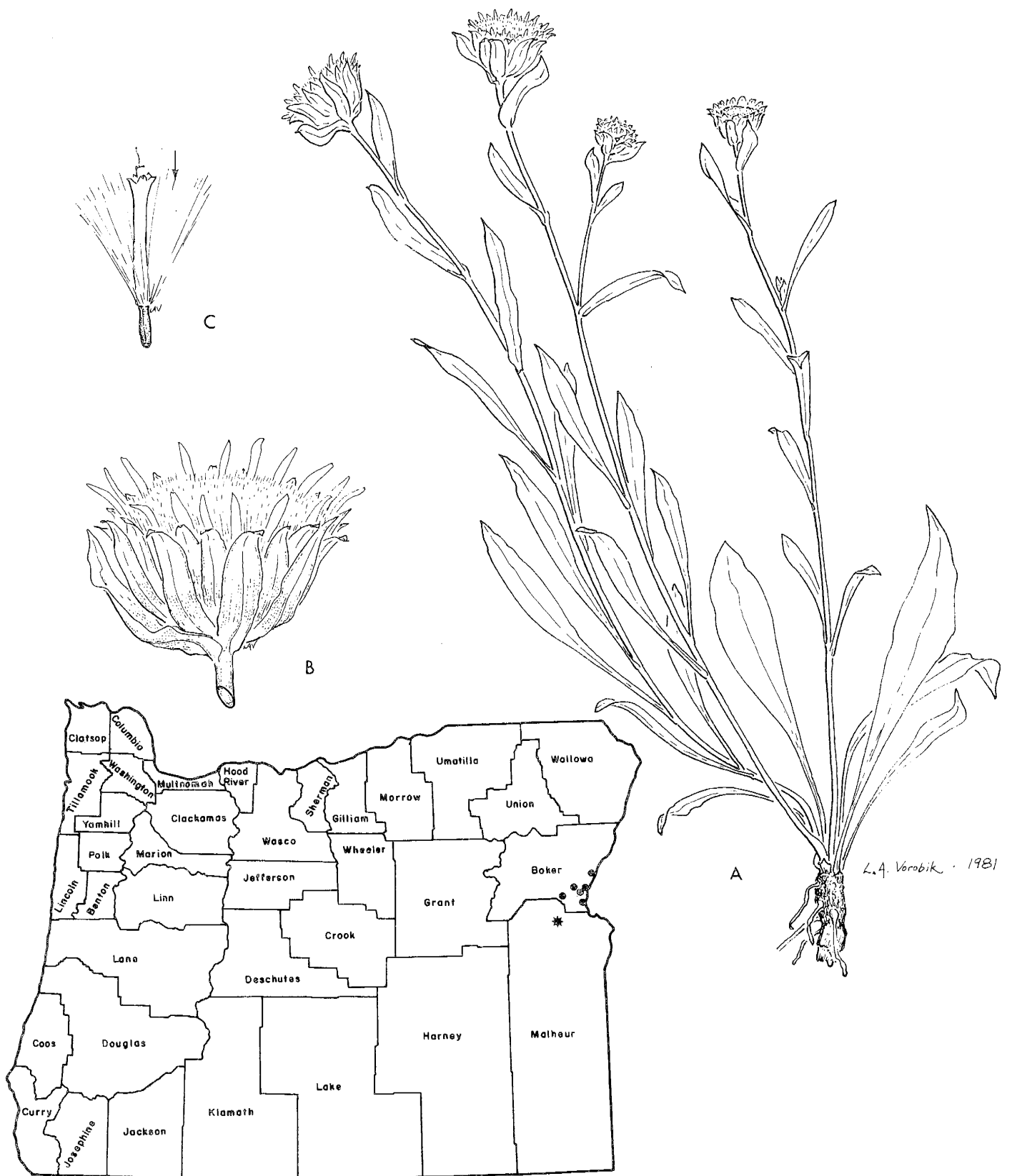
HABITAT: This is a plant of dry, rocky, open soil, nearly devoid of other perennial vegetation. Associated species include *Poa sandbergii*, *Crepis occidentalis*, *Bromus tectorum*, *Gutierrezia sarothrae*, *Cardaria draba*, *Artemisia tridentata*, *Erigeron pumilus*, and *Astragalus purshii*.

LAND OWNERSHIP/MANAGEMENT: The habitat of *H. radiatus* is on Bureau of Land Management and private lands.

PRESENT AND POTENTIAL THREATS: Primarily inadequate reproduction, widespread damage from grasshoppers, and adverse impacts of overgrazing which have resulted in the mass introduction of competitive annual grasses. Very occasional grazing of *H. radiatus* has also been observed.

MANAGEMENT RECOMMENDATIONS: Federally instigated land exchanges to acquire populations on heavily grazed private holdings may be desirable.

REMARKS: There is disagreement on the actual distribution and threats to this taxon. The Idaho Rare and Endangered Plants Technical Committee recommends the Idaho portion of the range be searched (Vascular Plant Species of Concern in Idaho, University of Idaho, Moscow, 1981).



L.A. Vorobik · 1981

Fig. 84. *Haplopappus radiatus*. A: Habit, X 4; B: Flower head, X 1; C: Disc floret, showing ample pappus, X 1.5 (drawn from Peck 21342, WILLU).

HORKELIA HENDERSONII Howell

(Henderson's horkelia)

Rose family (Rosaceae)

ORIGINAL PUBLICATION: Pacific Coast Pl. Coll. 1887:2. 1887.

STATUS: Candidate species for federal listing, Category 2, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Perennial with several stems from a branching, woody crown, ca. 1-1.5 dm high, hirsute below and not glandular; leaves silky, 4-6 cm long, leaflets 11-19, cleft, 2-10 mm long, stipules entire; inflorescence dense, villous; calyx broadly lanceolate, acuminate, 4 mm long; petals ca. equaling calyx, white or pink; filaments dilated (after Peck, 1961).

DISTRIBUTION: Endemic to southwest Oregon, this species is found only on a few mountain summits in Jackson County.

LOOK ALIKES: The localized alpine habitat and entire stipules readily identify *H. hendersonii*.

PHENOLOGY: Flowering occurs in June, July, and August.

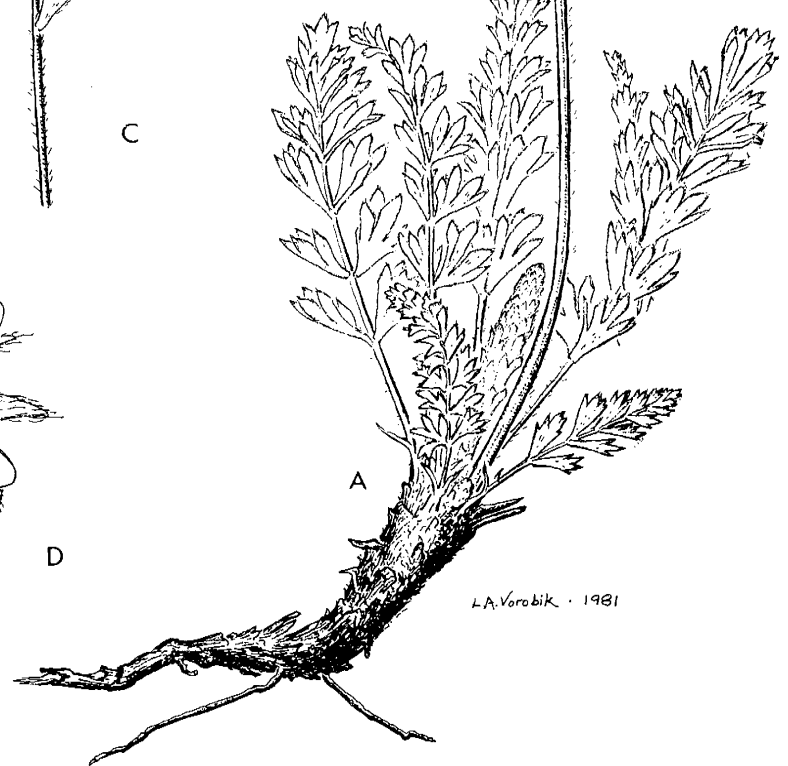
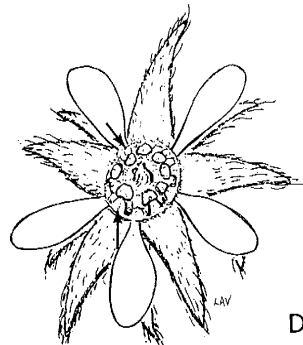
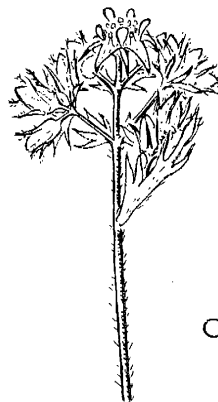
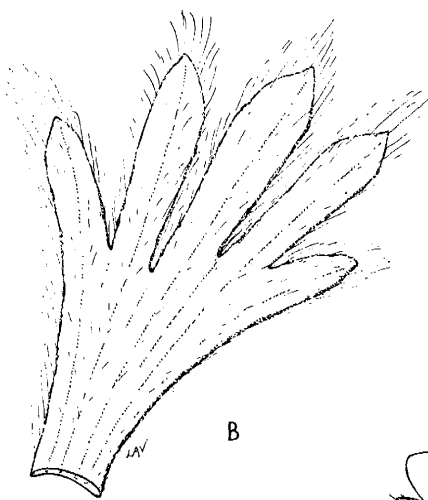
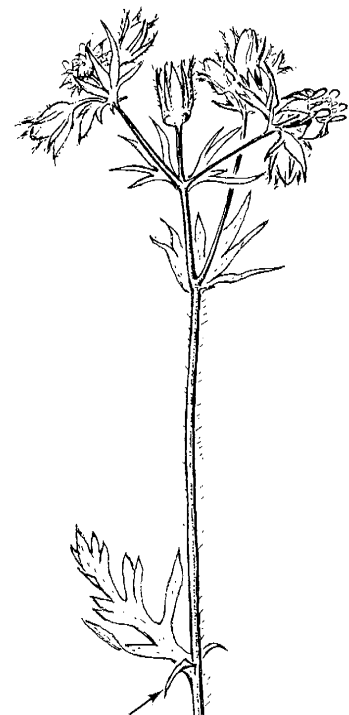
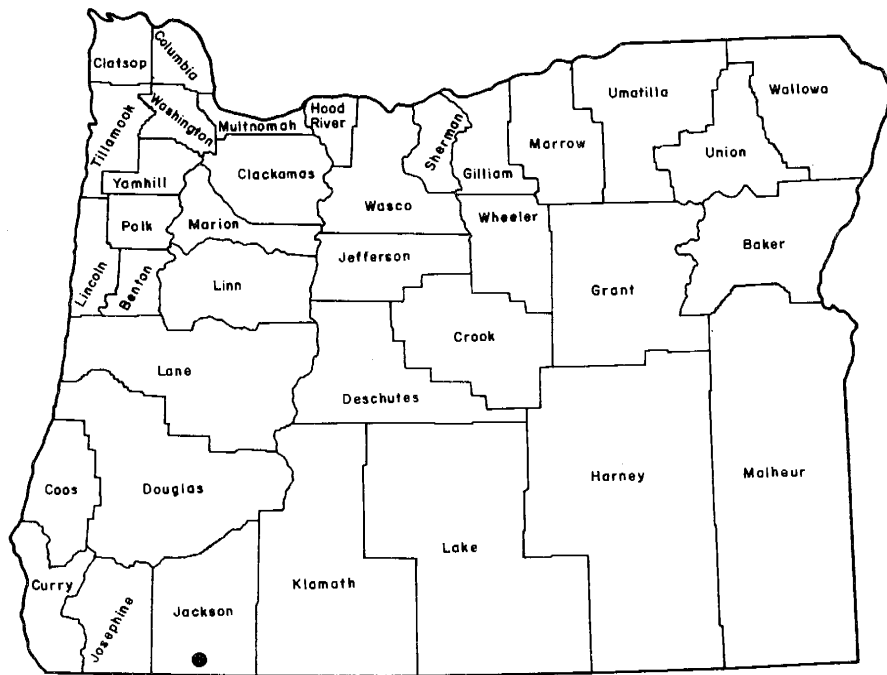
HABITAT: This species grows only on granitic peaks at high elevations, on rubbly talus slopes, with *Lupinus* sp., *Castilleja* sp., and *Trisetum* sp.

LAND OWNERSHIP/MANAGEMENT: U.S. Forest Service.

PRESENT AND POTENTIAL THREATS: High elevation mining, road construction, and recreational activities may prove to be threats.

MANAGEMENT RECOMMENDATIONS: Restrict or prevent surface disturbances of the high peaks on which *H. hendersonii* exists.

REMARKS: Although this species is considered rare, its habitat is remote and rugged and it is likely there are undisclosed localities. Recent field work has expanded its range from a single peak to include adjoining summits. This well marked and somewhat attractive species could conceivably have horticultural qualities. Its high elevation habitat preference would probably make it unsuitable for cultivation west of the Cascades, however.



L.A. Vorobik · 1981

Fig. 85. *Horkelia hendersonii*. A: Habit, showing entire stipules, X 1; B: Leaflet, X 8; C: Inflorescence, X 1.2; D: Flower, dilated (broadened) filaments indicated, X 4 (drawn from Detling 7198, ORE).

HOWELLIA AQUATILIS Gray

(Howellia)

Harebell family (Campanulaceae)

ORIGINAL PUBLICATION: Proc. Am. Acad. 15:43. 1879.

STATUS: Candidate species for federal listing, Category 2, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Flaccid stemmed annual, aquatic, somewhat fistulose, up to 7 dm long; leaves narrowly linear, mostly entire, 2.5-5 cm long; early flowers cleistogamous, axillary, later ones on short branches, with lavender or whitish corollas ca. 3 mm long; capsule clavate, 6-8 mm long (after Peck, 1961).

DISTRIBUTION: Widespread but sporadic in the Pacific Northwest. Recorded in Oregon from Multnomah, Marion, Wasco, and Clackamas counties.

LOOK ALIKES: Vegetatively, *H. aquatilis* is similar to many aquatics, particularly the genus *Potamogeton*. Reliable identifications should rely on flowers, which when present should clearly distinguish this species.

PHENOLOGY: Flowering from May through August.

HABITAT: Found in low elevation ponds or sloughs, this taxon is submersed or partially floating on the surface of slow moving water. Associated species include *Potamogeton* spp., *Ranunculus* spp., and *Veronica* spp.

LAND OWNERSHIP/MANAGEMENT: Private.

PRESENT AND POTENTIAL THREATS: Drainage of aquatic habitat for urban and agricultural development, and possibly grazing.

MANAGEMENT RECOMMENDATIONS: Careful field searches are needed for this diminutive annual. Populations found should be monitored and conversion of habitat prevented where possible.

REMARKS: This species is known from only a very few historic locations, most of which are widely scattered. It is not known whether this is an accurate reflection of its rarity, or simply its inconspicuousness. Comparative field studies of the various extant and historic sites may yield clues helpful in determining specific habitat preferences. It seems unlikely that an aquatic annual could be so widely distributed and so uncommon, yet concentrated searches in several promising locations have not yielded any new populations. It may be that *H. aquatilis* is randomly dispersed through the wanderings of migratory waterfowl.

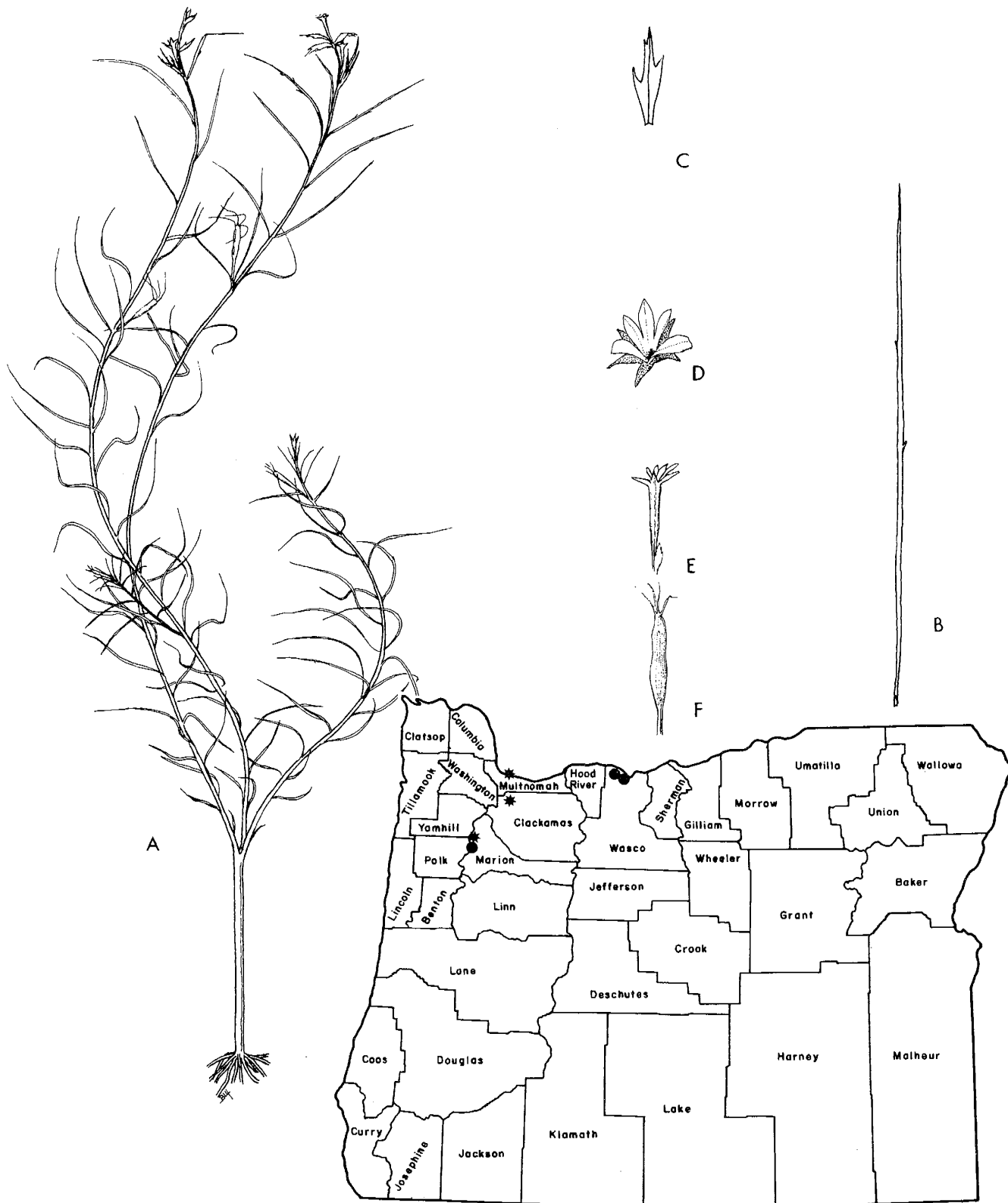


Fig. 86. *Howellia aquatilis*. A: Habit, X 0.8; B: Stem leaf, X 2; C: Floral bract, X 1.5; D: Flower, frontal view, X 3; E: Flower, lateral view, X 2; F: Capsule, X 2 (drawn from Howell 1892, WS).

IVESIA RHYPARA Ertter & Reveal

(Grimy ivesia)

Rose family (Rosaceae)

ORIGINAL PUBLICATION: Madrono 24:224-227. 1977.

STATUS: Candidate species for federal listing, Category 1, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Low, spreading perennial, 5-15 cm long, from a branched caudex atop a woody root system; herbage villous, not glandular; leaves mostly basal, 3-8 cm long, 5-15 pairs of overlapping leaflets which are divided into three to five segments; inflorescence a more or less open cyme; petals white, 0.8-1.5 mm long, narrowly spatulate (after Ertter & Reveal, 1977).

DISTRIBUTION: Endemic to eastern Malheur County, in southeast Oregon.

LOOK ALIKES: No other ivesias occur in this general area except *I. baileyi*, which is an erect, montane species.

PHENOLOGY: *Ivesia rhypara* blooms from May to October.

HABITAT: This distinctive endemic occurs on loose volcanic tuff, at elevations from ca. 1300-1450 m. Associated species on this barren substrate include *Eriogonum strictum*, *Physaria chambersii*, *Poa sandbergii*, *Eriophyllum lanatum*, and *Purshia tridentata*.

LAND OWNERSHIP/MANAGEMENT: Bureau of Land Management.

PRESENT AND POTENTIAL THREATS: Offroad vehicles, grazing, and mining are potential threats.

MANAGEMENT RECOMMENDATIONS: Strictly regulate surface disturbing activities within the small geographic range of this species.

REMARKS: Recreational activities in the area where *I. rhypara* occurs is heavy and concentrated. There have been significant attempts to regulate and control these activities, however, with generally good results. Exactly how this taxon reacts to disturbance is unknown. The specific epithet of *I. rhypara* refers not to the ashy soil in which the plant occurs, as might be assumed, but rather honors one of its discoverers, Jim Grimes.

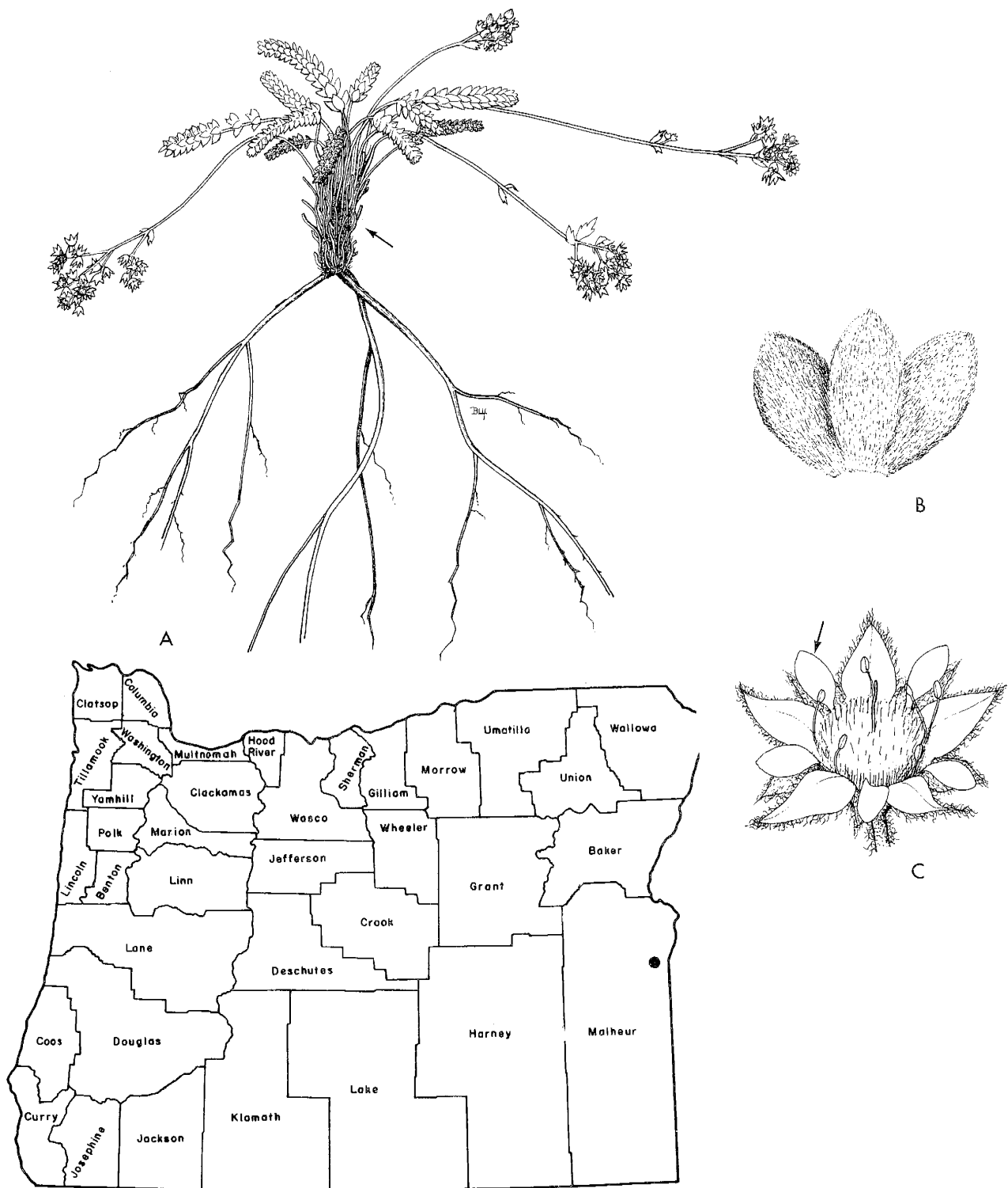


Fig. 87. *Ivesia rhypara*. A: Habit (note woody base), X 0.8; B: Leaflets, X 4; C: Flower, petals shorter than sepals, X 10 (drawn from Grimes 1050, OSC).

KALMIOPSIS LEACHIANA (Hend.) Rehder

(Kalmiopsis)

Heath family (Ericaceae)

ORIGINAL PUBLICATION: Journ. Arnold Arb. 13:32. 1932.

SYNONYMS: *Rhododendron leachianum* Hend. (Rhodora 33:205. 1931).
Rhodothamnus leachianus Copel. (Am. Midland Nat. 30:565. 1943).

STATUS: Candidate species for federal listing, Category 2, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Slender, highly branched shrub 1.5-2.5 dm high, somewhat spreading; leaves thick, numerous, dark green and ventrally glandular, 8-12 mm long, elliptic; inflorescence corymbose; flowers numerous; calyx red, 3-5 mm long; corolla deep rose, 12-15 mm long, with spreading lobes (after Peck, 1961).

DISTRIBUTION: This species is restricted to the mountains of Curry and Josephine counties, in southwest Oregon, and in northwest Douglas County.

LOOK ALIKES: This monotypic genus is similar to *Kalmia*, but the latter has saccate corollas and leaves which are not ventrally dotted with glands.

PHENOLOGY: Flowering occurs in May and June, rarely July.

HABITAT: On open mountain slopes, at middle elevations, usually in rocky areas. Associating with *Arctostaphylos* spp., *Berberis* spp., *Cheilanthes* sp., and *Heuchera micrantha*.

LAND OWNERSHIP/MANAGEMENT: U.S. Forest Service.

PRESENT AND POTENTIAL THREATS: Possibly horticultural collecting and trail construction.

MANAGEMENT RECOMMENDATIONS: Trail crews should be made aware of this and other sensitive taxa when working in the remote mountainous regions of southwest Oregon.

REMARKS: Actual threats to this species are probably minimal and it is known to be locally common in several areas. Most of its range lies within the appropriately named Kalmiopsis Wilderness Area managed by the U.S. Forest Service. Because of its status as an endemic Oregon genus, *Kalmiopsis* is certainly a unique and unusual taxon. This feature, combined with its great beauty, may in time legitimize the potential threat of horticultural exploitation.

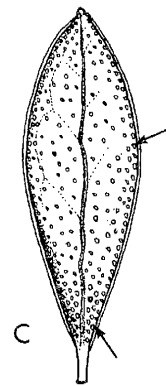
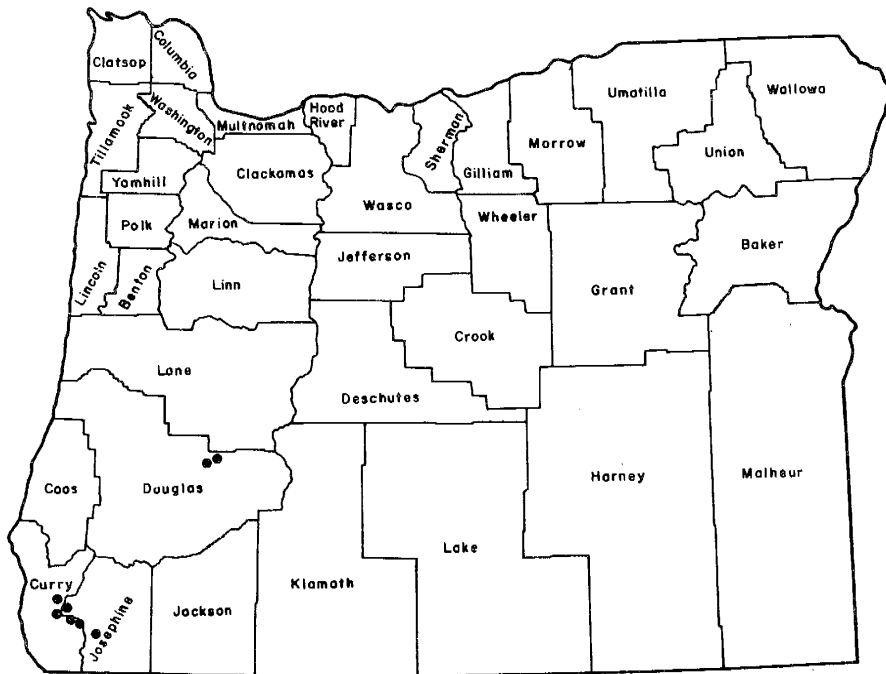
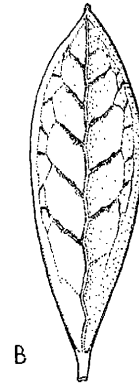


Fig. 88. *Kalamiopsis leachiana*. A: Habit, portion of branch, X 1; B: Leaf, dorsal surface, X 5; C: Leaf, ventral surface with glands indicated, X 5 (drawn from Overlander 1938, ORE).

LASTHENIA MACRANTHA (Gray) Greene SSP. PRISCA Ornduff

(Large flowered goldfields)

Composite family (Asteraceae)

ORIGINAL PUBLICATION: Madrono 21:96-98. 1971.

STATUS: Candidate species for federal listing, Category 1, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Perennial herb, blooming the first year, stems ascending, 1-4 dm high, leafy below; herbage more or less villous, leaves entire, linear to linear oblong, 2-4 cm long; phyllaries and ray florets usually eleven or fewer; ligules of ray flowers 5-9 mm long, yellow; peduncles usually 5-6 cm long (after Munz, 1959; Ornduff, 1971).

DISTRIBUTION: This plant is restricted to the coast of southern Oregon, known only to occur in Curry County.

TAXONOMIC PROBLEMS: Detailed taxonomic work (Ornduff, 1971) was required before this tetraploid subspecies could be reliably separated from the hexaploid ssp. *macrantha*. The morphologic differences between the two are apparently more readily observed when the plants are cultivated. Their ranges in nature, however, do not overlap, so there is not likely to be confusion between them in the field.

LOOK ALIKES: *Lasthenia minor* ssp. *maritima* occurs on the Oregon coast. It may be distinguished by its annual habit combined with much shorter rays (2-4 mm) than *L. m.* ssp. *prisca*.

PHENOLOGY: According to Ornduff (1971) "flowering.... only in the summer," as opposed to related taxa which are "less seasonal in their flowering behavior."

HABITAT: *Lasthenia macrantha* ssp. *prisca* is found on seaward slopes, cliff faces, and "sea terraces", with typically maritime species such as *Fragaria chiloensis* as well as dwarfed forms of *Gaultheria shallon* and *Vaccinium ovatum*.

LAND OWNERSHIP/MANAGEMENT: State of Oregon and private landowners.

PRESENT AND POTENTIAL THREATS: Land development and grazing are potential dangers. The populations are limited and such activities could eradicate them.

MANAGEMENT RECOMMENDATIONS: There are apparently no populations on federal land. The state needs to develop conservation plans for this plant, since it is probably the only public entity which will have dealings with it. Land acquisition of coastal habitat by private environmental interests may be beneficial.

REMARKS: There are few substantial populations of this taxon. Ornduff (1971) believes this is a relic subspecies which is only "tenuously surviving" in its steadily exploited habitat.



Fig. 89. *Lasthenia macrantha* ssp. *prisca*. A: Habit, X 1 (drawn from Ornduff 4986, UC).

LATHYRUS HOLOCHLORUS (Piper) Hitchc.

(Thin leaved peavine)

Pea family (Fabaceae)

ORIGINAL PUBLICATION: U. Wash. Pub. Biol. 15:31. 1952.

SYNONYMS: *Lathyrus ochropetalus* ssp. *holochlorus* Piper (Proc. Biol. Soc. Wash. 31:190. 1918).

STATUS: Candidate species for federal listing, Category 2, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Rhizomatous perennial, subglabrous stems 3-10 dm long, scandent; stipules ovate, mostly 1/5-1/2 the length of the leaflets; leaflets (6) 8-12, ovate or oblong ovate to elliptic, 2-5 cm long, 0.7-3 cm broad, tendrils fairly well developed; calyx 9-12 mm long; flowers 5-15, whitish, aging to buff, 13-17 mm long; pod 3-5 cm long, 4-7 mm broad (after Hitchcock, 1961).

DISTRIBUTION: *Lathyrus holochlorus* is endemic to the Willamette and Umpqua Valleys in western Oregon, ranging from Multnomah County south to Lane County (Steve Broich, pers. comm.).

LOOK ALIKES: The narrow calyx lobes, white flowers, several leaflets, and the presence of tendrils identify this peavine.

PHENOLOGY: Blooming occurs from late April to June.

HABITAT: Grows mostly along roadsides or fencerows, in grassland or climbing in low scrubby vegetation. Associated species include *Quercus garryana*, *Holodiscus discolor*, *Rhus diversiloba*, *Aster hallii*, *Delphinium pavonaceum*, and *Vicia* spp.

LAND OWNERSHIP/MANAGEMENT: Bureau of Land Management, U.S. Fish and Wildlife, Oregon Department of Transportation, and private.

PRESENT AND POTENTIAL THREATS: Roadside spraying and the agricultural and urban conversions of remaining habitat are the principle threats. There is also evidence that this species reproduces poorly.

MANAGEMENT RECOMMENDATIONS: Reduce or eliminate herbicide applications along right-of-ways where this and other Willamette Valley endemics are making a last stand.

REMARKS: This species is reported to be locally common in a few areas. Despite this tendency it is threatened by the increasing fragmentation and isolation of the remaining populations. While adult plants may persist for years, seedlings are becoming increasingly infrequent because of weedy competition.



Fig. 90. *Lathyrus holochlorus*. A: Habit, flowering branch, X 0.8; B: Pod, X 2 (drawn from Hitchcock 19289 & Mason 9713, ORE).

LEPIDIUM DAVISII Rollins

(Davis' peppergrass)

Mustard family (Brassicaceae)

ORIGINAL PUBLICATION: Madrono 9:162-165. 1948.

SYNONYMS: *Lepidium montanum* ssp. *davisii* Rollins (unpublished).

STATUS: Candidate species for federal listing, Category 1, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Cespitose, deep rooted perennial forming irregular or regular clumps; stems slender, mostly unbranched or sometimes branched, 4-8 cm tall, pubescent with small, simple hairs; leaves simple, sessile, entire to toothed or pinnately lobed, greenish but usually gray with adhering clay, sparingly pubescent to glabrous, 1-2.5 cm long; inflorescence subcorymbose; petals white or occasionally purple, 2-3 mm long; siliques crowded, glabrous to sparingly pubescent, slightly notched at apex, 3-5 mm long; style slightly longer than the notch (after Packard, unpub. data).

DISTRIBUTION: Davis' peppergrass is found in central Malheur County, Oregon. It is also known from scattered localities in several counties of southern Idaho.

TAXONOMIC PROBLEMS: There are apparently variations within the species which are as yet unnamed.

LOOK ALIKES: *Lepidium montanum*, an occasional associate, is not nearly as compact or "woody" and does not possess the fleshy, leathery leaves of *L. davisii*.

PHENOLOGY: This peculiar species flowers from May to August.

HABITAT: On hard, white, clayey playas with very few vegetative associates except for occasional perennial *Atriplex* spp., *Astragalus calycosus*, and *Allium anceps*. The sites are poorly drained and are often inundated in the early season by standing water. Elevational limits for *L. davisii* are from ca. 950 to 1700 m.

LAND OWNERSHIP/MANAGEMENT: Bureau of Land Management in Oregon.

PRESENT AND POTENTIAL THREATS: The major threats are offroad vehicles and the use of habitat as watering sites for feral and domestic livestock (resulting in considerable trampling).

MANAGEMENT RECOMMENDATIONS: Reasonable, limited use of the playa habitat is acceptable but heavy damage will surely result in substantial decline in population sizes. Perhaps one or two of these sites could be totally set aside as areas of scientific concern.

REMARKS: Although locally common, *L. davisii* is restricted to a unique habitat represented by a relatively few, disjunct sites. The populations appear to differ slightly from playa to playa.

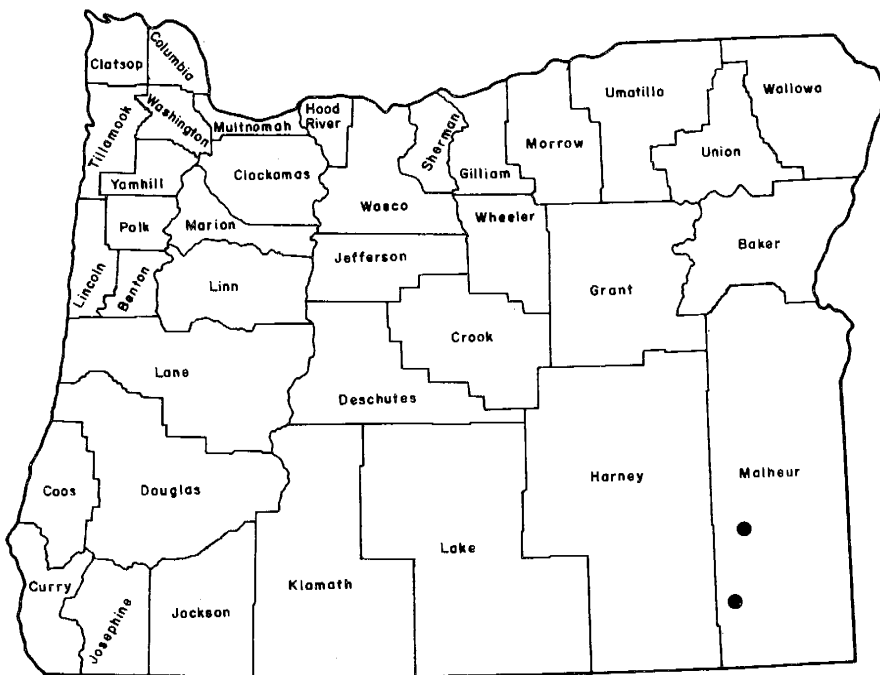


Fig. 91. *Lepidium davisii*. A: Habit, depicting woody base, X 0.8; B: Flower, X 10; C: Fruit (silique), X 10 (drawn from Packard 79-288, C1C).

LEPTODACTYLON HAZELAE Peck

(Hazel's prickly phlox)

Phlox family (Polemoniaceae)

ORIGINAL PUBLICATION: Proc. Biol. Soc. Wash. 49:111. 1936.

SYNONYMS: *Leptodactylon pungens* ssp. *hookeri* f. *hazela* Wherry (Amer. Midl. Nat. 34:383. 1945).

STATUS: Candidate species for federal listing, Category 2, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Slender, repeatedly branched shrub, sparingly glandular puberulent, primary branches 10-30 cm long; leaves persistent, rigid, five to nine parted into narrow segments, the longest 12-18 mm; flowers solitary to several at ends of branches, calyx 10 mm long, corolla 2-2.8 cm long, tube lilac, the limb creamy white; style less than half as long as corolla tube, cleft nearly halfway to ovary (after Peck, 1961; Meinke, unpub.).

DISTRIBUTION: Endemic to the Snake River Canyon and its immediate tributaries in Wallowa County, Oregon and adjacent Idaho.

TAXONOMIC PROBLEMS: The taxonomy of the group to which *L. hazela* belongs is currently being evaluated. Specific status for this plant is questionable.

LOOK ALIKES: *Leptodactylon hazela* differs from *L. pungens* most noticeably in its more slender habit and generally larger flowers, at least in comparison to the *L. pungens* of eastern Oregon and western Idaho.

PHENOLOGY: *Leptodactylon hazela* flowers from April to June.

HABITAT: This taxon frequents dry slopes on igneous rock, generally at low elevations, with *Phlox colubrina*, *Astragalus vallaris*, *Rhus radicans*, *Clematis ligusticifolia*, and *Mertensia longiflora*.

LAND OWNERSHIP/MANAGEMENT: U.S. Forest Service.

PRESENT AND POTENTIAL THREATS: Possibly road construction on the Idaho side. This is a rather attractive plant when in flower and might be collected where it occurs along roads or trails.

MANAGEMENT RECOMMENDATIONS: Continue taxonomic investigations and field inventory.

REMARKS: First collected by Hazel Barton in 1934, this "species" was re-collected in 1977 on the Idaho side and in 1979 on the Oregon side of the Snake River. It is probably best treated as an infraspecific unit of *L. pungens*.

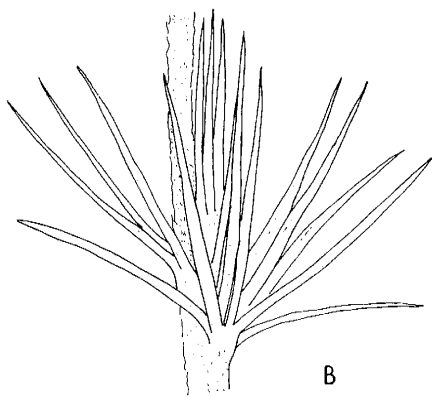
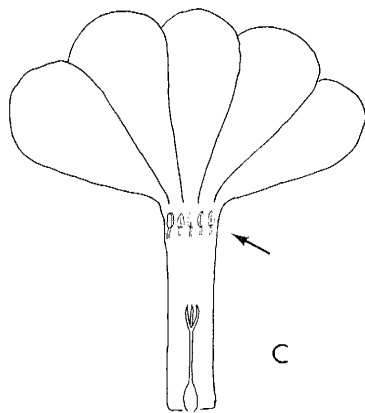


Fig. 92. *Leptodactylon hazelae*. A: Habit; X 1; B: Thinly dissected leaves, X 3; C: Dissected corolla, showing stamen insertion, X 2.5 (drawn from Meinke 1545, OSC).

LEWISIA COTYLEDON (Wats.) Robins. VAR. HOWELLII (Wats.) Jeps.

(Howell's lewisia)

Purslane family (Portulacaceae)

ORIGINAL PUBLICATION: Flora of California. W.L. Jepsen, 1914.

SYNONYMS: *Calandrinia howellii* Wats. (Proc. Am. Acad. 23:262. 1888).
Oreobroma howellii Howell (Erythea 1:32. 1893).
Lewisia howellii Robins. in Gray (Synop. Fl. No. Amer. 1:268. 1897).

STATUS: Candidate species for federal listing, Category 1, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Fleshy perennial from thickened caudex and taproot, stems thick and scapiform, 1-3.6 dm tall; basal leaves numerous and fleshy, spatulate, with crisped-undulate margins, 6-12 cm long; inflorescence paniculate, many flowered; flowers pinkish, petals ca. 15 mm long, mostly seven to nine, rarely thirteen (after Munz, 1959; Hohn, 1975).

DISTRIBUTION: Endemic to southwest Oregon, in Curry, Josephine, Jackson, and Douglas counties, to adjacent northern California.

TAXONOMIC PROBLEMS: This taxon will hybridize with all infraspecific taxa of *L. cotyledon*.

LOOK ALIKES: *L. cotyledon* var. *howellii* is similar to the type variety. However, the crisped-undulate leaf margins are a good field character.

PHENOLOGY: Flowers in April and May.

HABITAT: This taxon occurs on rocks or shallow soils and frequents low elevation oak woodland, between 160 and 375 m. Commonly associated with *Quercus chrysolepis*, *Q. kelloggi*, and *Garrya buxifolia*.

LAND OWNERSHIP/MANAGEMENT: U.S. Forest Service, Bureau of Land Management, and private.

PRESENT AND POTENTIAL THREATS: Recreational activities and collecting for horticultural purposes are primary potential threats.

MANAGEMENT RECOMMENDATIONS: Reduce recreational pressures where conflicts are likely. Trail access to major populations could be restricted or eliminated to lessen the impact of collectors.

REMARKS: This lewisia grows at a lower elevational range than any of the other infraspecific taxa of *L. cotyledon*.

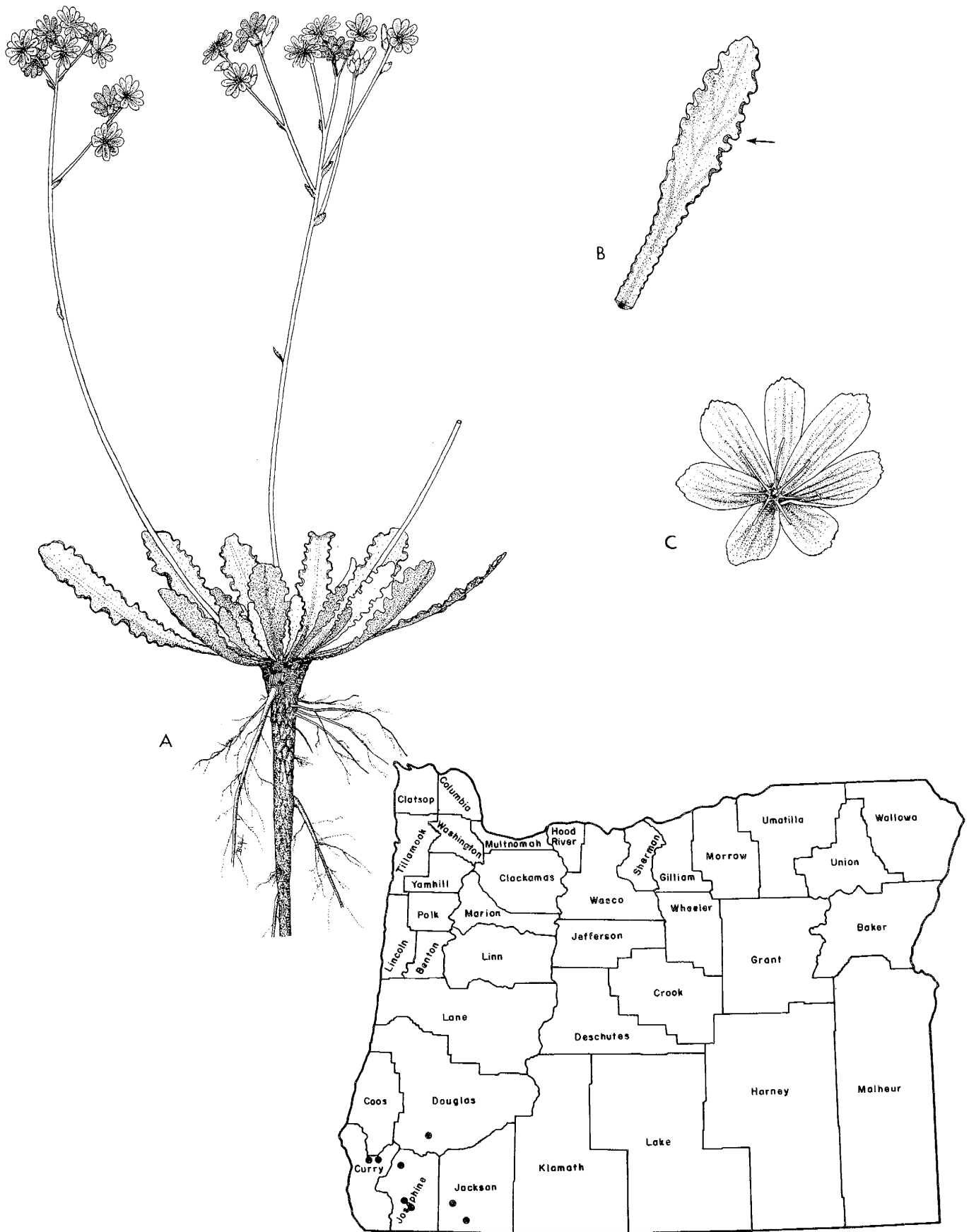


Fig. 93. *Lewisia cotyledon* var. *howellii*. A: Habit, X 0.7; B: Basal leaf (note undulate margin), X 1; C: Flower, X 1.5 (drawn from Hohn 1313, WTU).

LEWISIA COTYLEDON (Wats.) Robins. var. PURDYI

(Purdy's lewisia)

Purslane family (Portulacaceae)

ORIGINAL PUBLICATION: Flora of California. W.L. Jepson. 1914.

STATUS: Candidate species for federal listing, Category 1, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Fleshy perennial from a strong taproot, stems 1-3 dm tall; leaves basal, orbicular to oblanceolate, less than 3 cm long, strongly reflexed; inflorescence paniculate, bracteate, many-flowered; corolla white with pink stripes, petals 8-14 mm long, seven to nine (after Jepson, 1914; Hohn, 1975).

DISTRIBUTION: Restricted to Curry and Josephine Counties, in the Kalmiopsis Wilderness Area.

LOOK ALIKES: Both this taxon and var. *cotyledon* have entire leaf margins; however, var. *purdyi* is identified by its very short rosette leaves (less than 3 cm long) which are strongly reflexed.

PHENOLOGY: Blooming occurs mainly in June and July.

HABITAT: This subspecies prefers granitic or serpentine substrates, in full sun or partial shade. It occurs at elevations between ca. 600 and 1250 m, in oak or pine woodlands with *Luina hypoleuca*, *Penstemon rupicola*, and *Sedum obtusatum*.

LAND OWNERSHIP/MANAGEMENT: U.S. Forest Service, predominantly in the Kalmiopsis Wilderness Area.

PRESENT AND POTENTIAL THREATS: Populations occurring on serpentine could be subject to strip mining aimed at recovering nickel and other valuable minerals related to this soil formation. Horticultural collecting and damage from recreationers is also possible.

MANAGEMENT RECOMMENDATIONS: This taxon should be considered when strip mining is contemplated. Recreational activity in its habitat should be monitored.

REMARKS: *L. cotyledon* var. *purdyi* is known horticulturally as the "button" phase of *L. cotyledon*. According to recent reports, this plant is locally frequent in the Kalmiopsis Wilderness Area. This should help to partially alleviate the problems posed by horticultural collectors.



Fig. 94. *Lewisia cotyledon* var. *purdyi*. A: Habit, X 0.7; B: Fleshy basal leaf, X 1.5; C: Flower, X 1.3 (drawn from Hohn 481, WTU).

LEWISIA OPPOSITIFOLIA (Wats.) Robins.

(Opposite leaved lewisia)

Purslane family (Portulacaceae)

ORIGINAL PUBLICATION: Synop. Fl. N. Amer. 1:268. 1897.

SYNONYMS: *Calandrinia oppositifolia* Wats. (Proc. Amer. Acad. 20:355. 1885).

Oreobroma oppositifolia (Wats.) Howell (Erythea 1:32. 1893).

STATUS: Candidate species for federal listing, Category 2, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Caulescent perennial 10-17 cm high with a thickened, often branching root and short caudex; basal leaves few, linear spatulate, 5-10 cm long; stem leaves similar, one to two pairs near the base of the stem; stems one to four from each root; inflorescence subumbellate, two to six flowered; petals white or pinkish, 9-12 mm long; stamens many; stigmas deeply cleft; capsule ovoid, 5 mm high; seeds dark, shining (after Abrams, 1944).

DISTRIBUTION: Known from the region encompassed by Josephine and Curry counties, Oregon, and adjacent Del Norte County, California.

PHENOLOGY: Flowering from April through June, depending on elevation and moisture availability.

HABITAT: *Lewisia oppositifolia* occurs on open to brush covered sites which are generally moist in early spring. Restricted to shallow serpentine or peridotite soils at elevations ranging from approximately 330 to 1330 m. Common associates in this edaphically harsh environment include *Pinus jeffreyi*, *P. contorta*, *Ceanothus* spp., *Arctostaphylos* spp., *Garrya buxifolia*, *Festuca rubra*, and *Melica geyeri*.

LAND OWNERSHIP/MANAGEMENT: The various public managers are the Bureau of Land Management, U.S. Forest Service, and the State of Oregon. There are also populations known to occur on private land.

PRESENT AND POTENTIAL THREATS: Adverse impacts from grazing, geologic prospecting, recreation, and land development are possible threats but considered insignificant at this time. Strip mining of serpentine for nickel deposits may constitute a future threat. The most imminent problem facing this species is the known threat from collectors, who view the genus in general as desirable horticultural subjects.

MANAGEMENT RECOMMENDATIONS: Protected sites are needed for this species.

REMARKS: Although the populations of this endemic species are locally large and healthy, it should continue to be of concern to managers because of its strict occurrence on lands with high mineral content.

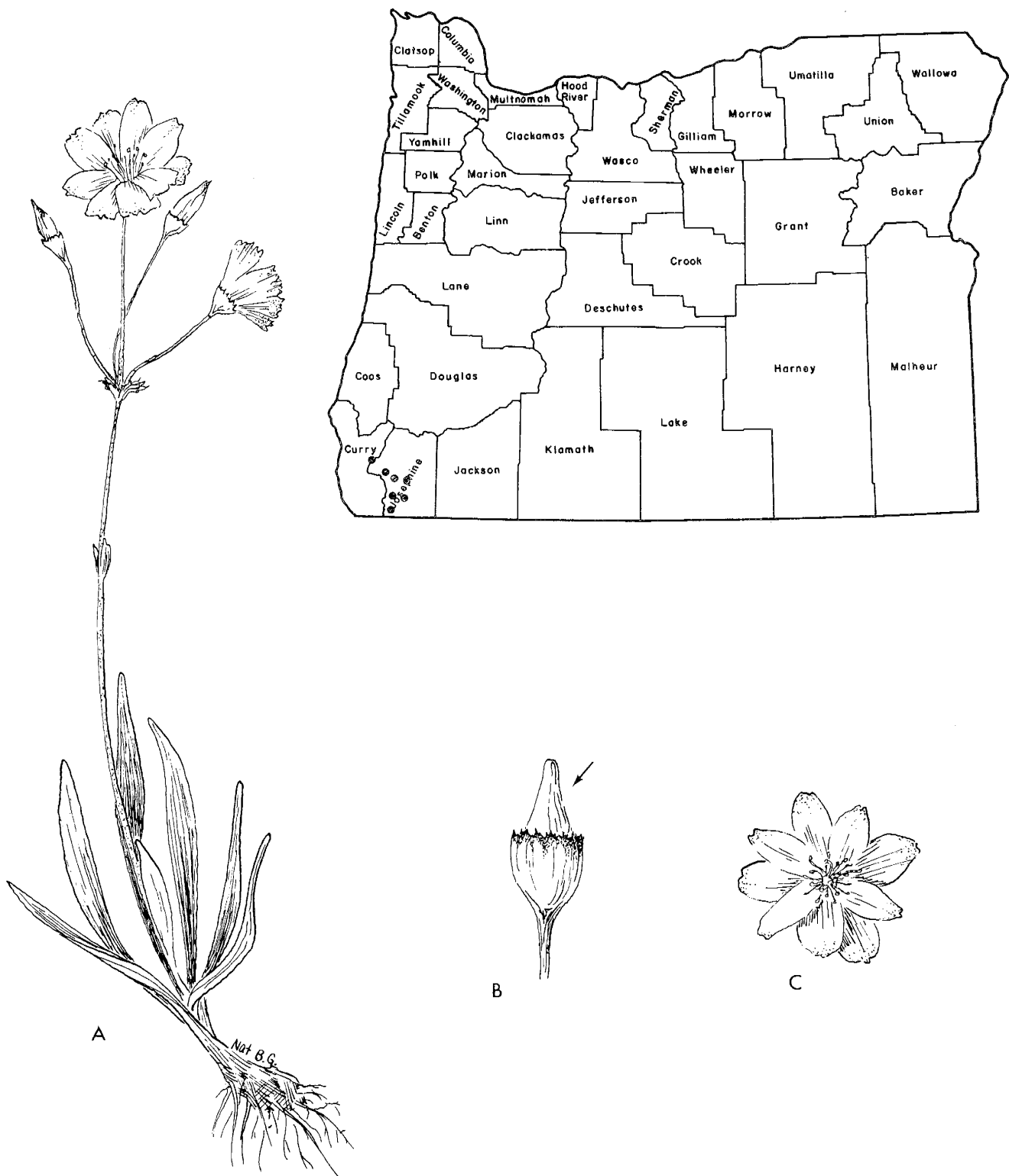


Fig. 95. *Lewisia oppositifolia*. A: Habit, X 1.2; B: Flower (in bud), petals tightly wrapped, X 3; Flower, X 1.5 (drawn from Warren 48, SOC).

LILIUM OCCIDENTALE Purdy

(Western lily)

Lily family (Liliaceae)

ORIGINAL PUBLICATION: Erythea 15:103-104. 1897.

STATUS: Candidate species for federal listing, Category 1, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Perennial herb from a rhizomatous bulb 4-5 cm long, scales fleshy, simple or jointed; stems slender, 60-80 cm tall; leaves dark green, narrowly oblanceolate, 6-22 cm long, 5-25 mm wide, usually only the central whorled; flowers one to ten (to 25), nodding, upper part crimson or deep red, lower part orange, yellow, or greenish yellow, sometimes shading to green in the throat, with maroon (dark red, purplish black) spots, the segments recurved on the outer half, 4-5 cm long at anthesis; anthers 4-12 mm long, standing close to the pistil; capsule broadly ellipsoid, 2-4 cm long; seeds rounded, 6-7 mm wide (after Ballantyne, 1978).

DISTRIBUTION: Reported from sites near the immediate coast, in Coos and Curry counties, Oregon, south to Humboldt County, California.

TAXONOMIC PROBLEMS: Lilies are a difficult group taxonomically. *L. occidentale* is thought to hybridize with *L. columbianum*. Many herbarium specimens are misidentified. Ballantyne (pers. comm.) separates the species into two distinct races, the Humboldt Bay, California race and the Oregon race. He is working on the taxonomy of the species.

LOOK ALIKES: *Lilium occidentale* may be distinguished from other lilies by its wet coastal habitat, its true bulb, lack of fragrance, recurved outer segments of perianth, nodding flowers, and flower color (Ballantyne, 1978).

PHENOLOGY: *Lilium occidentale* flowers from mid June to early August.

HABITAT: To be expected on the edges of bogs near the sea, composed of poorly drained, highly organic soils of *Sphagnum* origin. Associated species include *Drosera* spp., *Rhododendron macrophyllum*, *Vaccinium ovatum*, *Ledum groenlandicum*, and *Alnus rubra*.

LAND OWNERSHIP/MANAGEMENT: Primarily the State of Oregon, with some private.

PRESENT AND POTENTIAL THREATS: *Lilium occidentale* is under pressure from horticultural collecting. Other threats include land development and recreational activities.

MANAGEMENT RECOMMENDATIONS: Locality information for this collected species should not be made generally available. Existing and future recreational facilities should be constructed away from populations of this species.

REMARKS: Although the genus *Lilium* is included under the Oregon "Wildflower Law" (ORS 564.020), protective provisions are largely inadequate.



Fig. 96. *Lilium occidentale*. A: Habit, X 0.2; B: Flower, X 0.6 (drawn from Chambers s.n., OSC).

LILIUM VOLLMERI Eastw.

(Vollmer's lily)

Lily family (Liliaceae)

ORIGINAL PUBLICATION: Leaflet. West. Bot. 5:120-122. 1948.

STATUS: Candidate species for federal listing, Category 1, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Rhizomes unbranched, the scales three to four jointed, thick, ovoid, acute or obtuse; stems one, rarely two, ca. 1 m tall; leaves glabrous, linear lanceolate, light green on both surfaces, 10-15 cm long, 5-10 mm wide, the middle often whorled; flowers few to many, nodding, on long erect peduncles; perianth segments yellow to reddish orange, with reddish tinge along the margins near the apex and with dark spots on lower half of inner surface, 6-8 cm long, 5-10 mm wide, recurved from near base; anthers 7-10 mm long; capsules ellipsoid (after Munz, 1959).

DISTRIBUTION: This species is restricted to Curry and Josephine counties in southwest Oregon, and adjacent northwest California.

TAXONOMIC PROBLEMS: This taxon may hybridize with *L. wigginsii* (Beane, 1955).

LOOK ALIKES: *Lilium wigginsii* differs from *L. vollmeri* in its yellow, purple spotted flowers and its tendency to root from the stem. *L. vollmeri* also is distinguished from *L. pardalinum* by the latter having exclusively whorled leaves.

PHENOLOGY: Vollmer's lily blooms in July and August.

HABITAT: On flats and hillsides which are open or partially shaded, as well as moist or marshy throughout the year. Tolerant of serpentine derived soil but not restricted to it, often associated with *Darlingtonia californica* at elevations between ca. 150 and 1600 m.

LAND OWNERSHIP/MANAGEMENT: U.S. Forest Service.

PRESENT AND POTENTIAL THREATS: Grazing, logging, and strip mining of serpentine sites are potential threats. Collecting for horticultural purposes is probably the most serious current threat.

MANAGEMENT RECOMMENDATIONS: Exact locality data should be considered sensitive information to avert collecting by commercial interests and hobbyists.

REMARKS: *Lilium vollmeri* is known only from a few, scattered sites and is not abundant. As populations become increasingly isolated the vigor of the species decreases through the decline in genetic exchange.

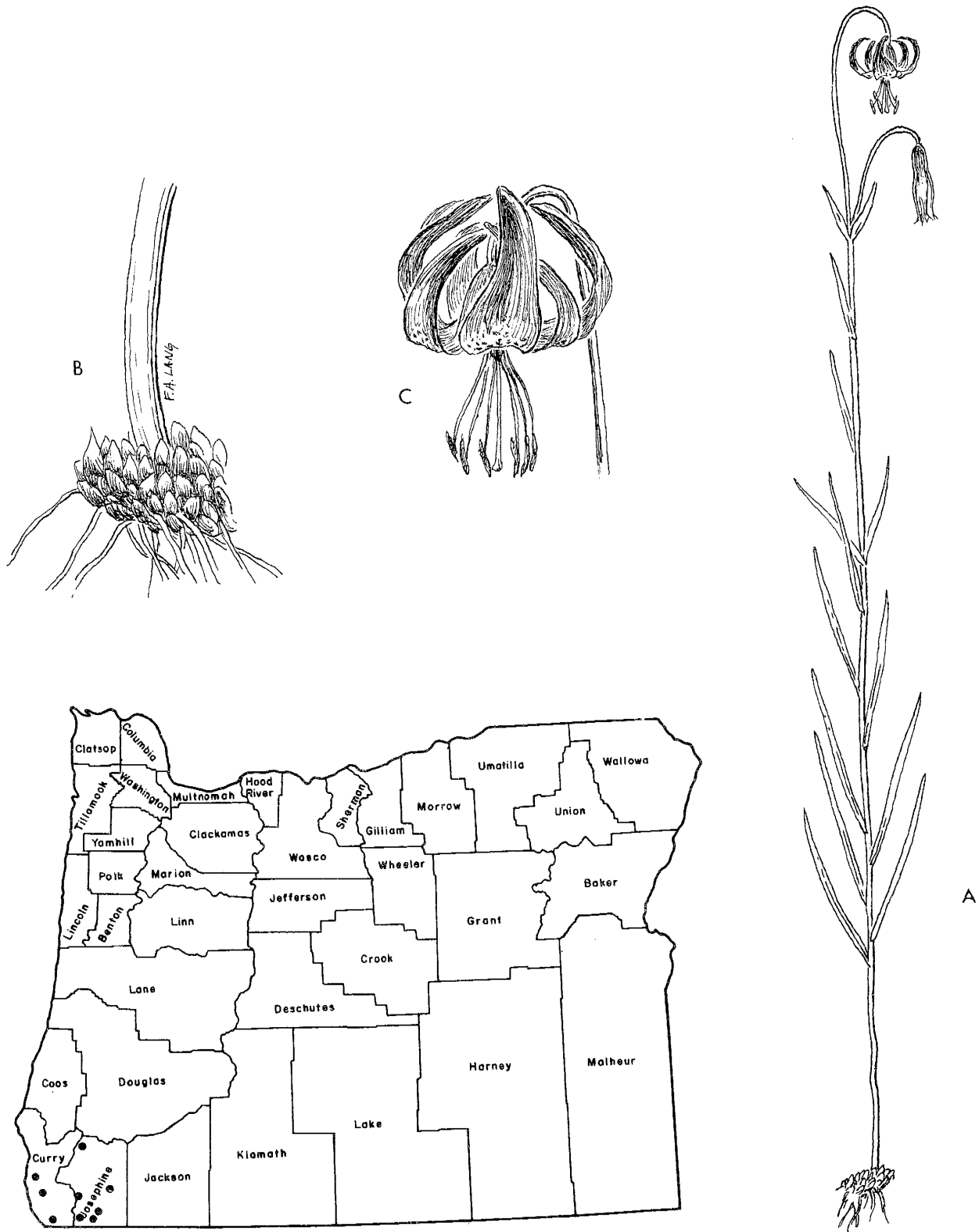


Fig. 97. *Lilium vollmeri*. A: Habit, X 0.2; B: Scaly root system, X 0.8; C: Flower, X 0.8 (drawn from Eastwood & Howell 3759B, UC).

LILIUM WIGGINSII Beane & Voll.

(Wiggin's lily)

Lily family (Liliaceae)

ORIGINAL PUBLICATION: Contr. Dudley Herb. 4:355. 1955.

STATUS: Candidate species for federal listing, Category 1, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Bulb with elongated axis, the scales simple or of two to four segments, 1-5 cm long; stem rather slender, up to 14 dm high; leaves linear lanceolate, 12-22 cm long, those of the mid stem in two to four verticels; flowers 1-12, on pedicels 1-3 dm long that are moderately curved at the tip; perianth parts 5-7 cm long, lanceolate, strongly revolute above the middle, clear yellow, spotted with purple; anthers 10-12 mm long, finally versatile; ovary 1-1.5 cm long (after Peck, 1961).

DISTRIBUTION: Ranging from the vicinity of Mount Ashland in southern Jackson County, Oregon, to adjacent northern California in Siskiyou and Del Norte counties.

TAXONOMIC PROBLEMS: Possible hybridization with *L. vollmeri* (Beane, 1955).

LOOK ALIKES: *Lilium vollmeri* (see species summary for *L. vollmeri*, page 196).

PHENOLOGY: *Lilium wigginsii* flowers in mid summer, mostly July.

HABITAT: A species of damp mountain meadows, bogs, or along creeks at mid elevations, with *Mertensia* sp., *Senecio* sp., and *Pedicularis* sp.

LAND OWNERSHIP/MANAGEMENT: U.S. Forest Service.

PRESENT AND POTENTIAL THREATS: Most of the sites in Oregon are in areas being managed for timber resources. Logging impacts on the meadow habitats could easily destroy populations of *L. wigginsii*. Collecting by horticulturalists is an equally serious problem.

MANAGEMENT RECOMMENDATIONS: Meadows containing populations of *L. wigginsii* need to be set aside, with exclusion of logging activities and accompanying road systems.

REMARKS: The fact that *L. wigginsii* is a vulnerable species is underscored by its extremely limited occurrence within a very restricted geographic range.



Fig. 98. *Lilium wigginsii*. A: Habit, X 0.2; B: Scaly root system, X 0.5; C: Flower, X 0.8 (drawn from Lang s.n., SOC).

LIMNANTHES FLOCCOSA How. SSP. BELLINGERIANA (Peck) Arroyo

(Woolly meadow foam)

Meadow foam family (Limnanthaceae)

ORIGINAL PUBLICATION: Brittonia 25:177-178, 186-188. 1973.

STATUS: Candidate species for federal listing, Category 1, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Stems several from a branching base, 8-15 cm high, simple; leaves pinnately divided, the segments 5-10 mm long, narrowly oblanceolate and acute or two parted, the basal on slender petioles 1.5-3 cm long; calyx lobes narrowly ovate, acute, 6-8 mm long, sparsely villous at base; petals white, oblong, retuse, shorter and often narrower than the calyx segments, the claw sparsely pilose; filaments 2-3 mm long; style cleft below the middle; carpels obovoid, 4-5 mm long (after Peck, 1961).

DISTRIBUTION: One extant location in southern Jackson County, Oregon with an historic location in Jackson County and another in Shasta County, California.

LOOK ALIKES: This taxon may be distinguished from the other *Limnanthes* of the general area by the combination of glabrous herbage and flowers, and the basally united styles.

PHENOLOGY: This annual flowers in April and May.

HABITAT: Inhabiting shallow, rocky, clayey soil at elevations around 1100 to 1200 m, on level sites at least partially shaded and moist in the spring. Associated species include various annual forbs, perennial grasses, and *Pinus ponderosa*. This species prefers vernal pool habitats.

LAND OWNERSHIP/MANAGEMENT: The only known site is privately owned. The ownership of the historic site and the California station is not known.

PRESENT AND POTENTIAL THREATS: The Oregon population on private land is not in any danger currently, as the locality is apparently unsuitable for farming and probably marginally worthwhile for grazing. Urban development of the site would be an unfortunate conversion of habitat.

MANAGEMENT RECOMMENDATIONS: Populations occurring on private land could be acquired by some public agency. Renewed inventory of potential sites is recommended.

REMARKS: The endemic subspecies of *L. floccosa* in Oregon are autogamous taxa whose methods of seed dispersal and varying dependence on vernal pool habitats seemingly accounts for their restricted distributions.

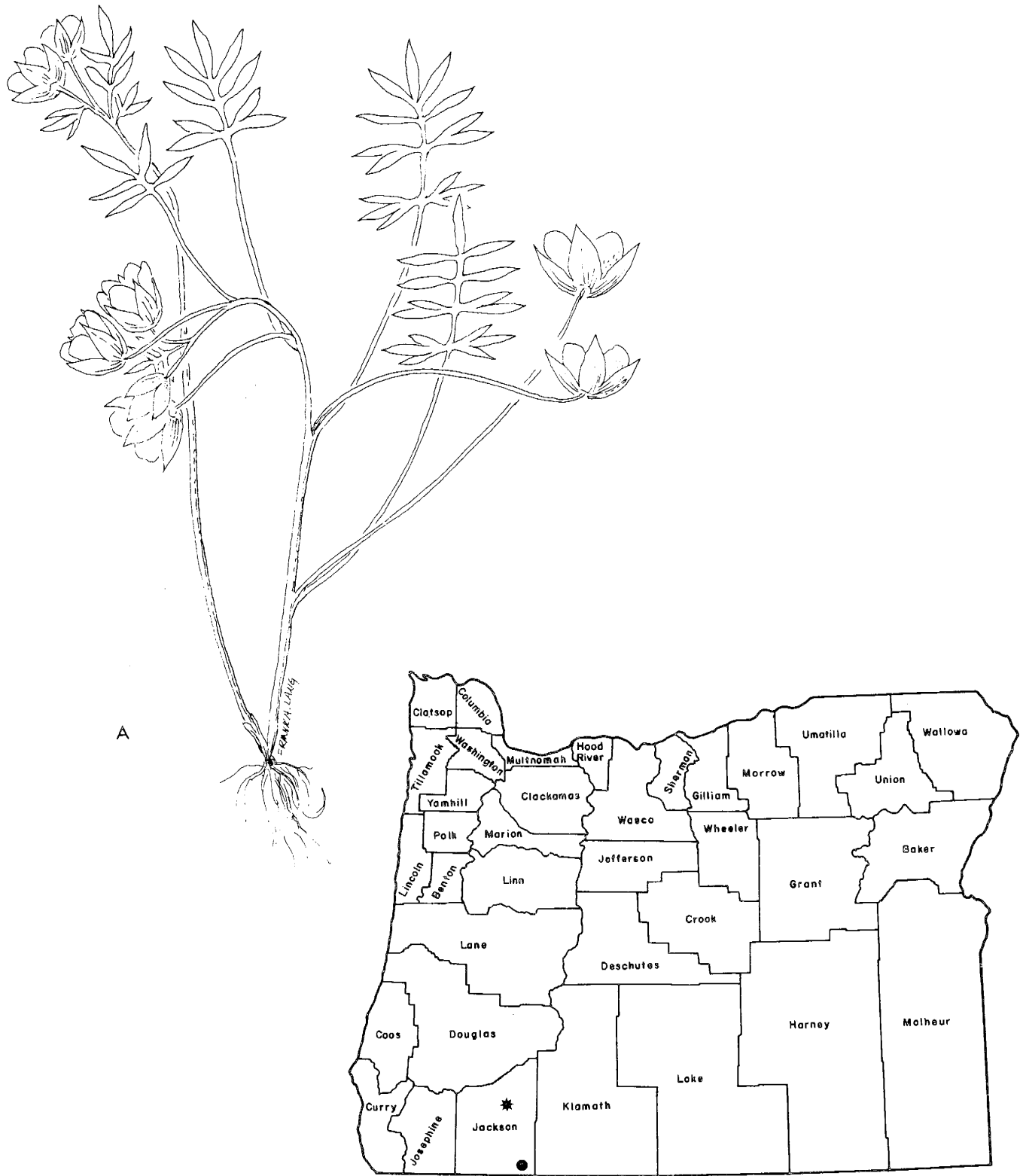


Fig. 99. *Limnanthes floccosa* ssp. *bellingneriana*. A: Habit, X 1 (drawn from Chambers 3049, OSC).

LIMNANTHES FLOCCOSA How. SSP. GRANDIFLORA Arroyo

(Woolly meadow foam)

Meadow foam family (Limnanthaceae)

ORIGINAL PUBLICATION: Brittonia 25:177-191. 1973.

STATUS: Candidate species for federal listing, Category 1, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Low annual 5-15 cm, pubescence sparse on stems and leaves; flowers pubescent, the calyx especially so; petals with two lines of pubescence on claws, 7.5 to 9.5 mm long; filaments 4.5 to 5 mm long, anthers less than 1 mm (after Arroyo, 1973). Vegetatively similar to *L. floccosa* var. *bellingermana*.

DISTRIBUTION: Known only from the "Agate Desert" region of Jackson County, in southwestern Oregon.

LOOK ALIKES: Distinguished from other species of *Limnanthes* by the woolly calyx pubescence and from other subspecies of *L. floccosa* by the two lines of hairs on the petal claws, the sparse pubescence of the stems and leaves, and the larger corolla.

PHENOLOGY: Flowering in April and May.

HABITAT: *Limnanthes floccosa* ssp. *grandiflora* occurs at the edge of vernal pools at elevations of ca. 375-400 m, generally near the wetter, inner edges as opposed to the drier outer fringes which harbor the sympatric ssp. *floccosa* (Arroyo, 1973). Associated species include *Lupinus micranthus*, *Trifolium depauperatum*, *Myosurus minimum*, and *Baeria chryso-stoma*.

LAND OWNERSHIP/MANAGEMENT: Jackson County, the Oregon Department of Fish and Game (Denman Wildlife Area), the City of Medford, and private land-owners all manage portions of the taxon's habitat.

PRESENT AND POTENTIAL THREATS: The Agate Desert is, at least in part, zoned for general industrial use. The Medford Sewage Treatment Plant is considering the area as a sludge dump site, with possible subsequent agricultural uses.

MANAGEMENT RECOMMENDATIONS: Some land acquisition or exchange by a federal agency or concerned private organization may be a solution towards preserving this plant.

REMARKS: This is a scientifically curious and aesthetically pleasing plant, well worth conserving. Research concerning the commercial potential of oil from *Limnanthes* seeds is currently being conducted. This and other local endemic *Limnanthes* may someday prove genetically valuable in future crop breeding.

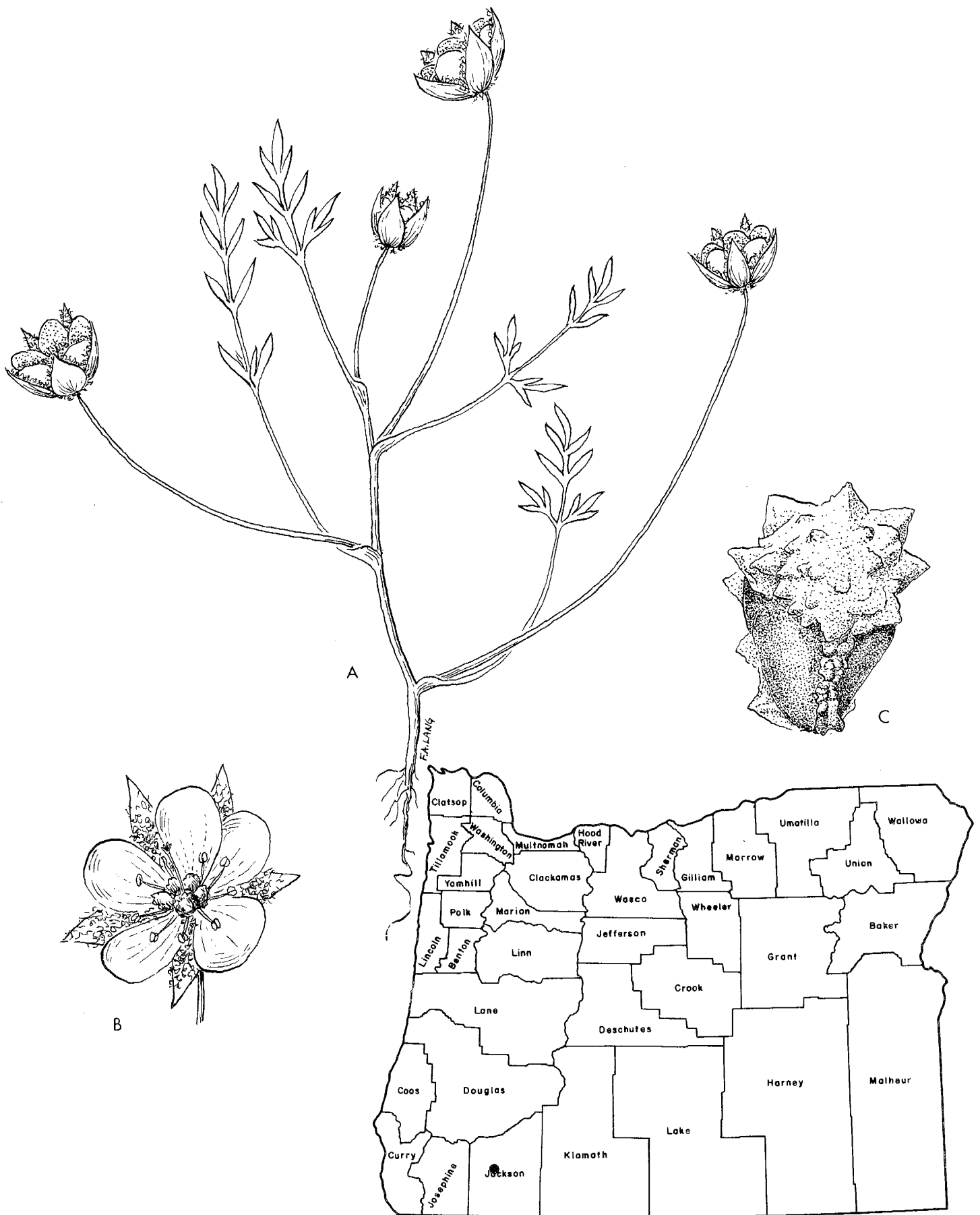


Fig. 100. *Limnanthes floccosa* ssp. *grandiflora*. A: Habit, X 1.3; B: Flower, X 2.5; C: Fruit (nutlet), X 10 (drawn from Detling 3951, ORE).

LIMNANTHES FLOCCOSA How. SSP. PUMILA (Howell) Arroyo

(Dwarf meadow foam)

Meadow foam family (Limnanthaceae)

ORIGINAL PUBLICATION: Brittonia 25:177-191. 1973.

SYNONYMS: *Limnanthes pumila* Howell (Fl. N.W. Amer. 1:108. 1897).
Limnanthes floccosa var. *pumila* (Howell) C.T. Mason (Univ. Calif. Publ. Bot. 25:455. 1952).

STATUS: Candidate species for federal listing, Category 1, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Annual, glabrous throughout, the stems simple to sparingly branched near the base, 5-10 cm high; lower leaves 3-4 cm long, pinately divided into five to nine linear lanceolate divisions, these entire or the lower sometimes three lobed; sepals lanceolate to ovate lanceolate, 6-8 mm long; petals white, about equaling the sepals, oblong, obtuse, not emarginate at apex; nutlets ovoid, rugose below, crowned with short conic processes at apex (after Abrams, 1951).

DISTRIBUTION: Endemic to two basalt formations of west central Jackson County in southwestern Oregon.

LOOK ALIKES: This taxon differs from the other subspecies of *L. floccosa* by its combination of glabrous herbage and pilose petals (Arroyo, 1973).

PHENOLOGY: Known to flower in March and April.

HABITAT: At the edges of deep vernal pools which dry by mid summer, generally in full sun. The substrate is a thin clay soil overlying old basalt. The elevation is approximately 650 to 700 m. Surrounding plant communities are dominated by grasses, with herbaceous species such as *Baeria chrysostoma*, *Collinsia grandiflora*, and *Lupinus bicolor* also commonly present.

LAND OWNERSHIP/MANAGEMENT: Mostly private, also Bureau of Land Management.

PRESENT AND POTENTIAL THREATS: Recreational vehicle use and grazing are the most significant potential threats.

MANAGEMENT RECOMMENDATIONS: Eliminate disturbances occurring on the BLM managed portion of the range. Consolidation of at least some of this subspecies' habitat on federally controlled land would be desirable from a management standpoint.

REMARKS: This annual is locally common in some seasons. Grazing may eventually prove to be detrimental to this plant, but it should be noted that this is an activity which has occurred on the sites for some time.

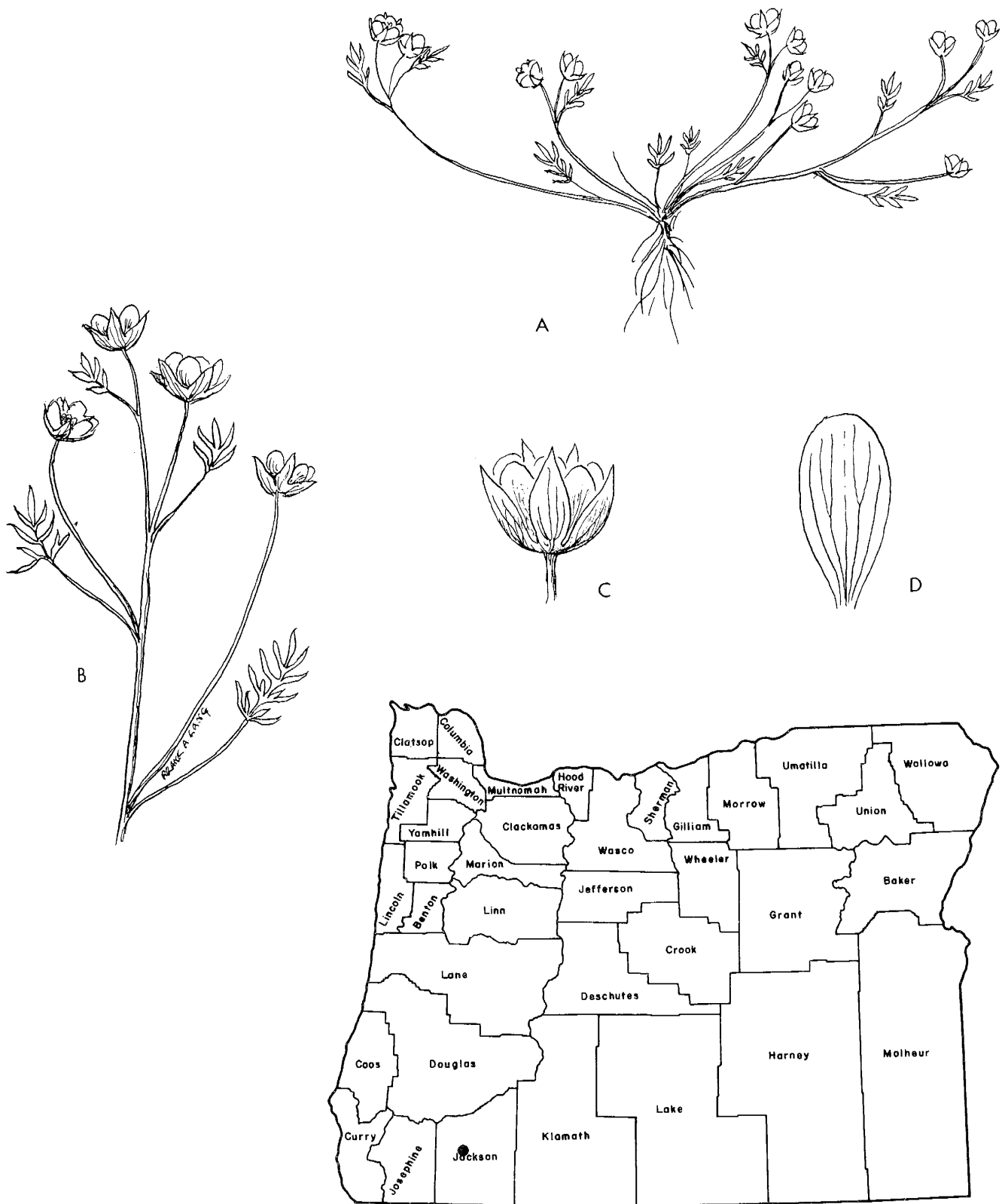


Fig. 101. *Limnanthes floccosa* ssp. *pumila*. A: Habit, X 0.8; B: Habit of branch, X 1.5; C: Flower, X 4; D: Individual petal, X 9 (drawn from Bork 145, SOC).

LIMNANTHES GRACILIS Howell VAR. GRACILIS

(Slender meadow foam)

Meadow foam family (Limnanthaceae)

ORIGINAL PUBLICATION: Fl. N.W. Amer. 108. 1897.

STATUS: Candidate species for federal listing, Category 1, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Annual, glabrous throughout, the stems slender, simple or branched from the base, 8-10 cm long; leaves pinnate, 3-5 cm long, the divisions ovate to linear lanceolate, entire or the lower three parted; sepals lanceolate, acuminate, 6 mm long; petals white with yellowish base, oblanceolate, 12-14 mm long, truncate or broadly emarginate at apex; nutlets smooth or crowned with a few long tubercles (after Mason, 1952).

DISTRIBUTION: Restricted to Oregon in the Rogue River Valley of Josephine and Jackson counties, less commonly north (according to collections) to Douglas County.

LOOK ALIKES: *Limnanthes gracilis* can be distinguished from the subspecies of *L. floccosa* by its glabrous calyx which is subjacent to the corolla.

PHENOLOGY: Flowering from March through May.

HABITAT: Rocky slopes or basins of various substrata, often serpentine, usually moist to wet in early spring. Information on associated species is scanty. Much of the closely associated vegetation is probably herbaceous. Elevations from 475 to 1700 m have been reported.

LAND OWNERSHIP/MANAGEMENT: The U.S. Forest Service, Bureau of Land Management, Oregon Department of Transportation, and private owners control this species' habitat.

PRESENT AND POTENTIAL THREATS: Development projects, road excavations, and serpentine strip mining for nickel are potential hazards.

MANAGEMENT RECOMMENDATIONS: Continued field searching and monitoring.

REMARKS: This species is interesting from a biogeographic standpoint. The only other variety is a scarcely morphologically different form endemic to San Diego County, California near the Mexican border. It is found in similar wet habitat. The two subspecies are speculated to have become established at such a distance from one another through transport on the bodies of migrating birds.

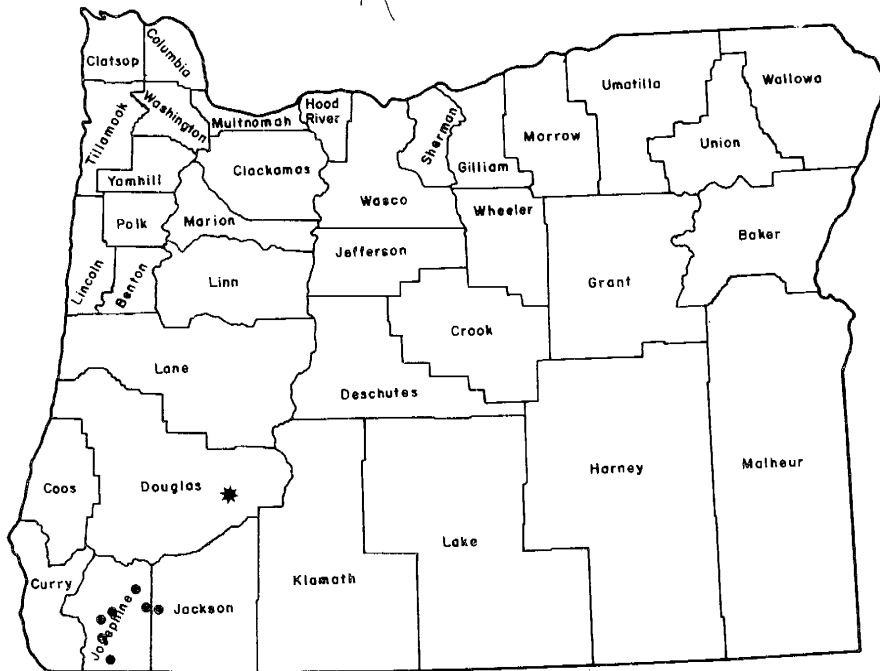


Fig. 102. *Limnathes gracilis* var. *gracilis*. A: Habit (note sepals which are shorter than petals), X 1.2 (drawn from Chambers 3969, OSC).

LOMATIUM BRADSHAWII (Rose) Math. & Const.

(Bradshaw's Lomatium)

Parsley family (Apiaceae)

ORIGINAL PUBLICATION: Bull. Torrey Club 69:246. 1942.

SYNONYMS: *Leptotaenia bradshawii* Rose ex. Mathias (Leafl. West. Bot. 1: 101. 1934).

STATUS: Candidate species for federal listing, Category 1, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Plants glabrous from a long taproot, acaulescent or nearly so, more or less erect, 2-6.5 dm tall; leaves dissected into linear or filiform segments; involucre bracts ternately or biternately divided; flowers light yellow, small, generally only two to five per umbel are fertile; fruit glabrous, wings corky, thickened, dorsal ribs inconspicuous, oil tubes obscure (after Cronquist, 1961).

DISTRIBUTION: *Lomatium bradshawii* is restricted to the Willamette Valley in Benton, Linn (?), Lane, and Marion counties, Oregon.

LOOK ALIKES: *Lomatium utriculatum* closely resembles *L. bradshawii*. *L. bradshawii* is distinguished by its conspicuously ternately or biternately divided involucre bracts, a unique feature.

PHENOLOGY: Flowering mostly in April and May and fruiting from late May to June.

HABITAT: This *Lomatium* is found in grassy swales in fields and along waterways at low elevations, in areas which are wet most of the year, and void of invasive shrubs and trees. Associated species include *Deschampsia cespitosa*, *Hordeum brachyantherum*, *Poa pratensis*, *Perideridia* sp., *Juncus* spp., *Grindelia integrifolia*, *Microseris laciniata*, and *Galium cymosum*.

LAND OWNERSHIP/MANAGEMENT: Private, Oregon Department of Fish and Wildlife, Bureau of Land Management, and U.S. Fish and Wildlife Service.

PRESENT AND POTENTIAL THREATS: Documented threats to this plant include land development for agriculture, housing, and collecting.

MANAGEMENT RECOMMENDATIONS: Habitat for this species on state and federal lands needs to be managed for effective conservation. Private lands where this species occurs could be acquired. Particular attention should be placed on control of shrubby species which are invading the grasslands. The role of fire in maintaining native grassland habitat might be investigated.

REMARKS: This plant has been given high priority for listing as endangered by the U.S. Fish and Wildlife Service.



Fig. 103. *Lomatium bradshawii*. A: Habit, X 0.5; B: Involucel bract, X 7; C: Fruit, illustrating thick, corky wings, X 2 (drawn from Franklin 808, OSC).

LOMATIUM GREENMANII Mathias

(Greenman's desert parsley)

Parsley family (Apiaceae)

ORIGINAL PUBLICATION: Ann. Mo. Bot. Gard. 25:274-275. 1938.

STATUS: Candidate species for federal listing, Category 1, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Dwarf perennial with a slender leafy stem, from a taproot, 5-18 cm tall; leaves chiefly basal, glabrous (almost glaucous), pinnate or bipinnate, leaflets 3-15 mm long, up to 2.5 mm wide; inflorescence small and compact, rays 1-6 mm long; involucrel of a few narrow bractlets; flowers small and yellow; ovaries and fruits glabrous, ovate with narrow dorsal wings, marginal wings only slightly wider; oil tubes solitary in the intervals, two on the commissure (after Meinke, unpub.).

DISTRIBUTION: Endemic to Wallowa County, Oregon, in the Wallowa Mountains.

TAXONOMIC PROBLEMS: Cronquist (1961) states that *L. greenmanii* may be "merely a glabrous form of *L. oreganum*. One does not expect to find two species as similar as these in the same habitat and local area." Recent work by Meinke & Constance (1982) has confirmed the specific status of this taxon.

LOOK ALIKES: *Lomatium cusickii* has larger, obviously winged fruit, and *L. oreganum* is pubescent and acaulescent.

PHENOLOGY: *Lomatium greenmanii* flowers from July to early August and fruits throughout August.

HABITAT: This species is found on moist subalpine ridges and rock summits at elevations of 2400 to 2550 m, with *Lomatium cusickii*, *Pinus albicaulis*, *Erigeron* spp., *Pedicularis contorta*, and *Spraguea umbellata*.

LAND OWNERSHIP/MANAGEMENT: U.S. Forest Service.

PRESENT AND POTENTIAL THREATS: The only known population of this plant occurs near the Mt. Howard nature trail (accessible via aerial tram) and is subject to unintentional abuse by outdoor enthusiasts. The tram personnel and the USFS have done an admirable job to date in preserving this fragile habitat. Construction of ski facilities on Mount Howard are currently being proposed.

MANAGEMENT RECOMMENDATIONS: Route future recreational trails and facilities away from populations of this species where possible. Enforce regulations against wandering from the established trail network. Strict guidelines will be necessary governing any construction activities on the mountain.

REMARKS: Peaks near Mount Howard are not particularly well known from a botanical standpoint and further inventory may conceivably produce additional populations of this rarity.

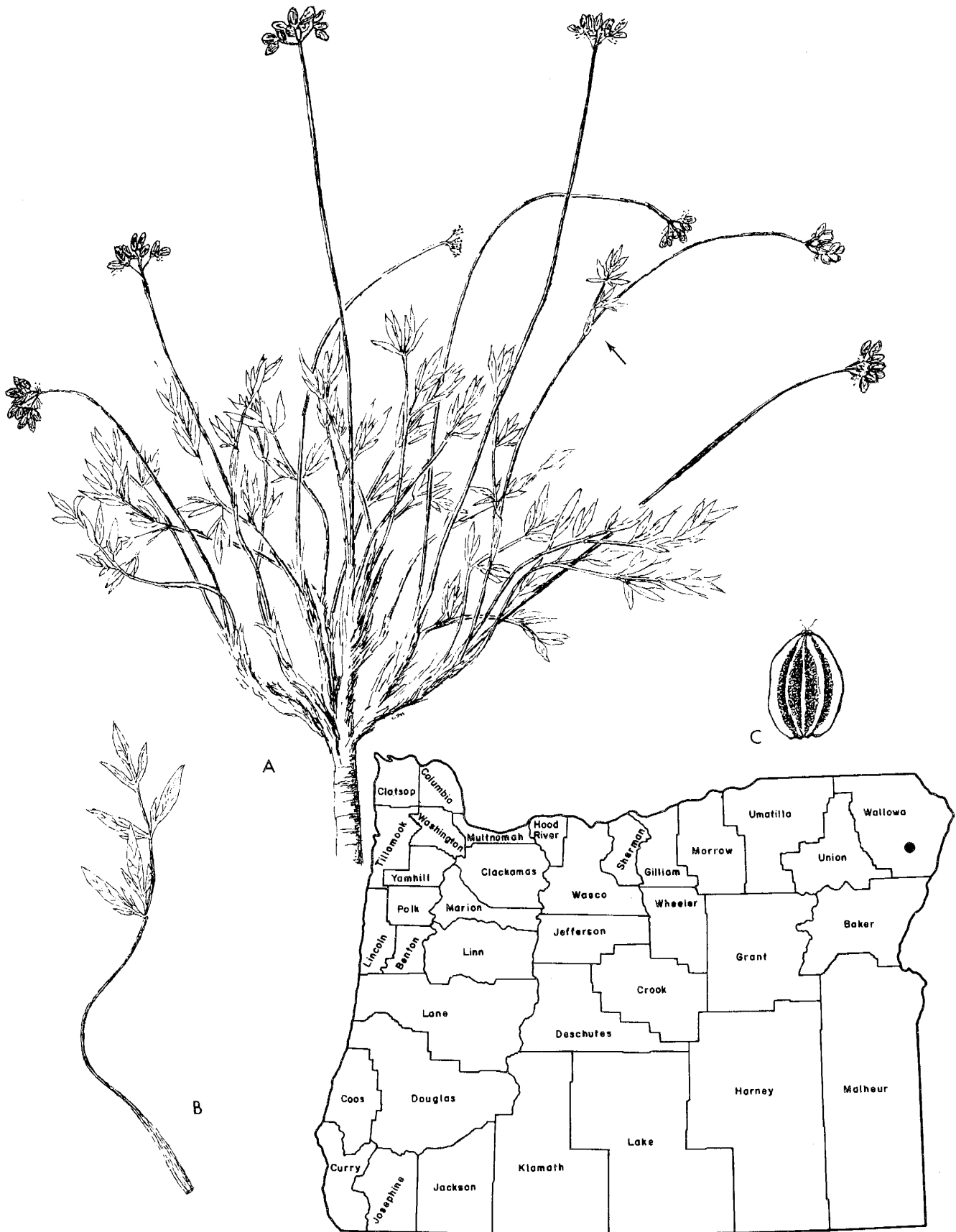


Fig. 104. *Lomatium greenmanii*. A: Habit (note cauline leaves), X 1; B: Basal leaf, X 1.3; C: Fruit, X 5 (drawn from Meinke 2433, OSC).

LOMATIUM LAEVIGATUM (Nutt.) Coulter & Rose

(Smooth Lomatium)

Parsley family (Apiaceae)

ORIGINAL PUBLICATION: Contr. U.S. National Herb. 7:225-226. 1900.

SYNONYMS: *Peucedanum laevigatum* Nutt. ex Torr. & Gray (Fl. N. Am. 1:627. 1840).

Cogswellia laevigata (Nutt.) Jones (Contr. Western Bot. 12:32. 1908).

STATUS: Candidate species for federal listing, Category 1, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Glabrous and slightly glaucous perennial from a stout, branching, woody caudex that surmounts a taproot; plants 2.5-4 dm tall at maturity; leaves chiefly or entirely basal, ternate pinnately dissected into linear ultimate segments 1-2 mm wide, the better developed segments mostly 1-3 cm long; flowers yellow; involucre wanting, or occasionally of one or two inconspicuous setaceous bractlets; fruit glabrous, elliptic, 7-12 mm long, the wings from about half as wide to nearly as wide as the body (after Cronquist, 1961).

DISTRIBUTION: The range of this species is poorly known but is suspected to occur mostly along the Columbia River in Wasco and Sherman counties, Oregon and Klickitat County, Washington. There are reports from Malheur, Umatilla, Crook, and Grant counties as well.

LOOK ALIKES: Similar to *L. triternatum* but with a woodier base and glabrous herbage.

PHENOLOGY: *Lomatium laevigatum* flowers in April and May, fruiting mainly in June.

HABITAT: Found in cracks of basalt cliffs and open, rocky slopes of the sagebrush steppe, at elevations ranging from 30 to 1200 m. Associate species are reported to include *Lomatium dissectum*, *Eriogonum compositum*, *Quercus garryana*, *Artemisia tridentata*, and *Rhus radicans*.

LAND OWNERSHIP/MANAGEMENT: Private and probably the Bureau of Land Management in Oregon.

PRESENT AND POTENTIAL THREATS: Grazing, agriculture, road construction near cliffs, and gravel mining may be threats.

MANAGEMENT RECOMMENDATIONS: Attempt to verify reports of remaining populations and search likely habitat on public lands.

REMARKS: Extant sites for *L. laevigatum* are nearly non-existent. The species appears to be drastically declining and we may never know the range this plant originally inhabited. The sketchy and conflicting information available indicates a scattered but nevertheless widespread distribution pattern.

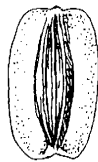
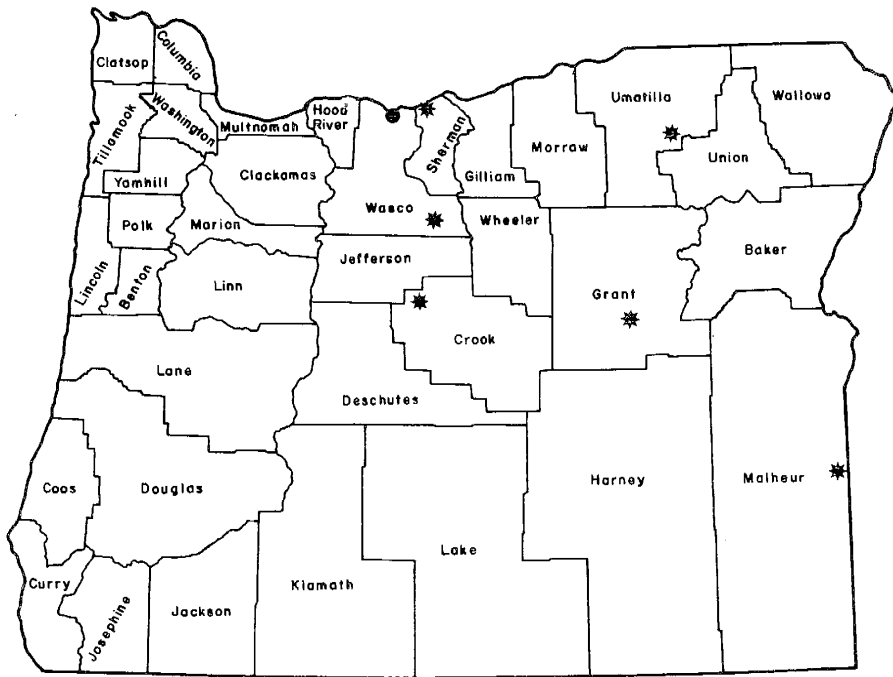


Fig. 105. *Lomatium laevigatum*. A: Habit, illustrating woody base, X 0.5; B: Fruit, X 2 (drawn from Henderson s.n., ORE).

LOMATIUM NELSONIANUM Macbr.

(Nelson's desert parsley)
Parsley family (Apiaceae)

ORIGINAL PUBLICATION: Contr. Gray Herb. 53:15. 1918.

STATUS: Candidate species for federal listing, Category 1, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Plants perennial, short caulescent, minutely pubescent, ca. 4 dm tall; leaves ovate, up to ca. 2.5 dm, ternately to ternate pinnately compound; leaflets linear, about 3 mm; peduncles exceeding the leaves; umbels 12-15 rayed, rays 2.5-7 cm long; flowers presumably yellow, tiny; fruiting pedicels 10-16 mm long; fruit oblong, 7-9 mm long, 4-5 mm wide (after Mathias, 1938).

DISTRIBUTION: *Lomatium nelsonianum* is restricted to southern Oregon, from Curry, Josephine, and Klamath counties.

LOOK ALIKES: This species may be differentiated from others of the genus in this region by its nontuberform roots, sparsely puberulent herbage, inconspicuous involucels, and suborbicular, widely winged fruit (Peck, 1961).

PHENOLOGY: Flowering in June and July.

HABITAT: Dry, rocky hillsides, apparently at middle elevations. Little else is known.

LAND OWNERSHIP/MANAGEMENT: Unknown, probably U.S. Forest Service or private.

PRESENT AND POTENTIAL THREATS: Grazing and urban or agricultural developments would be potential hazards.

MANAGEMENT RECOMMENDATIONS: Searches for this species should be conducted in future seasons, with any populations discovered protected. Considering the scattered range and lack of habitat data for this endemic, it is difficult to suggest where to look.

REMARKS: This rare *Lomatium* is poorly understood and known from extremely few collections. Its relatively broad pattern of distribution is somewhat unusual for a southern Oregon endemic. This tends to suggest that *L. nelsonianum* is probably a relict as opposed to a recent evolutionary product.



Fig. 106. *Lomatium nelsonianum*. A: Habit, X 0.5; B: Fruit, showing separating mericarps, X 5; C: Fruit, depicting wide wings, X 5 (drawn from Peck 24069, WILLU).

LOMATIUM OREGANUM Coult. & Rose

(Oregon desert parsley)

Parsley family (Apiaceae)

ORIGINAL PUBLICATION: Contr. U.S. Nat. Herb. 7:224. 1900.

SYNONYMS: *Peucedanum oreganum* Coult. & Rose (Rev. N. Am. Umbell. 64. 1888).
Cogswellia oregana M.E. Jones (Contr. West. Bot. 12:35. 1908).

STATUS: Candidate species for federal listing, Category 1, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Dwarf perennial from a taproot and much branched caudex, acaulescent, the slender peduncles (scapes) only 2-6 cm long at maturity; leaves, peduncles, inflorescence, and fruits hirtellous puberulent, rarely glabrous; leaves all basal, pinnately or ternate pinnately compound, the ultimate segments 1-3 (6) mm long; flowers yellow; inflorescence small and compact, the rays few and only 1-5 mm long at maturity; involucrel of a few narrow bractlets; pedicels about 1 mm long; fruit elliptic oblong, about 5 mm long, 2.5-3 mm wide, the wings narrower than the body (after Cronquist, 1961; and Meinke & Constance, 1982).

DISTRIBUTION: Restricted to higher portions of the Blue (Elkhorn Ridge) and Wallowa Mountains of Baker, Union, and Wallowa counties, Oregon.

LOOK ALIKES: *Lomatium cusickii* has fewer leaf segments, with at least some over 1 cm, and fruit well over 1 cm. *L. greenmanii* is always glabrous and subacaulescent.

PHENOLOGY: Typically flowering in July and August, fruiting in August.

HABITAT: *Lomatium oreganum* occurs in harsh, exposed subalpine to alpine sites near ridgetops on granitic substrates, with *Claytonia megarhiza* var. *bellidifolia*, *Geum rossii*, *Bupleurum americanum*, *Selaginella watsonii*, *Ribes montigenum*, and *Saxifraga bronchialis* var. *austromontana*.

LAND OWNERSHIP/MANAGEMENT: U.S. Forest Service.

PRESENT AND POTENTIAL THREATS: The State of Oregon (Department of Fish and Wildlife) is considering transplanting mountain goats into the Blue Mountains. The fragile alpine plant communities could be adversely impacted by such a transplant. Goats have been transplanted into the Wallowa Mountains; however, little information is available on the food preferences of the herd there.

MANAGEMENT RECOMMENDATIONS: Additional intensive inventories of the Elkhorn Ridge area should be conducted and vegetation monitoring studies implemented if and when goats are released.

REMARKS: This rarely collected or observed species may be locally common on the remote higher peaks of northeastern Oregon. A very few recent sightings have been reported from the Wallowas, and two extant populations are known from the Elkhorn Ridge.



Fig. 107. *Lomatium oregonum*. A: Habit, X 1; B: Leaf, X 1.5; C: Fruit, X 4 (drawn from Mason 6489, OSC).

LOMATIUM PECKIANUM Math. & Const.

(Peck's Lomatium)

Parsley family (Apiaceae)

ORIGINAL PUBLICATION: Bull. Torrey Club 69:155. 1942.

STATUS: Candidate species for federal listing, Category 1, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Essentially glabrous perennial, acaulescent, 1.0-1.5 dm high; leaves 5-8 cm long, ternately divided, the leaflets remote, petiole ca. equaling the blade; floral bracts two or three or absent; umbel rays two to five, unequal; petals tiny, color unknown; fruits several per umbellet, pedicels 2-4 mm (after Peck, 1961).

DISTRIBUTION: Historically known from a very limited geographic area near Bly, Klamath County, Oregon. Munz (1959) extends the distribution to adjacent Siskiyou County, California.

LOOK ALIKES: Mathias & Constance (1942) indicate this taxon may be distinguished by "its ternately compound leaves, wholly sheathing petioles, inconspicuous involucrel, few rays, and slender fruit".

PHENOLOGY: *Lomatium peckianum* flowers in May.

HABITAT: Very little data are available. The only Oregon collection, the type, was recorded from a "sterile" hillside in dry soil, presumably in a sagebrush or ponderosa pine community.

LAND OWNERSHIP/MANAGEMENT: Unknown, possibly U.S. Forest Service.

PRESENT AND POTENTIAL THREATS: Unknown, possibly including grazing, recreational activities, and collecting for scientific purposes.

MANAGEMENT RECOMMENDATIONS: Efforts to relocate this very rare Lomatium are needed. Any populations discovered should be afforded immediate protection.

REMARKS: The one and only known Oregon collection of this taxon is from 1927, It has not been reported since. Recent efforts to locate an extant site for *L. peckianum* have been repeatedly unsuccessful (L. Constance, pers. comm.).



Fig. 108. *Lomatium peckianum*. A: Habit, X 1; B: Leaf, X 2; C: Fruit, X 4 (drawn from Peck 15213 [holotype], WILLU).

LOMATIUM ROLLINSII Math. & Const.

(Rollin's Lomatium)

Parsley family (Apiaceae)

ORIGINAL PUBLICATION: Bull. Torrey Club 70:59. 1943.

STATUS: Candidate species for federal listing, Category 1, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Taproot short, tuberous thickened plants mostly 2-7 dm tall at maturity, with one or two stems from the base; herbage evidently scaberulous to subglabrous; leaves cauline and basal, more or less distinctly pinnately dissected into unequal narrow segments that are seldom much over 1 cm long; involucrel of inconspicuous narrow bractlets; flowers yellow; rays of the umbel elongating unequally, mostly 3-7 cm long at maturity; pedicels mostly 4-10 (15) mm long at maturity; fruit glabrous, elliptic, 5-8 mm long, the wings well developed (after Cronquist, 1961).

DISTRIBUTION: In and near the Snake and Salmon River Canyons, in the general area of convergence between Oregon, Washington, and Idaho.

LOOK ALIKES: Although a member of a taxonomically difficult genus, *L. rollinsii* is reported as "fairly distinct." Mathias & Constance (1943) indicate a superficial likeness to *L. ambiguum* but separate *L. rollinsii* by its pubescent pinnate (as opposed to glabrous ternate) leaves and an ovate oblong rather than oblong fruit.

PHENOLOGY: Flowering mid March to early May, in fruit through June.

HABITAT: This taxon prefers loose, rocky hillsides at lower elevations (300 to 600 m), in areas exposed to full sun. Associated species include *Amelanchier alnifolia*, *Collomia grandiflora*, *Agropyron spicatum*, and *Castilleja hispida*.

LAND OWNERSHIP/MANAGEMENT: In Oregon on private and perhaps Bureau of Land Management and U.S. Forest Service administered property.

PRESENT AND POTENTIAL THREATS: In Oregon, potential habitat is severely overgrazed in many areas. Being among the earliest green forbs on the range, *Lomatiums* are often grazed before having a chance to flower.

MANAGEMENT RECOMMENDATIONS: Searches for this little known species should continue with the elimination of grazing where any populations are discovered.

REMARKS: Once thought to be extremely rare in Oregon, float trips down the Snake River have recently revealed several populations. As the Snake River Canyon continues to be explored by botanists, this and other endemics of the area may eventually be discovered to be less sensitive than originally suspected.

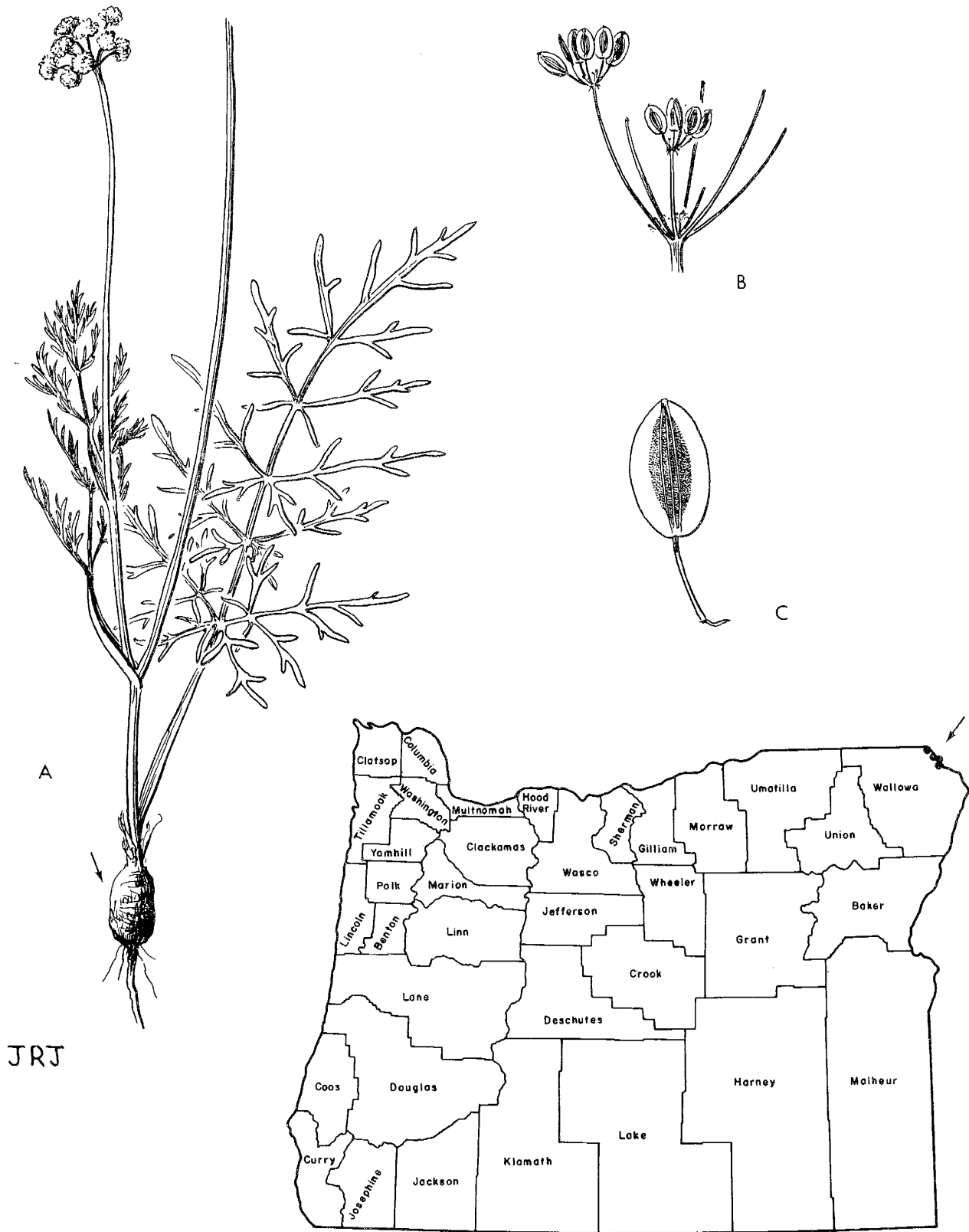


Fig. 109. *Lomatium rollinsii*. A: Habit (note tuberous root), X 0.5; B: Fruiting umbel, X 1; C: Fruit, X 3.5 (drawings taken from Hitchcock et al., 1961).

LOMATIUM SUKSDORFII (Wats.) Coult. & Rose

(Suksdorf's lomatium)

Parsley family (Apiaceae)

ORIGINAL PUBLICATION: Contr. U.S. Nat. Herb. 7:239. 1900.

SYNONYMS: *Peucedanum suksdorfii* Wats. (Proc. Am. Acad. 20:369. 1885).

STATUS: Candidate species for federal listing, Category 2, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Plants perennial, caulescent, glabrous, 9-21 dm tall; leaves ternate to biternate, then one to two pinnate; leaf divisions rather remote, linear, acute, 10-30 mm long; rays 13-25, 3-11 cm long; bractlets linear, acuminate; pedicels 6-17 mm long; flowers tiny, yellow; fruit linear oblong, 15-32 mm long (after Peck, 1961).

DISTRIBUTION: This plant is endemic to the vicinity of the Columbia Gorge, in Wasco and Hood River counties, Oregon, and Klickitat County, Washington.

LOOK ALIKES: The stout stems and numerous leaflets distinguish *L. suksdorfii* from the slender *L. triternatum*, the only other lomatium which even approaches the size of *L. suksdorfii* in this area.

PHENOLOGY: Flowering takes place in May and June.

HABITAT: Occurs on dry, rocky slopes at low to lower middle elevations. Associated species include additional *Lomatium* spp., *Phacelia* spp., *Collomia grandiflora*, *Quercus garryana*, and *Cirsium* spp.

LAND OWNERSHIP/MANAGEMENT: Private, Oregon Department of Transportation, and the city of The Dalles.

PRESENT AND POTENTIAL THREATS: Road construction, grazing, herbicide application along roadsides, and urban expansion and development are all potential threats.

MANAGEMENT RECOMMENDATIONS: Exempt portions of this species habitat from future development.

REMARKS: Now known to be locally common in a few areas near The Dalles, this species was discovered in Oregon only a few years ago. This is surprising considering its robust and conspicuous habit, particularly noticeable in its habitat. It is not known whether the adverse effects of grazing on *L. suksdorfii* are direct, or indirect through competition with weedy invaders; palatability in the genus varies greatly.

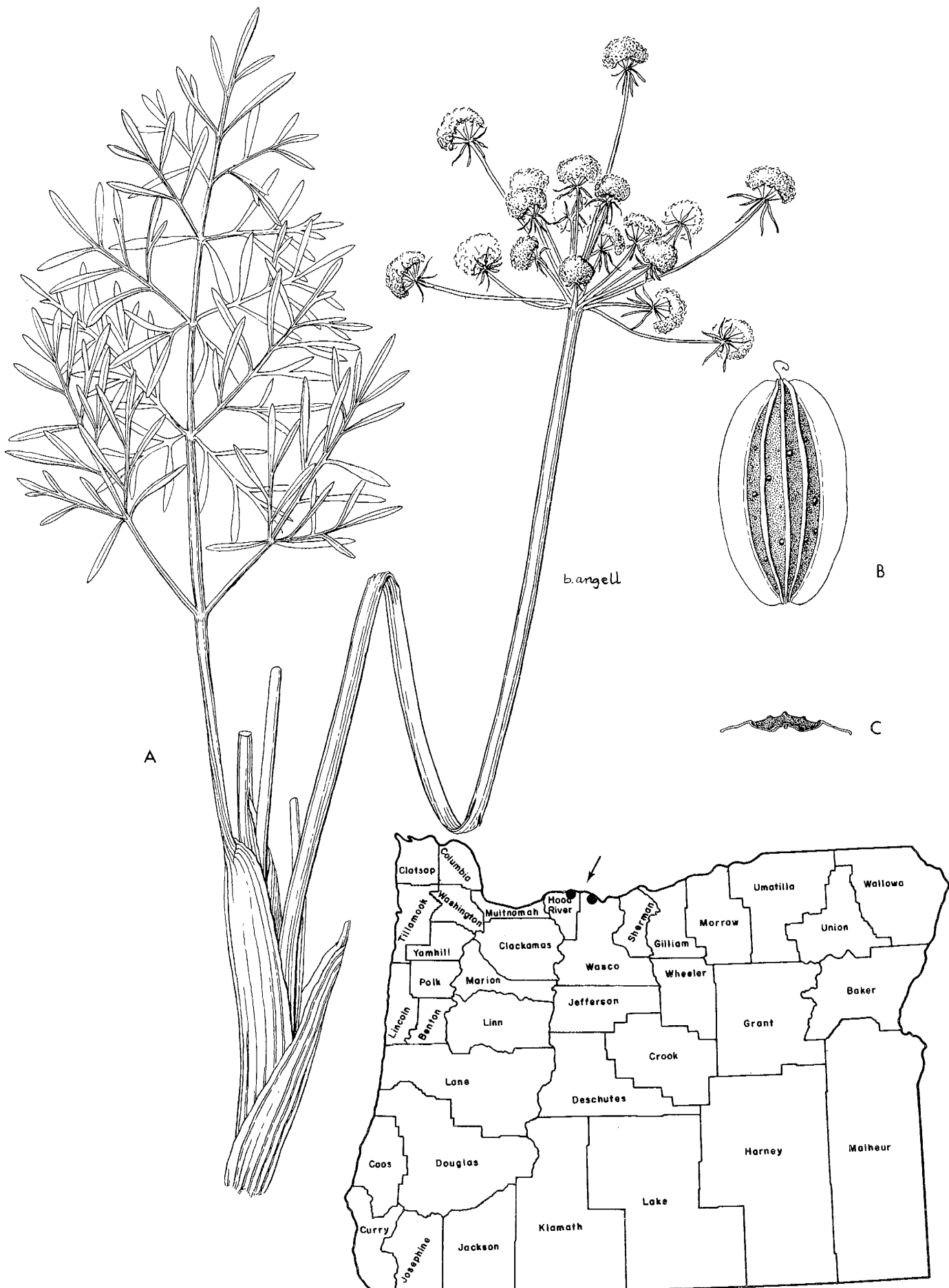


Fig. 110. *Lomatium suksdorfii*. A: Habit, X 0.5; B: Fruit, X 2; C: Fruit, cross section of a single half (mericarp), X 2 (drawn from Suksdorf s.n. & 3264, NY).

LUINA SERPENTINA Cronq.

(Colonial luina)

Composite family (Asteraceae)

ORIGINAL PUBLICATION: Vasc. Pl. Pac. Northw. 5:257-258. 1955.

STATUS: Candidate species for federal listing, Category 1, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Perennial from a stout, branching, woody base, forming colonies several m across; leaves densely white tomentose beneath, lanceolate or narrowly elliptic, entire, the middle and lower ones tapering, the upper more or less sessile; leaves several times as long as wide, 7-13 mm wide, the upper and lower gradually reduced; heads several in a short, corymbiform inflorescence, rather bright yellow at first, later dull, about 1 cm wide, 8-10 mm high (after Cronquist, 1955).

DISTRIBUTION: *Luina serpentina* is endemic to one area southeast of Dayville, in central Grant County, Oregon.

PHENOLOGY: This species flowers in July.

HABITAT: Found on steep, serpentine slopes above various small tributaries, at approximately 1050 m. Information concerning the plant communities in which this plant occurs is not well documented. Reports indicate an association with "grasses." Serpentine soils are typically sparsely vegetated.

LAND OWNERSHIP/MANAGEMENT: Managed by the U.S. Forest Service.

PRESENT AND POTENTIAL THREATS: No apparent threats, other than the vulnerability posed by its occurrence at only one location.

MANAGEMENT RECOMMENDATIONS: Botanists should continue to monitor this species for potential threats and search for other populations.

REMARKS: The slopes where *L. serpentina* grows are probably much too steep and devoid of vegetation to incur much grazing pressure. This unusual edaphic endemic is of scientific interest since serpentine substrates are rare in eastern Oregon.

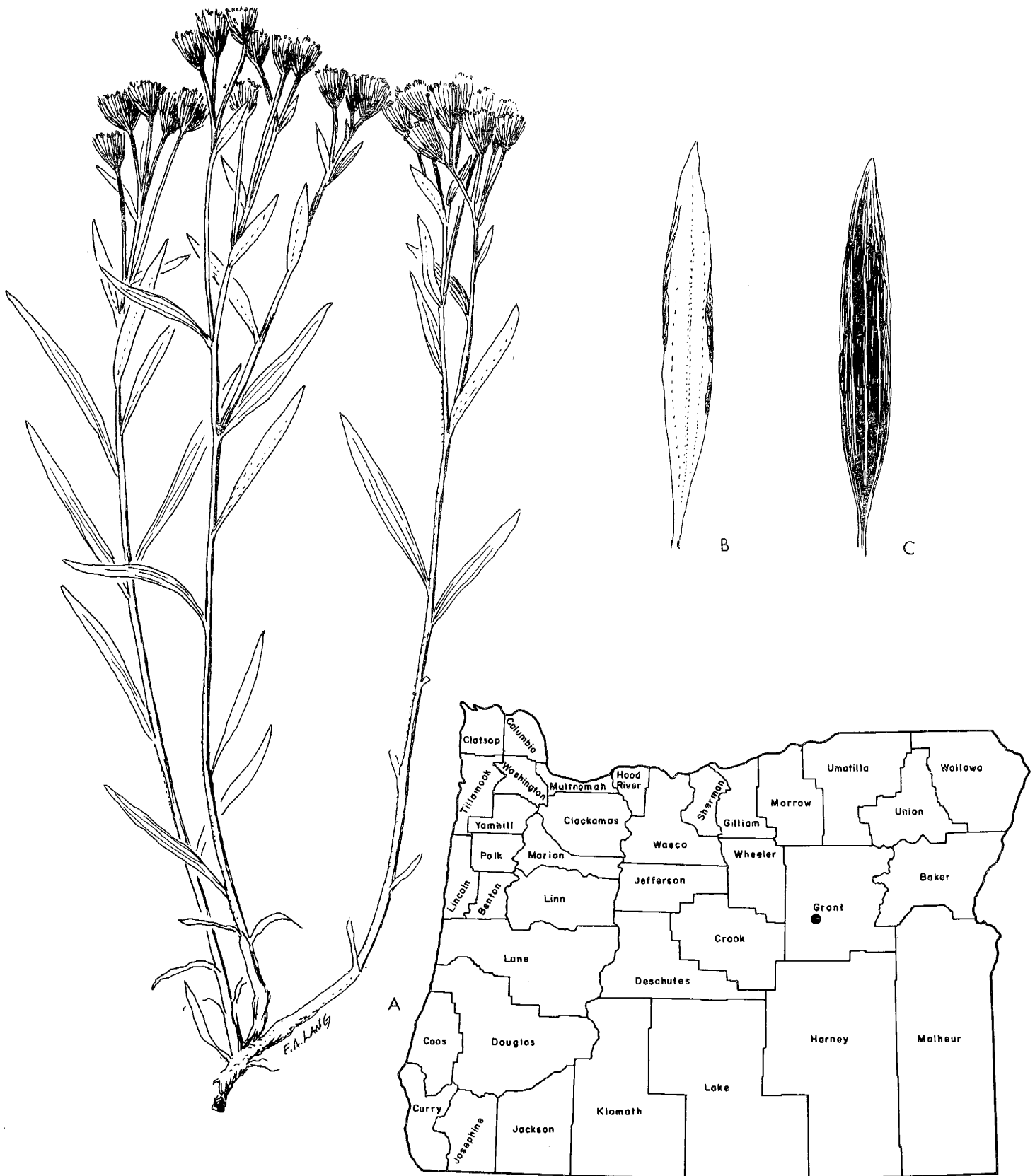


Fig. 111. *Luina serpentina*. A: Habit, X 0.6; B: Leaf, ventral surface, X 1; C: Leaf, dorsal surface, X 1 (drawn from Cronquist 7620 [isotype], OSC).

LUPINUS ARIDUS Dougl. ex Lindl. SSP. ASHLANDENSIS Cox

(Mount Ashland lupine)

Pea family (Fabaceae)

ORIGINAL PUBLICATION: Can. Journ. Bot. 52:655. 1974.

STATUS: Candidate species for federal listing, Category 2, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Cespitose perennial from clumps, 15-20 cm in diameter, stems 7-12 cm tall; leaves ascending, 3.5-6.5 cm long, stipules 4-7 mm long; leaflets 5-7, 9-18 mm long, 4.5-6.5 mm wide; peduncles 3-7.5 cm long; racemes 3.5-7 cm long; calyx 5.5-6 mm long; flowers 11 mm long, blue; fruit 9-11 mm long, 3-4.5 mm wide (after Cox, 1974).

DISTRIBUTION: Endemic to Mount Ashland, in Jackson County, Oregon.

LOOK ALIKES: This is the only cespitose perennial lupine within its limited geographic range, not likely to be confused with anything else.

PHENOLOGY: This taxon blooms in July and August.

HABITAT: Found on dry, granite outcrops at or near ridges and summits at elevations from ca. 2100-2300 m. Associated species include *Horkelia hendersonii*, *Castilleja arachnoidea*, *Eriogonum* spp., and *Phlox* spp.

LAND OWNERSHIP/MANAGEMENT: U.S. Forest Service.

PRESENT AND POTENTIAL THREATS: Recreational activities on the summit of Mount Ashland, and potentially mining.

MANAGEMENT RECOMMENDATIONS: Care should be exercised in the recreation management of Mount Ashland, for the sake of this and other endemic taxa which are constituents of its unusual flora.

REMARKS: This plant is scattered but occasionally locally abundant. It is considered an altitudinal isolate of *L. aridus* ssp. *aridus* (Cox, 1974), a much more widespread subspecies of the Sierra Nevada and Cascade ranges. The morphologically distinguishing characters of ssp. *ashlandensis* are not well defined, its subspecific status being apparently justified primarily by its spatial isolation.

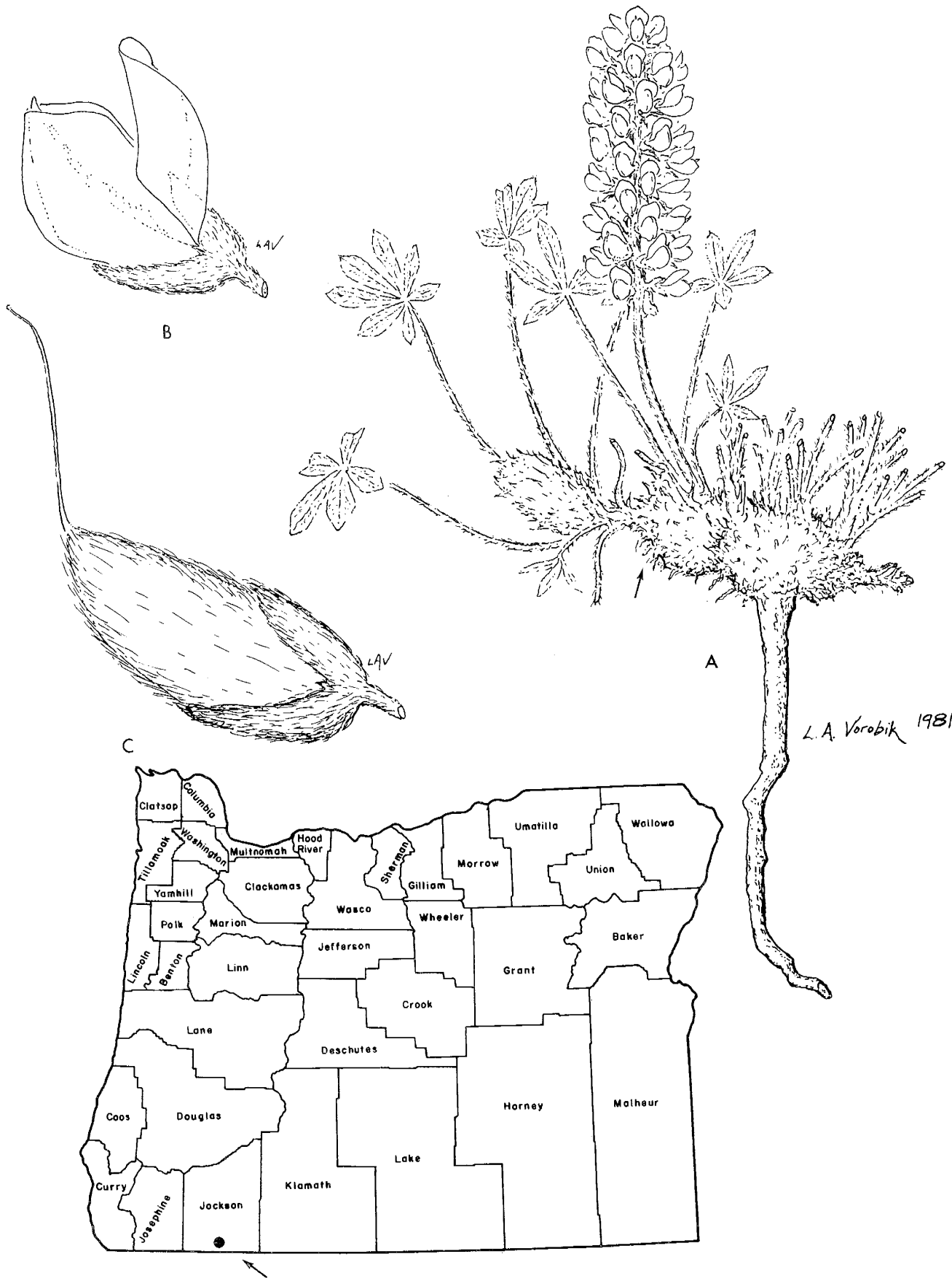


Fig. 112. *Lupinus aridus* ssp. *ashlandensis*. A: Habit, illustrating persistent petiole bases, X 0.8; B: Flower, X 5; C: Fruit, X 6 (drawn from Detling 7197, ORE).

LUPINUS BIDDLEI Hend. ex C.P. Smith

(Biddle's lupine)

Pea family (Fabaceae)

ORIGINAL PUBLICATION: Species Lupinorum. 108-109. 1939.

STATUS: Candidate species for federal listing, Category 1, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Plants 3-5 dm high, stems simple, stout and fistulose, glabrous; leaves glabrous above, loosely and sparsely villous beneath, the leaflets 2.5-4 cm long, broadly oblanceolate, rounded and mucronate at apex; peduncles very short, spreading pubescent pedicels 5-12 mm long; flowers 10-12 mm long, petals blue or often white, the standard and wings broad, the keel not ciliate (after Peck, 1961).

DISTRIBUTION: *Lupinus biddlei* is apparently endemic to southeast Oregon, in southern Harney and Malheur counties.

LOOK ALIKES: Easily distinguished in the white petaled form. The less common blue flowered plants differ from other similar lupines of the area in a variety of technical characters, most notable of which is the unpurred calyx.

PHENOLOGY: This lupine flowers from May to early June.

HABITAT: *Lupinus biddlei* occurs on low hillsides and flats, on dry open sites in moderately stoney soil at about 1350 to 1450 m. Associated species include *Artemisia tridentata*, *Agropyron cristatum*, *Bromus tectorum*, and *Lupinus caudatus*. Populations may occur along roadsides.

LAND OWNERSHIP/MANAGEMENT: Bureau of Land Management and the Oregon Department of Transportation.

PRESENT AND POTENTIAL THREATS: Grazing, seeding, and burning have occurred recently at the known sites. Road grading could be especially destructive if it occurred prior to seed set.

MANAGEMENT RECOMMENDATIONS: Continued inventory by the BLM for additional populations, with attention given those few currently known.

REMARKS: This species seems to tolerate moderate disturbance. Why it has not expanded its range is unknown. The competitive role of non-native species in its life cycle may be important. Until more is known of its ecological requirements, *L. biddlei* should be closely monitored.



Fig. 113. *Lupinus biddlei*. A: Habit, X 0.4; B: Fruiting and flowering raceme, X 0.8; C: Flower, X 1.8 (drawn from Henderson 8120, OSC).

LUPINUS CUSICKII Wats. SSP. ABORTIVUS (Greene) Cox

(Cusick's lupine)

Pea family (Fabaceae)

ORIGINAL PUBLICATION: Madrono 22: 175-176. 1973.

SYNONYMS: *Lupinus abortivus* Greene (Muhlenbergia 8:117. 1912).
Lupinus aridus Dougl. var. *abortivus* (Greene) C.P. Smith (Bull. Torrey Club 51:303. 1924).

STATUS: Candidate species for federal listing, Category 2, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Perennial from profusely branching, caespitose clumps, up to 30 cm in diameter, 12-15 cm tall, softly pubescent; leaflets six to seven, oblanceolate, acute, 8-21 mm long, stipules 10-15 mm long; racemes surpassing foliage, 2.0-3.5 cm long, dense, capitate or subcapitate; pedicels 3-4 mm long; calyx 4-5 mm long; corolla blue and yellow, ca. 9.5-12.0 mm long; fruit 6-11 mm long, mostly woolly (after Cox, 1973).

DISTRIBUTION: This is endemic to northern Harney County, in southeastern Oregon.

LOOK ALIKES: The profusely branching stems of *L. cusickii* separate it from the similar *L. caespitosus*. *L. cusickii* ssp. *abortivus* is unique within the species due to its flower length (to 12 mm) and stipule length (to 15 mm).

PHENOLOGY: Presumably flowers in June and July.

HABITAT: Unknown. The area around where the type collection was taken is sagebrush or sagebrush juniper dominated, with *Chrysothamnus nauseosus* and *Agropyron spicatum*.

LAND OWNERSHIP/MANAGEMENT: Probably Bureau of Land Management.

PRESENT AND POTENTIAL THREATS: Grazing, range seeding, and road construction are potential threats.

MANAGEMENT RECOMMENDATIONS: Continue searches for this rare lupine. Any populations found should be immediately protected.

REMARKS: *Lupinus cusickii* ssp. *abortivus* has not been seen since 1896. Field work in the vicinity of the type collection has been unsuccessful in relocating the taxon. Because of the relatively unbotanized nature of this region, however it is impossible to state with any certainty that it is extinct. Some very recent collections from Harney County are reported to be possibly referable to this subspecies. (C. Wright, pers. comm.).

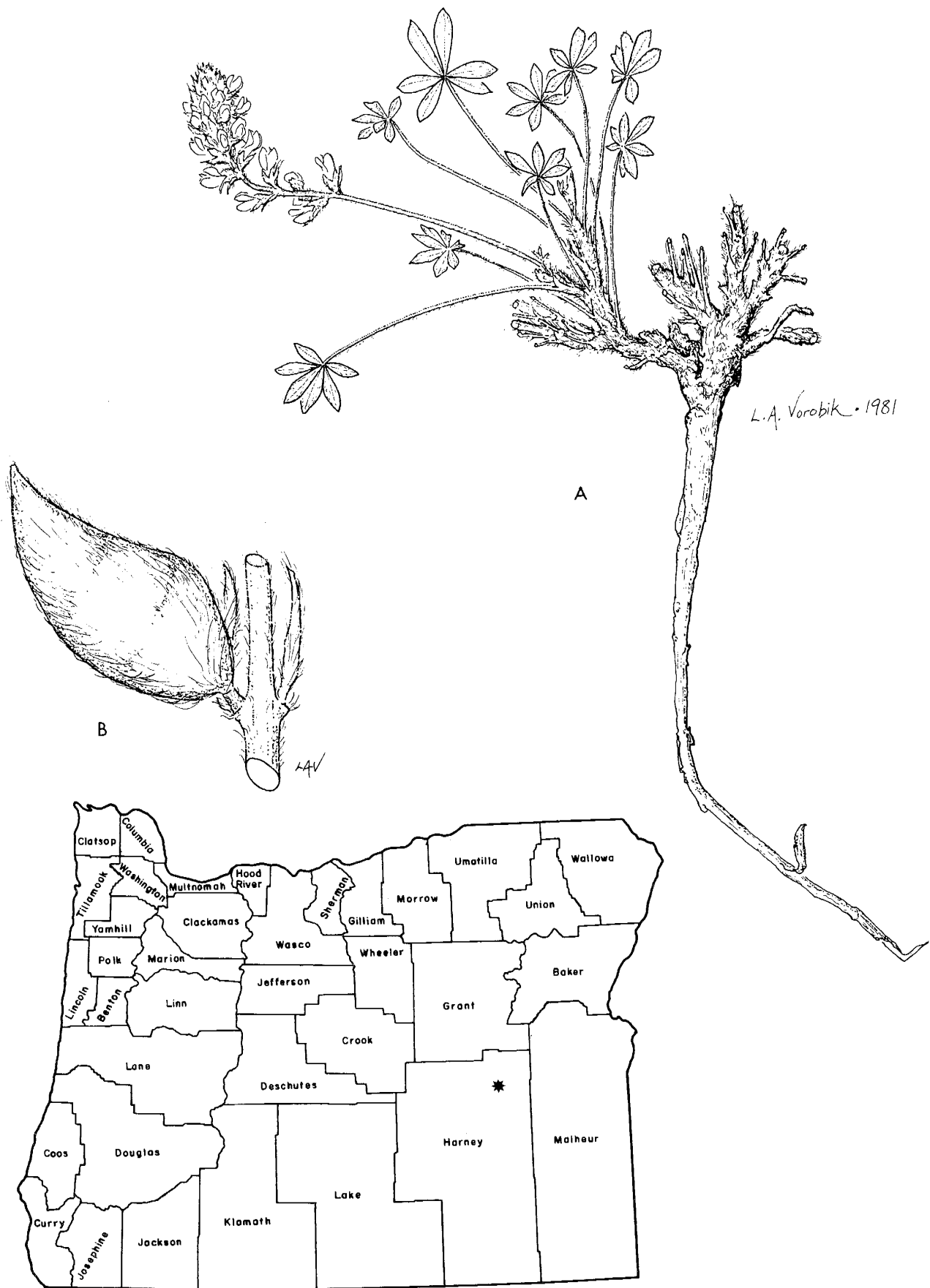


Fig. 114. *Lupinus cusickii* ssp. *abortivus*. A: Habit, X 0.5; B: Fruit, X 7 (drawn from Leiberg 2353, ORE).

LUPINUS SABINII Dougl.

(Sabin's lupine)

Pea family (Fabaceae)

ORIGINAL PUBLICATION: Fl. Bor. Am. 1:166. 1833.

SYNONYMS: *Lupinus sericeus* ssp. *sabinii* Phillips (Res. Stud. State Coll. Wash. 23:168. 1955).

STATUS: Candidate species for federal listing, Category 2, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Strong perennial with several stems, 7-12 dm tall, sparsely strigose sericeous; leaves mostly cauline, the lower with petioles up to twice the length of the blades, the upper with petioles and blades about equal; leaflets ca. 9-11, oblanceolate and acute, 4-15 cm long, 8-25 mm broad; racemes 1.5-3 dm long; flowers numerous (but not closely crowded), 15-18 mm long; calyx sericeous, slightly oblique but not truly saccate or spurred; petals intense yellow, sometimes purplish tinged; pods 3-4.5 cm long, 11-15 mm broad, yellowish sericeous; seeds 4-7 (after Hitchcock, 1961).

DISTRIBUTION: In the northern Blue Mountains of Union and Umatilla counties, Oregon and adjacent Washington.

LOOK ALIKES: *Lupinus sulphureus* is copiously pubescent throughout. *Thermopsis montana*, sometimes referred to as false lupine, looks quite similar from a distance but upon closer examination can be easily differentiated on the basis of its trifoliate leaves.

PHENOLOGY: Flowering occurs from May to July.

HABITAT: *Lupinus sabinii* inhabits lower to mid elevation coniferous forest or transition prairie, primarily on drier sites. Associated species include *Abies grandis*, *Pseudotsuga menziesii*, *Penstemon procerus*, and *Carex geyeri*. This species has been observed on roadcuts, indicating a tolerance to disturbance.

LAND OWNERSHIP/MANAGEMENT: Found on U.S. Forest Service, possibly Bureau of Land Management, and private land.

PRESENT AND POTENTIAL THREATS: Logging activities and road building, although additional study may reveal *L. sabinii* is somewhat tolerant of these activities despite its restricted distribution.

MANAGEMENT RECOMMENDATIONS: Further study to determine the species reaction to habitat disturbances and its geographic limit.

REMARKS: This is a showy lupine and would probably be collected by most foraging botanists who would happen to notice it. The paucity of recent collections is surely an accurate reflection of its scarcity, despite its being located within a poorly botanized area. Population size is usually small, suggesting tenuity in the reproductive cycle.



JRJ

Fig. 115. *Lupinus sabinii*. A: Habit, X 0.3; B: Flower, X 2.5; C: Banner petal, X 2.5; D: Keel petal, X 2.5; E: Fruit, X 0.8 (drawings taken from Hitchcock et al., 1961).

LUPINUS TRACYI Eastw.

(Tracy's lupine)

Pea family (Fabaceae)

ORIGINAL PUBLICATION: Leaf1. West. Bot. 2:268. 1940.

STATUS: Candidate species for federal listing, Category 2, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Glabrous and glaucous perennial from a woody base, stems 4-7 dm tall; lower petioles fused with stipules and leaflets dwarfed; cauline leaves with six or seven leaflets, 1-3.8 cm long, 1-1.3 cm wide, obtuse and mucronate; pedicels 5-6 mm long; calyx gibbous at base, more or less villous, 6-8 mm long; petals whitish blue, 10 mm long; pods villous (after Munz, 1959).

DISTRIBUTION: *Lupinus tracyi* is known from Josephine County in southwest Oregon, and from a disjunct site in Humboldt County, California.

LOOK ALIKES: *Lupinus tracyi* is apparently rather similar to *L. polyphyllus*. It may be distinguished from the latter by its shorter stems (4-7 dm vs. 5-15 dm) and smaller flowers (10 mm vs. 12-14 mm).

PHENOLOGY: Flowering in July and August.

HABITAT: Near melting snowbanks or other cool, damp sites, in coniferous forests at middle to upper middle elevations, with *Vaccinium* spp.

LAND OWNERSHIP/MANAGEMENT: U.S. Forest Service.

PRESENT AND POTENTIAL THREATS: Logging, road construction, and recreational activities all pose potential threats to *L. tracyi*.

MANAGEMENT RECOMMENDATIONS: Eliminate logging and deemphasize recreation near sites for this species.

REMARKS: This plant was only recently relocated in Oregon. Its disjunct pattern of distribution leads one to believe that searches of intermediate locations may reveal additional populations. The lone Oregon station is rather remote and more intensive inventories of the general area may quite possibly locate more sites. The delicate foliage and somewhat attractive flowers may make this species attractive to horticultural collectors.



Fig. 116. *Lupinus tracyi*. A: Habit, X 0.6; B: Flower, X 3; C: Fruit, X 4 (drawn from Leach 2664, OSC).

MENTZELIA MOLLIS Peck

(Smooth stickleaf)

Blazing star family (Loasaceae)

ORIGINAL PUBLICATION: Leaf1. West. Bot. 4:183. 1945.

STATUS: Candidate species for federal listing, Category 1, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Low annual 5-12 cm high; stem stout, erect and branching, dark colored, puberulent but not scabrous, the fine hairs glochidiate; leaves crowded below, oblong lanceolate or oblanceolate, obtuse, entire or obscurely repand, or with one or two low teeth, sessile or subsessile, less puberulent than the stem; flowers in small terminal clusters, nearly sessile and subtended but not hidden by two or three reduced leaves; calyx segments broadly lanceolate, 4-6 mm long; petals narrowly ovate, bright yellow, 10-12 mm long; stamens forty to fifty, shorter than the petals, the filaments filiform subulate; style much longer than the stamens, the stigma capitate; capsule four sided, 2.5 cm long (after Peck, 1961).

DISTRIBUTION: This species is found only in southeastern Oregon in Malheur County, and just across the border in adjacent Idaho.

LOOK ALIKES: *Mentzelia mollis* has a combination of entire floral bracts and a lack of an obvious basal rosette which distinguishes it from the common *M. albicaulis*. *M. packardiae*, an endemic occurring slightly west of *M. mollis*, differs in its slender, upright, less profusely branched habit, narrower leaves, and seed morphology.

PHENOLOGY: Flowers in May and June.

HABITAT: This species is an edaphic endemic, found only on "green or grey montmorillonite derived from the Succor Creek formation," with abnormally high potassium content (Glad, 1976). Elevations for the sites are around 1400 m. Associate species on these barren substrates are few. Examples include *Cleomella macbrideana*, *Phacelia lutea*, and *Monolepis pusilla*.

LAND OWNERSHIP/MANAGEMENT: Mostly Bureau of Land Management, with some populations reported from private land.

PRESENT AND POTENTIAL THREATS: Roadwork, offroad vehicle activities, grazing impacts (from trampling), and range improvement practices.

MANAGEMENT RECOMMENDATIONS: Ban significant ground disturbing activities in areas deemed particularly sensitive.

REMARKS: Only a handful of populations of *M. mollis* are known to be extant. Even though an annual, it seems likely that continued destruction or alteration of its required habitat will result in a marked decline in population size.



Fig. 117. *Mentzelia mollis*. A: Habit, X 1 (drawn from Glad 74-65, OSC).

MENTZELIA PACKARDIAE Glad

(Packard's mentzelia)

Blazing star family (Loasaceae)

ORIGINAL PUBLICATION: Madrono 23:289. 1976.

STATUS: Candidate species for federal listing, Category 1, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Plants annual, erect, 1-4 dm tall, sparsely branched; basal leaves linear, entire or with a few shallow lobes; flowers solitary and in terminal clusters; sepals five, triangular; petals five, 8-15 mm long, yellow; capsules 15-30 mm long; seeds 10-20, irregularly angled (after Glad, 1976).

DISTRIBUTION: *Mentzelia packardiae* is endemic to a very limited portion of extreme east central Malheur County, Oregon, near the border with Idaho.

LOOK ALIKES: Packard's mentzelia may be separated from *M. mollis* and other local annual members of the genus by its sparse branching, dense pubescence, rather large flowers, and irregularly angled seeds.

PHENOLOGY: Flowering takes place in May and June.

HABITAT: This mentzelia is restricted to volcanic ash high in potassium content, growing on loose slopes devoid of most woody vegetation but sharing its habitat with the herbaceous *Senecio ertterae*, *Trifolium owyheense*, and *Phacelia lutea*. These ash deposits occur within surrounding zones of *Artemisia-Atriplex* domination, at altitudes of ca. 900 to 1600 m.

LAND OWNERSHIP/MANAGEMENT: Bureau of Land Management.

PRESENT AND POTENTIAL THREATS: There are several current threats to *M. packardiae*, including mining, rapidly increasing recreational activities, and road construction (through removal of ash substrate for road material).

MANAGEMENT RECOMMENDATIONS: The unusual habitat which has been a factor in the evolution of *M. packardiae* and other local peculiar plant taxa should be withdrawn from mineral exploration and commercial mining. Recreation use, particularly on the loose, fragile slopes should be strictly regulated.

REMARKS: This species is an aesthetic and scientific curiosity. Its preservation will give the opportunity for continued study of an interesting evolutionary problem.



Fig. 118. *Mentzelia packardiae*. A: Habit, X 1 (drawn from Glad 74-76, OSC).

MICROSERIS HOWELLII Gray

(Howell's microseris)

Composite family (Asteraceae)

ORIGINAL PUBLICATION: Proc. Amer. Acad. 20:300. 1885.

SYNONYMS: *Scorzonella howellii* (Gray) Greene (Bull. Calif. Acad. Sci. 2:52. 1886).

STATUS: Candidate species for federal listing, Category 1, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Glabrous or lightly puberulent perennial herb with a fleshy taproot, the stem slender, erect, usually single, 15-50 cm tall, sparingly leafy branched below the middle or sometimes unbranched and only bracteate below; leaves chiefly basal, up to 30 cm long, linear to narrowly lanceolate, entire or lacinate pinnatifid, slender lobed; heads fifteen to twenty-five flowered, nodding before anthesis; florets pale yellow; achenes brown, 3.5-5.0 mm long, attenuate toward the base; pappus 6-12 mm long, the paleae six to ten, lanceolate, 3-6 mm long, each tapering into a white, minutely spiculate awn (after Chambers, 1960).

DISTRIBUTION: Howell's microseris is restricted in Oregon to southwestern Josephine County. It is suspected from adjacent northern California.

LOOK ALIKES: *Microseris howellii* is considered to differ from the *M. laciniata* complex in its mostly larger pappus paleae (3 to 6 mm as opposed to less than 4 mm) and its narrower flower heads (Chambers, 1957).

PHENOLOGY: Reportedly flowers from late March to July.

HABITAT: Found on slopes or flat ground with varying exposures, in rocky serpentine soils at about 350 to 1050 m. Associated species include *Pinus jeffreyi*, *Arbutus menziesii*, *Arctostaphylos viscida*, *Rhus diversiloba*, and *Horkelia* sp.

LAND OWNERSHIP/MANAGEMENT: The habitat for this species is managed by the Bureau of Land Management, U.S. Forest Service, and private landowners.

PRESENT AND POTENTIAL THREATS: Grazing and a local gravel quarry in Josephine County are threats currently having a minimal impact on the species. The most significant hazard is the prospecting and possible subsequent strip mining of nickel from the serpentine slopes.

MANAGEMENT RECOMMENDATIONS: Withdrawal of selected public lands with serpentine outcrops from mineral entry would serve to ensure the preservation of many of the populations.

REMARKS: Some populations are reported to be "healthy and maintaining themselves adequately" (Joan SeEVERS, pers. comm.).



Fig. 119. *Microseris howellii*. A: Habit, X 0.8; B: Pinnate version of a basal leaf, X 0.7, C: Flower head, X 1.2 (drawn from Chambers 3941, OSC).

MIMULUS PYGMAEUS Grant

(Pigmy monkeyflower)

Figwort family (Scrophulariaceae)

ORIGINAL PUBLICATION: Ann. Mo. Bot. Gard. 11:312. 1925.

SYNONYMS: *Mimulus minutissimus* Eastw. (Leaflets West. Bot. 1:207. 1936).

STATUS: Candidate species for federal listing, Category 2, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Annual herb, glandular pubescent, stem mostly simple, 0.5-1 cm tall; leaf blades linear or oblanceolate, 4-8 mm long; pedicels 0.5-1 mm long; calyx with unequal lobes, ca. 5 mm long; corolla 5-7 mm long, yellowish purple, the throat campanulate and slightly shorter than the tube, lobes rounded, the upper only slightly exceeding the lower; capsules ca. 4 mm long (after Munz, 1959).

DISTRIBUTION: This species is known from Jackson County, in southern Oregon, and from several counties of nearby northern California.

LOOK ALIKES: The tiny overall size and corolla color should distinguish *M. pygmaeus* from other local monkeyflowers.

PHENOLOGY: Flowering in May and June.

HABITAT: Damp sites at middle elevations (around 1200-1500 m) in open woods. Reportedly associated with annual species of *Plagiobothrys* and *Mimulus pulsiiferae*.

LAND OWNERSHIP/MANAGEMENT: U.S. Forest Service, possibly Bureau of Land Management, and private.

PRESENT AND POTENTIAL THREATS: Possibly logging, land development, and competition from introduced weeds.

MANAGEMENT RECOMMENDATIONS: Increased searches for this annual should be conducted in southern Oregon.

REMARKS: There are very few known sites for this species. Its small stature undoubtedly contributes to its elusiveness. The particular ecologic requirements which restrict this annual are not known. Information of this nature from California, where *M. pygmaeus* is apparently less rare, might be useful in the search for additional Oregon sites.



Fig. 120. *Mimulus pygmaeus*. A,B: Habit, (A) X 4, (B) X 2; C: Flower, X 8; D: Flower, frontal view, X 12; E: Fruiting calyces, X 5 (drawn from Heckard 5250 & 5251,UC).

OENOTHERA WOLFII (Munz) Raven, Dietrich, & Stubbe

(Wolf's evening primrose)

Evening primrose family (Onagraceae)

ORIGINAL PUBLICATION: Systematic Bot. 4:242-252. 1979.

SYNONYMS: *Oenothera hookeri* Torr. & Gray ssp. *wolfii* Munz (Aliso 2:16. 1949).

STATUS: Candidate species for federal listing, Category 2, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Erect, branching biennial or perennial, 5-15 dm tall, stems coarse, greenish or red, hirsute and strigulose; rosette leaves elliptic or oblanceolate, dentate, strigose, blades 10-18 cm long on petioles 5-10 cm long; cauline leaves lanceolate, 6-12 cm long; inflorescence dense, 1-4 dm long, hirsute and glandular; sepals 2-3 cm long; petals 2-2.5 cm long, pale yellow to orange in age (after Munz, 1959).

DISTRIBUTION: Southwest Oregon in Curry County and coastal Del Norte and Humboldt counties, California. See TAXONOMIC PROBLEMS.

TAXONOMIC PROBLEMS: There is speculation that some Jackson County collections may be referable to *O. wolfii* (Raven, pers. comm.). Additional material is required to fully document its Oregon range.

LOOK ALIKES: Flowers of the similar *O. villosa* (= *O. strigosa*) are less than 2 cm long.

PHENOLOGY: Flowering occurs from June to October.

HABITAT: Low elevations along coast and on bluffs in California; from near a "creek" according to label data from the Oregon collection. Apparently prefers sandy soil in grasslands, strand, or riparian habitats.

LAND OWNERSHIP/MANAGEMENT: Private, U.S. Forest Service, and possibly Bureau of Land Management.

PRESENT AND POTENTIAL THREATS: Coastal developments, road construction, and herbicide applications are all potential threats. According to Raven (pers. comm.) *O. wolfii* may face extinction from the aggressive spreading of *O. glazioviana*, a species which is moving into *O. wolfii*'s preferred habitat.

MANAGEMENT RECOMMENDATIONS: Active searches for *O. wolfii* are needed in Oregon.

REMARKS: The taxonomic position and limits of this species are still carefully being studied. There are collections from northern Oregon which are morphologically close to *O. wolfii* but their assignment to this taxon appears doubtful.

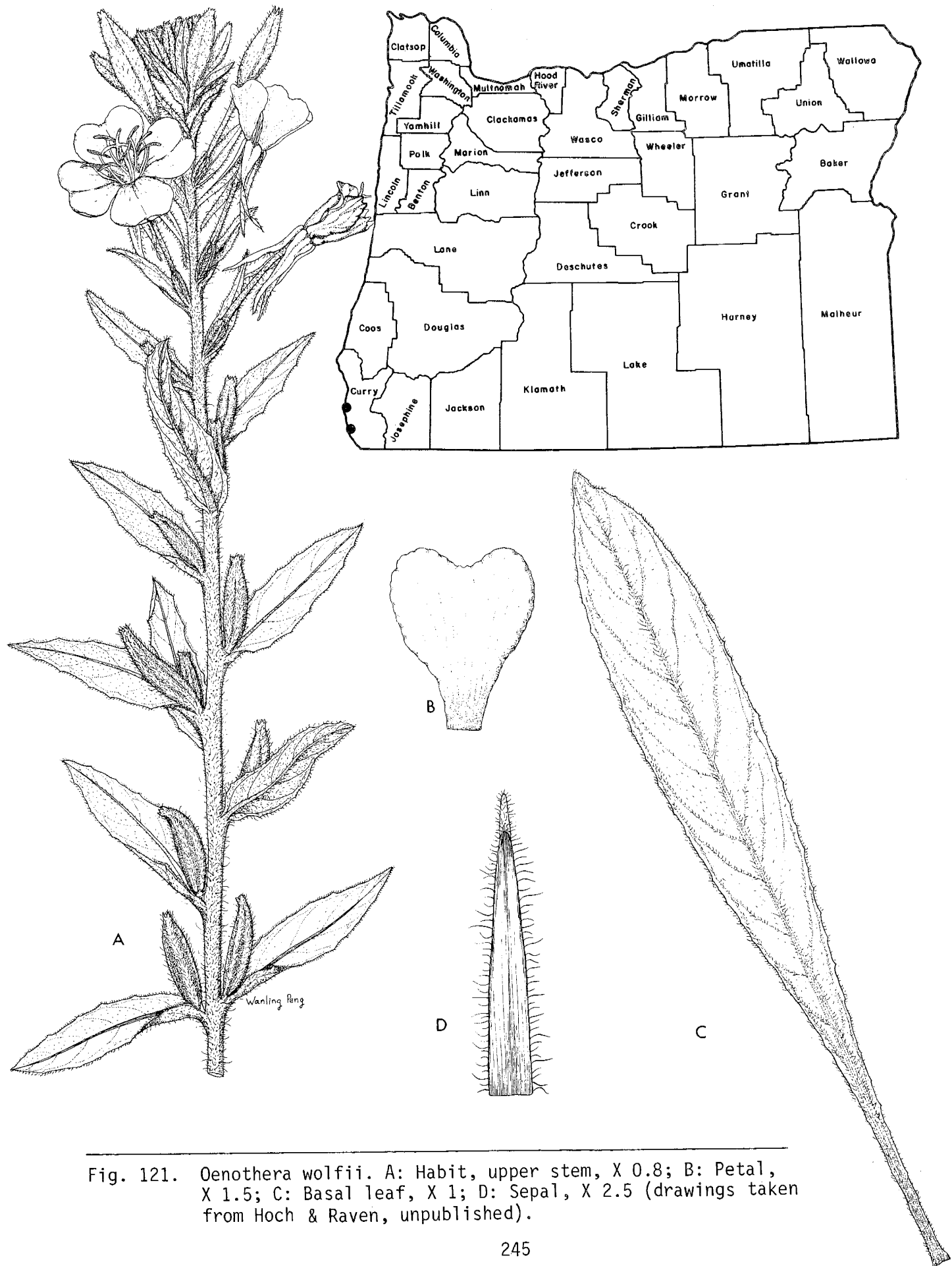


Fig. 121. *Oenothera wolfii*. A: Habit, upper stem, X 0.8; B: Petal, X 1.5; C: Basal leaf, X 1; D: Sepal, X 2.5 (drawings taken from Hoch & Raven, unpublished).

PEDICULARIS HOWELLII Gray

(Howell's lousewort)

Figwort family (Scrophulariaceae)

ORIGINAL PUBLICATION: Proc. Amer. Acad. 20:307. 1885.

STATUS: Candidate species for federal listing, Category 2, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Perennial herb, glabrous to the inflorescence; stem rather stout, 3-4.5 dm high, naked toward the base; basal leaves none, the cauline ovate or oblong ovate in outline, cleft and parted with three to seven more or less serrate or toothed segments, sometimes merely denticulate or mainly entire, 3-5 cm long, slender petioled; flowers in a short, dense spike, with ovate, denticulate bracts that are basally woolly; calyx campanulate, woolly villous, the lobes very short; corolla 8-10 mm long, pale yellowish or white, the sometimes rose colored galea short beaked, strongly arching over the much shorter, obscurely lobed lower lip (after Peck, 1961).

DISTRIBUTION: Endemic to the Siskiyou Mountains of southwest Oregon in Josephine County and adjacent Siskiyou County, California.

LOOK ALIKES: *Pedicularis racemosa*, a related species, can be distinguished on the basis of its two lobed calyx and its long, narrow, undivided leaves.

PHENOLOGY: This species flowers in June and July.

HABITAT: Restricted to ridges in mixed coniferous forests, under partial or total cover, with *Tsuga mertensiana*, *Abies grandis*, *A. lasiocarpa*, and *Pseudotsuga menziesii*. The elevational limits are approximately 1700 to 1950 m.

LAND OWNERSHIP/MANAGEMENT: Habitat managed by the U.S. Forest Service.

PRESENT AND POTENTIAL THREATS: Recreational activities and grazing are potential threats. Logging roads are proposed for portions of the known habitat.

MANAGEMENT RECOMMENDATIONS: Continued monitoring of known populations and an expanded inventory of sites in Josephine and adjacent counties which can be demonstrated as suitable potential habitat (i.e., mountain peaks or ridges above 1700 m).

REMARKS: Current stations are described as being comprised of "few" plants. Most are known from near trails and other frequented areas such as lakes and fire lookouts. Field work away from these zones of frequent human visitation may turn up additional, perhaps larger, populations.

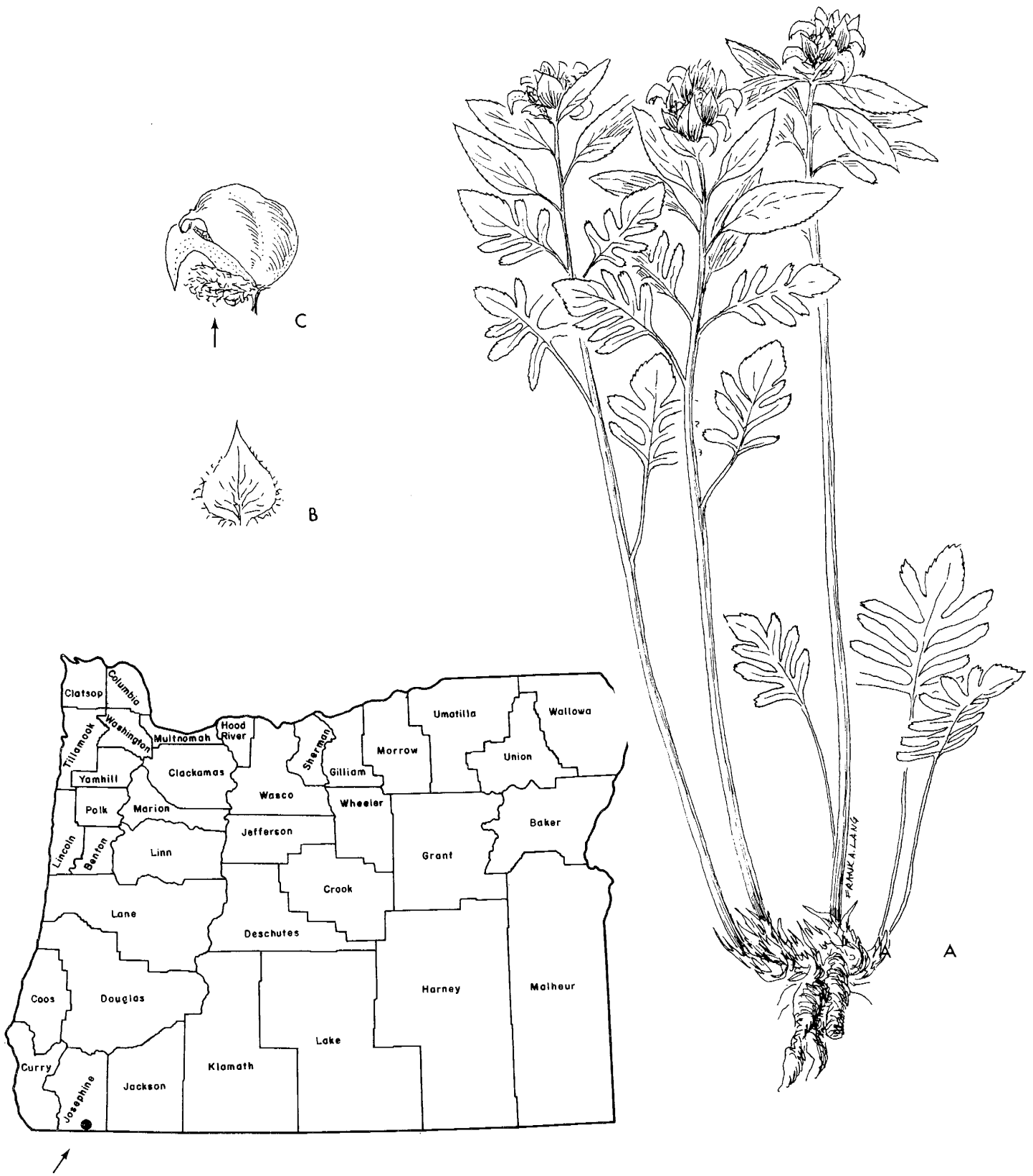


Fig. 122. *Pedicularis howellii*. A: Habit, X 0.4; B: Floral bract, X 1.2; C: Flower (note small, woolly calyx), X 2 (drawn from Thompson 12491, UC).

PENSTEMON BARRETTIAE Gray

(Barrett's penstemon)

Figwort family (Scrophulariaceae)

ORIGINAL PUBLICATION: Syn. Fl. 2nd ed. 2¹:440. 1886.

STATUS: Candidate species for federal listing, Category 1, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Plants 2-4 dm tall, shrubby and much branched; herbage glabrous and glaucous; leaves of sterile shoots up to 8 cm long and 2.5 cm wide, leaves of the flowering shoots mostly 1.5-3.5 cm long and 0.8-2 cm wide; inflorescence racemose or nearly so; calyx 5-7 mm long, the segments more or less ovate; corolla lilac or rose purple, 33-38 mm long, about 1 cm wide; anthers densely woolly; capsules narrow, nearly 1 cm long (after Cronquist, 1959).

DISTRIBUTION: An endemic relict (Every, 1977) of the Columbia River Basin, *P. barrettiae* is known only from a limited portion of Hood River and Wasco counties, Oregon, extending north slightly into Klickitat County, Washington.

PHENOLOGY: Flowers from April through June.

HABITAT: *Penstemon barrettiae* frequents arid basalt cliffs and rocky ground at lower elevations, ranging from ca. 30 to 600 m. Associated species are few, including *Lomatium suksdorfii*, *Penstemon richardsonii*, and *Eriogonum* spp.

LAND OWNERSHIP/MANAGEMENT: Private and commercial interests.

PRESENT AND POTENTIAL THREATS: *Penstemon barrettiae* occurs near roads and along railroad right-of-ways, consequently there is some hazard from spraying and construction activities. The most important threat, however, involves horticultural exploitation.

MANAGEMENT RECOMMENDATIONS: Management for this species is the responsibility of private land owners on whose property the remaining populations exist. A land exchange or purchase by some public or private conservation agency might provide an avenue for protection.

REMARKS: This is considered by many to be one of the showiest members of the genus, widely acclaimed for its ample blooms and hardy adaptation to cultivation. It is still locally common but is within easy striking distance of Portland collectors. Numerous specimens have been removed in recent years. Several sites, however, still produce showy displays in favorable seasons.

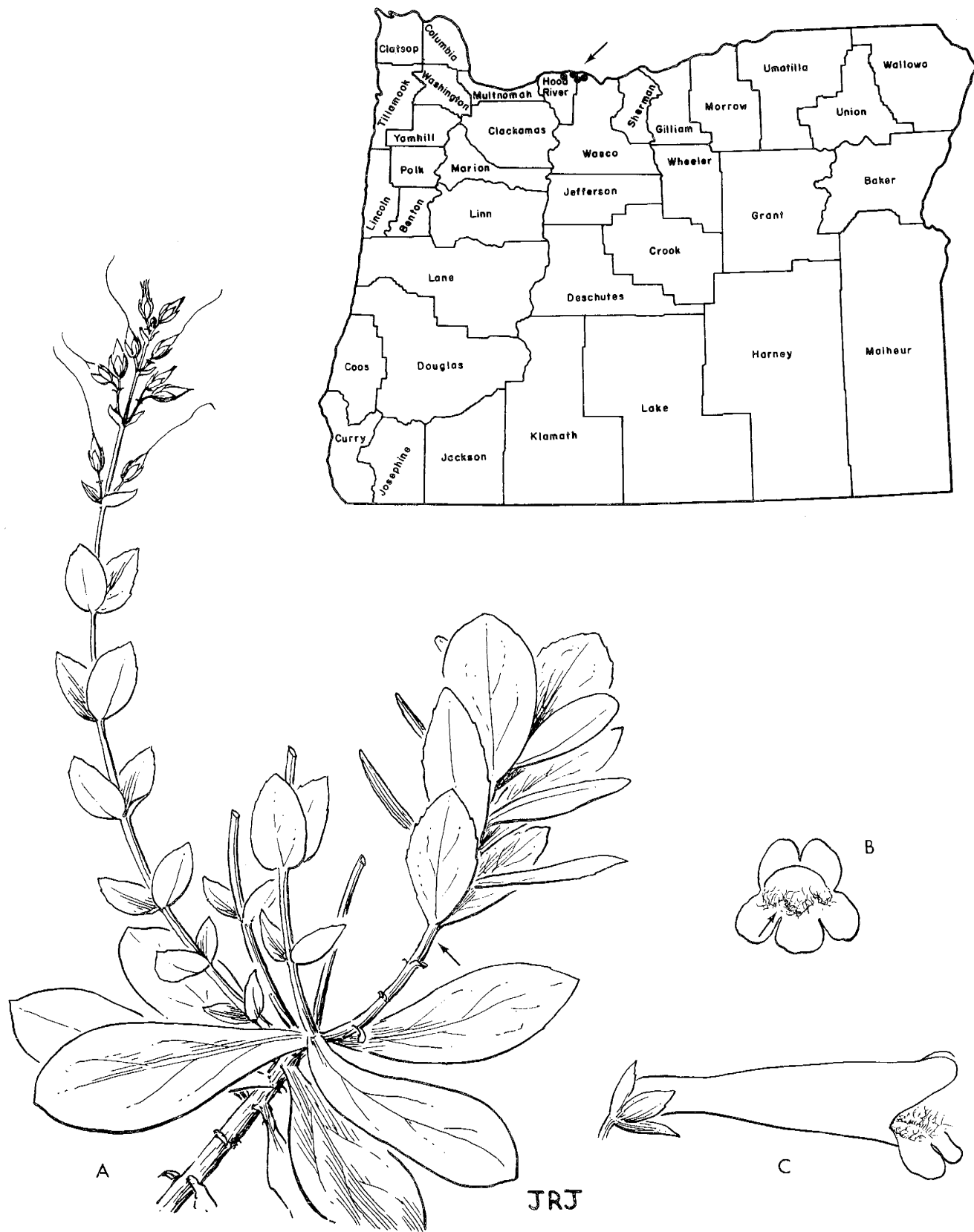


Fig. 123. *Penstemon barrettiae*. A: Fruiting habit, indicating sterile shoot, 0.5; B: Corolla, front view, showing woolly anthers, X 2; C: Flower, lateral view, X 2 (drawings taken from Hitchcock et al., 1959).

PENSTEMON ELEGANTULUS Penn.

(Lovely penstemon)

Figwort family (Scrophulariaceae)

ORIGINAL PUBLICATION: Not. Nat. Acad. Phila. 71:14. 1941.

STATUS: Candidate species for federal listing, Category 2, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Plants tufted from a compact, woody caudex, 1-3 dm tall, glandular in the inflorescence, otherwise finely puberulent throughout, or glabrous or nearly so; cauline leaves 6 cm long and ca. 1 cm wide, elliptic to lanceolate, remotely toothed; inflorescence few flowered; calyx 3-6 mm long, the segments ovate, sometimes erose; corolla blue, glandular hairy externally, 15-22 mm long, 5-6 mm wide; palate bearded; pollen sacs about 1 mm long; staminode bearded toward the tip (after Cronquist, 1959).

DISTRIBUTION: In Wallowa, Union, and Umatilla counties in northeast Oregon, and in Idaho County, Idaho.

LOOK ALIKES: *Penstemon humilus* occurs in some phases which are nearly indistinguishable from *P. elegantulus* save for the characters of entire versus remotely toothed leaves and the larger corolla of the latter.

PHENOLOGY: Flowering from June to July.

HABITAT: The Oregon sites are composed of very shallow soils within an *Artemisia rigida* community, with *Poa sandbergii*, *Arabis cobrensis*, *Castilleja hispida* var. *acuta*, and *Astragalus whitneyi*. They are adjacent to coniferous woods and at ca. 1500-2000 m.

LAND OWNERSHIP/MANAGEMENT: U.S. Forest Service.

PRESENT AND POTENTIAL THREATS: There are few threats of a human origin, although roadwork and collecting are conceivable conflicts. At one site, *P. elegantulus* is facing elimination through introgressive hybridization with other *Penstemon* spp.

MANAGEMENT RECOMMENDATIONS: Continued inventory and study is recommended so the ecological requirements of the species may be assessed.

REMARKS: The status and distribution of this poorly known taxon is still very much in doubt. Until a 1979 Oregon collection, it was only known in the state from the 1897 type collection. Recent field work indicates that this species is probably relict and may be of value in systematic study of the genus. Its range was extended to Union and Umatilla counties in 1980.

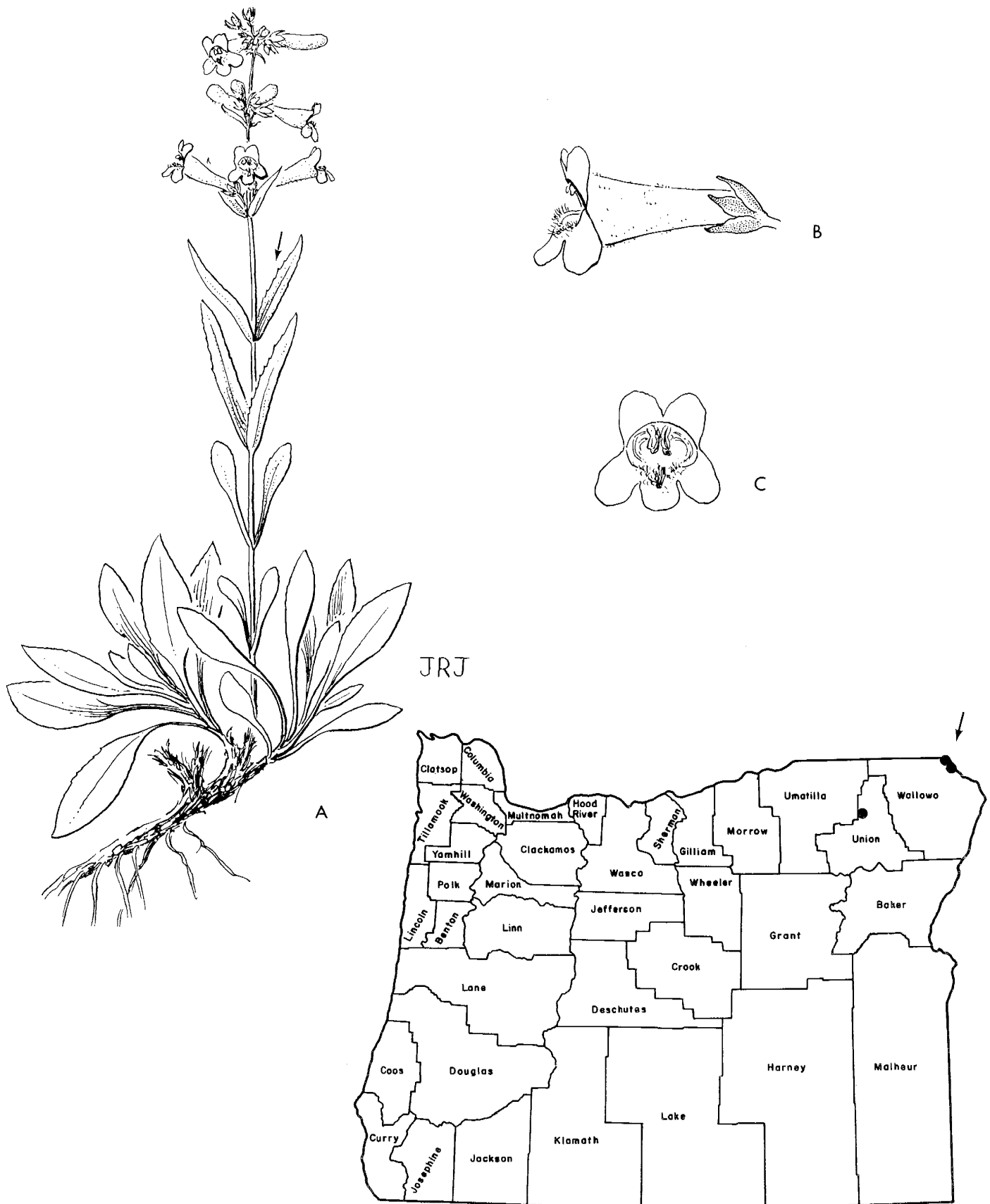


Fig. 124. *Penstemon elegantulus*. A: Habit (note remotely toothed leaves), X 0.8; B: Flower, lateral view, X 2.2; C: Corolla, front view, X 2.2 (drawings taken from Hitchcock et al., 1959).

PENSTEMON GLAUCINUS Penn.

(Blue leaved penstemon)

Figwort family (Scrophulariaceae)

ORIGINAL PUBLICATION: Not. Nat. Acad. Phila. 71:10. 1941.

STATUS: Candidate species for federal listing, Category 1, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Stems branched, 1.2 to 3 dm, spreading from base; leaves opposite, glaucous; inflorescence of two to three pairs of densely flowered cymes, glandular pubescent; corolla ca. 12 mm long, violet blue; anthers with cells 1 mm long, lanceolate oblong, glabrous; sterile filament glabrous throughout (after Pennell, 1941; Virginia Crosby, pers. comm.).

DISTRIBUTION: This penstemon is known only from Klamath and Lake counties, Oregon, near Gearhart Mountain.

TAXONOMIC PROBLEMS: Virginia Crosby (pers. comm.) indicates that *P. glaucinus* is closely allied to several species but recommends continued recognition of the taxon until the complex is thoroughly studied.

LOOK ALIKES: Resembles *P. euglaucus* but may be distinguished by its glabrous sterile filament and glandular inflorescence.

PHENOLOGY: *Penstemon glaucinus* flowers in July and August.

HABITAT: Found on fine, ashy soils or weathered tuff in *Pinus albicaulis* or *P. contorta* woodland, with *Eriogonum umbellatum*, *Penstemon davidsonii*, *Haplopappus bloomeri*, *Castilleja chlorotica*, and *Arctostaphylos nevadensis*. Encountered at elevations between ca. 2350 and 2650 m.

LAND OWNERSHIP/MANAGEMENT: U.S. Forest Service.

PRESENT AND POTENTIAL THREATS: Recreational use of habitat, collecting for horticultural purposes, and trail work are potential threats, but are having very little impact at this time.

MANAGEMENT RECOMMENDATIONS: Review future trail placement and provide adequate mitigating measures for increasing recreational use of the area.

REMARKS: *Penstemon glaucinus* is known only from collections in 1932 and 1979. The recently discovered population is roughly estimated at 100 acres in size, being termed "vigorous" and in "excellent condition". Although this is an extremely local species the number of individuals and the remoteness of its habitat may disqualify it for listing consideration, especially if additional sites are uncovered.



Fig. 125. *Penstemon glaucinus*. A: Habit, X 0.9; B: Flower, X 2.2; C: Dehiscent anther, X 8 (drawn from Straw 2200, UC).

PENSTEMON PECKII Penn.

(Peck's penstemon)

Figwort family (Scrophulariaceae)

ORIGINAL PUBLICATION: Not. Nat. Acad. Phila. 71:12. 1941.

STATUS: Candidate species for federal listing, Category 1, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Plants tufted, mostly 2.5-7 dm tall, slender stemmed, glabrous below the glandular hairy inflorescence, the stem sometimes puberulent; leaves up to 7 cm long and 5 mm wide, nearly all cauline, the lower rather crowded, the upper more distant; calyx 2-3.5 mm long, the segments abruptly pointed, often with scarious margins; corolla tending to be declined, glandular hairy, pale purplish blue to white, 8-10 mm long; staminode bearded at the tip; pollen sacs glabrous and becoming opposite (after Cronquist, 1959).

DISTRIBUTION: Endemic to the east slope of the Oregon Cascades, from a limited area in northern Deschutes and southern Jefferson counties.

LOOK ALIKES: *Penstemon humilus* differs in its fine, ashy pubescence and *P. euglaucus* in its completely glabrous or glaucous foliage and inflorescence. Both of these species also possess more or less well developed basal leaf tufts, a feature lacking in *P. peckii*.

PHENOLOGY: *Penstemon peckii* blooms from June to early August.

HABITAT: Preferring slopes and open flats within the Ponderosa Pine belt, generally at elevations between 680 and 1090 m. Associated species include *Larix occidentalis*, *Purshia tridentata*, *Carex geyeri*, and *Horkelia fusca*.

LAND OWNERSHIP/MANAGEMENT: U.S. Forest Service and private.

PRESENT AND POTENTIAL THREATS: This species is threatened by logging activities, recreational activities, and summer home development.

MANAGEMENT RECOMMENDATIONS: A reduction of surface disturbances is needed in much of the Deschutes National Forest where *P. peckii* occurs.

REMARKS: *Penstemon peckii* is intolerant of heavy logging activities. Additionally, recreation activities are expanding in this portion of the Cascades and will doubtlessly continue to, considering escalating fuel prices and the close proximity of major population centers at Bend and in the Willamette Valley. *P. peckii* is locally frequent, however, and it may be demonstrated to resist moderate levels of disturbance.

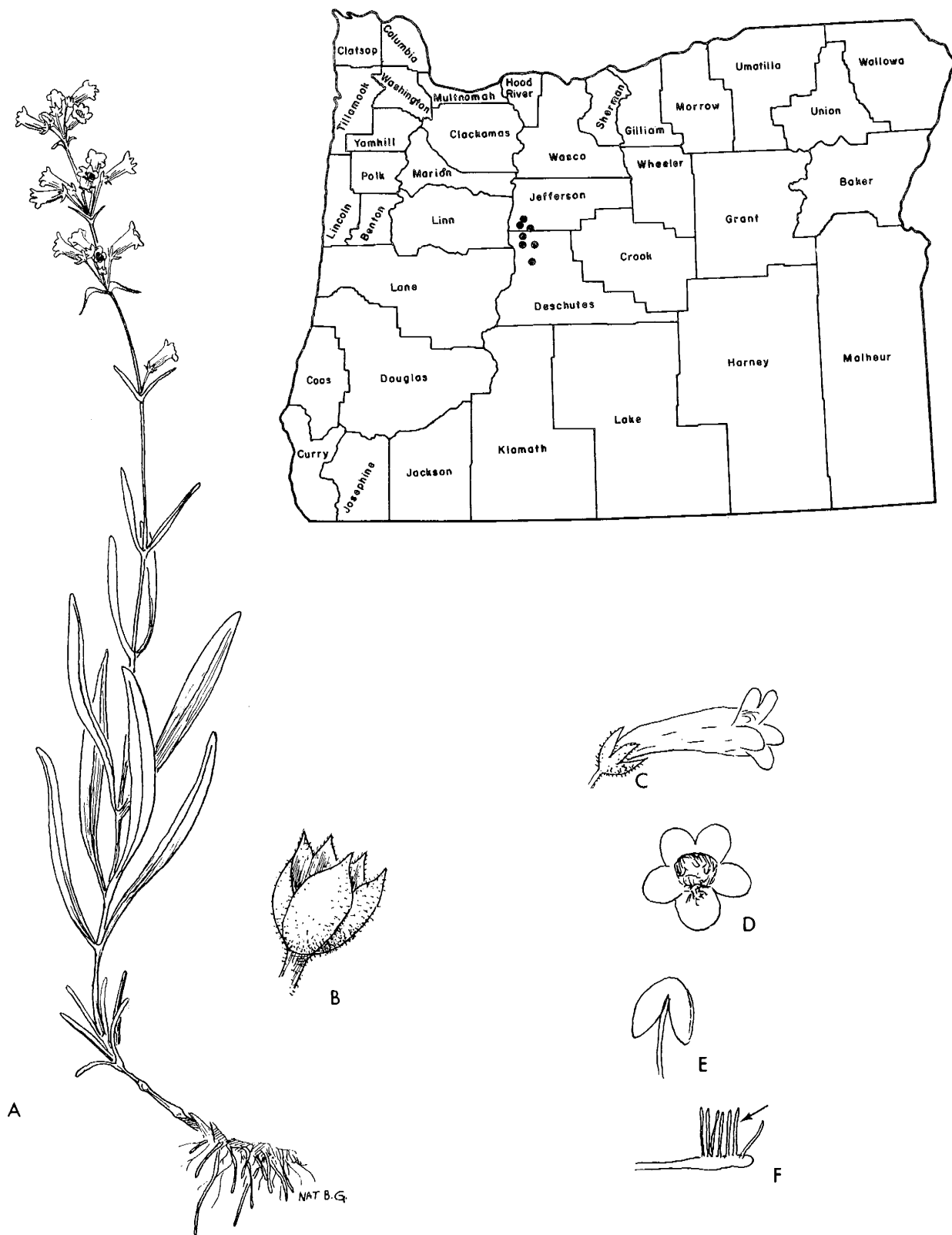


Fig. 126. *Penstemon peckii*. A: Habit, X 0.4; B: Calyx, X 8; C: Flower, lateral view, X 3.2; D: Corolla, front view, X 3.5; E: Anther, X 10; F: Staminode (sterile stamen), illustrating bearded tip, X 12 (drawn from Chambers 4231, OSC).

PENSTEMON SPATULATUS Penn.

(Wallowa beardtongue)

Figwort family (Scrophulariaceae)

ORIGINAL PUBLICATION: Not. Nat. Acad. Phila. 71:10-11. 1941.

STATUS: Candidate species for federal listing, Category 2, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Perennial forming mats, with many short branches, stems 10-20 cm tall, glabrous or finely puberulent; leaves entire, dimorphic, old growth and sterile shoot leaves rounded, leaves of fertile stems oblong lanceolate; inflorescence somewhat glandular pubescent; corolla 11-13 mm long, violet blue, marked with fine guidelines within; sterile filament bearded with yellow hairs (after Pennell, 1941).

DISTRIBUTION: This species is restricted to the Strawberry, Blue, and Wallowa Mountains of Baker, Grant, Union, and Wallowa counties, Oregon.

LOOK ALIKES: *Penstemon spatulatus* somewhat resembles the blue flowered forms of *P. attenuatus*. *P. spatulatus* may be distinguished by its lower growth, more rounded and mostly basal leaves, and strongly lined corollas. It especially resembles *P. procerus* var. *formosus*, but the two taxa are differentiated by the glandular inflorescence of *P. spatulatus* versus glabrous in the former plant.

PHENOLOGY: Flowering from late June through August.

HABITAT: This is a species of subalpine or alpine communities (usually above 2000 m), known from open, stony slopes. It may rarely be found at slightly lower elevations in coniferous woods. Associated species include *Stipa lettermanii*, *Monardella odoratissima*, *Silene douglasii*, *Cryptantha nubigena*, *Oxytropis viscida*, and *Linanthastrum nuttallianum*.

LAND OWNERSHIP/MANAGEMENT: Apparently restricted to U.S. Forest Service administered lands.

PRESENT AND POTENTIAL THREATS: Increasing recreational use of habitat and collecting by rock garden enthusiasts are possible threats; however most of the potential habitat for this species is very isolated.

MANAGEMENT RECOMMENDATIONS: Additional inventory work is recommended.

REMARKS: Although there are only a few collections of this taxon, it may eventually be found to be locally common. It is one of the few endemics of northeast Oregon which is found in both the Blue and Wallowa Mountains. Its occurrence in Baker County, long suspected, was verified by a 1980 sighting.

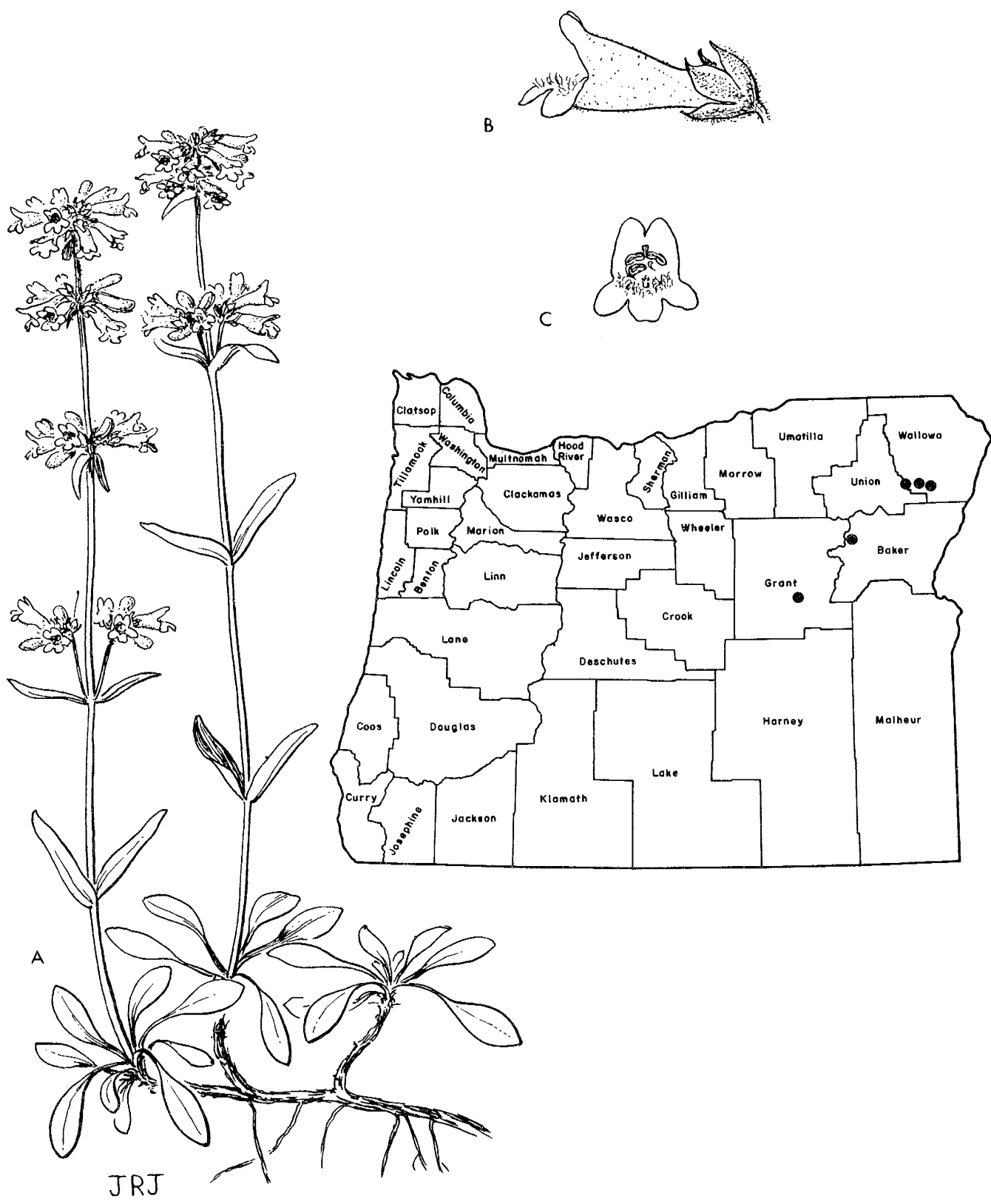


Fig. 127. *Penstemon spatulatus*. A: Habit, X 1; B: Flower, lateral view, X 4; C: Corolla, front view, X 4 (drawings taken from Hitchcock et al., 1959).

PERIDERIDIA ERYTHORRHIZA (Piper) Chuang & Const.

(Red root yampah)

Parsley family (Apiaceae)

ORIGINAL PUBLICATION: Univ. Calif. Publ. Bot. 55:69-72. 1969.

SYNONYMS: *Carum erythrorhizum* Piper (Proc. Biol. Soc. Wash. 29:100. 1916).
Ataenia erythrorhiza Wolff (Pflanzenr 90:172. 1927).

STATUS: Candidate species for federal listing, Category 1, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Perennial herb, 60-80 cm tall, from a fascicle of several fusiform, rose to chestnut brown tuberous roots; basal leaves ovate or ovate lanceolate, 10-20 cm long, 5-10 cm broad, simply pinnate with three to seven pairs of narrow pinnae, cauline leaves pinnate or ternate; inflorescence of concave umbels, the peduncles 4-12 cm long; involucre wanting, or of one bract 0.5-1.5 cm long; rays six to eleven, 1-5 cm long, spreading and conspicuously unequal; involucre of linear lanceolate bractlets 2-3 mm long; calyx teeth evident; petals whitish, spatulate or narrowly obovate, 1.8 mm long, 1 mm broad, with three to five veins; fruit ellipsoid, tapering at both ends, 4-7 mm long, 3.5 mm broad (after Chuang & Constance, 1969).

DISTRIBUTION: In the lowlands of the southern cascades of Oregon, in Douglas, Klamath, Josephine, and perhaps Jackson counties.

LOOK ALIKES: *Perideridia erythrorhiza* differs from *P. gairdneri* and other yampahs in its carrot like root clusters with numerous individual roots and the narrow, multinerved petals (Chuang & Constance, 1969).

PHENOLOGY: The red root yampah flowers from mid July through August.

HABITAT: Moist prairies, valleys, and pastureland, often (but not exclusively) in heavy, poorly drained soils. Frequenting oak or pine woodlands at lower to mid elevations (up to about 1525 m), with *Fraxinus latifolia*, *Eryngium petiolatum*, *Juncus* spp., *Aster* spp., *Plantago* spp., and grasses.

LAND OWNERSHIP/MANAGEMENT: U.S. Forest Service, private, and possibly Bureau of Land Management.

PRESENT AND POTENTIAL THREATS: Agricultural and housing development projects, as well as agricultural spraying.

MANAGEMENT RECOMMENDATIONS: Most of the historic and current sites for this species are under private ownership. Study is needed to estimate the feasibility of private-federal land exchanges to facilitate its conservation.

REMARKS: This species has been collected only a few times since its discovery in 1914.

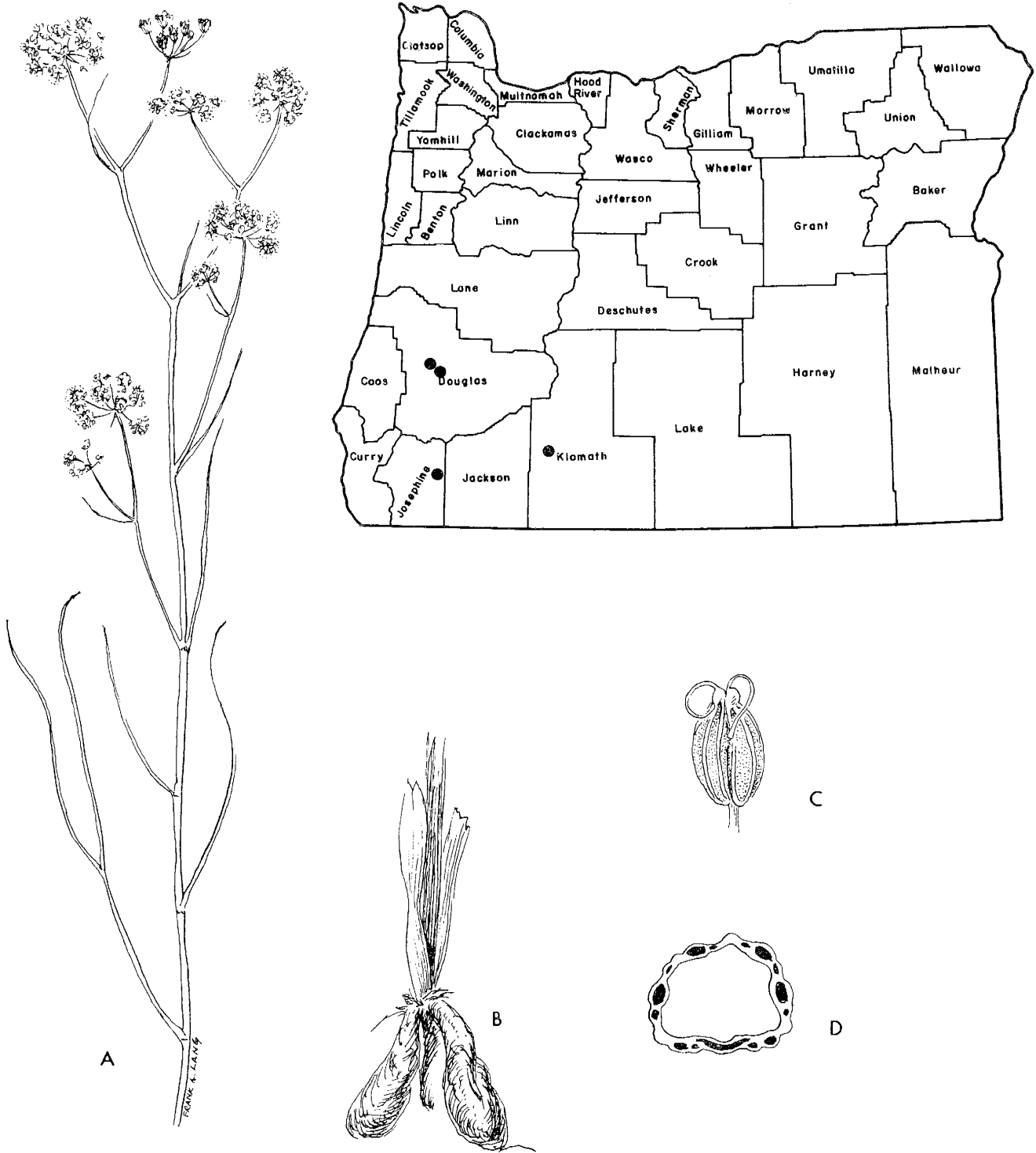


Fig. 128. *Perideridia erythrorhiza*. A: Habit of flowering stem, X 0.4; B: Habit of root cluster, X 0.7; C: Fruit, X 4; D: Fruit, cross section, X 8 (drawn from Savage 7380, ORE).

PHACELIA ARGENTEA Nels. & Macbr.

(Silvery phacelia)

Waterleaf family (Hydrophyllaceae)

ORIGINAL PUBLICATION: Bot. Gaz. 61:34. 1916.

SYNONYMS: *Phacelia heterophylla* Pursh var. *rotundata* Dundas (Bull. S. Calif. Acad. 33:156. 1935).

STATUS: Candidate species for federal listing, Category 2, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Perennial from a branched, elongated caudex, stems decumbent or ascending, 1-4.5 dm long; stems and petioles white hispid, hairs appressed upwards; leaves thick, entire or with a pair of leaflets, 5-12 cm long, 2-3 cm wide, elliptic to orbicular, densely hairy; inflorescence densely cymose; calyx hispid, lobes 3-4 mm long; corolla white, campanulate, 5-7 mm long (after Heckard, 1960).

DISTRIBUTION: Near the coast in Coos and Curry counties, Oregon, south to at least Del Norte County, California.

TAXONOMIC PROBLEMS: This taxon will intergrade with *P. nemoralis* ssp. *oregonensis*.

LOOK ALIKES: *Phacelia nemoralis* has an erect stem and two or more pairs of leaflets.

PHENOLOGY: Flowering takes place from late May to August.

HABITAT: On sandy beach dunes and bluffs near the coast. Associated species include *Fragaria chilensis*, *Polygonum paronychia*, *Franseria chamissonis*, and *Abronia* sp.

LAND OWNERSHIP/MANAGEMENT: Private, State of Oregon, and possibly within the city limits of coastal towns such as Port Orford, Gold Beach, etc.

PRESENT AND POTENTIAL THREATS: Coastal recreational activities and developments are the greatest potential threats.

MANAGEMENT RECOMMENDATIONS: Sites for *P. argentea* need to be set aside and exempted from excessive recreational use, particularly offroad vehicles.

REMARKS: While this species may still be locally common in a few areas, its coastal habitat as a whole must be considered endangered. As anthropic pressures on our seacoast ecosystems increase, endemic taxa such as *P. argentea* will be the first natural resources to be lost.



Fig. 129. *Phacelia argentea*. A: Habit, X 1; B: Corolla, cut away to expose corolla scales and stamen insertion, X 5; C: Calyx cut away exposing fruit (capsule), X 5 (drawn from Henderson 10075, ORE).

PHACELIA CAPITATA Kruck.

(Capitate phacelia)

Waterleaf family (Hydrophyllaceae)

ORIGINAL PUBLICATION: Madrono 13:209-213. 1956.

STATUS: Candidate species for federal listing, Category 1, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Perennial growing in dense, low tufts from a deep taproot, forming rosettes 25-30 cm in diameter, the erect, unbranched stems 20-25 cm tall with silky hairs; herbage eglandular, silvery with appressed bristles on a background of thinly matted hairs; basal leaves linear lanceolate, 2-3 cm long; cauline leaves narrow, eight to twelve; inflorescence made up of two to four terminal and subterminal cymes in congested subcapitate cluster, 2.0-2.5 cm long and 3.0-3.5 cm wide in early fruit; calyx lobes 3 mm long, lengthening in fruit to 6 mm; corolla white, saucer to bell shaped, stamens and style exerted 5-7 mm; immature capsule ovoid (after Kruckeberg, 1956; Heckard, 1960).

DISTRIBUTION: This phacelia is endemic to river drainages of Coos and Douglas counties, Oregon.

LOOK ALIKES: *Phacelia capitata* is very similar to *P. corymbosa*. It may be distinguished by its large number of thin, wiry stems, the numerous cauline leaves, and the rarity of cymes below the terminal capitate cluster. Also, *P. corymbosa* is glandular.

PHENOLOGY: The capitate phacelia blooms in May and June.

HABITAT: To be expected on dry serpentine outcrops within the *Pinus jeffreyi* - *Calocedrus decurrens* community. Associated species include *Cheilanthes siliquosa*, *Eriophyllum lanatum*, *Ceanothus cuneatus*, *Silene hookeri*, *Calochortus howellii*, *Viola hallii*, *Epilobium minutum*, and *Whipplea modesta*. The elevational range is ca. 500-900 m.

LAND OWNERSHIP/MANAGEMENT: Currently known from Bureau of Land Management and private lands.

PRESENT AND POTENTIAL THREATS: Threatened by herbicide spraying along roadsides and nickel mining of the serpentine habitat.

MANAGEMENT RECOMMENDATIONS: Eliminate herbicide spraying where populations occur and monitor mining operations, if any are initiated.

REMARKS: *Phacelia capitata* may be somewhat tolerant of disturbance since it does grow along road cuts. Although this species has a very limited range, it is locally abundant in several areas.



Fig. 130. *Phacelia capitata*. A: Habit, X 0.5 (drawn from Fosback s.n., OSC).

PHACELIA VERNA Howell

(Spring phacelia)

Waterleaf family (Hydrophyllaceae)

ORIGINAL PUBLICATION: Erythea 3:35-36. 1895.

SYNONYMS: *Phacelia howellii* Macbride (Contr. Gray Herb. 49:41. 1917).

STATUS: Candidate species for federal listing, Category 1, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: An erect simple or branched annual, 8-25 cm high, rather harshly pubescent; leaves ovate to obovate, 1.5-3 cm long, narrowed below to a winged petiole or the upper sessile, nearly entire, appressed bristly above; racemes terminal and axillary, becoming loose in fruit; calyx lobes linear or spatulate, obtuse, nearly as long as the corolla; corolla campanulate, white or pale blue, cleft to the middle, 5-7 mm long; scales small, nearly semicircular, free from the filaments, the latter slightly exerted; style cleft nearly to the base (after Peck, 1961).

DISTRIBUTION: This taxon is restricted to the Umpqua Valley of Douglas County, Oregon.

PHENOLOGY: The spring phacelia blooms from April to June.

HABITAT: In shallow soils of steep banks or hillsides, to nearly 1300 m elevation. Howell (1953) provided a rather detailed popular account of *P. verna*'s habitat. Accordingly, it prefers open faces, often growing among cushions of moss or *Selaginella*. Additional herbaceous associates included *Trifolium microdon*, *Mimulus guttatus*, *Plantago erecta*, *Micropus californicus*, and *Eriogonum nudum*. This microhabitat is usually moist or seeping in the spring. Surrounding these sites are open woodland dominated by *Pseudotsuga menziesii*, *Quercus garryana*, and *Arbutus menziesii*.

LAND OWNERSHIP/MANAGEMENT: Bureau of Land Management and private.

PRESENT AND POTENTIAL THREATS: Roadwork, rock quarrying, and logging are all potential threats.

MANAGEMENT RECOMMENDATIONS: Logging probably does not constitute an equal threat to quarrying. Destruction of bluffs and slopes by such excavation needs to be curtailed or avoided altogether.

REMARKS: The populations of this annual herb are scattered and usually small. It may not do well on disturbed ground considering populations in nature seem to occur mostly on fragile, mossy sites which are essentially pristine. The very small range of this species is remarkable. It would be interesting and useful to learn what ecological factors contribute to this restriction.

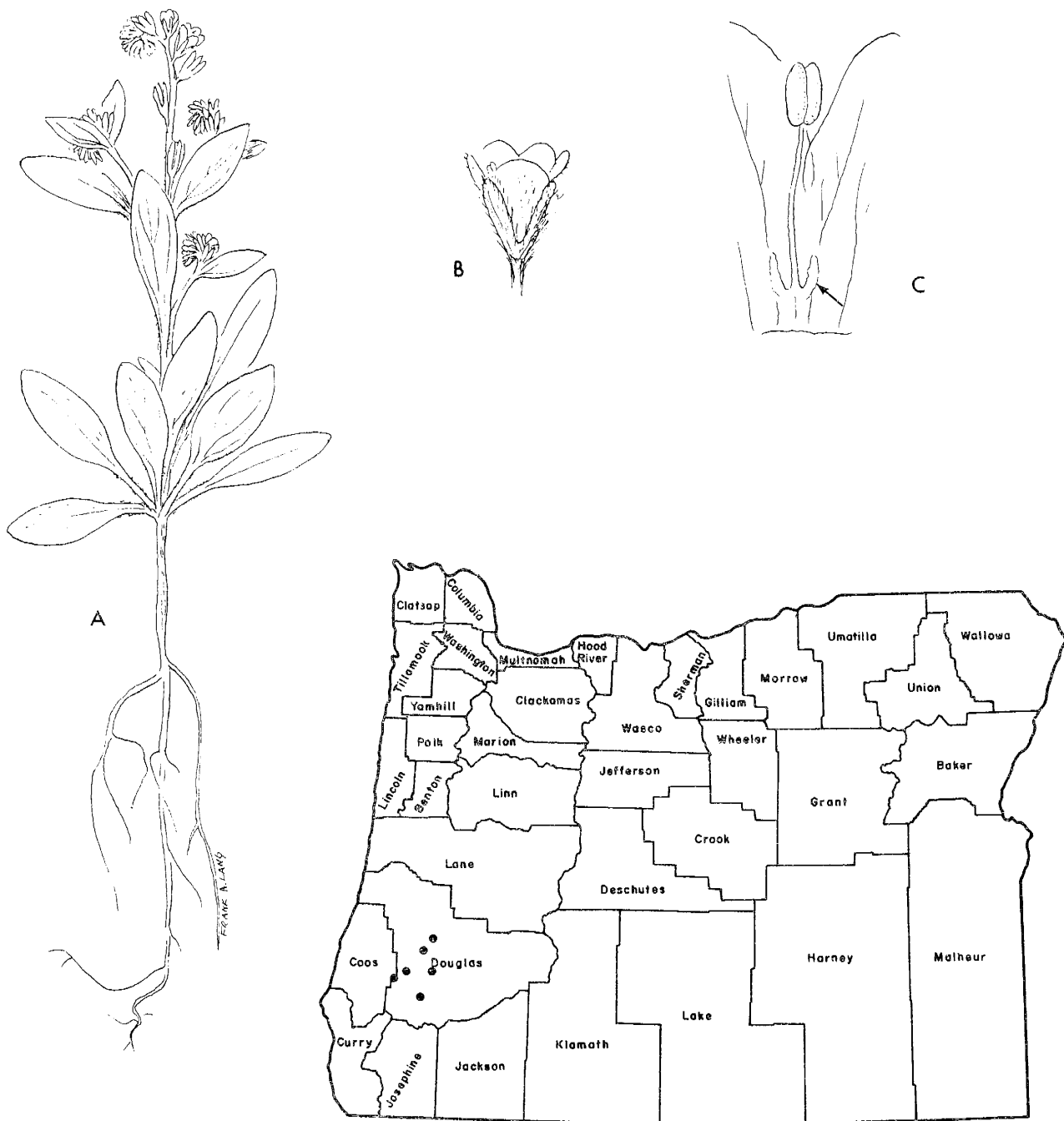


Fig. 131. *Phacelia verna*. A: Habit, X 0.8; B: Flower, X 3; C: Enlarged dissection of corolla, illustrating corolla scales, X 9 (drawn from Savage & Rollins 2955, UC).

PLAGIOBOTHRYUS HIRTUS (Greene) Johnst. SSP. CORALLICARPA (Piper) Johnst.

(Coral seeded allocarya)

Borage family (Boraginaceae)

ORIGINAL PUBLICATION: Journ. Arnold Arb. 16:193. 1935.

SYNONYMS: *Allocarya corallcarpa* Piper (Proc. Biol. Soc. Wash. 37:93. 1924).

Plagiobothrys scouleri var. *corallicarpus* Johnst. (Contr. Arnold Arb. 3:52. 1932).

Allocarya hirta ssp. *corallicarpa* (Piper) Abrams (Illus. Fl. Pac. States 3:565. 1951).

STATUS: Candidate species for federal listing, Category 1, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Apparently very similar to *P. hirtus* ssp. *hirtus*, set apart by the following fruit characters. Nutlets deeply and irregularly alveolate with conspicuous high thin ridges and papillae (after Abrams, 1951). See following DESCRIPTION of ssp. *hirtus* for additional descriptive information (page 268).

DISTRIBUTION: Known only from the general vicinities of Grants Pass (Josephine County) and Medford (Jackson County), in southwestern Oregon.

LOOK ALIKES: Differs from *P. hirtus* ssp. *hirtus* in its irregularly ridged nutlets, reminiscent of coral. This species has larger flowers than most *Plagiobothrys* of southern Oregon.

PHENOLOGY: Believed to flower in June and July.

HABITAT: In open areas, dry according to one collection, moist according to another. Little is known about the ecological preferences of this taxon, since the label data from the few collections is very meager. Probably occurs between 500 and 650 m, perhaps associated with grassland or vernal pool habitats.

LAND OWNERSHIP/MANAGEMENT: Probably private or municipal.

PRESENT AND POTENTIAL THREATS: Industrial and agricultural development has covered much of the potential habitat near Grants Pass and Medford in the 60 years since the last collection. Since there are no known populations at this time, no current threats can be documented.

MANAGEMENT RECOMMENDATIONS: Immediate protection of any populations located on federal land. This taxon should be searched for in undeveloped remnants of land near Grants Pass and Medford.

REMARKS: Very little is known about this plant. It may be extinct but additional surveys will be necessary before we can make this assumption with any degree of certainty. Too often plants are labeled "extinct" prior to adequate field searches.

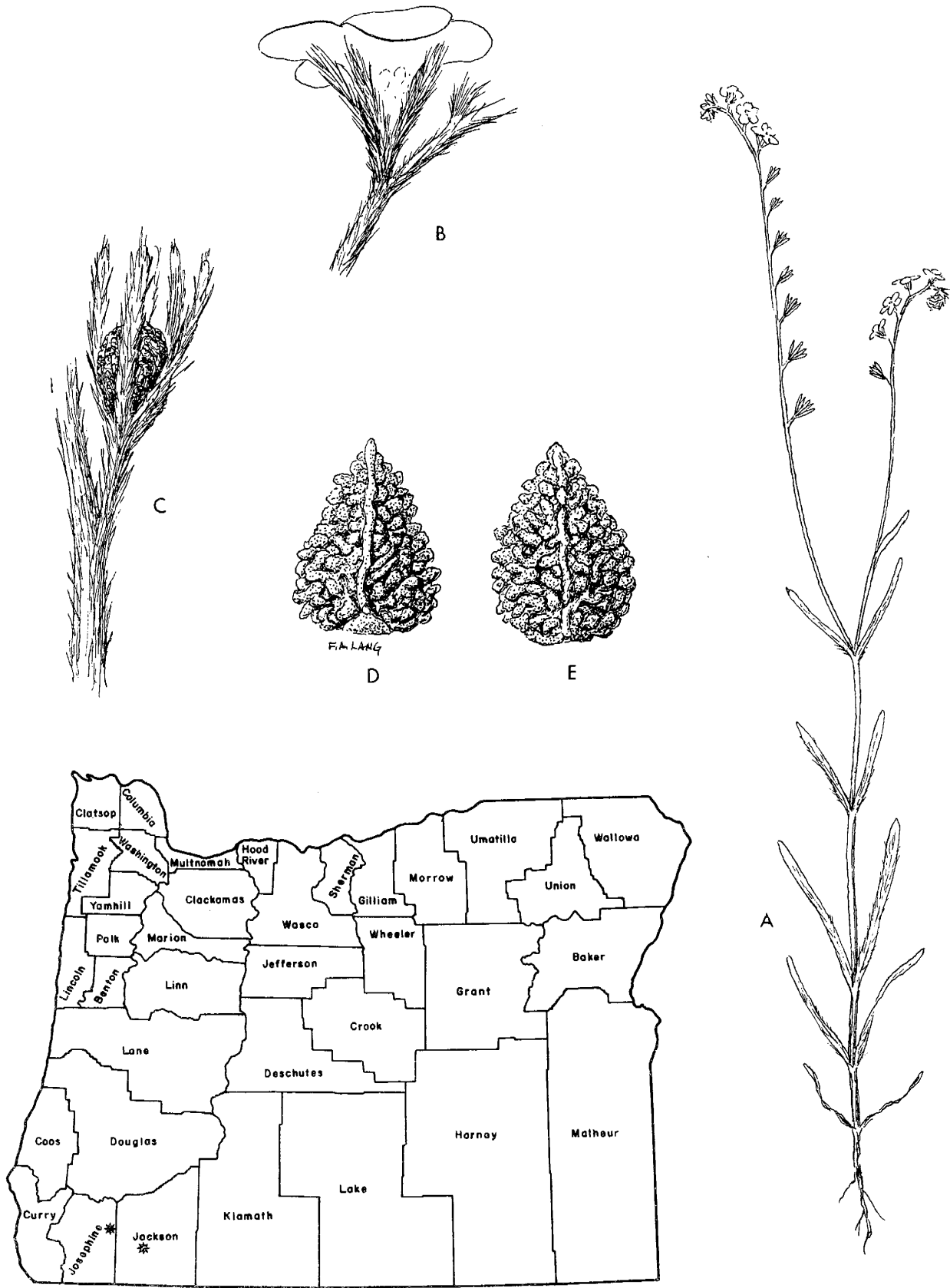


Fig. 132. *Plagiobothrys hirtus* ssp. *corallicarpa*. A: Habit, X 0.5; B: Flower, X 4; C: Fruiting calyx, nutlets inside, X 5; D: Nutlet, ventral side, X 16; E: Nutlet, dorsal view, X 16 (drawn from Heller 10026, DS).

PLAGIOBOTHRYUS HIRTUS (Greene) Johnst. SSP. HIRTUS

(Rough popcornflower)

Borage family (Boraginaceae)

ORIGINAL PUBLICATION: Studies in the Boraginaceae, XI. Journal of the Arnold Arboretum 16:193. 1935.

SYNONYMS: *Allocarya hirta* Greene (Pittonia 1:161. 1888).
Allocarya scouleri var. *hirta* (Greene) Nelson & Macbr. (Bot. Gaz. 61:36. 1916).
Allocarya calycosa Piper (Contr. U.S. Nat. Herb. 22:101. 1920).
Plagiobothrys scouleri var. *hirtus* I.M. Johnst. (Contr. Arnold Arb. 3:52. 1932).

STATUS: Candidate species for federal listing, Category 1, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Annual, stem stout, erect or reclining, 30-70 cm high, pubescent above, glabrous below; leaves linear, the three to five lower pairs opposite, the upper alternate; racemes bractless, in pairs, terminating the branches; pedicels 1-2 mm long; calyx hirsute, 5-6 mm in fruit; flowers white; nutlets ovate, 2 mm long, with prominent dorsal keel, scar large and nearly basal (after Peck, 1961).

DISTRIBUTION: Apparently restricted to the Umpqua Valley of Douglas County, in southwest Oregon.

LOOK ALIKES: *Plagiobothrys hirtus* ssp. *hirtus* may be confused with *P. scouleri* and *P. figuratus*. *P. hirtus* ssp. *hirtus* may be distinguished by its wide spreading as opposed to oppressed pubescence. *Plagiobothrys scouleri* also differs in having bracteate and unpaired racemes and smaller flowers, 4 mm or less in diameter. *Plagiobothrys hirtus* ssp. *corallicarpa* differs in its strongly alveolate, irregularly ridged nutlets (see page 267).

PHENOLOGY: Flowering from mid to late June, perhaps into July.

HABITAT: According to label data, in boggy, marshy sites in grasslands, between 100 and 150 m.

LAND OWNERSHIP/MANAGEMENT: Possibly Oregon Department of Transportation.

PRESENT AND POTENTIAL THREATS: Unknown. Probably competition from weedy species and habitat conversion have played important threatening roles.

MANAGEMENT RECOMMENDATIONS: Field work is needed to determine how many extant populations exist and to assess essential habitat.

REMARKS: Four collections have been recorded for this taxon, one in the 1880's, two in the 1930's, and the last in 1961. This plant was probably never common and may be extinct despite the one relatively recent collection. It was along a major highway.

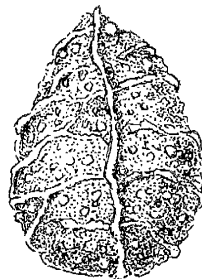
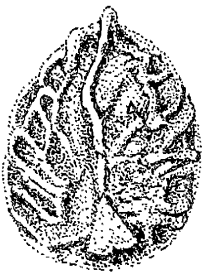
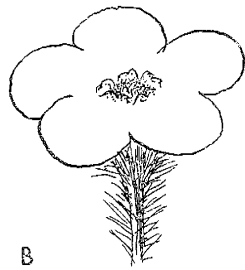
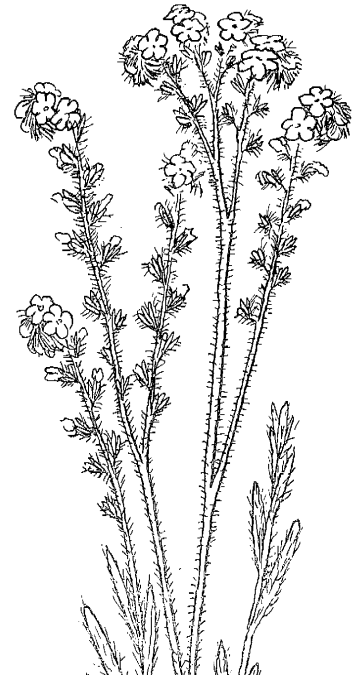
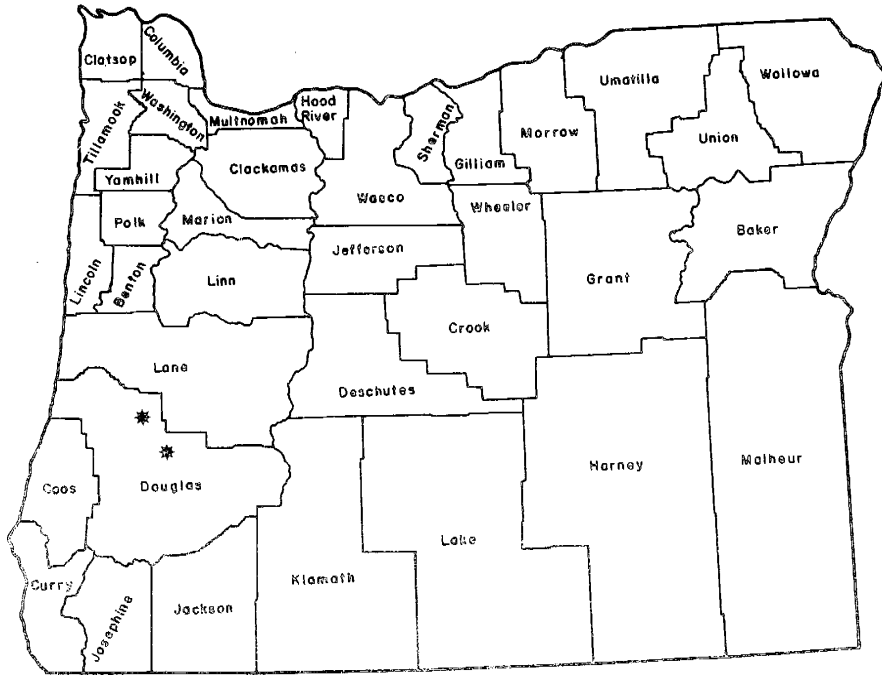


Fig. 133. *Plagiobothrys hirtus* ssp. *hirtus*. A: Habit, X 0.4; B: Flower, X 3; C: Nutlet, ventral side, X 18; D: Nutlet, dorsal side, X 18 (drawn from Peck 20179, WILLU).

PLAGIOBOTHRYVS LAMPROCARPUS (Piper) Johnst.

(Shiny fruited popcornflower)

Borage family (Boraginaceae)

ORIGINAL PUBLICATION: Contributions from the Arnold Arboretum 3:56-57. 1932.

SYNONYMS: *Allocarya lamprocarpa* Piper (Proc. Biol. Soc. Wash. 37:94. 1924).

STATUS: Candidate species for federal listing, Category 1, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Erect annual, 10-30 cm tall, stems simple; leaves pubescent, linear, 1-2 cm long, pubescent below, glabrous above; racemes one sided, bracted only towards base; fruiting calyx somewhat thickened at base, lobes lanceolate, 1-2 mm long; corolla whitish, very small; nutlets one or two, broadly ovate, 1.6 mm long, 1 mm broad, apex incurving, dorsum with broad keel and ridges, ventral keel strongly developed (after Peck, 1961; Johnston, 1932).

DISTRIBUTION: Known only from Josephine County near Grants Pass, in southwest Oregon.

LOOK ALIKES: Although *Plagiobothrys* species may be difficult to distinguish and morphologically quite similar, *P. lamprocarpus* has a "very peculiar nutlet" (Johnston, 1932). This is presumably the only reliable distinguishing character from the other annual members of the genus.

PHENOLOGY: Known to flower in June.

HABITAT: "In moist places in an old road", according to data from the type collection. Specific habitat data are nonexistent.

LAND OWNERSHIP/MANAGEMENT: Unknown. This site may now be incorporated within the city limits of Grants Pass.

PRESENT AND POTENTIAL THREATS: Agricultural and urban development are possible threats.

MANAGEMENT RECOMMENDATIONS: Intensive field searches should be conducted to try and locate any remaining populations of this species.

REMARKS: This species is known only from the type collection of 1921. If it is indeed strictly endemic to this part of Josephine County it is unlikely, if rediscovered, that it will occur on federal land. Nevertheless, this should not discourage field workers from continuing to search for extant populations, even if they do occur on private or city owned property.

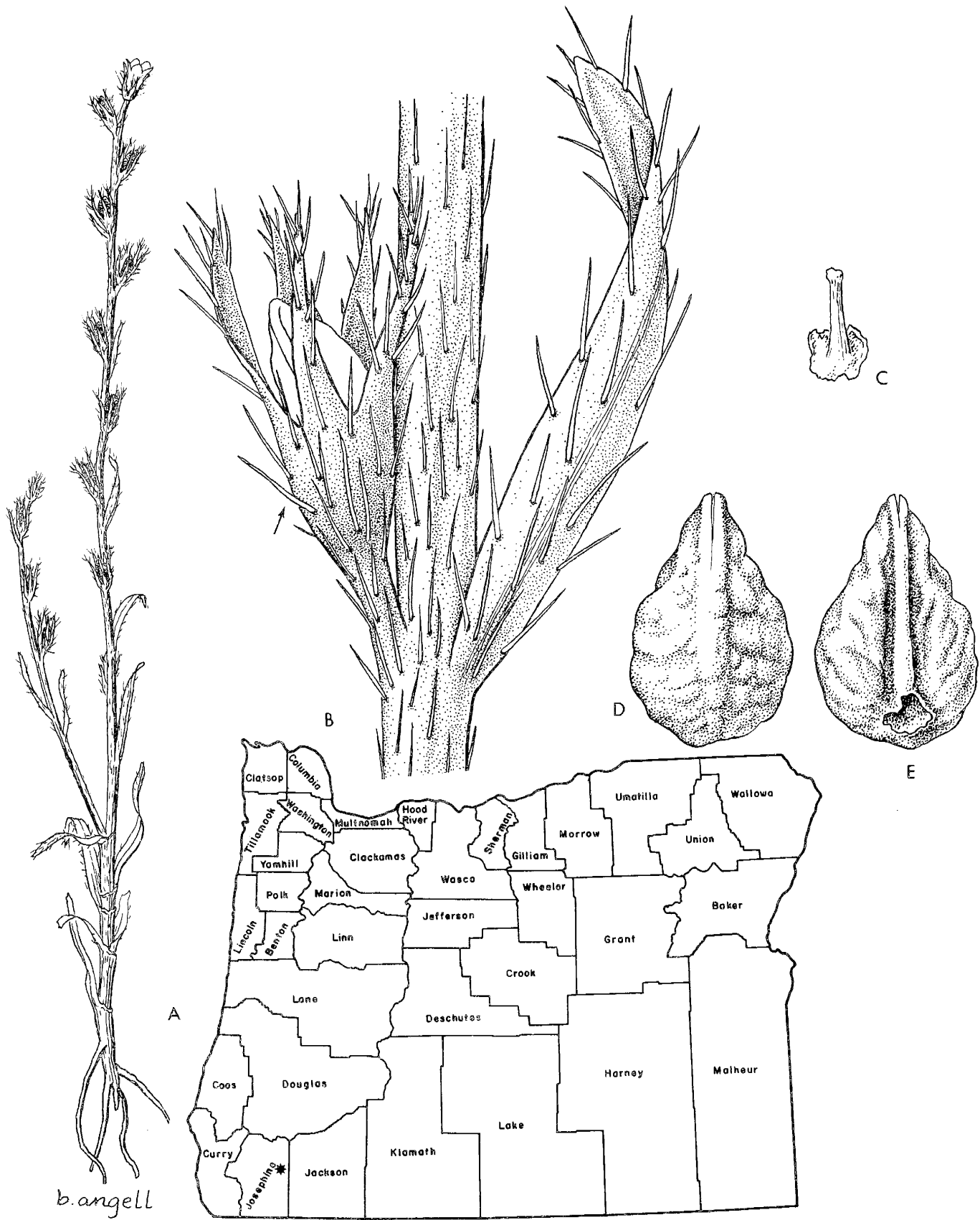


Fig. 134. *Plagiobothrys lamprocarpus*. A: Habit, X 1.8; B: Stem close-up, indicating fruiting calyx opposite floral bract, X 18; C: Style from developing fruit, X 20; D: Nutlet, dorsal side, X 25; E: Nutlet, ventral side, X 25 (drawn from Piper 5023 [isotype], NY).

PLEUROPOGON OREGONUS Chase

(Oregon semaphoregrass)

Grass family (Poaceae)

ORIGINAL PUBLICATION: Jour. Wash. Acad. Sci. 28:52-53. 1938.

STATUS: Candidate species for federal listing, Category 1, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Glabrous, perennial grass from slender rhizomes with purplish red scales and long soft internodes; culms erect, soft and spongy, 55-90 cm tall; sheaths closed 3/4 their length, purplish red; blades erect, flat, 8-18 cm long, 4-7 mm wide; raceme 7-20 cm long, bearing six to eight spikelets, each spikelet seven to fourteen flowered, upper florets pistillate, the lower perfect; glumes unequal, 2-4 mm long; lemmas strongly seven nerved, 5.5-7 mm long, bearing an awn 5-12 mm long at apex; paleas same length as lemmas, with two subapical awns 2-7 mm long (after Chase, 1938).

DISTRIBUTION: Known only from disjunct locations in Lake and Union counties, Oregon.

PHENOLOGY: The Oregon semaphoregrass flowers in June.

HABITAT: Moist meadows and marshland at about 750-1200 m elevation (Benson, 1941); undoubtedly with numerous aquatic and semiaquatic associates.

LAND OWNERSHIP/MANAGEMENT: Unknown, possibly State Game Refuge and private in Union County.

PRESENT AND POTENTIAL THREATS: Unknown, although grazing and agriculture would be potentially threatening land uses.

MANAGEMENT RECOMMENDATIONS: Suitable marsh habitats in Lake and Union counties have been recently searched for this species without success. Future inventories are needed.

REMARKS: This species is known from only three herbarium specimens, the most recent of which was collected west of Adel, Lake County in 1937. Peck (1961) states that this is "one of the rarest of Oregon grasses." Statewide opinion suggests this species is extinct. Considering the marshy habitat, its geographic range which is not well collected, and the fact that many botanists (perhaps not admittedly) shy from collecting graminoids, one may assume that relocation efforts for *P. oregonus* have probably been minimal at best.



Fig. 135. *Pleuropogon oregonus*. A: Habit, X 0.3; B: Flowering spikelet, X 1.5; C: Floret, illustrating the paired palea awns, X 8 (drawings taken from Hitchcock et al., 1969).

POA MARCIDA A.S. Hitchc.

(Weak bluegrass)

Grass family (Poaceae)

ORIGINAL PUBLICATION: Pro. Biol. Soc. Wash. 41:158. 1928.

STATUS: Candidate species for federal listing, Category 1, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Tufted perennial grass, culms smooth, 3-8 dm tall, more or less decumbent; sheaths smooth, closed to near the tip; ligules inconspicuous; leaf blades soft, flat, ca. 1-2.5 dm long, 1-2.5 mm wide; panicle narrow, 10-18 cm long, the branches distant; spikelets mostly two flowered; lemmas 4.5-5 mm long (after Hitchcock, 1969).

DISTRIBUTION: From northwest Oregon in Tillamook, Clatsop, and Yamhill counties north to Vancouver Island, British Columbia.

LOOK ALIKES: The short ligules, nearly closed sheaths, and two flowered spikelets should help distinguish this from other local bluegrasses.

PHENOLOGY: Flowering in June and July.

HABITAT: Moist areas in deep, coastal coniferous forests. Primarily in *Pseudotsuga* and *Tsuga* associations, on the mountain slopes and flats. Associated species include *Abies amabilis*, *Oxalis oregana*, *Alnus rubra*, and *Streptopus streptopoides*.

LAND OWNERSHIP/MANAGEMENT: U.S. Forest Service, Bureau of Land Management private, and probably State of Oregon.

PRESENT AND POTENTIAL THREATS: Heavy logging is the primary potential threat, in the form of physical destruction of populations as well as elimination through the competitive pressures of weedy species which invade or are sown in logged areas.

MANAGEMENT RECOMMENDATIONS: *Poa marcida* must be carefully evaluated with respect to logging activities in its habitat.

REMARKS: Recent studies have revealed several additional populations of *P. marcida*, perhaps validating Hitchcock's (1969) remark that "it is probably less rare than extant collections would indicate." Scofield et al. (1979) state that *P. marcida* cannot tolerate clear cutting, but that the less intense surface disturbance associated with partial cuts or thinning may be acceptable. These types of cutting would not be suitable, of course, if they were followed by the usual practice of heavy seeding of foreign species designed to hamper erosion. The Salem Office of the Bureau of Land Management has done an excellent job in initiating research on this species.



JRJ

Fig. 136. *Poa marcida*. A: Habit, X 0.3; B: Spikelet, X 10; C: Single floret, X 8 (drawings taken from Hitchcock et al., 1969).

POA PIPERI A.S. Hitchc.

(Piper's bluegrass)

Grass family (Poaceae)

ORIGINAL PUBLICATION: Illustr. Fl. Pac. States 1:201. 1923.

STATUS: Candidate species for federal listing, Category 2, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Perennial grass with long underground rhizomes and culms 1-4.5 dm tall, glabrous; sheaths glaucous or striate, closed to one half their length, sparsely pubescent or glabrous; leaf blades 30-60 cm long, 0.5-2 mm wide, lightly pubescent on ventral surface only; ligule short, 1-2 mm; inflorescence paniculate; plants dioecious, staminate and pistillate plants externally indistinguishable; spikelets with four or five flowers, 3-12 mm long; lemmas 3-6 mm long, nearly glabrous (after Marsh, 1952).

DISTRIBUTION: Endemic to southwest Oregon, in Josephine and Curry counties, south to adjacent Del Norte County, California.

LOOK ALIKES: *Poa rhizomata* has longer ligules and densely pubescent, cobwebby lemmas.

PHENOLOGY: Flowering from April to June.

HABITAT: Found on dry, rocky serpentine slopes, typically in open pine woods or in meadows at lower mid elevations (to ca. 1000 m). Associated species include *Viola cuneata*, *Senecio canus*, *Festuca rubra*, *Phlox diffusa*, and *Pinus jeffreyi*.

LAND OWNERSHIP/MANAGEMENT: U.S. Forest Service and possibly private.

PRESENT AND POTENTIAL THREATS: Grazing, logging, and strip mining of serpentine for mineral content are potential threats.

MANAGEMENT RECOMMENDATIONS: This should be considered a sensitive species with regard to mining. Inventories to accurately determine its frequency are needed.

REMARKS: At least one recent collection label lists *P. piperi* as "a major dominant". Further study may show it is not in need of protection, despite its limited geographic range and edaphic obligation to a mineral rich substrate. There is a definite need for additional inventory and documentation, however, particularly in Josephine County.

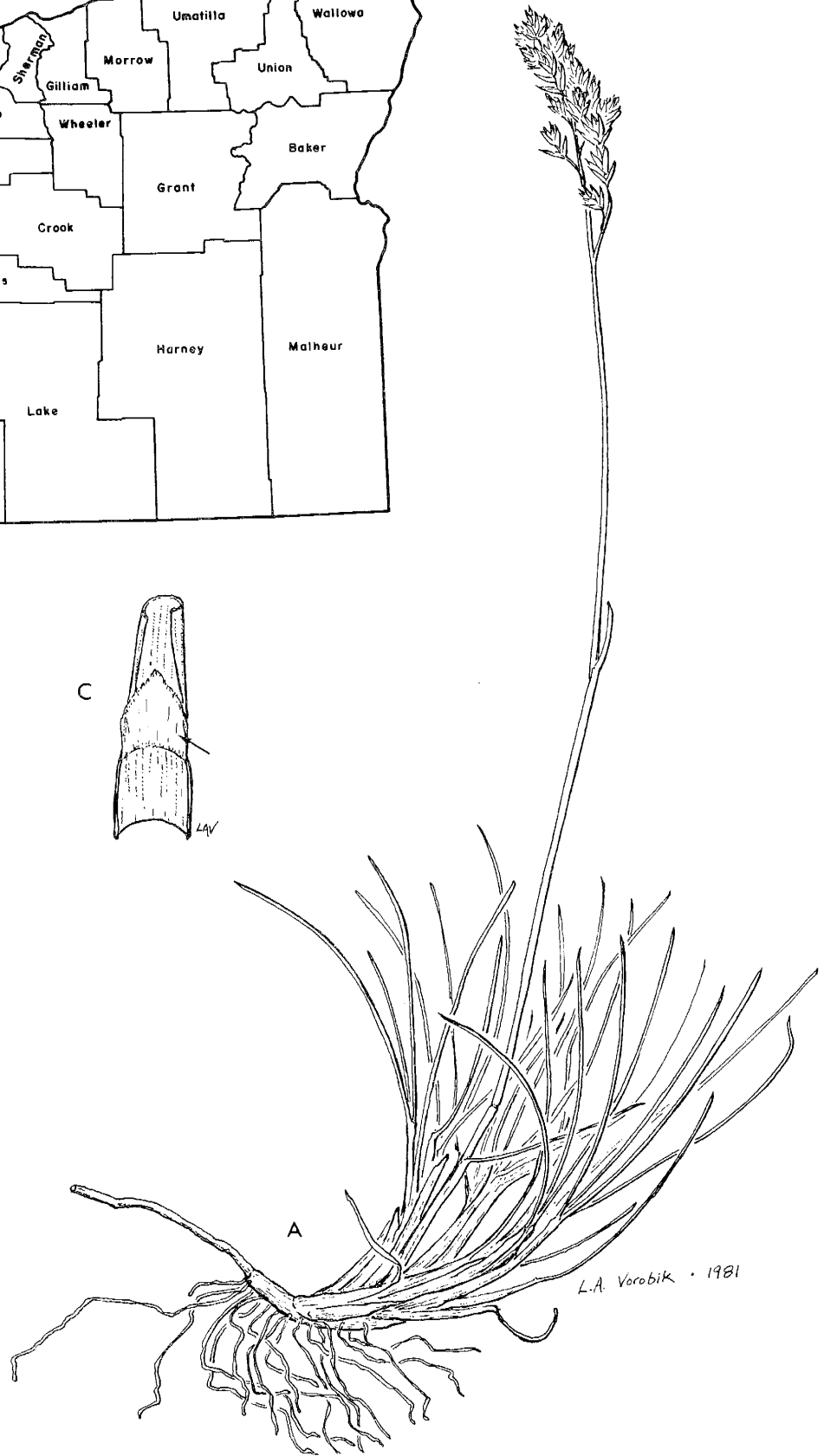
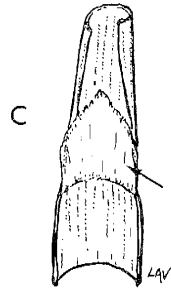
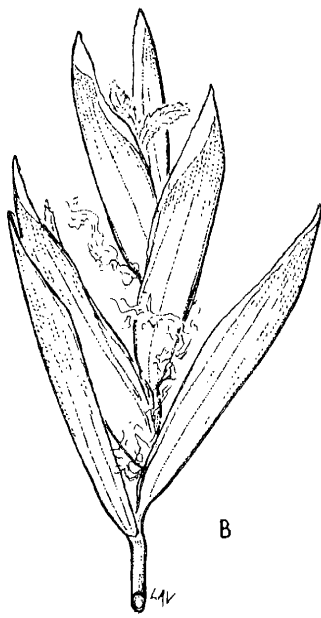
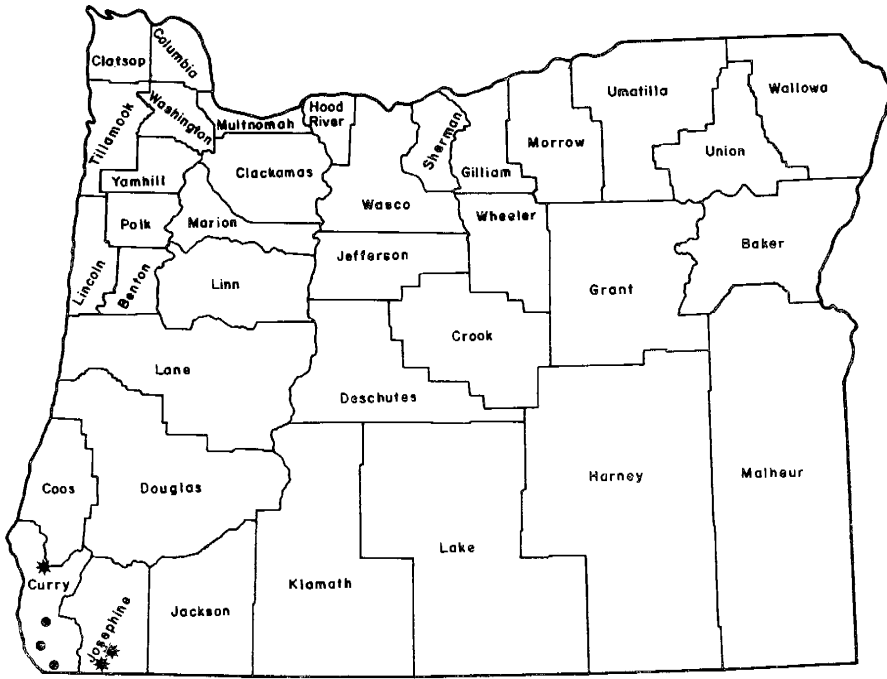


Fig. 137. *Poa piperi*. A: Habit, X 1; B: Spikelet, X 7; C: Opened leaf sheath, displaying ligule, X 6 (drawn from Sundberg 950, ORE).

RANUNCULUS AUSTRO-OREGANUS Benson

(Southern Oregon buttercup)

Buttercup family (Ranunculaceae)

ORIGINAL PUBLICATION: Amer. Midl. Nat. 52:341-342. 1950.

STATUS: Candidate species for federal listing, Category 2, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Perennial herb from a thickened rootstock, slender and erect with one to few stems ca. 2-4 dm high, sparingly branched; leaves few, the lower cauline three parted, the divisions two or three cleft, the blade 3-4 cm long, loosely hairy above but long silky pubescent below, petioles 5-10 cm long, upper leaves reduced; inflorescence branches few, pedicels ca. 1 cm long; sepals villous; petals oblong, 8-10 mm long, light yellow or whitish within, purplish red veined dorsally; achenes to 4 mm long (after Peck, 1961).

DISTRIBUTION: Endemic to central Jackson County, Oregon.

LOOK ALIKES: The conspicuously purplish red veined petals (dorsally) and the petal number should distinguish this species from *R. californicus* and *R. occidentalis*.

PHENOLOGY: Flowering from mid April to late May.

HABITAT: On damp or dry, grassy loam slopes, often among scattered oak, at elevations around 500 to 600 m.

LAND OWNERSHIP/MANAGEMENT: Private, possibly U.S. Forest Service and Bureau of Land Management.

PRESENT AND POTENTIAL THREATS: Grazing, spraying, and agricultural and urban developments are potential threats.

MANAGEMENT RECOMMENDATIONS: More intensive searches for this rare buttercup are needed. Populations located on federal land should be carefully considered in land management decisions.

REMARKS: The label from at least one comparatively recent collection of this species indicates local abundance. Overall, however, there have been very few collections in the last thirty years, particularly on federally controlled land. It is one of the most attractive of Oregon's numerous native species of *Ranunculus*.

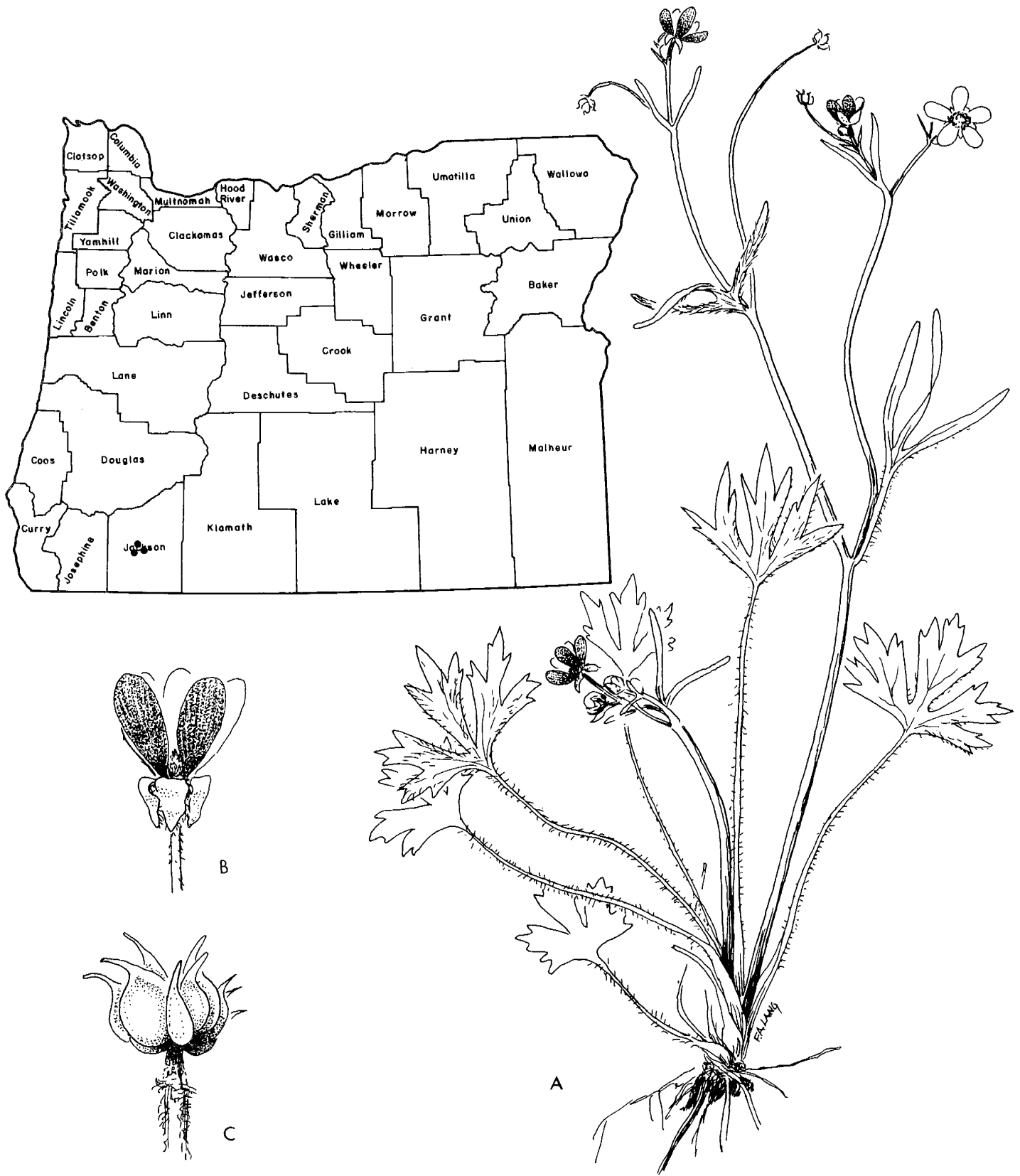


Fig. 138. *Ranunculus austro-oreganus*. A: Habit, X 0.8; B: Flower, X 2; C: Cluster of achenes, X 4 (drawn from Gentner & Steward 6681, OSC).

RANUNCULUS RECONDITUS Nels. & Macbr.

(Obscure buttercup)

Buttercup family (Ranunculaceae)

ORIGINAL PUBLICATION: Bot. Gaz. 56:473. 1913.

SYNONYMS: *Ranunculus triternatus* Gray (Proc. Am. Acad. 21:370. 1886).
Ranunculus glaberrimus Hook. var. *reconditus* Benson (Amer. Jour. Bot. 23:170. 1936).

STATUS: Candidate species for federal listing, Category 1, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Perennial herb, 5-15 cm tall; leaves mostly basal, finely dissected, triternately parted or divided, the primary divisions long petiolate, with the secondary and finer divisions filiform linear to linear spatulate, obtuse, the dissected blade deltoid to reniform in outline, 3-4 cm long, 3-5 cm broad; cauline leaves similar to the basal; flowers on nearly naked stalks, bright yellow, petals 8-15 mm long; achenes small, numerous (after Benson, 1948; Hitchcock, 1964).

DISTRIBUTION: Above the Columbia River in Wasco County, Oregon and adjacent Klickitat County, Washington. Recent collections of the taxon from Idaho are misidentified. Benson (1948) reports a disjunct population in Elko County, Nevada.

LOOK ALIKES: *Ranunculus reconditus* is recognized by its triternately dissected leaves, a unique feature of the genus within its range and habitat.

PHENOLOGY: The obscure buttercup flowers in April and May.

HABITAT: *Ranunculus reconditus* inhabits well drained sagebrush slopes, probably at lower to middle elevations (900 to 1200 m). Associated species are not specifically known but are speculated to include *Artemisia tridentata*, *Agropyron spicatum*, *Poa sandbergii* and various herbaceous genera such as *Erigeron*, *Allium*, *Penstemon*, and *Castilleja*.

LAND OWNERSHIP/MANAGEMENT: Unknown, probably private.

PRESENT AND POTENTIAL THREATS: Specific threats are not documented but grazing and agriculture may be potential threats.

MANAGEMENT RECOMMENDATIONS: A diligent search of public land which may yet harbor populations is needed. Any sites located should be given immediate protection and the sites designated critical habitat if appropriate. Exclusion of grazers would be mandatory. Extant sites discovered on private property could be protected by land exchange, or by soliciting the aid of cooperative landowners.

REMARKS: This buttercup is known from a very few collections. It may be on the brink of extinction in Oregon, tenuously surviving in Washington.

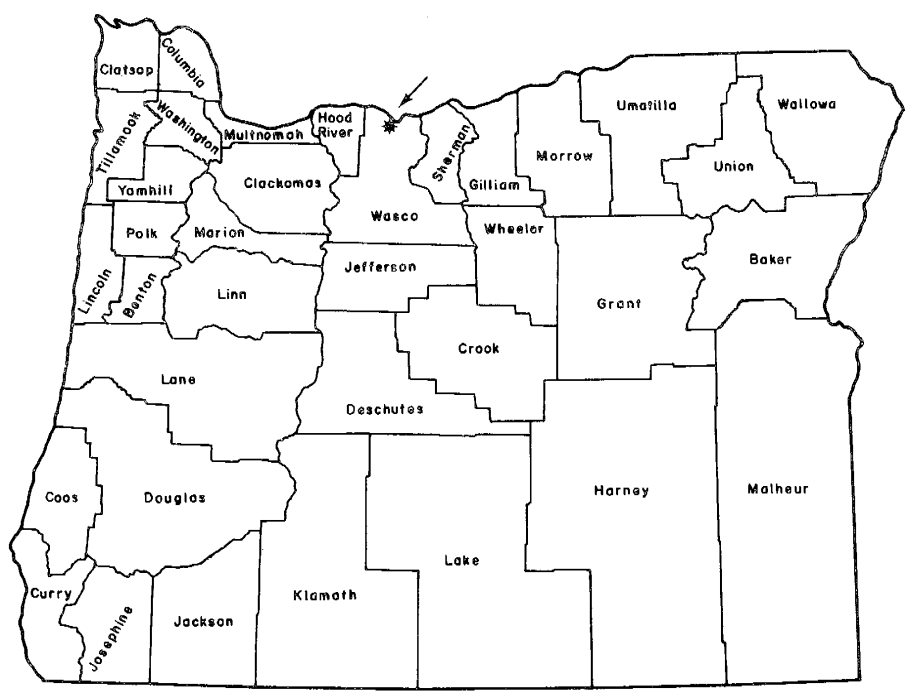
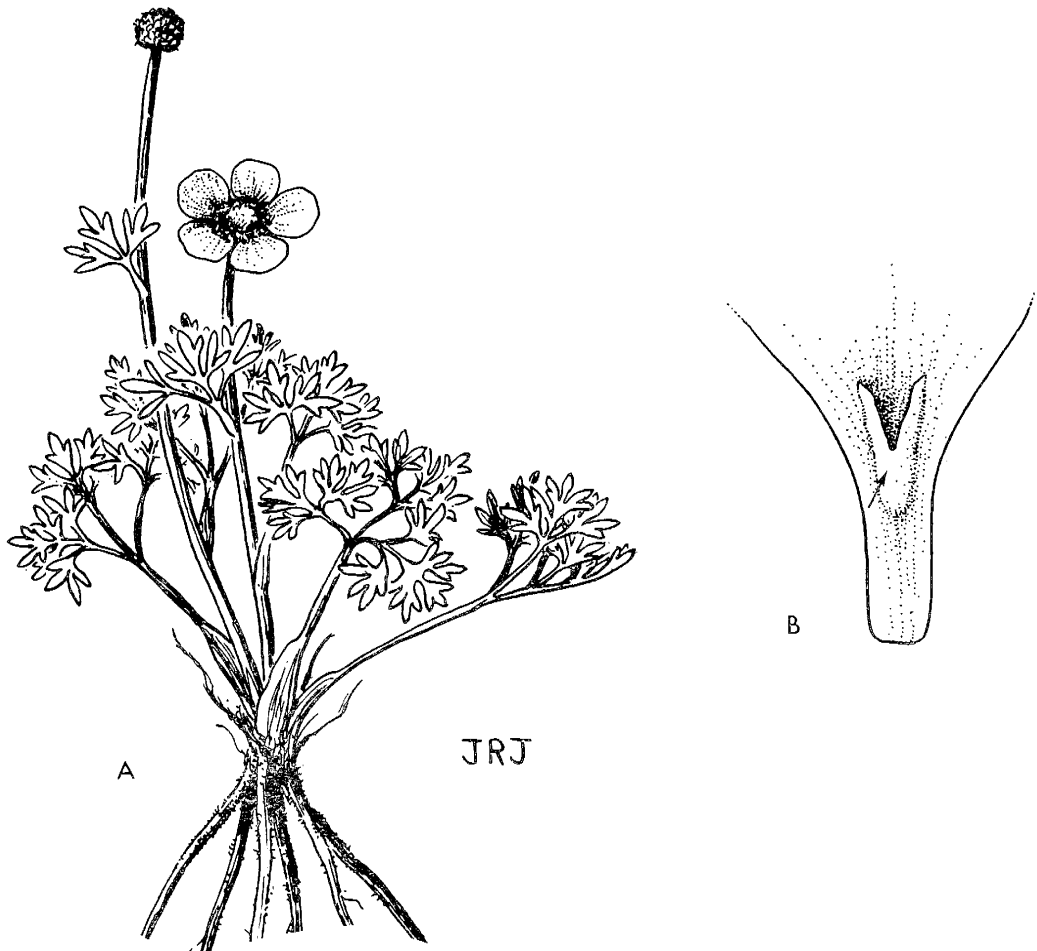


Fig. 139. *Ranunculus reconditus*. A: Habit, X 0.8; B: Base of petal indicating v-shaped gland, X 12 (drawings taken from Hitchcock et al., 1964).

RORIPPA COLUMBIAE (Robbins.) Howell

(Columbia cress)

Mustard family (Brassicaceae)

ORIGINAL PUBLICATION: Fl. N.W. Am. 1:40. 1897.

SYNONYMS: *Nasturtium sinuatum* var. *columbiae* Suksd. ex Robins. in Gray (Syn. Fl. N. Amer. 1:147. 1895).

Nasturtium columbiae Suksd. (Deutsch. Bot. Mon. 16:211. 1898).

Radicula columbiae Greene (Leafl. Bot. Obs. 1:114. 1905).

Rorippa calycina var. *columbiae* Rollins (Contr. Dudley Herb. 3:176. 1941).

STATUS: Candidate species for federal listing, Category 2, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Rhizomatous perennial, finely hirsute to papillose throughout, the stems 1-4 dm long, usually somewhat weak (and decumbent or spreading) to erect, rather freely branched; leaves 3-7 cm long, pinnatifid, the lower ones petiolate, the upper ones sessile and often somewhat auriculate, the segments ovate to oblong, often toothed; pedicels spreading to ascending, 4-8 mm long; sepals not saccate at the base, tending to persist after anthesis; petals light yellow, about 4 mm long; siliques ascending to erect, oblong, usually somewhat arcuate, 4-7 mm long, 2-2.5 mm broad, soft pubescent; style 1-2 mm long; stigma entire (after Hitchcock, 1964).

DISTRIBUTION: At very scattered sites in the Pacific States, mostly areas east of the Cascades crest. In Oregon, along the Columbia River and in Harney and Lake counties, although perhaps across southeast Oregon from Malheur to Jackson counties. Hitchcock & Cronquist (1973) report it as "occasional east to Montana, Nebraska, and New Mexico."

LOOK ALIKES: The yellow flowered species of *Rorippa* are superficially quite similar. *R. columbiae* may be distinguished by its rhizomatous habit, pinnatifid or lyrate pinnate leaves, and the rather stubby, oblong fruit.

PHENOLOGY: This species flowers from May to early September.

HABITAT: Moist areas in gravelly soil, generally along rivers, near springs, or in sites which are vernal wet, probably at lower to middle elevations. Surrounding vegetation is generally dominated by *Artemisia* spp. and various bunchgrasses.

LAND OWNERSHIP/MANAGEMENT: Private and apparently on Bureau of Land Management rangeland.

PRESENT AND POTENTIAL THREATS: Riparian zones and spring sites are natural gathering points for livestock and the concentrated use of these areas has probably contributed to the scarcity of this rare species.

MANAGEMENT RECOMMENDATIONS: Populations on public lands should be protected from grazing influences.

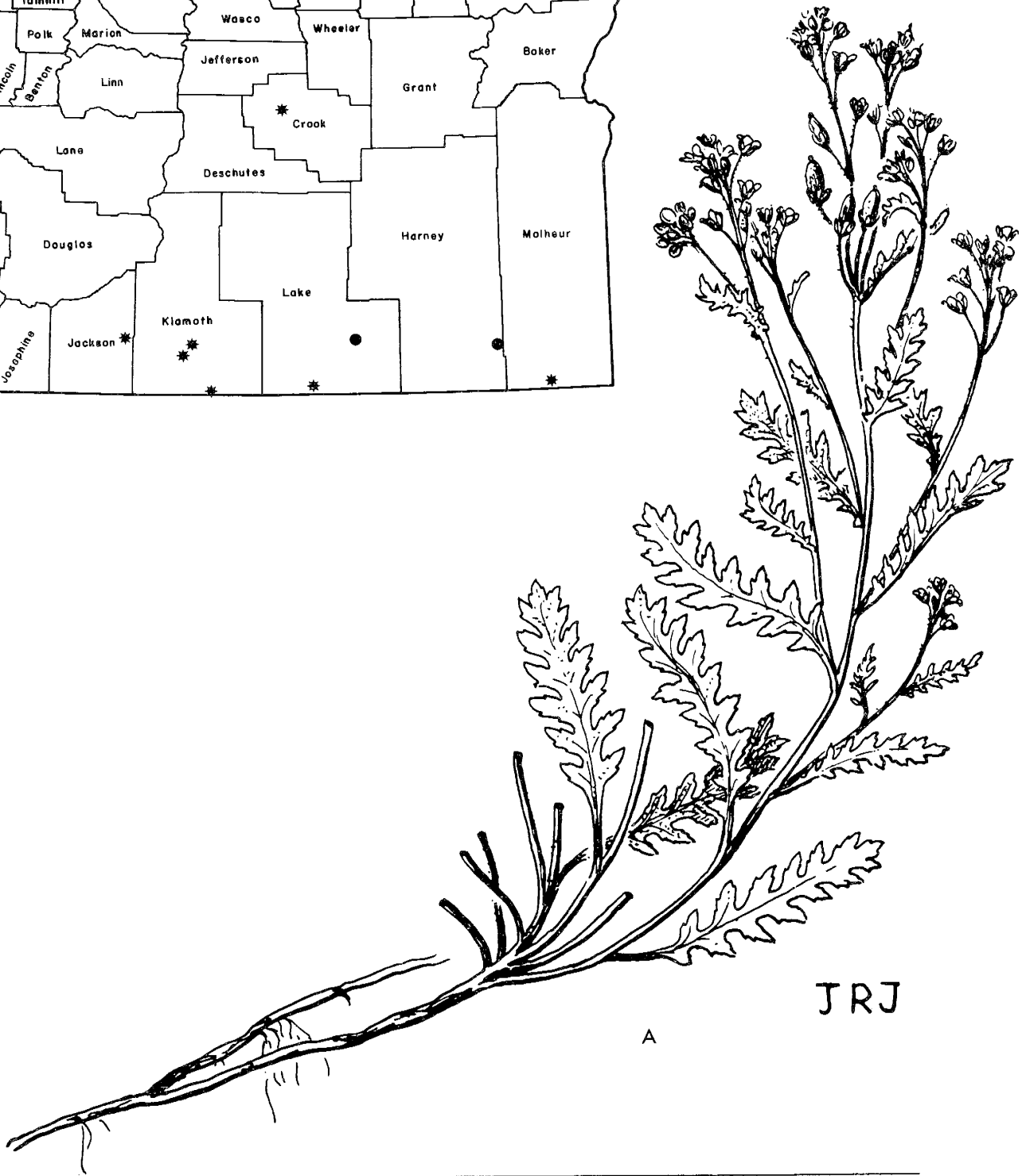
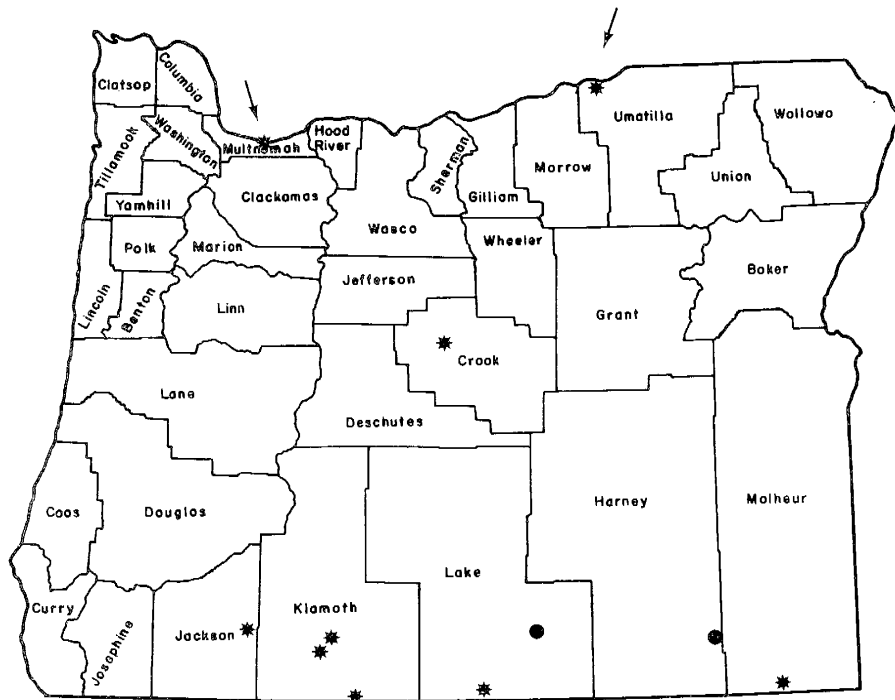


Fig. 140. *Rorippa columbiae*. A: Flowering and fruiting habit, X 1 (drawing taken from Hitchcock et al., 1964).

SANICULA TRACYI Shan & Const.

(Tracy's sanicle)

Parsley family (Apiaceae)

ORIGINAL PUBLICATION: Univ. of Calif. Publ. Bot. 25:69. 1951.

STATUS: Candidate species for federal listing, Category 1, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Slender, erect biennial, 3.5-6 dm tall, the single stem sparingly branched, purplish below from a slender, elongated taproot; basal leaves few, petiolate, ovate, 2.5-3.5 cm long, 2-4 cm broad, ternately and pinnately twice lobed or divided, the margins serrate; inflorescence of several capitate yellow clusters, each with six to ten flowers, of which half are slender stalked, staminate, and sterile; calyx lobes minute, ovate, united to the middle; fruits one to three per cluster subglobose, 2-3 mm in diameter, covered with low, inflated tubercles, only the uppermost of these bearing prickles (after Constance, 1977).

DISTRIBUTION: This taxon is distributed in the Siskiyou Mountains of Josephine County in southwest Oregon, and adjacent California in Trinity and Humboldt counties.

LOOK ALIKES: *Sanicula tracyi* may be distinguished by its ternately pinnate basal leaves, fusiform taproot, and apically prickly or totally unarmed fruit (Munz, 1959). Several other sanicles occur in southwest Oregon.

PHENOLOGY: Flowering from April to June, perhaps into July.

HABITAT: *Sanicula tracyi* prefers dry gravelly flats or slopes, usually in or at the margin of oak woodland with scattered trees (Constance, 1977), at higher elevations.

LAND OWNERSHIP/MANAGEMENT: Found on U.S. Forest Service lands.

PRESENT AND POTENTIAL THREATS: Threats to *S. tracyi* may include logging, mining, and collecting.

MANAGEMENT RECOMMENDATIONS: Future disturbances of potential habitat for this plant should be analyzed to ascertain the most likely conflicts.

REMARKS: Constance (1977) commented, "distribution is apparently very local, suggesting vulnerability." Recent field work has uncovered several unvouchered populations in Oregon, all of which are small but thriving. Although *S. tracyi* occurs sympatrically with several other species of *Sanicula*, there is no evidence of hybridization (Jacque Greenleaf, pers. comm.).

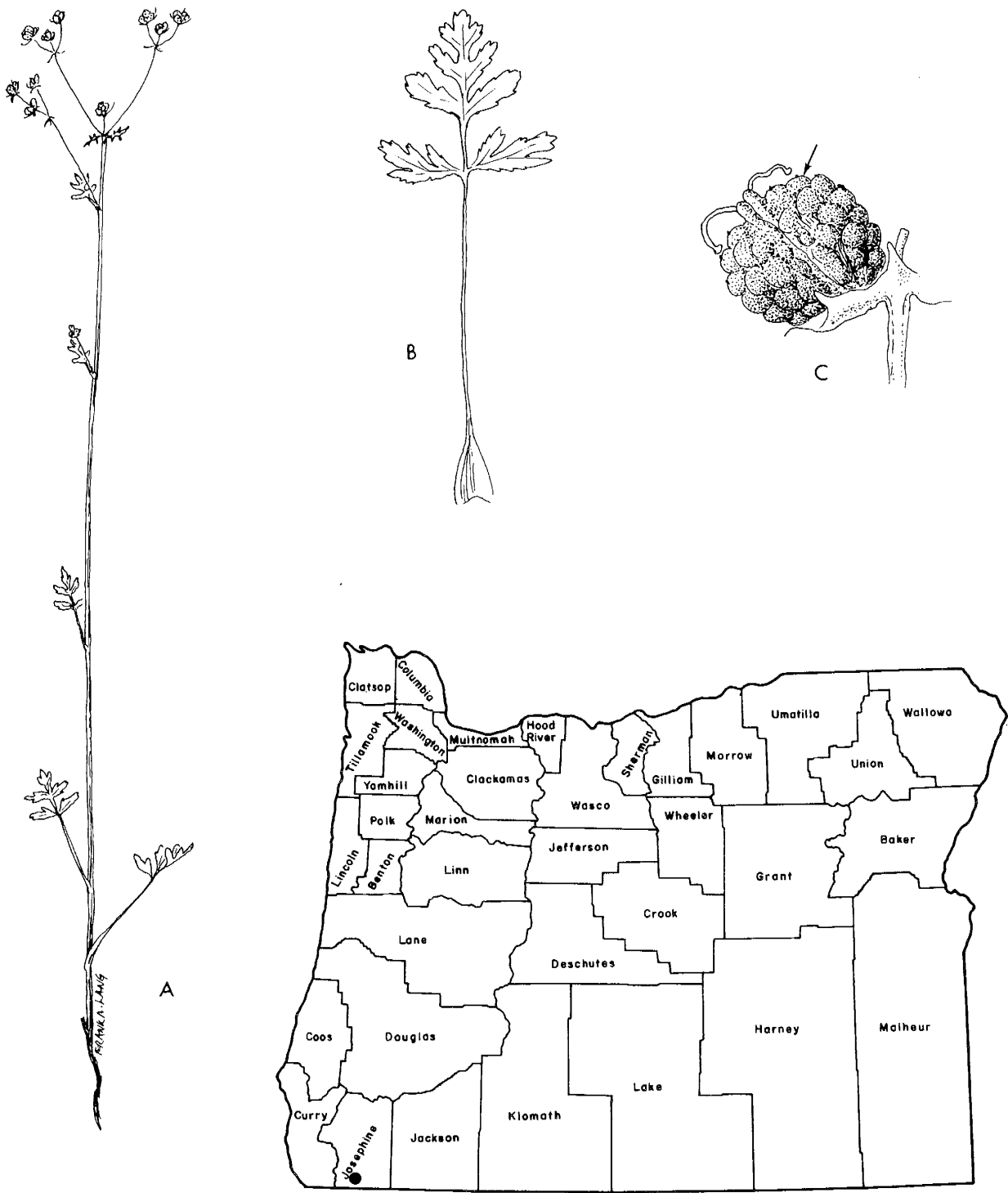


Fig. 141. *Sanicula tracyi*. A: Habit, X 0.3; B: Leaf blade and petiole, X 0.8; C: Fruit, illustrating inflated tubercles, X 10 (drawn from Tracy 19622, UC).

SAXIFRAGA OCCIDENTALIS Wats. VAR. LATIPETIOLATA Hitchc.

(Saddle Mountain saxifrage)

Saxifrage family (Saxifragaceae)

ORIGINAL PUBLICATION: Vasc. Pl. Pac. Northw. 3:49-50. 1961.

STATUS: Candidate species for federal listing, Category 1, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Perennial, rosette forming herb with short, stout rhizome, 5-30 cm tall, variously pubescent but usually reddish glandular; leaves widely ovate, up to 6 cm long and 3 cm broad, tapering to a short, broad petiole, margins toothed; inflorescence a many flowered head, flowers pinkish or purplish tinged; fruit a follicle, greenish to reddish purple, 2.5-6 mm long (after Hitchcock, 1961; Perkins, 1978).

DISTRIBUTION: In the northern Coastal Range of Clatsop and northern Tillamook counties, Oregon.

TAXONOMIC PROBLEMS: According to Hitchcock (1961), "*Saxifraga occidentalis* is a complex and variable species consisting of numerous local races, nearly all of which have been recognized at more than one taxonomic level. Several of these are more striking than others, but without exception they are interfertile, as judged by their intergradation". Perkins (1978) presents evidence indicating that var. *latipetiolata* could be treated at the species level.

LOOK ALIKES: The var. *latipetiolata* may be distinguished from other varieties of the species by its broad petiole that is much shorter than the leaf blade and the dense pubescence of the inflorescence with inconspicuously yellow glandular hairs.

PHENOLOGY: This taxon blooms from April to August.

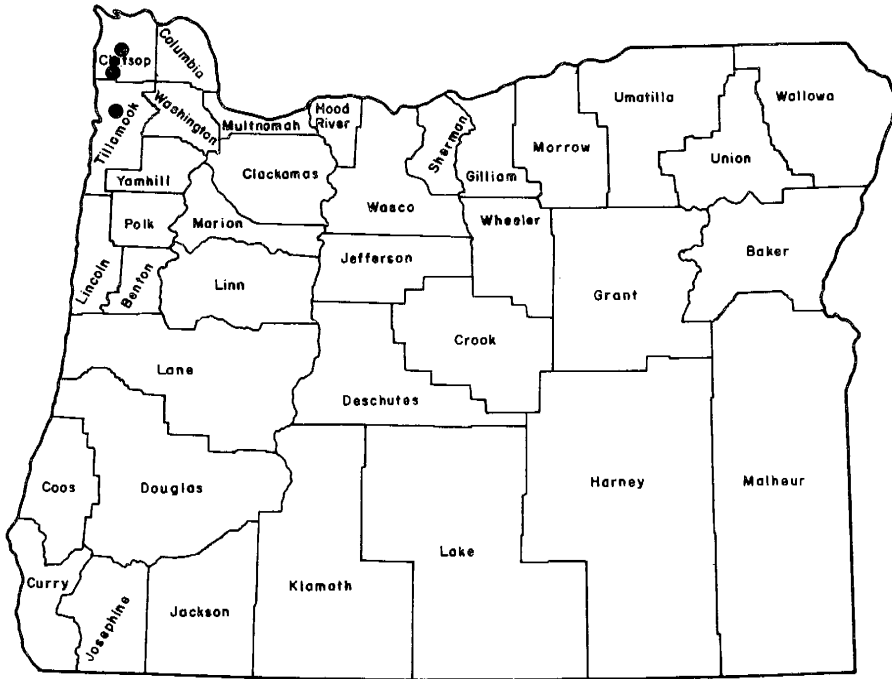
HABITAT: Occurring in shallow soil of volcanic origin and moist, grassy mountaintop areas. Associated species include *Abies amabilis*, *Tsuga heterophylla*, *Iris tenax*, *Lomatium martindalei*, *Ranunculus occidentalis*, and *Saxifraga caespitosa*. To be expected at elevations between 600 and just over 1000 m.

LAND OWNERSHIP/MANAGEMENT: Oregon State Parks (Saddle Mountain), and possibly Bureau of Land Management.

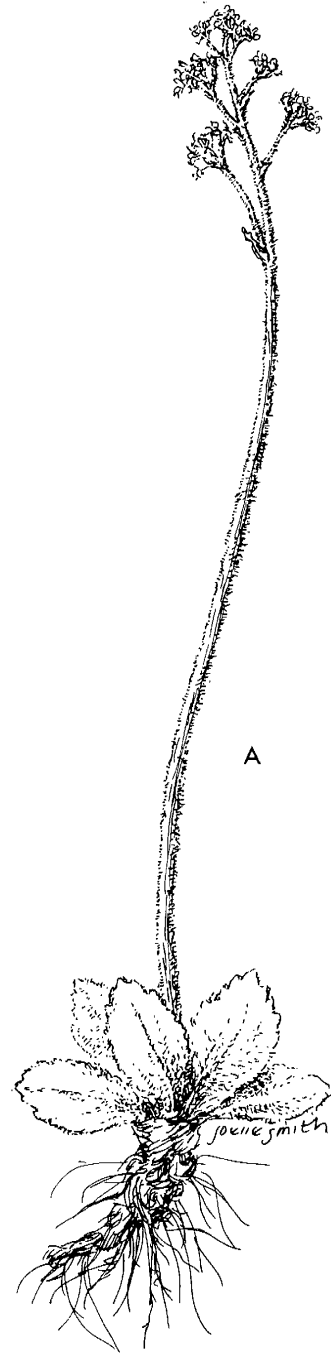
PRESENT AND POTENTIAL THREATS: Logging and grazing are of major concern.

MANAGEMENT RECOMMENDATIONS: Encourage the exclusion of logging from at least the higher portions of the coastal peaks in northwest Oregon. The fragile habitat provided by these hilltop "balds" supports an unusual flora not found elsewhere in the state. Grazing should likewise be curtailed from these sites.

REMARKS: As the remote mountains in the Coastal Range are opened up by logging and other human activities, more populations of this variety may be found.



B



A

Fig. 142. *Saxifraga occidentalis* var. *latipetiolata*. A: Habit, X 0.8; B: Close-up of flower and developing follicle, X 3 (drawn from Elvander s.n., WTU).

SCHOENOLIRION BRACTEOSUM (Wats.) Jeps.

(Large flowered rush lily)

Lily family (Liliaceae)

ORIGINAL PUBLICATION: Fl. Calif. p. 268. 1922.

SYNONYMS: *Hastingsia bracteosa* S. Wats. (Proc. Amer. Acad. 20:377. 1885).

STATUS: Candidate species for federal listing, Category 1, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Herb from a narrowly ovoid bulb 4-8 cm high, stem 4-7 dm high, bearing 1-3 reduced leaves; leaves 2.5-5 dm long, 3-7 mm wide; raceme 2-3 dm long, sometimes with a few branches below, the bracts narrowly attenuate, 7-10 mm long, the stout pedicels 2-3 mm long; perianth dull white or purplish, the lanceolate, long acuminate segment 10-12 mm long; stamens 1/2-2/3 as long as the perianth; style nearly as long as the ovary; capsule broadly ovoid, 8-10 mm high, barely stipitate (after Peck, 1961).

DISTRIBUTION: Known from southwest Oregon in Josephine and Jackson counties, and in Del Norte County, California. Restricted to the vicinity of the Siskiyou Mountains.

PHENOLOGY: This lily flowers from late May to June.

HABITAT: Found in serpentine bogs at lower elevations, often in open areas on gentle slopes. Associated species in these bogs include *Darlingtonia californica*, *Rudbeckia californica*, *Rhododendron occidentale*, *Tolfieldia glutinosa*, and *Narthecium californicum*.

LAND OWNERSHIP/MANAGEMENT: Bureau of Land Management, U.S. Forest Service, and possibly private.

PRESENT AND POTENTIAL THREATS: Grazing activities appear to be the major threat at present. Mining is a possible threat because of *S. bracteosum*'s preference for serpentine, a habitat potentially rich in nickel or chrome ore. Presently, it is felt such mineral exploitation on a full scale is not economically feasible. This stance, however, is certainly subject to reevaluation should future economic trends dictate.

MANAGEMENT RECOMMENDATIONS: Grazing in areas known to have existing populations should be suspended. Grazing policy should be reviewed with respect to the impact it is imparting on the fragile serpentine bogs of southwestern Oregon. Bog sites containing this and other rare endemics need to be set aside for preservation and study. This would tend to facilitate their protection from existing and potential hazards, particularly mining.

REMARKS: Additional field work is needed for this plant. Extant populations appear to be very few.

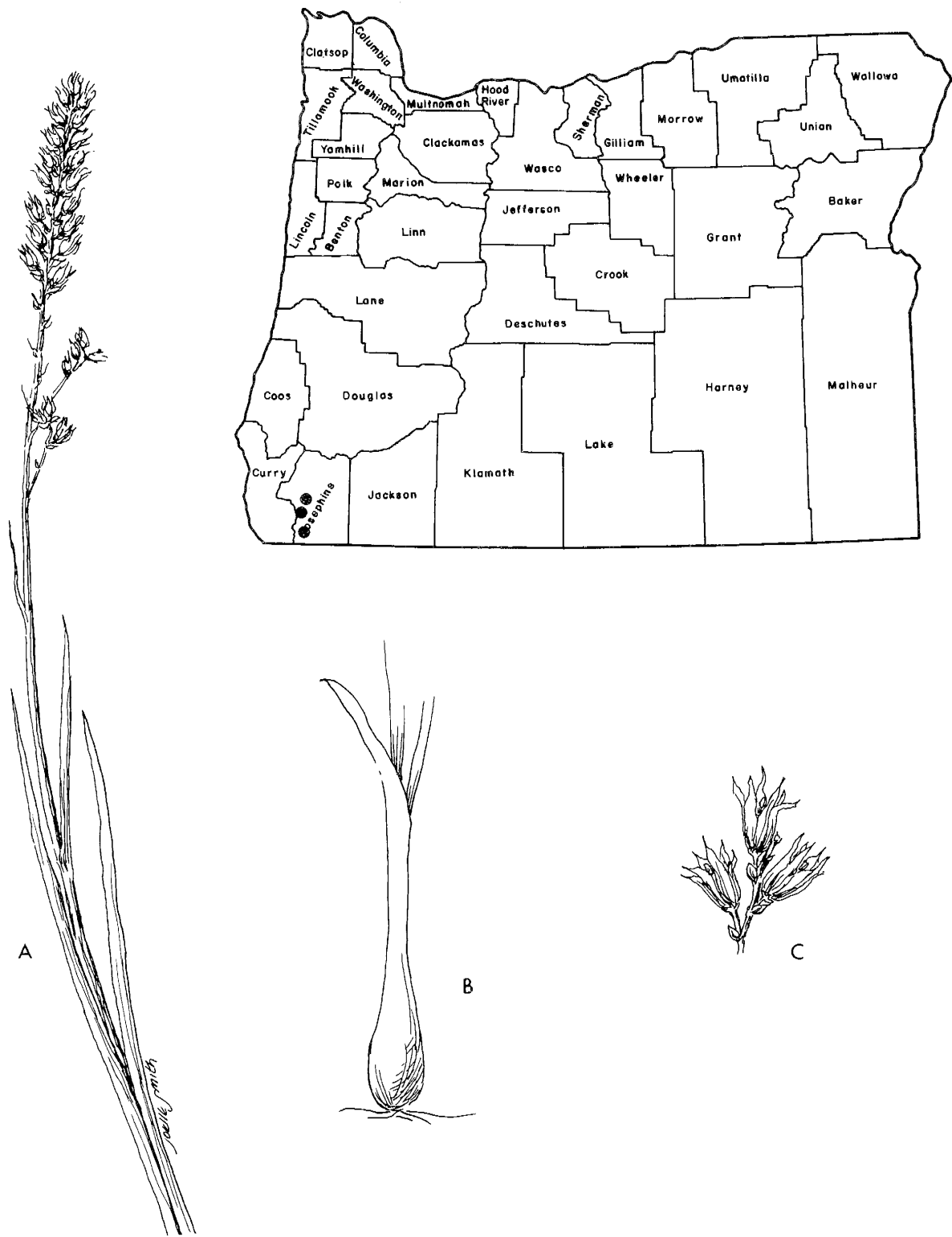


Fig. 143. *Schoenolirion bracteosum*. A: Habit of upper portion of plant, X 0.3; B: Bulb, X 0.6; C: Tip of flowering raceme, X 1 (drawn from Lang s.n., SOC).

SEDUM MORANII R.T. Clausen

(Moran's stonecrop)

Stonecrop family (Crassulaceae)

ORIGINAL PUBLICATION: Bull. Torr. Bot. Club 69:40. 1942.

SYNONYMS: *Cotyledon glandulifera* Henderson (Rhodora 32:26. 1930).
Sedum glanduliferum (Henderson) Peck (Madrono 6:134. 1941).
Gormanina glandulifera (Henderson) Abrams (Illustrated Flora of the Pacific States 2:343. 1944).

STATUS: Candidate species for federal listing, Category 1, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Erect succulent perennial with bare rootstock, stems 15-27 cm high; leaves mostly basal, spatulate; plant, except flowers, greenish to markedly red purple, upper one third of stem glandular with many bracts; flowers greenish yellow, 12-15 mm long, glandular puberulent; stamens slightly longer than calyx; seeds many, finely striate and brown (after Clausen, 1975).

DISTRIBUTION: Endemic to Josephine County, Oregon, along the Rogue River.

LOOK ALIKES: *Sedum moranii* resembles *S. albomarginatum*. *S. albomarginatum* may be distinguished by its eglandular, nonpubescent cymes, shorter and paler yellow petals, and the larger, white margined leaves of the primary rosette (Clausen, 1975).

PHENOLOGY: This succulent blooms from late May to mid June.

HABITAT: Found on serpentine outcrops on west or southwest slopes. Associated species include *Selaginella wallacei*, *Rhus diversiloba*, *Achillea millefolium*, *Pityrogramma triangularis*, *Monardella odoratissima* and several mosses. Elevational limits are narrow, ca. 200-275 m.

LAND OWNERSHIP/MANAGEMENT: Administered by the Bureau of Land Management.

PRESENT AND POTENTIAL THREATS: Increasing recreational use, trail maintenance, collecting for rock gardens, and manipulation of the water level which might inundate populations are documented threats.

MANAGEMENT RECOMMENDATIONS: The construction of additional trails or roads into the tiny range of this species should be avoided.

REMARKS: The known distribution of this species is very limited, perhaps two or three km². There are few plants even in this restricted area (Clausen, 1975). Siddall et al. (1979) note that *S. moranii* is a prized species for the rockgarden and is sought by many collectors.

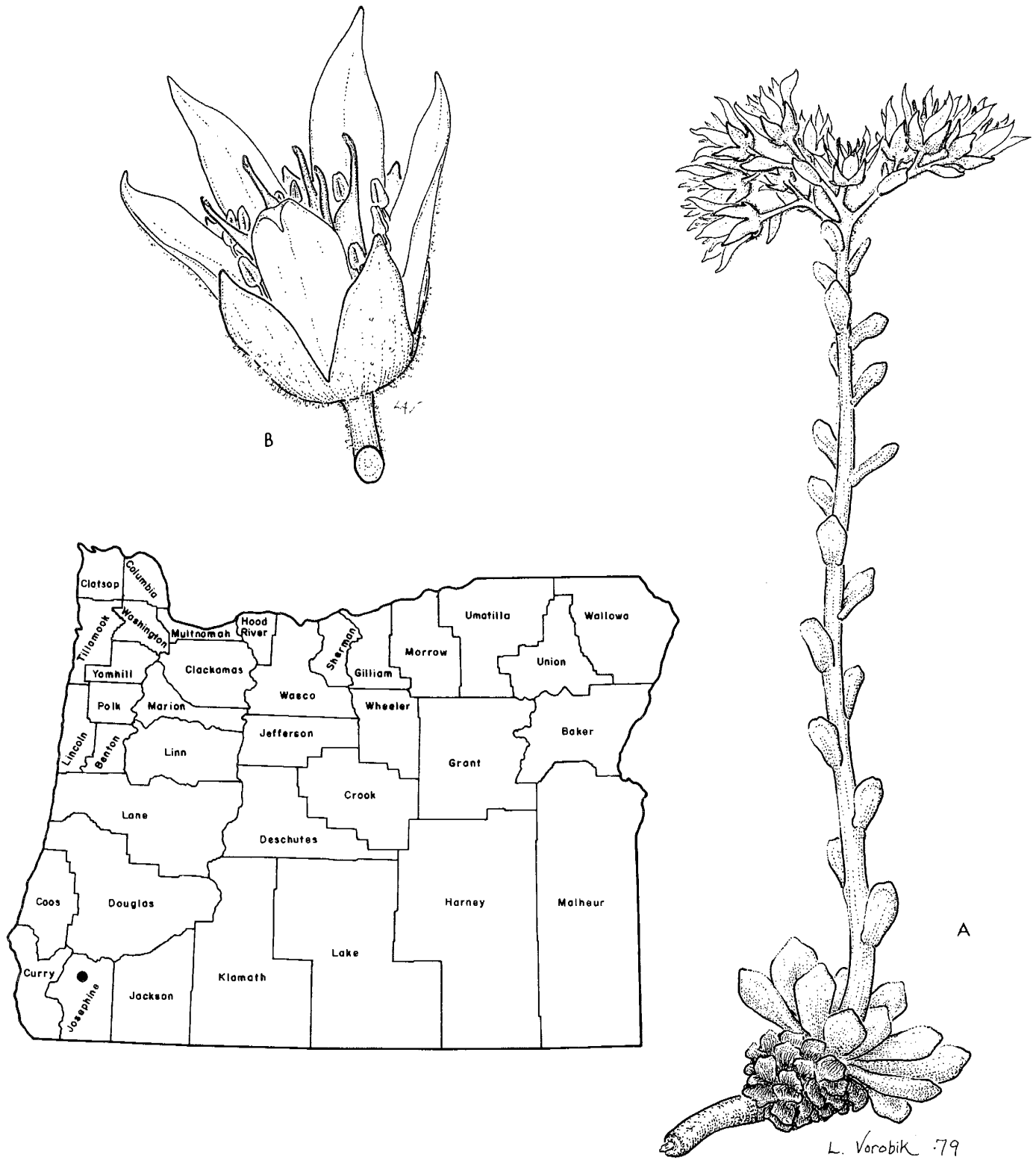


Fig. 144. *Sedum moranii*. A: Habit, X 0.8; B: Enlargement of flower, X 6 (drawn from Leach 4334, ORE).

SEDUM OBLANCEOLATUM Clausen

(Applegate stonecrop)

Stonecrop family (Crassulaceae)

ORIGINAL PUBLICATION: *Sedum* of North Am. north of the Mex. Plateau.
pp. 403-410. 1975.

STATUS: Candidate species for federal listing, Category 1, United States
Fish and Wildlife Service (Federal Register 45:82480-82569. December
15, 1980).

DESCRIPTION: Succulent perennial herb, rather slender, leaves of the ros-
ettes and upper parts of the floriferous stems pruinose, stems ca. 6-15
cm high; basal leaves cuneate, ca. 10-18 mm long, stem leaves ca. 22 mm
long and 6 mm wide; sepals 5-6 mm long; petals cream or pale yellow,
lobes erect, ca. 10-12 mm long (after Clausen, 1975; Denton, 1979).

DISTRIBUTION: Known only from Jackson County, in southwest Oregon.

LOOK ALIKES: Petals of *S. laxum* are rose or pinkish. The pruinose (frost-
ed) appearance of *S. oblancoolatum* and its sepal length should separate
it from other whitish flowered *Sedum* in the area.

PHENOLOGY: Flowering in June and July.

HABITAT: This stonecrop occurs on dry, dioritic slopes with good drainage,
at elevations to 1725 m (Denton, 1979). It associates with *Sedum*
radiatum, *Pinus ponderosa*, and *Arctostaphylos nevadensis*.

LAND OWNERSHIP/MANAGEMENT: U.S. Forest Service.

PRESENT AND POTENTIAL THREATS: Horticultural and botanical collecting, and
possibly trampling from hikers.

MANAGEMENT RECOMMENDATIONS: Carefully inventory suspected geographic range
(reported by Clausen as ca. 20 km²) for additional extant populations.
Monitor known sites and take appropriate protective steps.

REMARKS: Denton (1979) considers this species a relict. Her recent re-
search on the genus has confirmed the specific status of this extremely
local taxon. *S. oblancoolatum* has one of the most restricted distribu-
tions of Oregon plants under pressure from horticultural exploitation,
making it exceptionally vulnerable. Fortunately, the rugged topography
of its habitat makes mass collecting somewhat prohibitive.

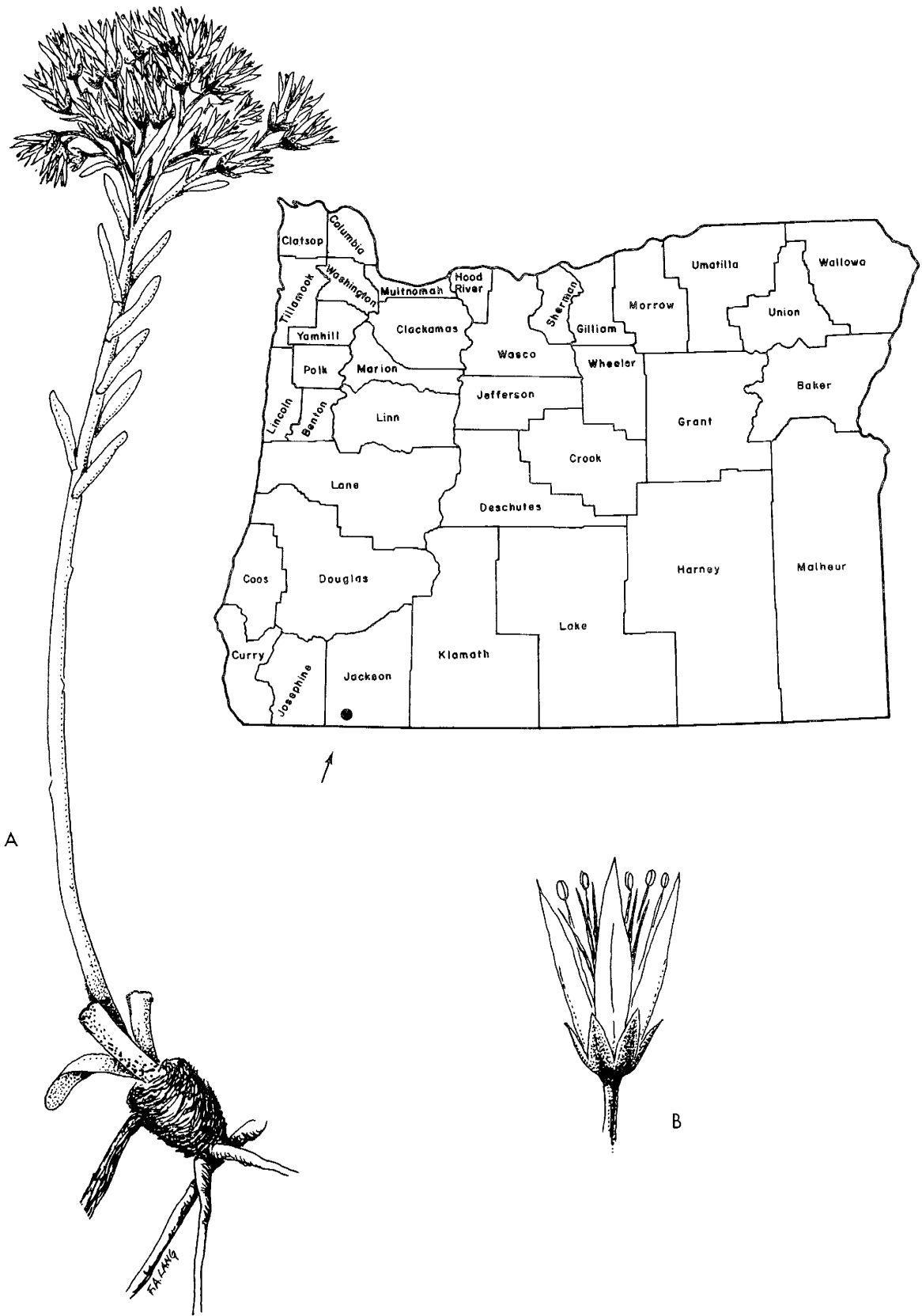


Fig. 145. *Sedum oblanceolatum*. A: Habit, X 1; B: Enlargement of flower, X 3.2 (drawn from Denton 4110, OSC).

SENECIO ERTTERAE Barkley

(Ertter's senecio)

Composite family (Asteraceae)

ORIGINAL PUBLICATION: No. Amer. Fl., Ser. II., 10:60, 124-125. 1978.

STATUS: Candidate species for federal listing, Category 1, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Herbaceous annual, simple, erect, 2-6 dm tall; herbage somewhat succulent and bluish, irregularly silvery villous tomentose, glabrescent in age; leaves reduced upwards, variously toothed, 4-7 cm long; heads cymose, 6-10; involucral bracts ca. 13 in a single series; rays 8 or 13, ca. 5 mm long, yellow; pappus dull white; achenes 3 mm long (after Barkley, 1978).

DISTRIBUTION: Restricted to a tiny portion of eastern Malheur County, Oregon, near Leslie Gulch.

LOOK ALIKES: *Senecio ertterae* is essentially unmistakable, the only annual *Senecio* within its range and unique habitat.

PHENOLOGY: This species blooms from July to September.

HABITAT: An inhabitant of generally dry, clayey ash deposits subject to occasional flash flooding, *S. ertterae* occurs at ca. 1200 m elevation. It associates with *Allium parvum*, *Phacelia lutea*, *Eriogonum novonudum*, *Trifolium owyheense*, and *Mimulus cusickii*.

LAND OWNERSHIP/MANAGEMENT: Bureau of Land Management.

PRESENT AND POTENTIAL THREATS: Mining claims and exploration (presumably for zeolites) are being worked out for this local area. Immediate threats include recreational use (mostly offroad vehicles) and the removal of critical substrate for road surfacing and construction.

MANAGEMENT RECOMMENDATIONS: Review land use plans for the limited geographic area comprising this species' range. Since there are several rare and very unusual endemics growing together here, measures designed to reduce their chances of extirpation, such as expanded closures of critical sites, may be more easily justified.

REMARKS: Despite the remoteness of east central Malheur County, the particular portion discussed here is heavily utilized by several interest groups.

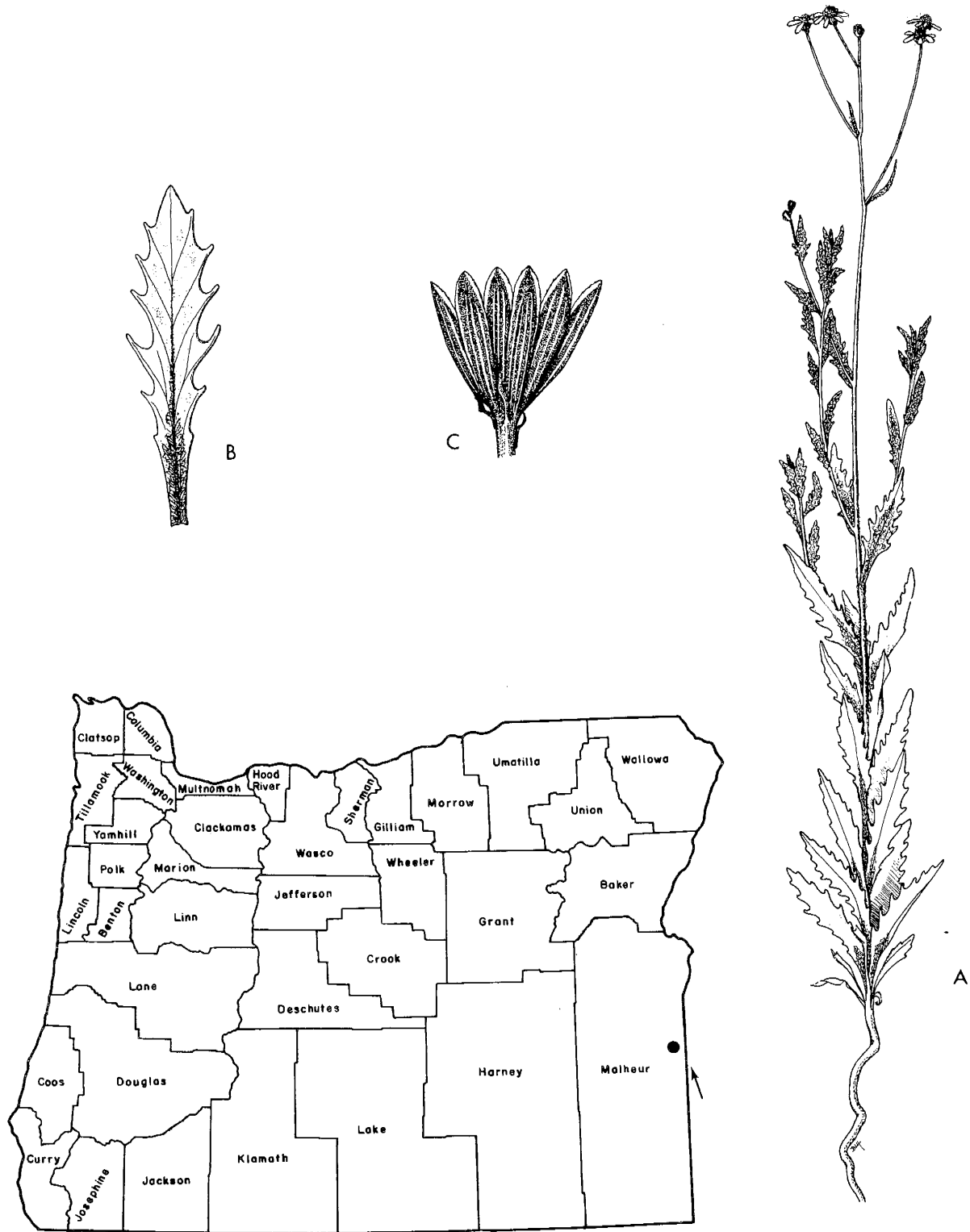


Fig. 146. *Senecio ertterae*. A: Habit, X 0.4; B: Lower stem leaf, X 0.8; C: Involucral bracts, X 4.5 (drawn from Reveal 3891, ORE).

SENECIO HESPERIUS Greene

(Western senecio or Siskiyou butterweed)

Composite family (Asteraceae)

ORIGINAL PUBLICATION: Pittonia 2:166. 1891.

SYNONYMS: *Senecio auleticus* Greene (Leafl. Bot. Obs. 2:15. 1910).

STATUS: Candidate species for federal listing, Category 1, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Short lived herbaceous perennial 0.7-1.5 dm tall, lightly tomentose or glabrate, but virtually always pubescent on the upper peduncle, at the base of the head and in the axils of the leaves; stems arising singly from a weakly defined caudex; basal leaves petiolate, firm in texture, the blades ovate to lanceolate, wavy margined, subdentate, 1-3 cm long and 0.5-2 cm wide; cauline leaves few, the lowermost ones resembling the basal leaves, the upper ones reduced to bracts, often clasping at the base; inflorescence of one to five heads; principle involucre bracts 7-9 mm long, often reddish tipped; ray florets 6-10 mm long; achenes glabrous (after Barkley, 1978).

DISTRIBUTION: Endemic to the Illinois River Valley in southern Josephine County, Oregon.

LOOK ALIKES: This is the only few headed *Senecio* with strictly basal crenate leaves and a hint of persistent tomentose pubescence which could be expected on the serpentine outcrops of southwest Oregon.

PHENOLOGY: *Senecio hesperius* blooms from April to June.

HABITAT: Found on serpentine soils at lower elevations, on gentle to steep slopes. Generally in open forests dominated by *Pinus jeffreyi*, with *Arctostaphylos viscida*, *Viola cuneata*, *Horkelia sericata*, and *Allium falcifolium*.

LAND OWNERSHIP/MANAGEMENT: Bureau of Land Management, U.S. Forest Service, and private.

PRESENT AND POTENTIAL THREATS: Primarily potential mining of the serpentine habitat, while grazing and logging present problems of a lesser magnitude.

MANAGEMENT RECOMMENDATIONS: Few populations of this species have recently been reported, although it is suspected it may be locally common in certain limited areas. Additional inventories are needed, especially on sites where future mining is likely.

REMARKS: The disturbance tolerances of *S. hesperius* are not known. Barkley (1978) refers to this as a "frail" herb. This species is more restricted in distribution than most of the serpentine endemics of the Siskiyou region.

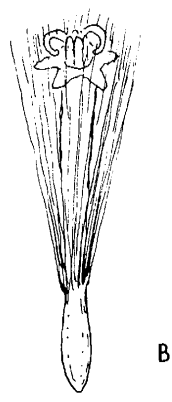
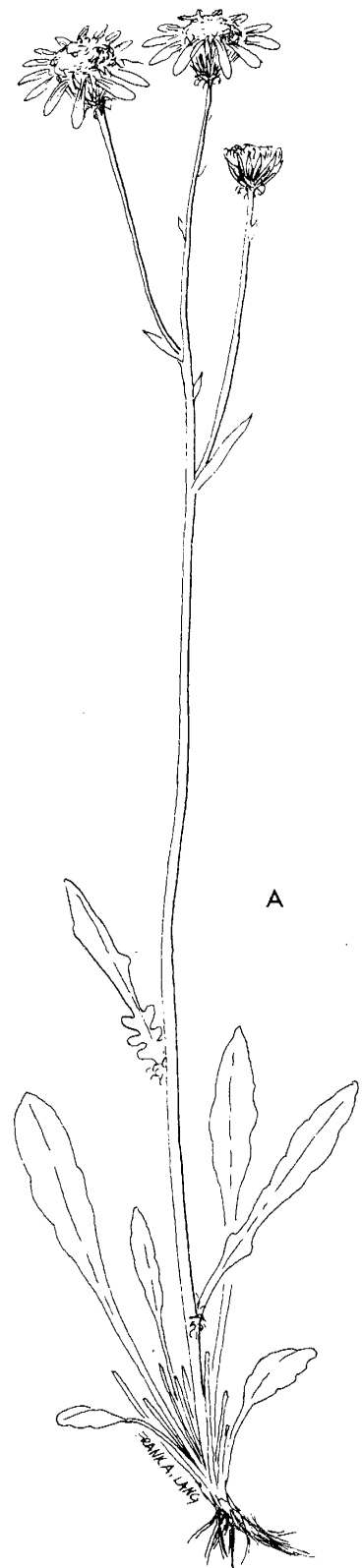
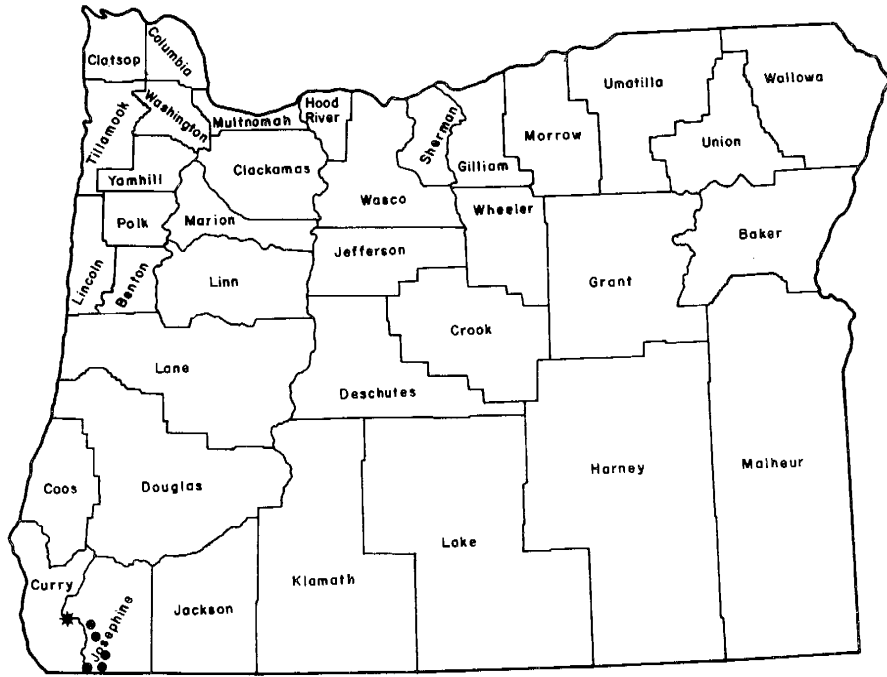


Fig. 147. *Senecio hesperius*. A: Habit, X 1.3; B: Disc floret, X 6 (drawn from White 569, OSC).

SIDALCEA CAMPESTRIS Greene

(Meadow sidalcea)

Mallow family (Malvaceae)

ORIGINAL PUBLICATION: Bull. Calif. Acad. Sci. 1:76. 1885.

SYNONYMS: *Sidalcea asplenifolia* Greene (Pitt. 3:158. 1897).
Sidalcea sylvestris Nels. (Proc. Biol. Soc. Wash. 20:36. 1907).

STATUS: Candidate species for federal listing, Category 1, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Stout perennial herb, 0.5-2 m tall with a thick taproot and short thick rootstocks; stems variously pubescent; leaves 5-15 cm broad, seven to nine lobed, cauline leaves usually deeply divided into five to seven lobes; loose racemose inflorescence up to 30 cm long; petals from nearly white to pale pink or pinkish orchid, 12-25 mm long; carpels about 3.5 mm long, reticulate (after Hitchcock, 1957).

DISTRIBUTION: Found in the Willamette Valley of Benton, Clackamas, Douglas, Lane, Linn, Marion, Multnomah, Polk, Washington, and Yamhill counties, Oregon. Now primarily centered in the central portion of its range.

LOOK ALIKES: Usually recognized by the paleness of flowers, though this character varies as does pubescence and leaf characters. *S. campestris* may be distinguished from *S. hirtipes* (with which it may hybridize) by its distinctive ecological and geographical range (*S. hirtipes* is mostly coastal), more open, less spicate inflorescence, and more deeply dissected leaves. It may be distinguished from the sympatric *S. virgata* by its pale flowers, more deeply dissected leaves, and longer racemes (Hitchcock, 1957).

PHENOLOGY: This species flowers from April through July.

HABITAT: Inhabits fields, roadsides, and fence rows, in areas not regularly plowed. Associated species include *Symphoricarpos albus*, *Camassia quamash*, *Iris tenax*, *Pteridium aquilinum*, *Dipsacus sylvestris*, *Rhus diversiloba*, and several grasses. Not expected above 250 m elevations.

LAND OWNERSHIP/MANAGEMENT: Private, Oregon Department of Transportation, county road commissions, and U.S. Fish and Wildlife Service.

PRESENT AND POTENTIAL THREATS: Loss of habitat from land development, road maintenance, and herbicide and agricultural spraying. Spraying is particularly worrisome considering that most present populations generally occur along roadsides or fences.

MANAGEMENT RECOMMENDATIONS: Eliminate spraying and plowing along roads where populations occur. Remaining natural habitat on the Willamette Valley National Wildlife Refuges should be maintained.

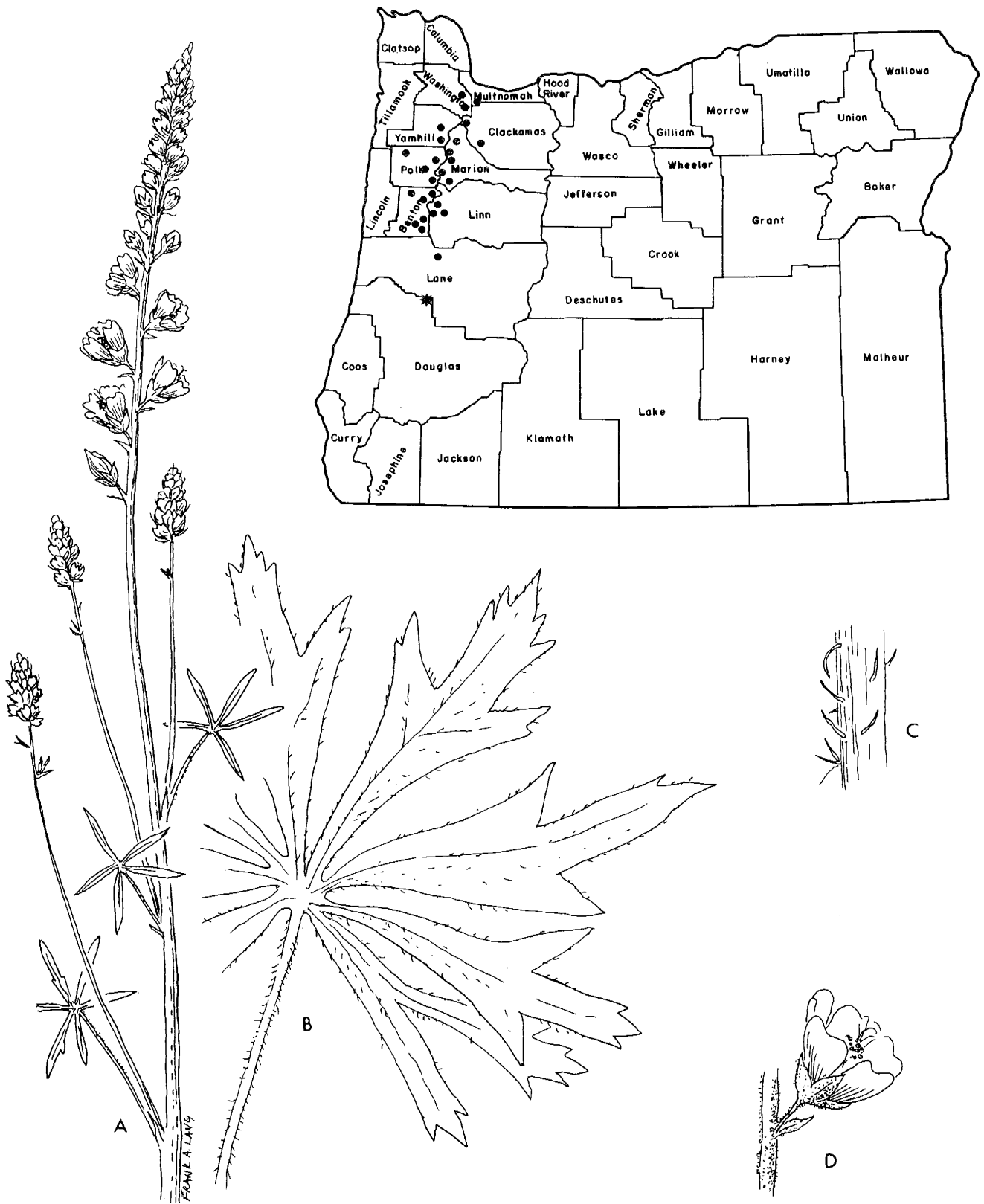


Fig. 148. *Sidalcea campestris*. A: Habit of flowering branch, X 0.4; B: Basal leaf, X 1; C: Close-up of stem pubescence, X 2; D: Flower, X 1 (drawn from Mika 181, OSC).

SIDALCEA CUSICKII Piper

(Cusick's sidalcea)

Mallow family (Malvaceae)

ORIGINAL PUBLICATION: Proc. Biol. Soc. Wash. 29:99-100. 1916.

SYNONYMS: *Sidalcea oregana* var. *cusickii* (Piper) Roush (Ann. Mo. Bot. Gard. 18:174. 1931).

STATUS: Candidate species for federal listing, Category 1, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Perennial from a heavy taproot and with rootstocks varying from short and thick to slender and rather elongate; stems 4-18 dm tall, often fistulose, glabrous or very finely scabrid pubescent with two to many rayed appressed hairs below, but always finely stellate above; racemes usually compounded, very tightly flowered and spikelike, the pedicels 1-2 (5) mm long; calyx 6-10 mm long, finely grayish stellate to subglabrous and purplish, the lobes broadened above the base and somewhat ovate lanceolate, prominently veined; petals deep pink, 10-18 mm long; carpels about 3 mm long (after Hitchcock, 1961).

DISTRIBUTION: In the Coquille, Umpqua, and southern Willamette Valleys of Coos, Douglas, and Lane counties, Oregon.

LOOK ALIKES: Many species of *Sidalcea* look alike, nearly always to the uninitiated and often to the experienced botanist as well. *S. cusickii* is a robust species, the larger specimens taller than most *Sidalcea*s one is likely to encounter in western Oregon. To be certain of the identification of such a difficult taxon, specimens should be referred to a reputable herbarium.

PHENOLOGY: Found in flower from May through July.

HABITAT: Apparently restricted to heavy, poorly drained, "adobe like" soils in the lower valleys and foothills. Commonly reported associating with species of *Cammisia*, *Juncus*, *Brodiaea*, *Geum*, and perennial grasses, in seasonally wet open meadows or along streambanks. Continued loss of habitat has restricted some populations to roadside and fencerow sites.

LAND OWNERSHIP/MANAGEMENT: Bureau of Land Management, private, and possibly U.S. Forest Service.

PRESENT AND POTENTIAL THREATS: Loss of habitat from agricultural, industrial, and housing development. Populations relegated to roadsides or other similar places are severely threatened by herbicides applied for weed control.

MANAGEMENT RECOMMENDATIONS: Reduce or eliminate spraying and development activities in areas known or suspected to harbor *S. cusickii* populations.

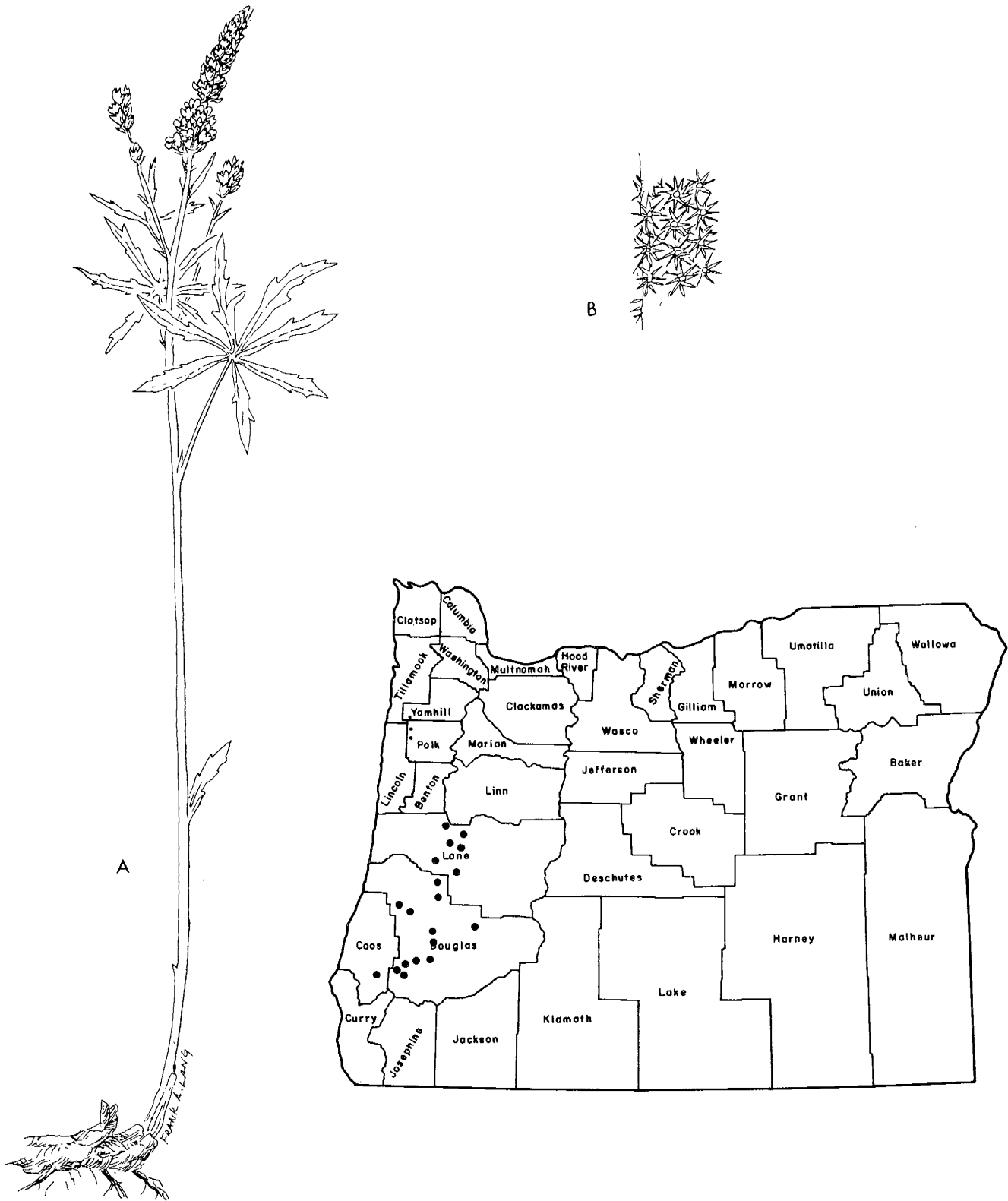


Fig. 149. *Sidalcea cusickii*. A: Habit, X 0.2; B: Close-up of stellate upper stem pubescence, X 3 (drawn from Hitchcock 19604, OSC).

SIDALCEA NELSONIANA Piper

(Nelson's checker mallow)

Mallow family (Malvaceae)

ORIGINAL PUBLICATION: Proc. Biol. Soc. Wash. 32:41. 1919.

STATUS: Candidate species for federal listing, Category 1, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Erect perennial, 60-90 cm high, from a stout taproot, stem pubescence simple; leaf blades orbicular, glabrous above, sparsely hirsutulous beneath, 5-10 cm broad, the lower ones seven lobed, the lobes toothed, upper leaves increasingly deeply cleft; racemes many flowered, somewhat spikelike, but elongate and open; pedicels about 3 mm long; calyx 4-6 mm long, purplish tinged; petals pinkish purple, 5-15 mm long; carpels about 3 mm long (after Piper, 1919; Hitchcock, 1957).

DISTRIBUTION: Known historically from lowlands of Benton, Lane, Linn, Marion, Multnomah, Polk, Tillamook, and Yamhill counties, now much more restricted.

LOOK ALIKES: *Sidalcea nelsoniana* may be distinguished by its small, rose colored corollas, the shorter almost glabrous calyx lobes, the nearly smooth carpels, and the simple pubescence.

PHENOLOGY: This species flowers from late May through mid July.

HABITAT: Encountered on gravelly, well drained soil. Once an undisturbed prairie species, it is now found primarily where remnant patches of native grassland species still occur, as along fencerows, roadsides, and old cemeteries. It is often found where the prairie merges with deciduous woodlands with *Geum* sp. and *Fraxinus latifolia*.

LAND OWNERSHIP/MANAGEMENT: U.S. Fish and Wildlife Service, private, and county road commissions.

PRESENT AND POTENTIAL THREATS: Herbicide spraying and plowing by highway crews and farmers, and habitat destruction due to widespread urban development.

MANAGEMENT RECOMMENDATIONS: Discourage herbicide spraying by road maintenance crews and farmers near remaining populations. This species is attractive and may be threatened by collectors.

REMARKS: Hitchcock (1957) remarked "there is cause for wonder at the comparative rarity of this species." Siddall et al. (1979) state that it "teeters on the brink of extinction." Only a handful of populations are known, most of them near Corvallis. Except for one site, all occur along roads.

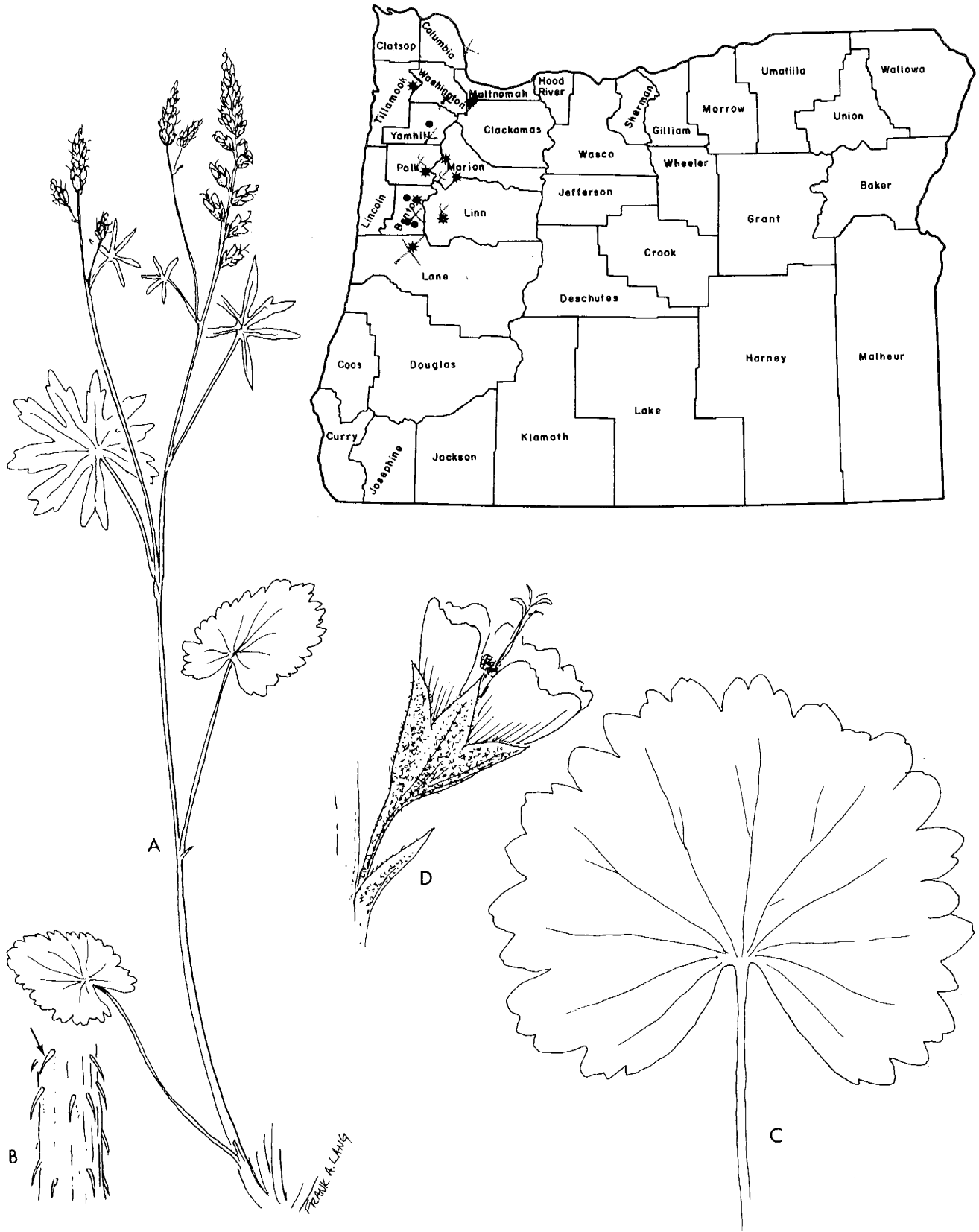


Fig. 150. *Sidalcea nelsoniana*. A: Habit of flowering stem, X 0.4; B: Close-up of stem, illustrating simple hairs, X 4; C: Basal leaf, X 1; D: Flower, X 8 (drawn from Hitchcock 19309, OSC).

SIDALCEA SETOSA C.L. Hitchc.

(Bristly sidalcea)

Mallow family (Malvaceae)

ORIGINAL PUBLICATION: Univ. Wash. Publ. Biol. 18:53-56. 1957.

STATUS: Candidate species for federal listing, Category 2, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Perennial from a thick heavy root and short rootstocks; stems 5-10 dm tall, pubescent at base with fine soft stellate hairs, and some longer simple or forked hairs, finely stellate above; leaves stellate above and beneath, the basal long toothed, upper divided into entire to lacinate segments; inflorescence usually compound, the racemes spicate, many flowered, 3-7 cm long; pedicels mostly 1-2 mm long; calyx 5-8 mm long, to 10 mm in fruit, finely stellate but conspicuously bristly; petals pinkish-lavender, 5-15 mm long; carpels ca. 2.5 mm long (after Munz, 1959).

DISTRIBUTION: Found in southwest Oregon, in Douglas, Josephine, and Jackson counties; also in Siskiyou County, California.

TAXONOMIC PROBLEMS: Crossing may occur between this species and its congeners, resulting in identification problems.

LOOK ALIKES: There are several sidalceas in southwest Oregon. Generally speaking, *S. setosa* is the only one with a densely stellate, very bristly, and lightly veined calyx. It is difficult to adequately differentiate the species on paper, however, without a lengthy discussion.

PHENOLOGY: *Sidalcea setosa* blooms in June and July.

HABITAT: From woods to dry roadsides (one collection), with *Arbutus menziesii*, *Pseudotsuga menziesii*, *Calocedrus decurrens*, and *Quercus* spp. Ranging in elevation from "lower slopes" to "alpine" peaks (Mount Ashland). The few collections indicate a curiously broad altitudinal range for this endemic *Sidalcea*.

LAND OWNERSHIP/MANAGEMENT: Mainly U.S. Forest Service, while state or county jurisdiction would apply if populations are still extant along public roads.

PRESENT AND POTENTIAL THREATS: Spraying or roadwork for roadside populations. Logging would be a threat to populations in timbered areas of the National Forests.

MANAGEMENT RECOMMENDATIONS: Continued inventory is recommended. Populations discovered on Forest Service land require protection and their habitat should be exempt from logging influences, spraying, and any road construction. It is curious that so little recent field data are available for this taxon, considering the comparatively greater amount of botanical attention this endemic rich section of the state receives.

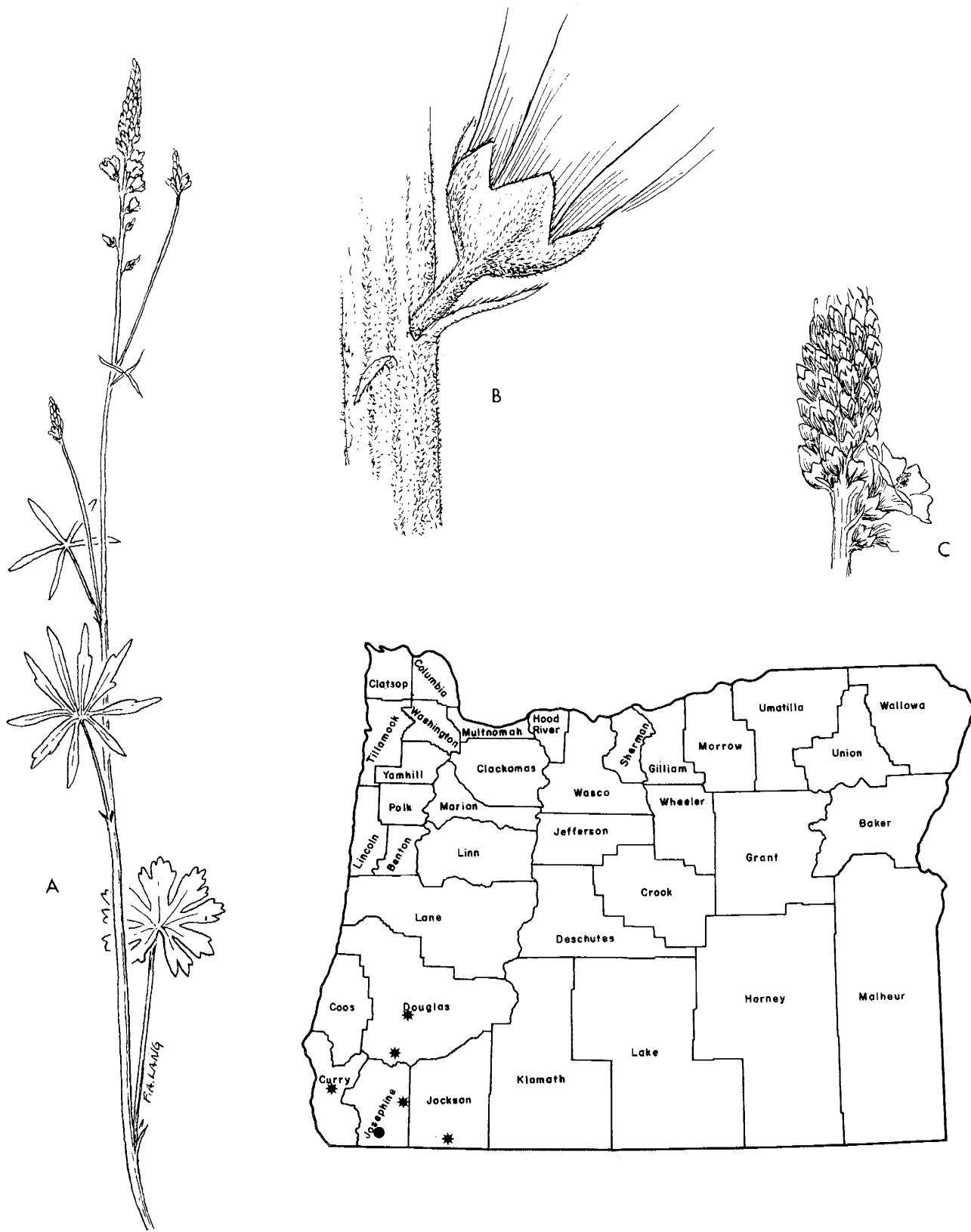


Fig. 151. *Sidalcea setosa*. A: Habit of flowering stem, X 0.3; B: Close-up of stem and calyx pubescence, X 4.5; C: Tip of raceme in early flowering stage, X 1 (drawn from Cusick 4838, ORE).

SILENE DOUGLASII Hook. VAR. *ORARIA* (Peck) Hitch. & Maguire

(Cascade Head catchfly)

Pink family (Caryophyllaceae)

ORIGINAL PUBLICATION: Univ. of Wash. Pub. Biol. 13:40. 1947.

SYNONYMS: *Silene oraria* Peck (Torreya 32:148. 1932).

STATUS: Candidate species for federal listing, Category 1, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Perennial with stout taproot growing in dense, low tufts, with numerous decumbent stems 10-70 cm tall, finely and densely pubescent; leaves mostly matted at base of stems and on the new shoots, 2-8 cm long, 2-12 mm broad, oblanceolate to linear lanceolate, cauline leaves one to eight pairs, becoming smaller and sessile above; flowers one to seven, cymose; calyx tubular, 12-15 mm long, with five obtuse teeth, becoming inflated, papery, and tubular campanulate in fruit; corolla creamy white or greenish, pink, or purplish tinged; petals 12-18 mm long, with bilobed blades and two appendages; fruit a one celled capsule (after Hitchcock & Maguire, 1947).

DISTRIBUTION: Coastal bluffs of Tillamook County, Oregon.

TAXONOMIC PROBLEMS: Hitchcock & Maguire (1947) remark, "this plant needs further study. There is the possibility that it is merely an ecologic variant of little significance; on the other hand, it may be genetically distinct and of significant difference to merit subspecific treatment."

LOOK ALIKES: *Silene scouleri* var. *pacifica* has petal blades bilobed over half their lengths, while those of *S. douglasii* var. *oraria* are only slightly notched.

PHENOLOGY: Generally blooming from April through August.

HABITAT: Found only on steep bluffs, ledges, and slopes facing the ocean. Associated species include *Senecio bolanderi*, *Castilleja littoralis*, and *Rhus diversiloba*.

LAND OWNERSHIP/MANAGEMENT: Managed by the Nature Conservancy and the State of Oregon.

PRESENT AND POTENTIAL THREATS: Heavy recreational use and competition from aggressive, weedy species.

MANAGEMENT RECOMMENDATIONS: It would be wise to route existing and planned foot trails away from this taxon. Fire may be useful in preserving habitat for this and other native species. A lack of fire has apparently been a factor contributing to the increase in competition from weeds. The Nature Conservancy plans to study this plant in 1982.

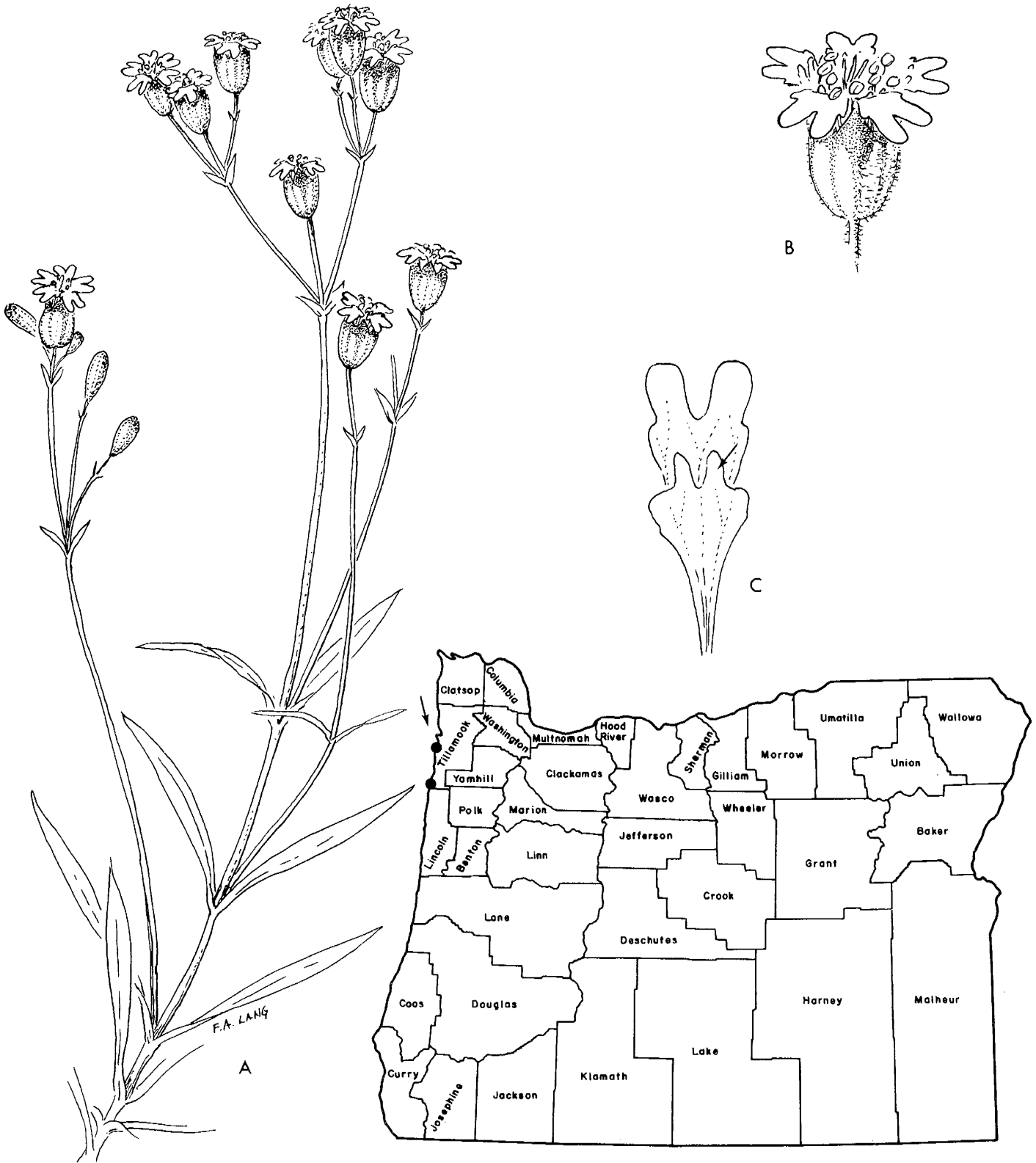


Fig. 152. *Silene douglasii* var. *oraria*. A: Habit of flowering stem, X 0.9; B: Flower, X 2; C: Individual petal, showing pair of appendages, X 4 (drawn from Hitchcock s.n., WTU).

SILENE SCAPOSA Robins. VAR. SCAPOSA

(Scapose catchfly)

Pink family (Carophyllaceae)

ORIGINAL PUBLICATION: Proc. Amer. Acad. 28:145. 1893.

STATUS: Candidate species for federal listing, Category 1, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Stems somewhat clustered, from short rootstocks, erect and rigid, finely and densely puberulent, viscid glandular above, 1.5-5.0 dm high; leaves mostly basal; one or two pairs on the stem, oblanceolate, acute, rather thick, slightly puberulent or glabrous and glaucous, 4-7 cm long; branches of the inflorescence erect, the pedicels equaling or exceeding the calyx; calyx 10-12 mm long, conspicuously nerved, the lobes obtuse, triangular, scarious margined; petals white or pinkish, the lobes retuse, 2-4 mm long, the scales short; capsule narrowly elliptic (after Peck, 1961).

DISTRIBUTION: This plant is endemic to north central Oregon, from Gilliam and Wheeler counties east to the Blue Mountains of Umatilla, Grant, and Baker counties.

LOOK ALIKES: The genus *Silene* can be a difficult group, but *S. scaposa* var. *scaposa* is rather easily distinguished from other species in its range by its scapose habit, glandular pubescence, and the nearly entire to simply cordate petal blades.

PHENOLOGY: *Silene scaposa* flowers from May to July.

HABITAT: This occurs at mid elevations in the sagebrush, sagebrush-juniper, or Ponderosa pine communities. Soils are typically shallow. Associated species include *Festuca idahoensis*, *Purshia tridentata*, and *Eriogonum* spp., on typically open sites.

LAND OWNERSHIP/MANAGEMENT: U.S. Forest Service and Bureau of Land Management.

PRESENT AND POTENTIAL THREATS: Logging and grazing are the major threats to this species.

MANAGEMENT RECOMMENDATIONS: High quality range sites should be surveyed for additional populations. Studies concerning this taxon's ecological requirements are recommended.

REMARKS: Recently, populations of this plant have been found in logging zones. It's tolerance to disturbance needs studying. It may depend upon fire to open up essential habitat.

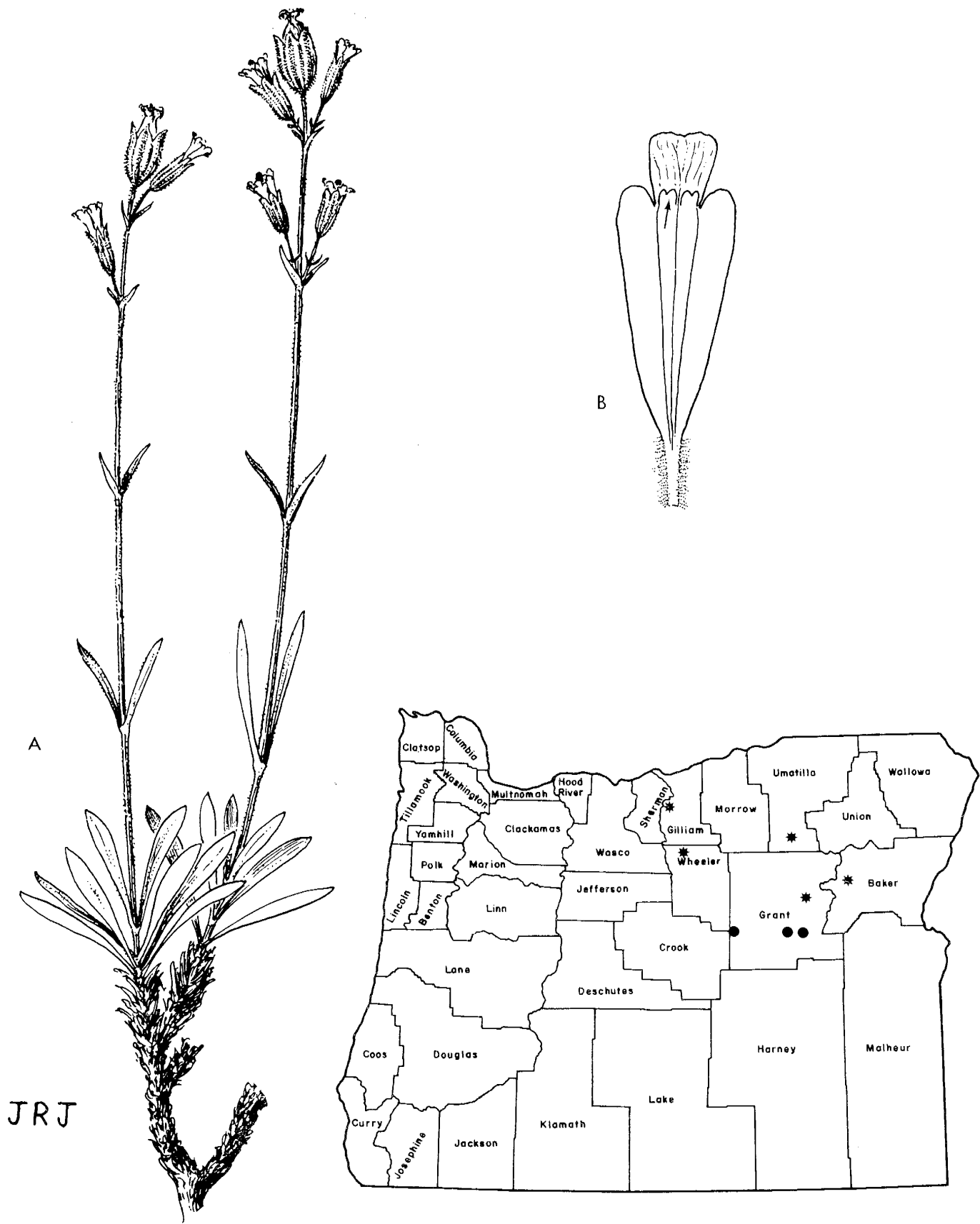


Fig. 153. *Silene scaposa* var. *scaposa*. A: Habit, X 0.8; B: Individual petal, showing tiny appendages (scales), X 5 (drawings taken from Hitchcock et al., 1964).

SILENE SPALDINGII Wats.

Spalding's silene

Pink family (Caryophyllaceae)

ORIGINAL PUBLICATION: Proc. Amer. Acad. 10:344. 1875.

STATUS: Candidate species for federal listing, Category 1, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Perennial with one to several stems, 20-60 cm tall, leafy, viscid pubescent and villous tomentose; cauline leaves in four to eight pairs, lanceolate, 3-7 cm long, 5-15 mm broad, sessile; inflorescence usually very leafy with numerous crowded flowers; calyx tubular campanulate, about 15 mm long at anthesis, viscid pubescent, ten nerved; corolla white, claws of petals about 15 mm long, petals not exceeding or barely exceeding calyx lobes, appendages four (five or six); seeds wrinkled and inflated, about 2 mm long (after Hitchcock & Maguire, 1947).

DISTRIBUTION: Mainly a species of the Palouse Prairie and adjacent areas in Washington, Oregon, Idaho, and Montana. Known in Oregon from Wallowa County.

LOOK ALIKES: *Silene spaldingii* faintly resembles *S. scouleri* in habit, but is more glandular. *Silene spaldingii* may be distinguished from *S. oregana* by its long calyx lobes, short petal blades, and the large inflated seeds (after Hitchcock & Maguire, 1947).

PHENOLOGY: This silene flowers from June to September.

HABITAT: Reported from undisturbed prairie on loessal hills, at low to mid elevations. Associated species include *Festuca idahoensis*, *Crataegus douglasii*, *Symphoricarpos albus*, and *Agropyron spicatum*. Occasionally in sagebrush scabland or open woodland.

LAND OWNERSHIP/MANAGEMENT: Private and possibly U.S. Forest Service.

PRESENT AND POTENTIAL THREATS: Any disturbance of native prairie grassland habitat, especially through grazing and logging. This species is extremely intolerant of disturbances.

MANAGEMENT RECOMMENDATIONS: Intensive field searches should be conducted to locate additional populations in Oregon. The few previous collections are now quite dated, with the exception of a few scattered plants located in 1980 (unvouchered).

REMARKS: Hitchcock & Maguire (1947) commented, "Peculiarly enough, this species has been collected but a few times, even though its range is fairly extended . . . All in all it is one of our most distinct plants". The species is extremely rare in Oregon and is locally uncommon the few places it occurs in its range.



JRJ

Fig. 154. *Silene spaldingii*. A: Habit of stem, X 0.5; B: Calyx (note lobes), X 2.5; C: Individual petal, X 4.5 (drawings taken from Hitchcock et al., 1964).

SOPHORA LEACHIANA Peck

(Western sophora)

Pea family (Fabaceae)

ORIGINAL PUBLICATION: Madrono 6:13. 1941.

STATUS: Candidate species for federal listing, Category 2, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Stems mostly arising singly from elongated rootstocks, usually branched, 3-4 dm high, finely grayish tomentose; leaves several, somewhat crowded above, 1-2 dm long, the leaflets broadly oblong, rounded at both ends, 1-2 cm long, thin, tomentose and paler beneath, thinly pubescent above; raceme usually solitary and terminal on the stem or stems, 7-15 cm long, the flowers numerous; calyx broadly campanulate, strongly gibbous above, 7-9 mm long, the teeth short and triangular; petals greenish white, 9-12 mm long; fruit curved upward, several seeded, constricted between the seeds, densely short villous tomentose and silvery (after Peck, 1961).

DISTRIBUTION: *Sophora leachiana* is endemic to a limited area of Josephine County, Oregon.

PHENOLOGY: Western sophora blooms from April through June.

HABITAT: Typically found on south or west slopes, usually near perennial drainages at lower elevations. Restricted to open sites, not infrequently on clear cuts, within a mixed evergreen-oak woods habitat type. The substrate is primarily peridotite.

LAND OWNERSHIP/MANAGEMENT: U.S. Forest Service, Bureau of Land Management, and possibly private.

PRESENT AND POTENTIAL THREATS: Physical destruction of colonies by logging, spraying, and mining activities. The major threat to *S. leachiana* stems from its tendency to produce very few viable seeds, therefore making its vegetatively reproducing colonies particularly vulnerable to disturbance.

MANAGEMENT RECOMMENDATIONS: Complete elimination of spraying in areas occupied by *S. leachiana* is essential. Road building and other radical surface disturbance should be planned to avoid existing populations. Disturbed sites colonized by this species should be allowed to revegetate naturally, unimpaired by human manipulation.

REMARKS: *Sophora leachiana* is the only member of the genus in the Pacific States. It is an example of a truly threatened Oregon plant which is a rather vigorous colonizer of disturbed sites. Its very low seed set, however, restricts its spread from the small area it now occupies and it maintains itself primarily through vegetative reproduction (Crowder, 1978).

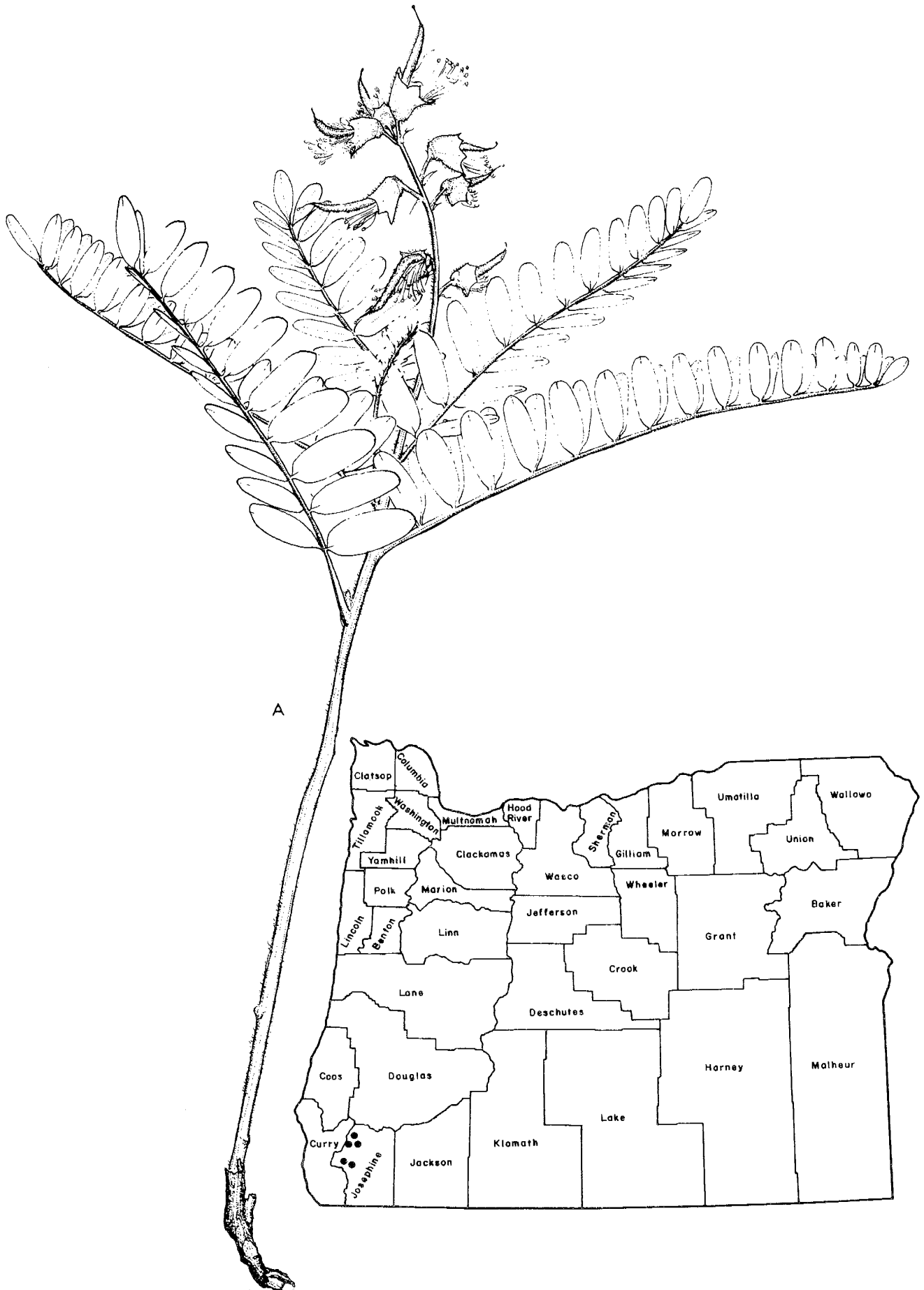


Fig. 155. *Sophora leachiana*. A: Habit of above ground portion of plant, X 0.7 (drawn from Leach 4343 [isotype], ORE).

STREPTANTHUS HOWELLII Wats.

(Howell's streptanthus)

Mustard family (Brassicaceae)

ORIGINAL PUBLICATION: Proc. Amer. Acad. 20:353. 1885.

SYNONYMS: *Cartiera howellii* Greene (Leafl. Bot. Observ. 1:226. 1906).

STATUS: Candidate species for federal listing, Category 2, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Erect perennial, stems 3-7 dm tall, glabrous and glaucous, occasionally dilated upward; leaves obovate to spatulate, denticulate to entire, not clasping; raceme loosely flowered; petals ca. equal to the sepals, perhaps slightly longer, 8-10 mm long, dark purple to maroon; siliques flat, 5-8 cm long, strongly curved (after Munz, 1959).

DISTRIBUTION: This taxon is endemic to the Siskiyou Mountains of Josephine and Curry counties, in southwest Oregon, and in adjacent Del Norte County, California.

LOOK ALIKES: The flattened fruit, bractless inflorescence, and nonclasping leaves should serve to distinguish *S. howellii*.

HABITAT: *Streptanthus howellii* prefers dry, serpentine slopes, from ca. 650 to 950 m elevation. Occurring in open pine woods or in brushy areas, it typically associates with *Ceanothus cuneatus*, *Arctostaphylos viscida*, *Eriogonum pendulum*, and *Lomatium howellii*.

LAND OWNERSHIP/MANAGEMENT: U.S. Forest Service, State of Oregon, private, and possibly Bureau of Land Management.

PRESENT AND POTENTIAL THREATS: Mining of serpentine substrate for nickel and other minerals and recreational activities are potential threats.

MANAGEMENT RECOMMENDATIONS: Additional populations of this taxon should be actively sought and studied. Mineral exploration and excavation should be prohibited where this species occurs.

REMARKS: Very few plants of *S. howellii* occur per population. It may have extremely strict ecological requirements as well as a poor reproductive capacity. Considering these factors it seems that *S. howellii* has a particular need to be protected from surface disturbances, perhaps even more than the majority of serpentine endemics in the area.

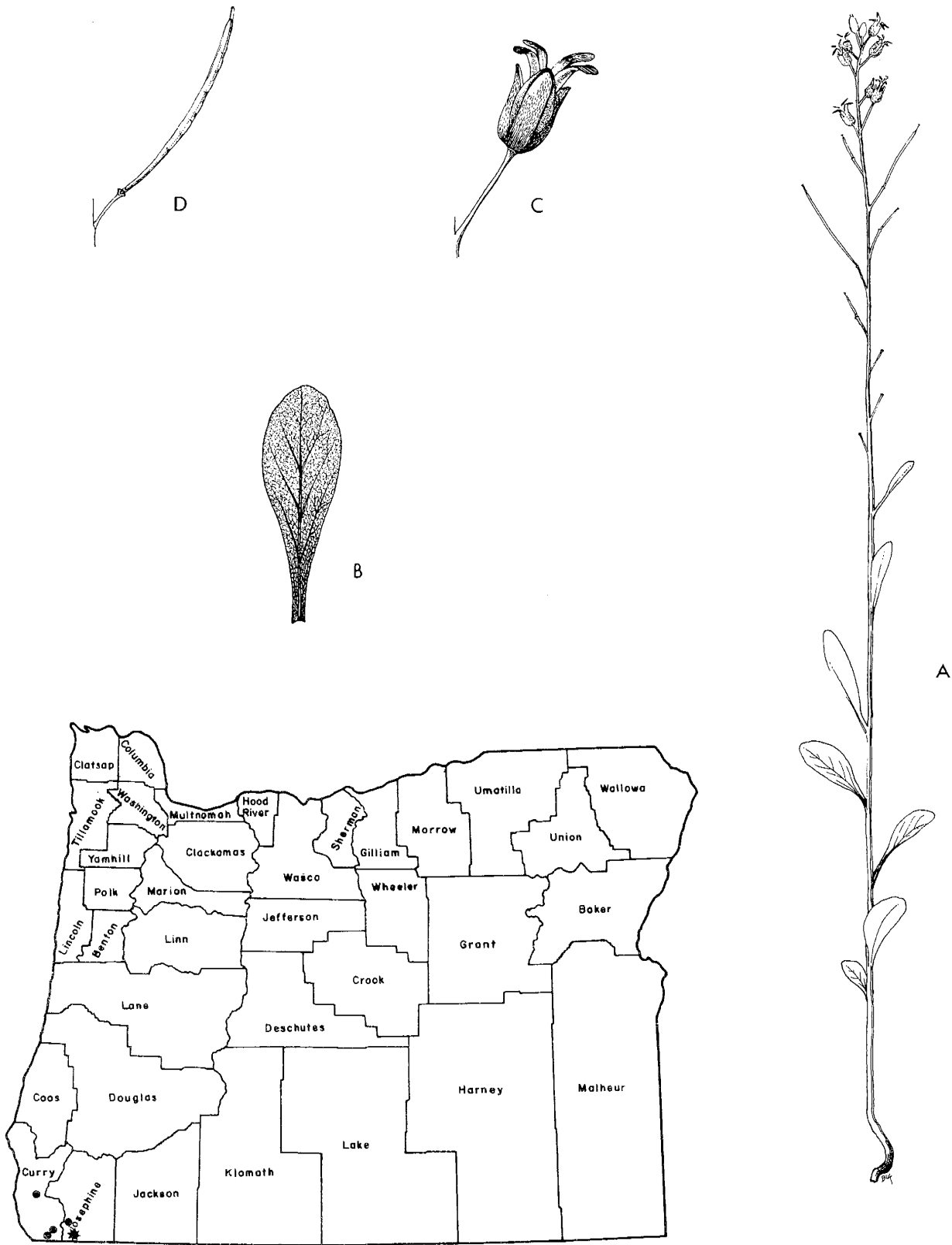


Fig. 156. *Streptanthus howellii*. A: Habit, X 0.5; B: Close-up of leaf X 1.2; C: Flower and pedicel, X 2; D: Fruit (silique), X 0.6 (drawn from Baker s.n. and Stansell s.n., OSC).

SULLIVANTIA OREGANA Wats.

(Oregon sullivantia)

Saxifrage family (Saxifragaceae)

ORIGINAL PUBLICATION: Proc. Amer. Acad. 14:292. 1879.

STATUS: Candidate species for federal listing, Category 2, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Stem very slender, 7-20 cm high, producing filiform stolons, glabrous below, glandular puberulent above; leaves orbicular to reniform, 1.5-5 cm wide, five to nine cleft, the divisions mostly sharply two to five toothed, thin and glabrous, with long slender petioles; inflorescence loose and few flowered; calyx about 3 mm high, glabrous, turbinate or campanulate, the triangular acute lobes about equaling the tube; petals ovate or obovate, white, about twice as long as the calyx lobes (after Peck, 1961).

DISTRIBUTION: Restricted to the lower Willamette River area just south of Portland to the Columbia River Gorge, in Multnomah, Clackamas, and Hood River counties, Oregon. Recently found in adjacent Skamania County, Washington.

PHENOLOGY: In flower from May to July.

HABITAT: Found on shaded cliffs and ledges or among boulders in areas perpetually moist or wet, often under waterfalls or within their spray zone. Surrounding forest is often dominated by Douglas fir. Immediate associates include *Heracleum lanatum* and other herbaceous members of the Saxifragaceae.

LAND OWNERSHIP/MANAGEMENT: U.S. Forest Service, Oregon State Parks, and private.

PRESENT AND POTENTIAL THREATS: The habitat south of Portland (near Lake Oswego) is threatened by land development. Sites within the Columbia Gorge may be jeopardized by collecting and unintentional damage from the general public.

MANAGEMENT RECOMMENDATIONS: Future inventory along the Columbia River might yield additional locations. Those populations on government lands may require protective measures, such as closing or altering trails routes which pass near or through them.

REMARKS: Few populations of this endemic are known. The two Washington populations are reported to be large. Although there are not many current stations for *S. oregana*, it is probably not in immediate danger because of its cliff habitat. There may very well be populations high on the rock walls of the Columbia Gorge and out of the view of potential collectors.

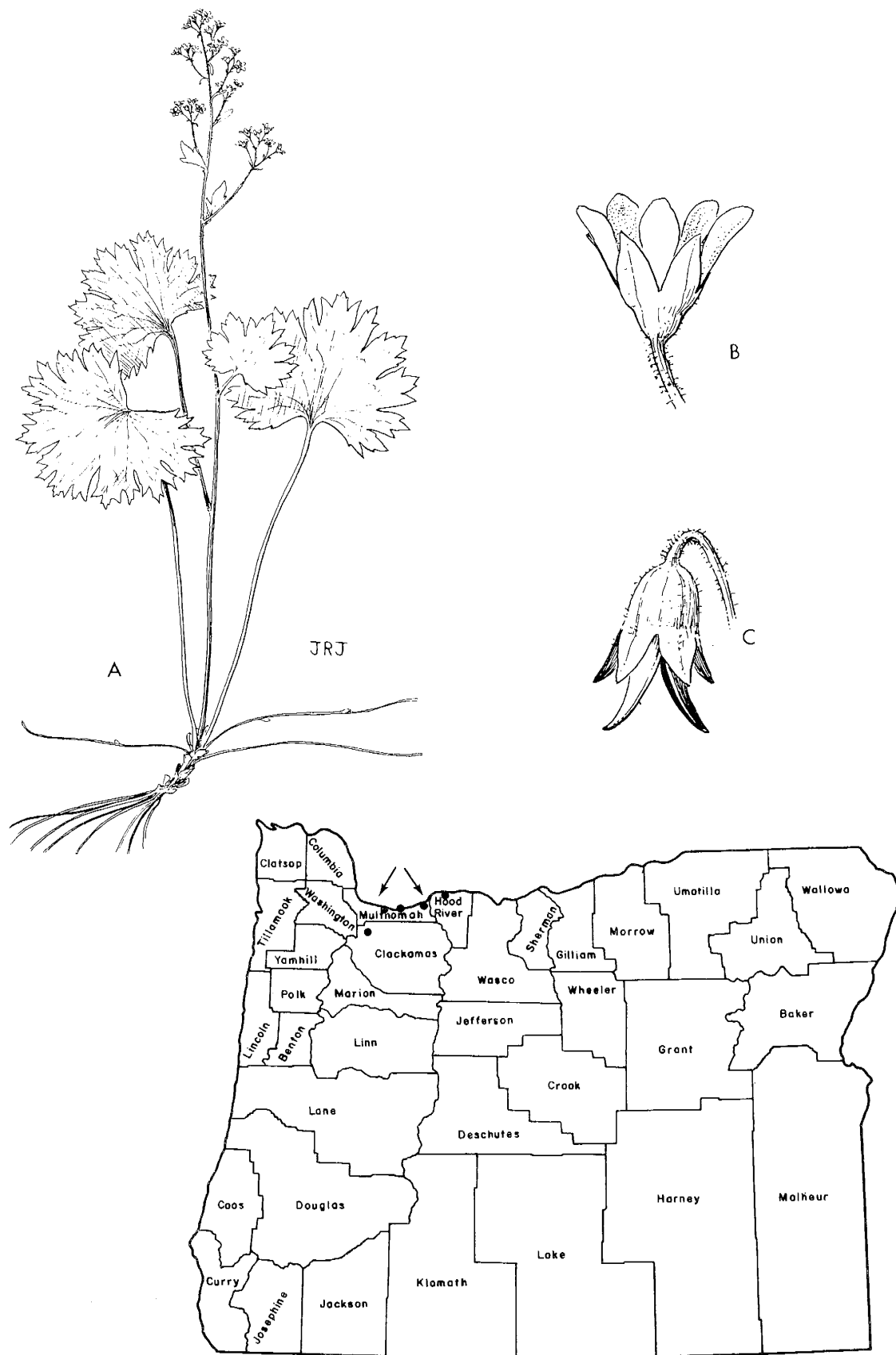


Fig. 157. *Sullivantia oregana*. A: Habit, X 0.6; B: Flower, X 6; C: Calyx, with developing fruit inside, X 6 (drawings taken from Hitchcock et al., 1961).

SYNTHYRIS MISSURICA (Raf.) Penn. SSP. HIRSUTA Penn.

(Mountain kittentails)

Figwort family (Scrophulariaceae)

ORIGINAL PUBLICATION: Proc. Acad. Nat. Sci. Phila. 85:91. 1933.

STATUS: Candidate species for federal listing, Category 1, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Perennial herb from scaly rootstock; leaf blades rounded cordate, hirsutulous at least when young; flowering stem 12-15 cm at anthesis; bract leaves below inflorescence widely ovate, rounded, serrate; sepals oblong lanceolate to nearly oval; corolla blue, 6-7 mm long (after Pennell, 1933).

DISTRIBUTION: Apparently northern Douglas County, Oregon. The only known collection is labeled "Oakland." Pennell (1933) remarks, "I suspect that it came from some high part of the Cascade Range rather than from Oakland in the low trough to the westward; the only collection is labeled "Oakland," but without statement of county."

TAXONOMIC PROBLEMS: The ssp. *hirsuta* is based on only one collection, taken by Howell in 1881. This specimen has neither mature leaves nor ripe fruit. Pennell (1933) commented "the large flowers and spreading pubescence suggest that it will prove to be a distinct species."

LOOK ALIKES: This taxon may be distinguished from other members of the *S. missurica* complex by the brown hirsute pubescence present on the stalks.

PHENOLOGY: Reported flowering in April, but perhaps later.

HABITAT: Montane, otherwise not known.

LAND OWNERSHIP/MANAGEMENT: Probably U.S. Forest Service.

PRESENT AND POTENTIAL THREATS: Undocumented.

MANAGEMENT RECOMMENDATIONS: Field searching is needed to determine if there are any extant populations of this taxon.

REMARKS: Essentially nothing is known about this plant. Although the only specimen is decidedly distinct, the possibility of it being merely an aberrant form of the species must be considered.



Fig. 158. *Synthyris missurica* ssp. *hirsuta*. A: Habit, X 1; B: Close-up of flower and hirsute pedicel, X 5 (drawn from Howell s.n. [holotype], A).

TAUSCHIA HOWELLII (C. & R.) Macbr.

(Howell's tauschia)

Parsley family (Apiaceae)

ORIGINAL PUBLICATION: Contr. Gray Herb. 59:32. 1919.

SYNONYMS: *Velaea howellii* Coult. & Rose (Rev. N. Amer. Umbell. 122. 1888).

Drudeophytum howellii Coult. & Rose (Contr. U.S. National Herb. 7:80-83. 1900).

STATUS: Candidate species for federal listing, Category 2, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Plants short stemmed, 5-8 cm high, glabrous; leaves one or two, ovate, 1.5-3 cm long, rather thick; leaflets oblong to ovate with revolute margins, irregularly toothed or lobed, the teeth pungently tipped; rays three to five, usually with one or two sessile umbels, without bracts; bractlets resembling the leaves and forming most of the foliage of the plant; sepals prominent, pedicels up to 5 mm long; fruit oblong, glabrous, 2-4 mm long (after Peck, 1961).

DISTRIBUTION: Restricted to the Siskiyou Mountains of Jackson and Curry counties, Oregon, south to Siskiyou and Del Norte counties, California.

PHENOLOGY: This taxon flowers in June and July.

HABITAT: Siddall et al. (1979) describe the habitat for this species as "alpine slopes", while Munz (1959) states that the elevational range in California is between 2,000 and 3,000 feet. A collection from Siskiyou County in 1968 was taken at just under 2200 m, and other much earlier collections were also at high elevations. The question of altitudinal restrictions is not yet satisfactorily resolved, but it would seem that Munz was misinformed. Regardless, *T. howellii* seems to prefer dry, exposed ridges and the like, reportedly in decomposed granite. Surrounding forests are often dominated by red fir.

LAND OWNERSHIP/MANAGEMENT: Known from U.S. Forest Service lands.

PRESENT AND POTENTIAL THREATS: Perhaps threatened by collectors and potential high altitude mining.

MANAGEMENT RECOMMENDATIONS: Additional surveys of the high Siskiyou are needed in Oregon. If *T. howellii* is indeed restricted to alpine or subalpine habitats, little specific management consideration will be necessary.

REMARKS: The isolated habitat of this plant has prevented it from becoming well known. At least one population in California has been described as "rather locally abundant".

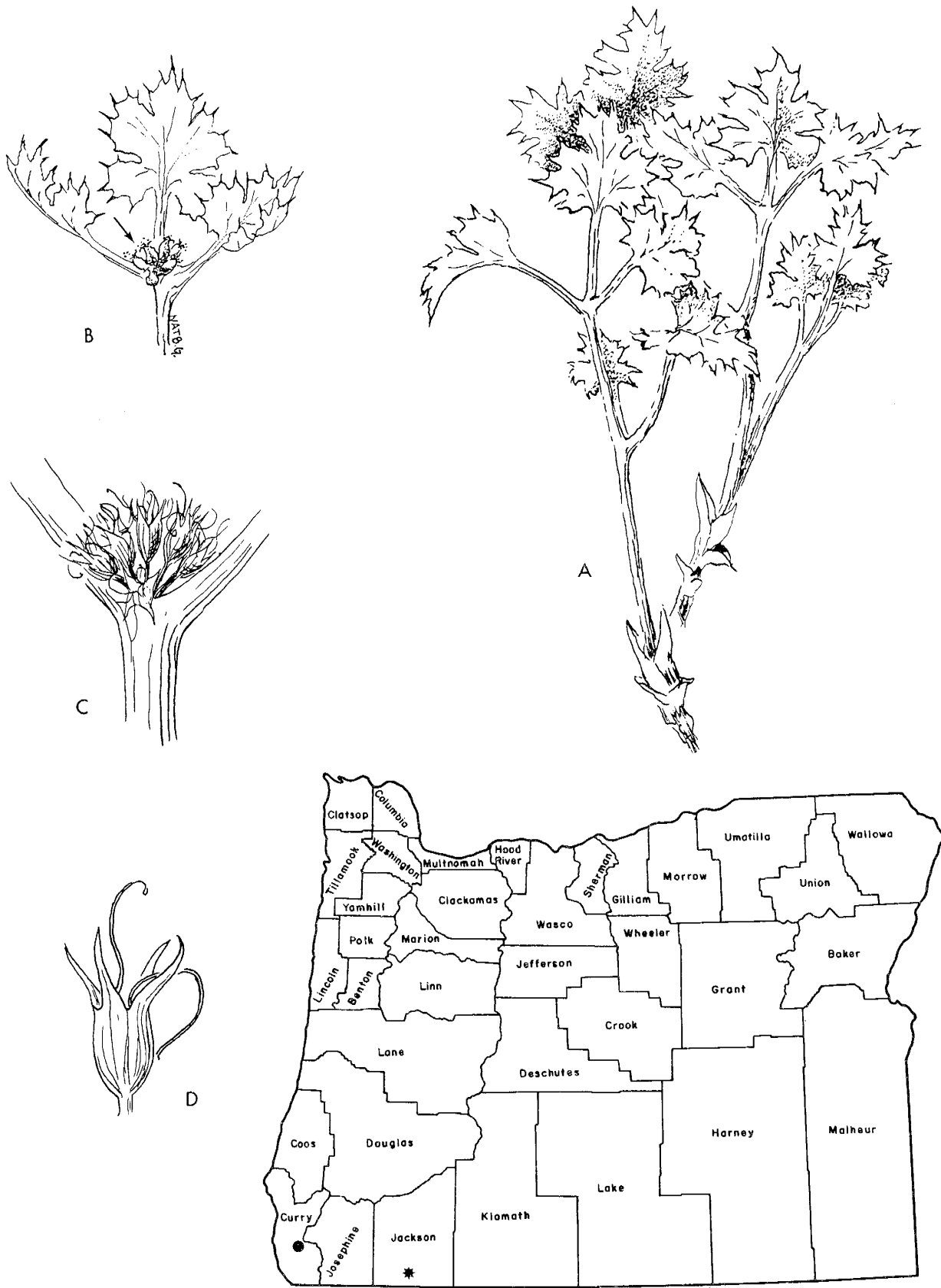


Fig. 159. *Tauschia howellii*. A: Habit, X 1.2; B: Cluster of fruit, X 1.2; C: Close-up of inflorescence, X 4; D: Sepals in early fruit, X 6 (drawn from Howell 1366, ORE).

TAUSCHIA STRICKLANDII (Coul. & Rose) Math. & Const.

(Strickland's tauschia)

Parsley family (Apiaceae)

ORIGINAL PUBLICATION: Bull. Torrey Club 68:121. 1941.

SYNONYMS: *Hesperogenia stricklandii* Coul. & Rose (Contr. U.S. Nat. Herb. 5:203. 1899).

Zizia stricklandii K. (Pol. Bull. Soc. Nat. Mosc. n.s. 29:200. 1915).

STATUS: Candidate species for federal listing, Category 1, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Glabrous perennial from a deep seated, tuberous thickened root, to ca. 10 cm high, stem scapose; leaves few, ternate or biternate, segments lanceolate, ca. 12 mm long, petioles 3.8-5 cm long; inflorescence 1 cm wide, rays of the umbel three to six, 4-14 mm long; flowers tiny, bright yellow; fruit ca. 2-3 mm long, on pedicels 4 mm long or less, glabrous (after Cronquist, 1961).

DISTRIBUTION: Endemic to Mount Rainier, Washington, and a recently discovered disjunct site in Multnomah County, Oregon.

LOOK ALIKES: The small inflorescence and the relatively few but comparatively large leaflets should distinguish this from other members of the Apiaceae of northern Oregon.

PHENOLOGY: Blooming from late June until August.

HABITAT: In damp meadows and grassy fields, often in sunny openings near coniferous woodlands. Collected in Oregon at about 1150 m, but known in Washington from between ca. 1540 and 2000 m.

LAND OWNERSHIP/MANAGEMENT: U.S. Forest Service in Oregon and National Park Service in Washington.

PRESENT AND POTENTIAL THREATS: Logging and grazing are potential threats in Oregon. Recreational activities may have additional impacts.

MANAGEMENT RECOMMENDATIONS: The only known site for this taxon in Oregon deserves special attention and consideration with respect to the overall management of the area.

REMARKS: This plant was first located in Oregon in 1980. This discovery not only extended the species' geographic range, but its phenological and altitudinal limits as well. It indicates that its overall range must have originally been considerably greater than previously assumed. The populations remaining today were undoubtedly isolated through the forces of past glaciation.

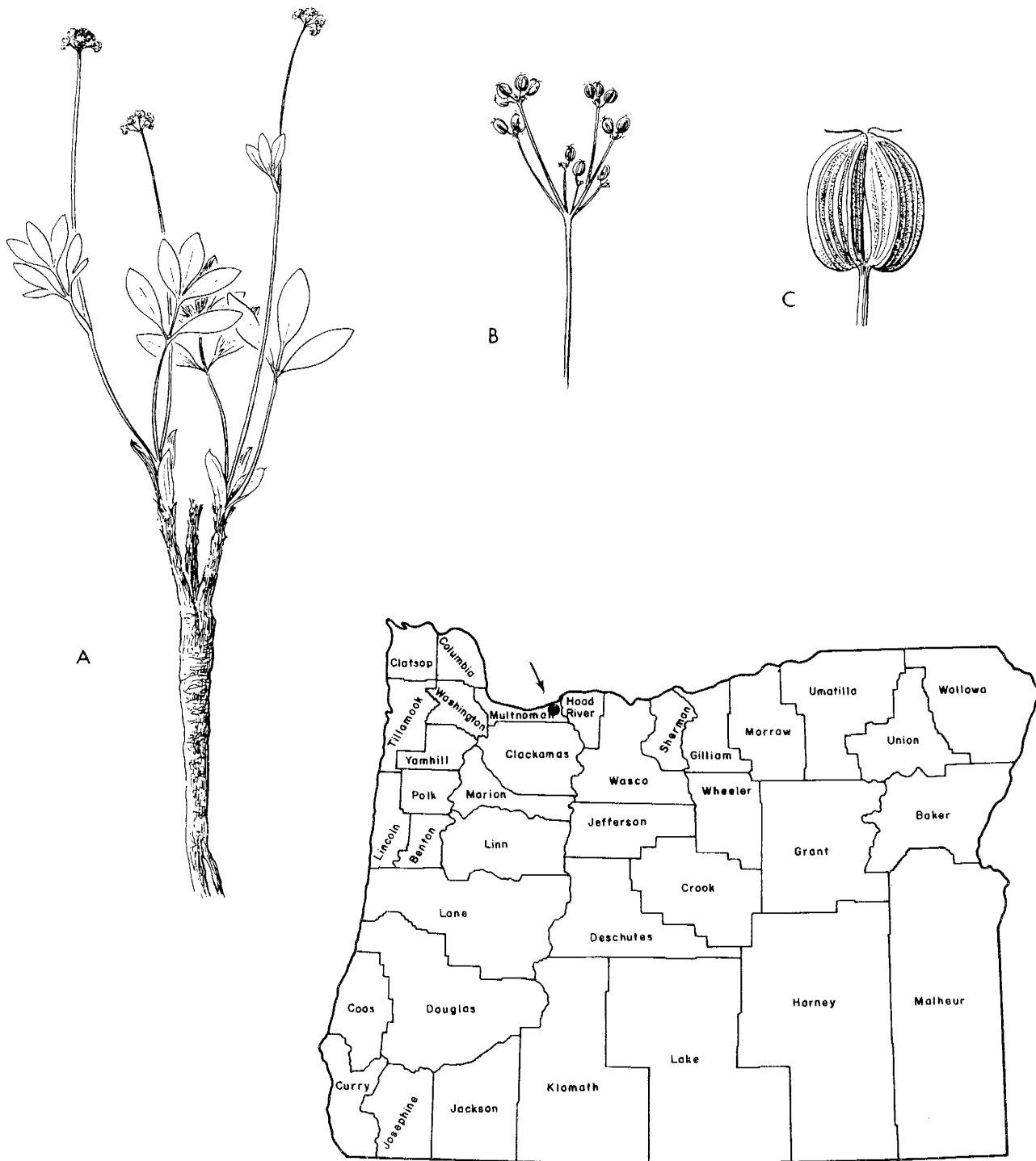


Fig. 160. *Tauschia stricklandii*. A: Habit, X 0.8; B: Expanded fruiting umbel, X 1.3; C: Close-up of fruit, X 10 (drawings taken from Hitchcock et al., 1961).

THELYPODIUM BRACHYCARPUM Torr.

(Short fruited thelypody)

Mustard family (Brassicaceae)

ORIGINAL PUBLICATION: Wilkes Exped. Bot. 17:231. 1874.

SYNONYMS: *Thelypodopsis brachycarpa* (Torr.) Schulz (Bot. Jahrb. 66:98. 1933).

STATUS: Candidate species for federal listing, Category 2, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Biennial, glabrous or sparsely pilose towards the base; stems 3-15 dm high, simple or virgately branched, usually stout; basal leaves oblanceolate or spatulate, definitely toothed to deeply lyrate pinnatifid, 4-6 cm long; cauline leaves 1-5 cm long, narrow, acute, entire or toothed; sepals and petals white, the former linear lanceolate, acute, the latter linear, two to three times as long as the sepals; stamens exserted; inflorescence dense, racemose; pedicels stout, 1-2 mm long, divergent; fruit ascending, 15-30 mm long (after Payson, 1922).

DISTRIBUTION: Southern Oregon in Klamath County, perhaps Lake County as well (there is an old herbarium record). Also in northern California in Siskiyou, Shasta, and Napa counties.

LOOK ALIKES: *Thelypodium brachycarpum* is distinguished from the closely allied *T. crispum* by its shorter (1-2 mm), straight fruiting pedicels as opposed to those of the latter which are longer (3-5 mm) and curved ascending. *T. howellii* var. *howellii*, which also occurs in Klamath County, is differentiated by its longer pedicels (over 5 mm) and less dense raceme.

PHENOLOGY: Flowers mid April to August, dependent upon elevation.

HABITAT: In meadows and open flats at lower to mid elevations (ca. 650 to 2300 m). This taxon grows on sites exhibiting a broad range of alkalinity. Associated species include *Chrysothamnus* spp., *Salsola kali*, *Atriplex* spp., *Sitanion hystrix*, and *Bromus tectorum*.

LAND OWNERSHIP/MANAGEMENT: Mostly private, with a small amount of habitat occurring on Miller Island Refuge managed by the State of Oregon. It is potentially on some Bureau of Land Management parcels as well.

PRESENT AND POTENTIAL THREATS: Populations are apparently not vigorous and are being reduced by grazing and offroad vehicles.

MANAGEMENT RECOMMENDATIONS: Continued inventory for additional populations. A reduction or elimination of grazing where this species occurs on state land would be desirable. Populations located on federal land should be given careful management consideration as well.

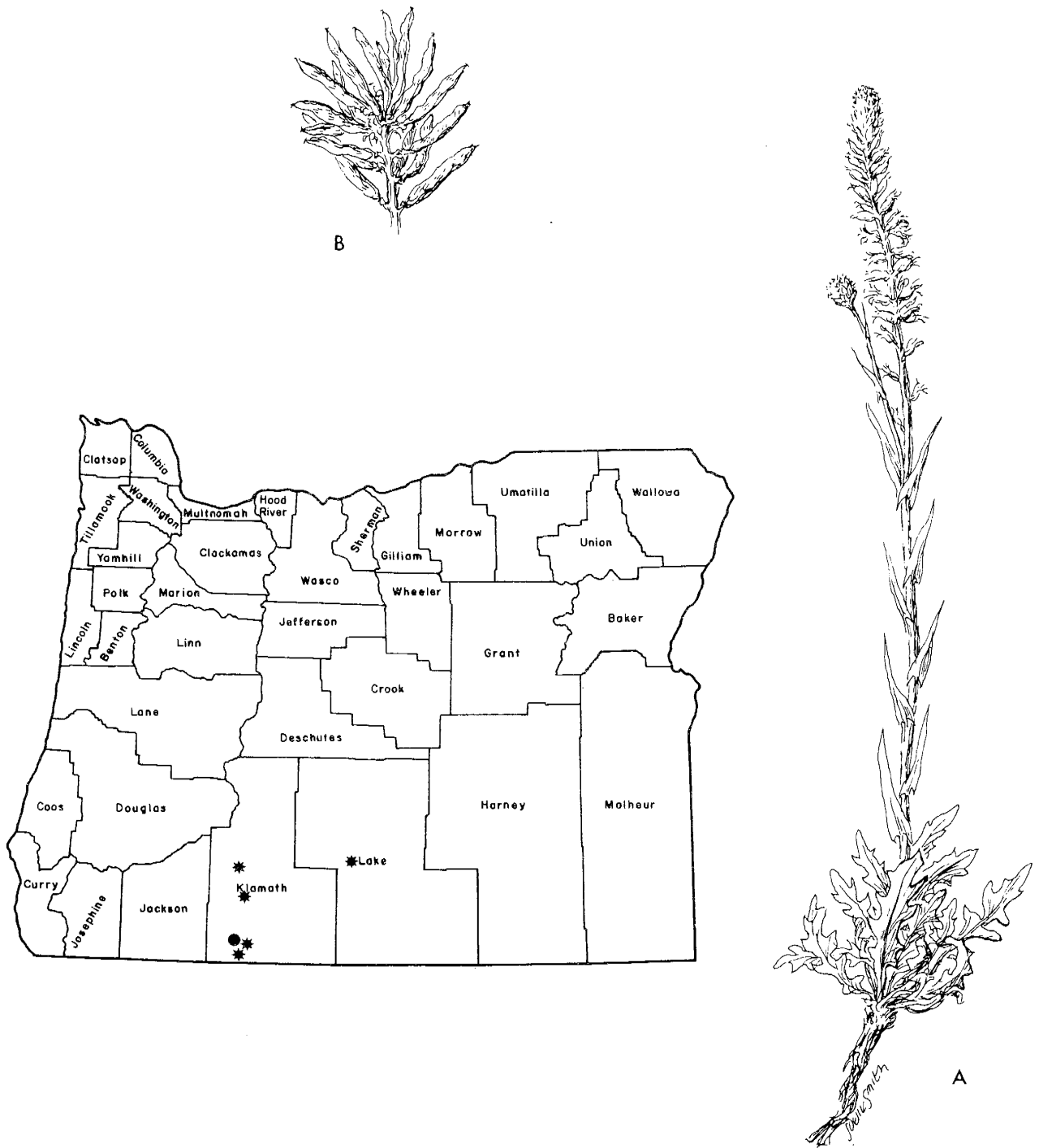


Fig. 161. *Thelypodium brachycarpum*. A: Habit, X 0.3; B: Fruiting raceme, X 0.8 (drawn from Peck 9401, WILLU).

THELYPODIUM EUCOSMUM Robins.

(Arrowleaf thelypody)

Mustard family (Brassicaceae)

ORIGINAL PUBLICATION: Synop. Fl. No. Amer. 1:175. 1895.

STATUS: Candidate species for federal listing, Category 1, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Biennial, or perennial, glabrous throughout, more or less glaucous; basal leaves oblanceolate, narrowed to a petiole, sub-entire, cauline leaves oblong to lanceolate, entire, 2-6 cm long, usually acute, amplexicaul at the base; inflorescence racemose; sepals reddish purple, narrow, 5-7 mm long, not saccate; petals narrowly spatulate, 8-11 mm long, red purple; filaments linear, 6-7 mm long, purplish, anthers about 3 mm long; pedicels horizontal or slightly descending, enlarged at the apex, 3-5 mm long; pods ascending (after Payson, 1922).

DISTRIBUTION: In central and eastern Oregon, apparently restricted to Wheeler, Grant, and Baker counties, perhaps as far west as Crook County. Reported by various early authors from Idaho; however, no specimens have been verified from that state and it appears probable that it is restricted to Oregon (Al-Shehbaz, 1973).

LOOK ALIKES: There are several species of thelypody in eastern Oregon. Recent work by Al-Shehbaz (1973) reveals that this particular species is easily distinguished by its combination of dark purple flowers, exerted anthers, and oblong linear floral buds.

PHENOLOGY: Flowers from May to July.

HABITAT: Dry slopes, shaded under junipers, less commonly moist (alkaline?) soil near rivers, probably at lower to intermediate elevations in the juniper-sagebrush series of plant communities. Probably not tolerant of extremely dry sites, since it is known only from shaded or moist areas.

LAND OWNERSHIP/MANAGEMENT: Probably private, perhaps also the Bureau of Land Management.

PRESENT AND POTENTIAL THREATS: Collecting is a possible threat. Populations along rivers could be subject to flooding or hazards created by local irrigation projects. Cattle are widespread in this part of Oregon. Hermann (1966) notes that at least two common *Thelypodium* from our area are known to be directly consumed.

MANAGEMENT RECOMMENDATIONS: A diligent search is needed to determine how many populations of this plant remain. *Thelypodium eucosmum* should not be subjected to grazing pressure.

REMARKS: This is reputedly one of the most attractive members of the genus. Extant populations were recently found (1981) in Grant and Wheeler counties.

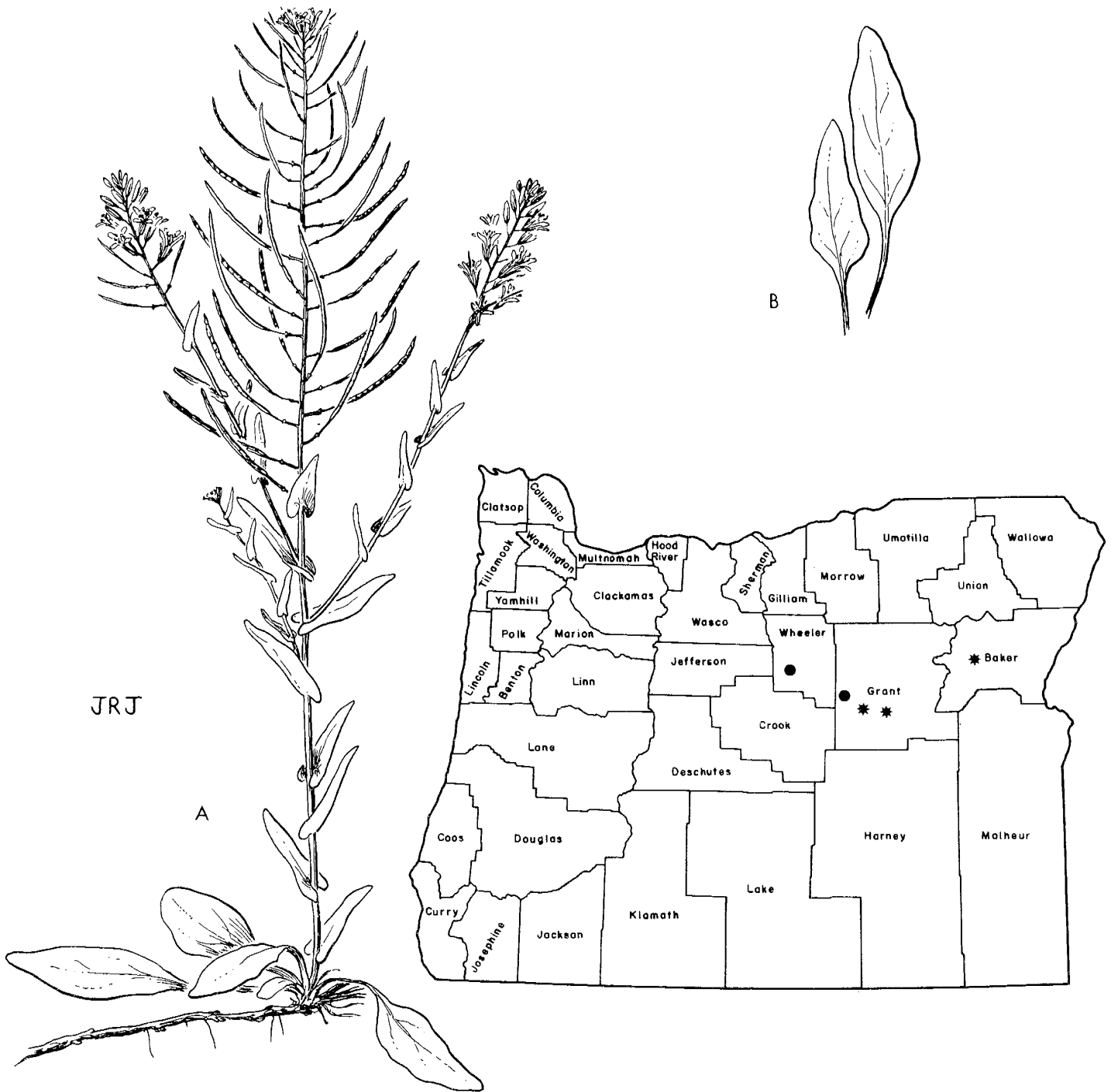


Fig. 162. *Thelypodium eucosmum*. A: Habit, X 0.5; B: Petiolate basal leaves, X 0.5 (drawings taken from Hitchcock et al., 1964).

THELYPODIUM HOWELLII Watson SSP. SPECTABILIS (Peck) Al-Shehbaz

(Howell's thelypody)

Mustard family (Brassicaceae)

ORIGINAL PUBLICATION: Contr. Gray. Herb. 204:93. 1973.

SYNONYMS: *Thelypodium howellii* var. *spectabilis* Peck (Torreya 32:150. 1932).

STATUS: Candidate species for federal listing, Category 1, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Herbaceous biennial, stems mostly single from the base, usually branched above, 10-80 cm high; basal leaves oblanceolate to spatulate, 2-10 cm long; cauline leaves lanceolate to linear lanceolate, entire, often sagittate at base, 1-9.7 cm long; inflorescence a raceme, lax; sepals erect, scarious at margin, green, purple or lavender; petals mostly spatulate, rarely oblanceolate, lavender to purple; paired filaments free; siliques terete, straight to slightly incurved, mostly ascending, or sometimes nearly erect to divaricately ascending (after Al-Shehbaz, 1973).

DISTRIBUTION: This is an Oregon endemic, known historically from the type locality in northern Malheur County, the Powder River Valley of Baker and Union counties, and southern Harney County.

LOOK ALIKES: *Thelypodium howellii* ssp. *spectabilis* is distinguished from *T. howellii* ssp. *howellii* by its paired free filaments and petals, which are mostly spatulate, rarely oblanceolate (Al-Shehbaz, 1973).

PHENOLOGY: To be expected in flower from June through July.

HABITAT: Lower elevation river valleys and moist (often alkaline) plains, probably growing mostly with salt tolerant species such as *Sarcobatus vermiculatus*, *Elymus cinereus*, and *Chenopodium* spp.

LAND OWNERSHIP/MANAGEMENT: Private and possibly Bureau of Land Management.

PRESENT AND POTENTIAL THREATS: Agriculture and grazing are potential threats in this taxon's habitat.

MANAGEMENT RECOMMENDATIONS: Intensive inventories of likely sites are needed. Immediate protective measures should be implemented if any populations are located on public lands.

REMARKS: Repeated field searches in the vicinity of the type locality have yielded nothing. The Powder River Valley is highly agriculturally developed and it is quite possible the populations there have been extirpated. There is a reported sighting from this area in 1981, however, which although unvouchered appears reliable.

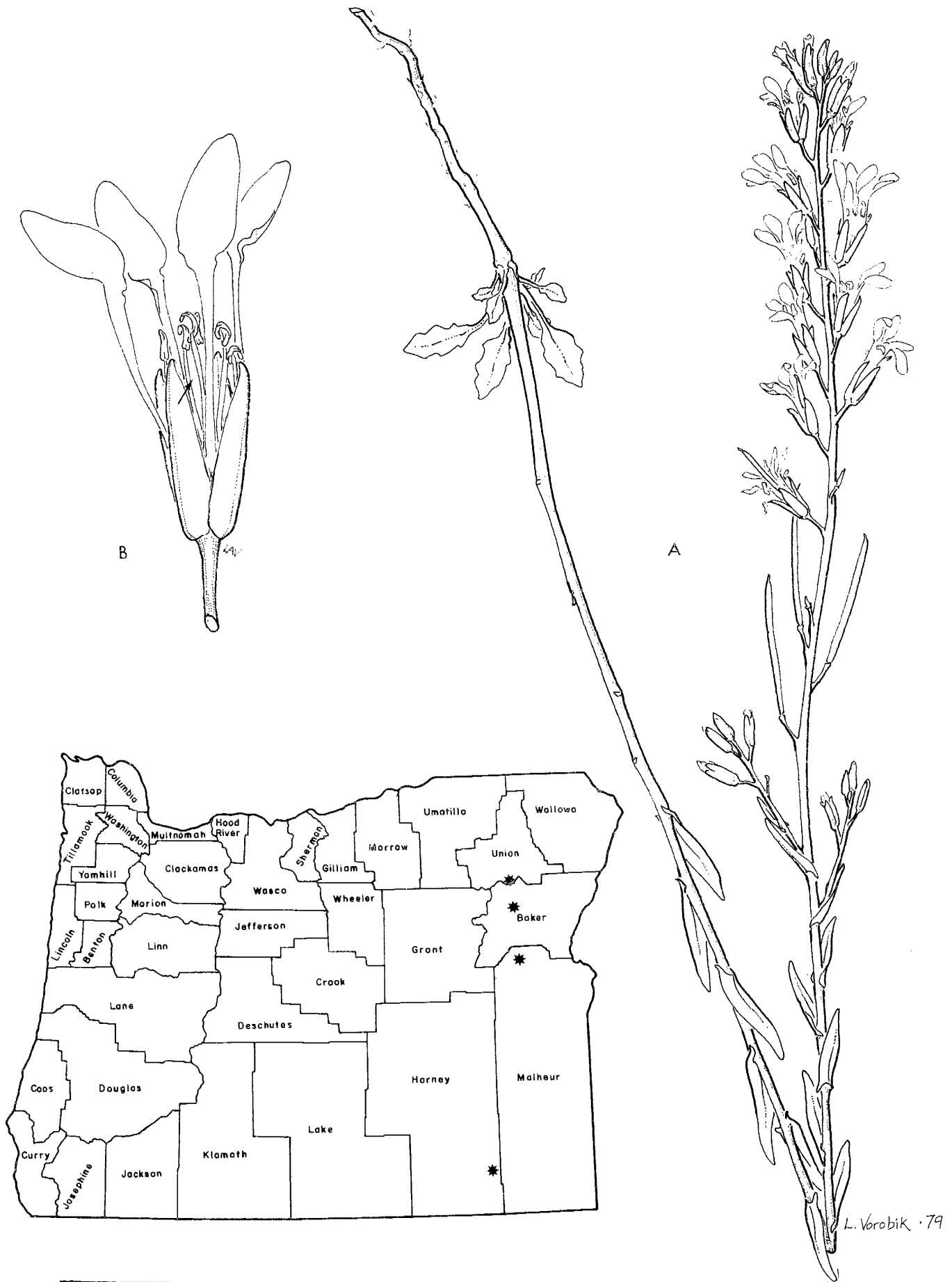


Fig. 163. *Thelypodium howellii* ssp. *spectabilis*. A: Habit, X 1; B: Enlargement of flower, showing free filaments, X 4 (drawn from Peck 16066, WILLU).

THLASPI MONTANUM L. VAR. SISKIYOUENSE P. Holmgren

(Siskiyou Mountains pennycress)
Mustard family (Brassicaceae)

ORIGINAL PUBLICATION: Mem. N.Y. Bot. Gard. 21:60 (key), 84-87. 1971.

STATUS: Candidate species for federal listing, Category 2, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Glabrous, occasionally glaucous, short lived perennial, averaging 12 cm tall at maturity with a simple to freely branched caudex; basal leaves numerous, frequently drying and withering before ripening of fruit; cauline leaves green or purplish, sessile and auriculate clasping, averaging 7-11 mm long; flowers racemose, white; infructescence averaging 4.8 cm long, loose to fairly compact; siliques mostly horizontal, obovate to obdeltoid, from truncate to strongly emarginate at the apex (after Holmgren, 1971).

DISTRIBUTION: This taxon is restricted to southern Josephine County, Oregon, in the Siskiyou Mountains.

LOOK ALIKES: *Thlaspi montanum* var. *siskiyouense* might be confused with var. *montanum*, although the latter usually occurs at much higher elevations (ca. 1300 m).

PHENOLOGY: Flowering from April to June.

HABITAT: Occurs in mixed pine-douglas fir forest, growing mostly on serpentine; commonly on moist, open, rocky slopes with little soil development at ca. 370 to 500 m. Associated species include *Ceanothus pumilus*, *Phlox speciosa*, *P. diffusa*, *Phacelia* sp., and *Arctostaphylos* spp.

LAND OWNERSHIP/MANAGEMENT: U.S. Forest Service.

PRESENT AND POTENTIAL THREATS: Logging, mineral prospecting, and other disruption of the serpentine substrate.

MANAGEMENT RECOMMENDATIONS: Consider providing protected areas on federal lands to protect this and other Siskiyou Mountains endemics, whose futures may ultimately be compromised by strip mining.

REMARKS: This variety has been collected at several locations and has been reported as somewhat abundant. Although local, it is one of the more frequent serpentine endemics of southwest Oregon. According to Holmgren (1971), this variety may be sympatric with var. *montanum* near Waldo, Oregon, and intermediate specimens are to be expected here.

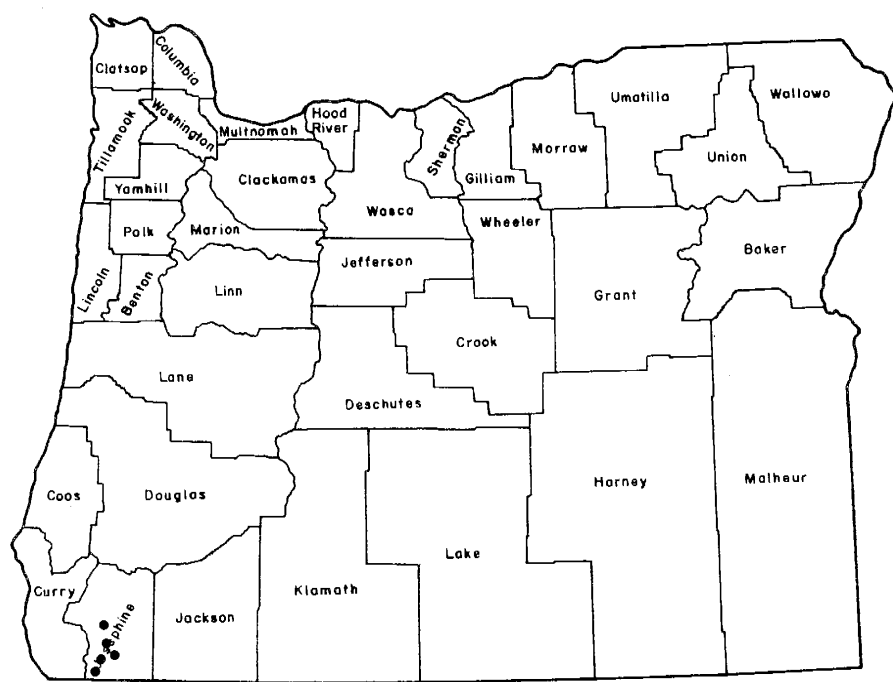


Fig. 164. *Thlaspi montanum* var. *siskiyouense*. A: Habit, X 1; B: Fruiting raceme, X 1; C: Fruit (silique), X 3.5 (drawn from Crosby 1123, ORE).

TRIFOLIUM OWYHEENSE Gilkey

(Owyhee clover)

Pea family (Fabaceae)

ORIGINAL PUBLICATION: Madrono 13:167-169. 1956.

STATUS: Candidate species for federal listing, Category 1, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Perennial herb, glaucous, stems several, spreading, up to 2 dm long; leaflets three, thick and broad, green with white crescents; head lacking an involucre, ca. 3.5-4 cm long, equally as wide; calyx tube villose, inflating with age, 6-8 mm long; corolla 12-18 mm, rose colored above, whitish below; seeds two or three, spotted (after Gilkey, 1956).

DISTRIBUTION: Known from a few scattered sites in eastern Malheur County, in southeastern Oregon, and from adjacent Owyhee County, Idaho.

LOOK ALIKES: *Trifolium macrocephalum*, another local clover with a large headed inflorescence, differs in its possession of five to six leaflets.

PHENOLOGY: Blooming occurs in May and June.

HABITAT: *Trifolium owyheense* is found at moderate elevations, on bleak slopes composed of loose diatomaceous talus or volcanic ash. Surrounding plant communities are dominated by sagebrush and juniper, with the few direct associates being mostly annuals. These include *Mimulus cusickii*, *Senecio ertterae*, *Mentzelia packardiae*, and *Phacelia lutea*.

LAND OWNERSHIP/MANAGEMENT: Private and Bureau of Land Management.

PRESENT AND POTENTIAL THREATS: Rangeland improvement (spraying and seeding), removal of required substrate for road construction material, offroad vehicle traffic, and grazing.

MANAGEMENT RECOMMENDATIONS: Mitigate range projects which are suspected of being damaging to this species. Gravel and ash excavation should be halted in sensitive areas. Zones designated for recreational activity should be scrutinized for this and other rare taxa and closures effected if necessary.

REMARKS: *Trifolium owyheense* is known from a few scattered populations. This part of Oregon is poorly botanized, however, and additional field work may very likely turn up additional stations. This species should not be easily overlooked, considering its large and rather showy inflorescence.

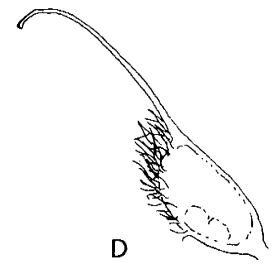
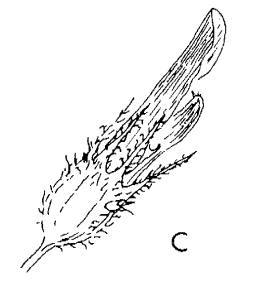
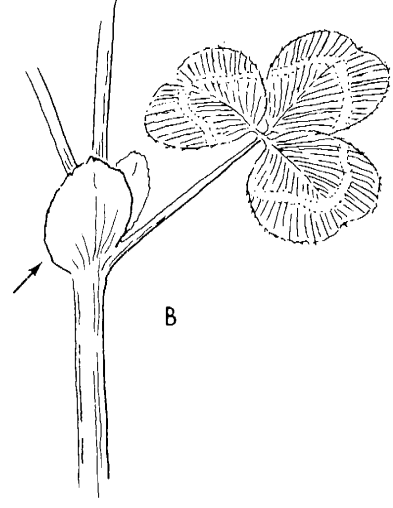
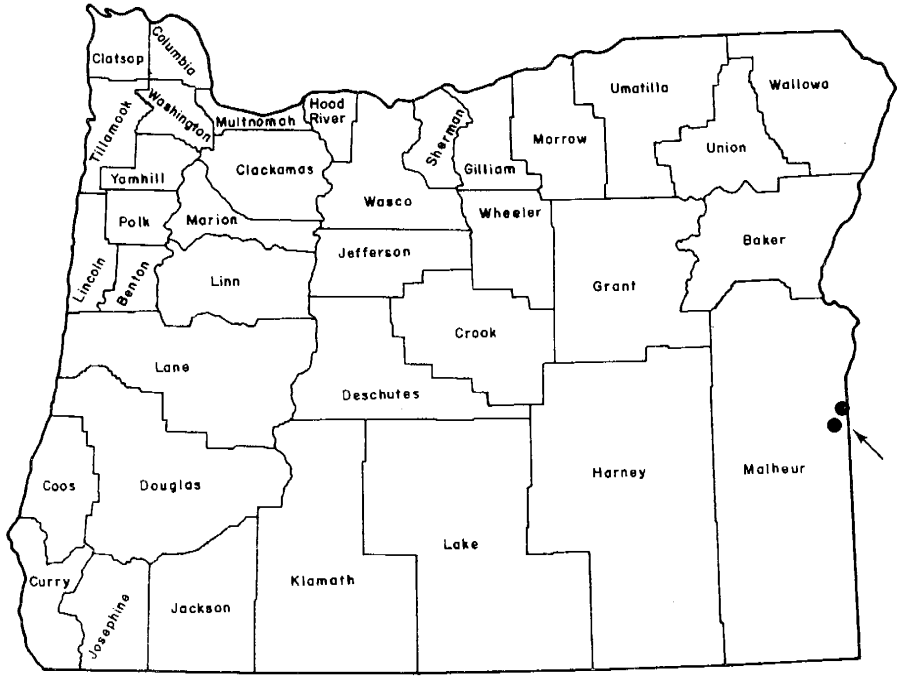
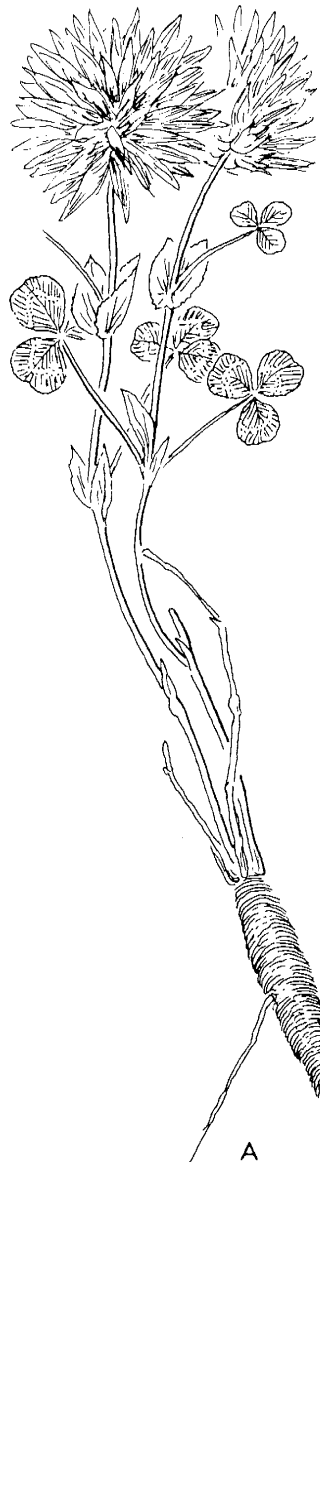


Fig. 165. *Trifolium owyheense*. A: Habit, X 0.6; B: Leaf, showing large stipules, X 1; C: Individual flower, X 3; D: Fruit, with developing ovules depicted inside, X 2.3 (drawn from Murphy s.n., OSC).

VIOLA LANCEOLATA L. SSP. *OCCIDENTALIS* (Gray) Russell

(Lance leaf violet)

Violet family (Violaceae)

ORIGINAL PUBLICATION: Bot. Gaz. 11:255. 1886.

SYNONYMS: *Viola primulifolia* L. var. *occidentalis* Gray (Bot. Gaz. 11:255. 1886).

Viola occidentalis Howell (Fl. N.W. Amer. 1:69. 1897).

STATUS: Candidate species for federal listing, Category 2, United States Fish and Wildlife Service (Federal Register 45:82480-82569. December 15, 1980).

DESCRIPTION: Perennial plant without an obvious stem, glabrous throughout, producing runners; the leaves arise directly from a short root-stalk, to 10 cm, ovate to oblong spatulate, narrowed to a long slender petiole; peduncles 8-15 cm long, mostly shorter than the leaves; flowers single, petals white, the lower veined with purple, 8-12 mm long, the lateral pair bearded with slender hairs, spur short, saccate (after Abrams, 1951).

DISTRIBUTION: Restricted to Curry and Josephine counties in southwestern Oregon, and nearby Del Norte County, California.

PHENOLOGY: The lance leaf violet blooms from April to occasionally June.

HABITAT: Found in *Sphagnum* bogs, swamps, or marshes, below 800 m, in mixed evergreen forest. Associated species include *Darlingtonia californica*, *Pinguicula vulgaris*, *Cypripedium californicum*, *Narthecium californicum*, *Rhamnus californicus* ssp. *occidentalis*, and *Rhododendron occidentale*.

LAND OWNERSHIP/MANAGEMENT: U.S. Forest Service, Bureau of Land Management, and possibly private.

PRESENT AND POTENTIAL THREATS: Mining activities and prospecting are affecting bog habitats in portions of southwest Oregon. Water is being diverted from the springs which support a number of populations. Collecting may also prove to be a problem.

MANAGEMENT RECOMMENDATIONS: Additional field work is needed to determine how many populations actually exist. Bog habitats on Federal land especially need protection from exploitation since much of this habitat type is in unconcerned private hands.

REMARKS: *Viola lanceolata* var. *occidentalis* is a member of a threatened plant community. Several of its associates are also listed for review as threatened or endangered. The preservation of these fragile bog sites is essential in maintaining viable populations of many of the unusual endemics restricted to southwest Oregon and northern California.

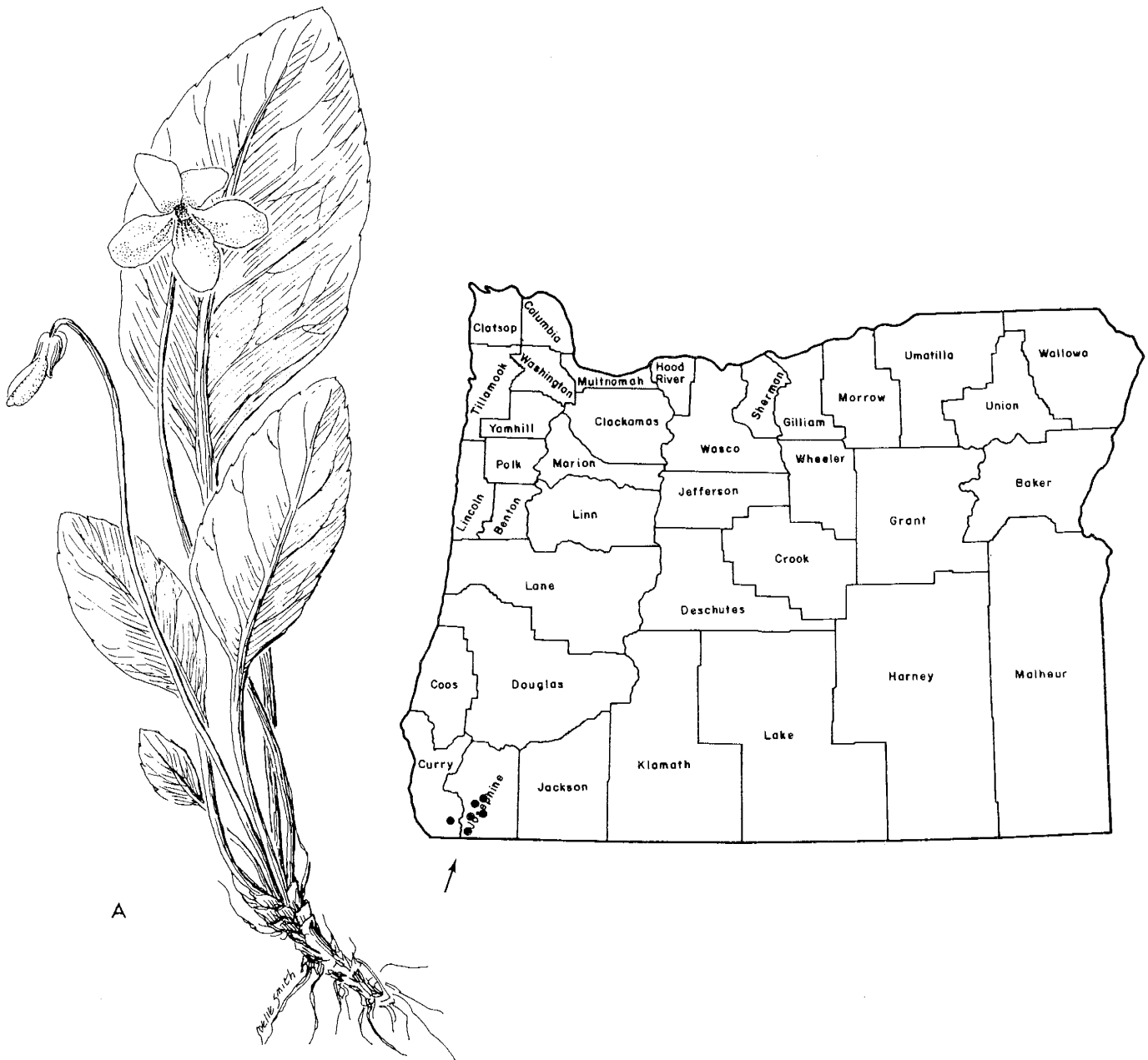


Fig. 166. *Viola lanceolata* ssp. *occidentalis*. A: Habit, X 1.3 (drawn from Overlander s.n., OSC).

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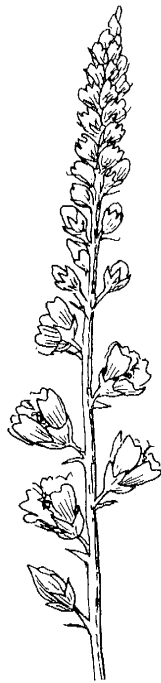
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APPENDICES



APPENDIX I

Species Under Review Not Illustrated

Phlox peckii Wherry (Polemoniaceae). This species is a small undershrub to ca. 6 cm high, with narrow, opposite leaves, and white to pink flowers ca. 10-20 mm long including the corolla lobes. It is known from a single old collection, recorded in the vicinity of Crater Lake (Klamath County). *P. peckii* is extremely similar to *P. diffusa*, a species reportedly widespread at the type locality. There is speculation that *P. peckii* may represent a pathologic form of the latter taxon. The only distinguishing feature between the two is the unusually hairy (shaggy) aspect of the corolla lobes of *P. peckii*, glabrous in *P. diffusa*. In fact, this type of corolla pubescence is otherwise unknown in the genus. A critical reexamination of the type specimen with this possibility in mind may be worthwhile. In a seemingly similar case reported by Peabody (1980), *Phlox grahamii*, thought to be an extremely rare Utah endemic, was shown to be merely a rust affected form of a common species after a check of the only collection.

Astragalus purshii Dougl. ex Hook., ined. (Fabaceae). This perennial milk-vetch is low and somewhat matted, with hairy leaves and purplish flowers. It was listed as *A. purshii* var. *ophiogenes* Barneby in the Federal Register (45:82480-82569. 1980), but the taxonomy of this entity is unclear and it seems the var. *ophiogenes* may represent more than one taxon. It frequents dunes and other sandy sites along the Snake River in eastern Malheur County, Oregon and apparently adjacent Idaho, blooming from April to June.

Balsamorhiza sericea Weber, ined. (Asteraceae). This endemic balsamroot of the Siskiyou region of southwestern Oregon has been included under the names *B. platylepis* and *B. macrolepis* var. *platylepis* by earlier taxonomists. It apparently frequents serpentine soils and would therefore be susceptible to the disturbances of strip mining for nickel and other minerals indigenous to this substrate. According to Weber (pers. comm. to Ken Chambers) *B. sericea* "is one of the cleanest species of *Balsamorhiza*" and a very sensitive taxon.

Microseris laciniata (Hook.) Sch.-Bip. ssp. *detlingii* Chamb., ined. (Asteraceae). This annual relative of the dandelion is known only from southern Jackson County in southwestern Oregon not far from the California border. It prefers heavy clay soils and typically occurs in open oak woodland with an herbaceous understory. It flowers in May and June. Populations are reported to be small and may be jeopardized by grazing and road construction.

Romanzoffia thompsonii Marttala, ined. (Hydrophyllaceae). This, the only annual member of the genus, is known from a very few scattered localities in the western Oregon Cascades, in Linn, Lane, Douglas, and Jackson counties. It is a delicate plant, somewhat succulent, ca. 3-4 cm tall, with tiny, opposite leaves and one to several white, funnel shaped flowers ca. 5-6 mm long. *R. thompsonii* occurs at mid to upper elevations, in moist moss and rocks or in grassy meadows, flowering from April to early July. Label data from the few collections indicate that the populations are ecologically

restricted but that the species is rarely locally common. *R. thompsonii* is an interesting plant in that it has been known to botanists since at least 1899, is apparently a very distinct species, and yet has never been published in the literature. Vernon Marttala is reportedly intending to rectify this situation and he proposed the specific epithet a number of years ago.

APPENDIX II.

Species Reviewed and Determined Ineligible for Listing

The majority of the following taxa were previously published together as either candidate (Federal Register 40:27824-27924. 1975) or proposed (Federal Register 41:24524-24572. 1976) species for Federal listing as threatened or endangered. A few were individually requested to be similarly reviewed at later dates. All are currently considered not to require protection and are consequently no longer being reviewed for listing (Federal Register 45:82545-82561. 1980), including *Camassia leichtlinii* and *Cypripedium californicum* which were dropped from review in 1981.

Reasons for being dropped from listing eligibility vary with each individual taxon, the particular details of which are impractical to discuss here. There are, however, three broad deletion categories to which a plant may be assigned and they are identified below.

- A. Taxa which are known to be extinct. While there are several Oregon plants which have not been seen in many years and have been suggested to be extinct, there have been no efforts made to verify suspected extirpation. Therefore, no plants from Oregon are included in this category.
- B. Taxa whose taxonomic standing has been questioned by reputable authorities. Most are now felt to represent aberrant populations or ecotypes which are unrecognizable as consistently distinct entities.
- C. Taxa which have been found to be too plentiful in at least part of their geographic range to justify future consideration as threatened or endangered.

	Taxon	Family
C	<i>Agrostis howellii</i>	Poaceae
C	<i>Allium madidum</i>	Liliaceae
C	<i>Antennaria suffrutescens</i>	Asteraceae
C	<i>Arabis oregana</i>	Brassicaceae
B	<i>Arctostaphylos intricata</i> var. <i>oblongifolia</i>	Ericaceae
C	<i>Arenaria howellii</i>	Caryophyllaceae
B,C	<i>Arnica amplexicaulis</i> var. <i>piperi</i>	Asteraceae
C	<i>Artemisia papposa</i>	Asteraceae
C	<i>Aster brickellioides</i>	Asteraceae
C	<i>Aster hallii</i>	Asteraceae
C	<i>Astragalus alvordensis</i>	Fabaceae

	Taxon	Family
B	<i>Astragalus lentiginosus</i> var. <i>chartaceus</i>	Fabaceae
C	<i>Camassia leichtlinii</i> var. <i>leichtlinii</i>	Liliaceae
B	<i>Campanula rotundifolia</i> var. <i>sacajawean</i>	Campanulaceae
C	<i>Cardamine penduliflora</i>	Brassicaceae
C	<i>Carex interrupta</i>	Cyperaceae
C	<i>Castilleja brevilobata</i>	Scrophulariaceae
C	<i>Castilleja chrysantha</i>	Scrophulariaceae
C	<i>Castilleja elata</i>	Scrophulariaceae
C	<i>Castilleja oresbia</i>	Scrophulariaceae
B	<i>Castilleja ownbeyana</i>	Scrophulariaceae
B,C	<i>Chrysothamnus nauseosus</i> ssp. <i>nanus</i>	Asteraceae
C	<i>Cimicifuga laciniata</i>	Ranunculaceae
C	<i>Cirsium brevifolium</i>	Asteraceae
C	<i>Cirsium hallii</i>	Asteraceae
B	<i>Clarkia amoena</i> var. <i>pacifica</i>	Onagraceae
C	<i>Claytonia bellidifolia</i>	Portulacaceae
C	<i>Cryptantha hypsophila</i>	Boraginaceae
B,C	<i>Cryptantha interrupta</i>	Boraginaceae
C	<i>Cymopterus corrugatus</i>	Apiaceae
C	<i>Cypripedium californicum</i>	Orchidaceae
C	<i>Dodecatheon poeticum</i>	Primulaceae
C	<i>Douglasia laevigata</i> var. <i>laevigata</i>	Primulaceae
C	<i>Draba douglasii</i> var. <i>douglasii</i>	Brassicaceae
C	<i>Draba sphaeroides</i> var. <i>cusickii</i>	Brassicaceae
C	<i>Erigeron bloomeri</i> var. <i>nudatus</i>	Asteraceae
C	<i>Erigeron oreganus</i>	Asteraceae
C	<i>Eriogonum diclinum</i>	Polygonaceae
C	<i>Eriogonum novonudum</i>	Polygonaceae
C	<i>Eriogonum thymoides</i>	Polygonaceae
C	<i>Eryngium petiolatum</i>	Apiaceae
C	<i>Erythronium howellii</i>	Liliaceae
C	<i>Erythronium oregonum</i>	Liliaceae
C	<i>Frasera idahoensis</i>	Gentianaceae

	Taxon	Family
B	<i>Fritillaria adamantina</i>	Liliaceae
C	<i>Hackelia hispida</i>	Boraginaceae
C	<i>Haplopappus hallii</i>	Asteraceae
C	<i>Hieracium longiberbe</i>	Asteraceae
C	<i>Hydrophyllum capitatum</i> var. <i>thompsonii</i>	Hydrophyllaceae
B,C	<i>Iris tenax</i> var. <i>gormanii</i>	Iridaceae
C	<i>Iris tenuis</i>	Iridaceae
C	<i>Lasthenia minor</i> ssp. <i>maritima</i>	Asteraceae
B,C	<i>Lesquerella kingii</i> ssp. <i>diversifolia</i>	Brassicaceae
C	<i>Lewisia columbiana</i> var. <i>wallowensis</i>	Portulacaceae
C	<i>Lilium bolanderi</i>	Liliaceae
C	<i>Lomatium hendersonii</i>	Apiaceae
C	<i>Lomatium howellii</i>	Apiaceae
C	<i>Lomatium minus</i>	Apiaceae
C	<i>Lomatium ravenii</i>	Apiaceae
C	<i>Lomatium serpentinum</i>	Apiaceae
B,C	<i>Lupinus burkei</i> ssp. <i>caeruleomontanus</i>	Fabaceae
B	<i>Lupinus mucronulatus</i>	Fabaceae
C	<i>Microseris nutans</i> ssp. <i>siskiyouensis/ined.</i>	Asteraceae
C	<i>Mimulus jungermannioides</i>	Scrophulariaceae
C	<i>Monardella purpurea</i>	Lamiaceae
C	<i>Penstemon cinicola</i>	Scrophulariaceae
C	<i>Phacelia peckii</i>	Hydrophyllaceae
B	<i>Phlox mollis</i>	Polemoniaceae
C	<i>Pityopus californicus</i>	Ericaceae
B	<i>Platanthera unalascensis</i> ssp. <i>maritima</i>	Orchidaceae
C	<i>Polygonum cascadense</i>	Polygonaceae
C	<i>Polystichum kruckebergii</i>	Polypodiaceae
C	<i>Primula cusickiana</i>	Primulaceae
B,C	<i>Rhysopterus plurijugus</i>	Apiaceae
C	<i>Rubus bartonianus</i>	Rosaceae
C	<i>Salix fluviatilis</i>	Salicaceae
C	<i>Sanicula peckiana</i>	Apiaceae
C	<i>Sedum laxum</i> ssp. <i>heckneri</i>	Crassulaceae

	Taxon	Family
B	<i>Sedum radiatum</i> ssp. <i>depauperatum</i>	Crassulaceae
C	<i>Senecio porteri</i>	Asteraceae
C	<i>Sidalcea malvaeiflora</i> ssp. <i>elegans</i>	Malvaceae
C	<i>Silene scaposa</i> var. <i>lobata</i>	Caryophyllaceae
C	<i>Steironema laevigatum</i>	Primulaceae
C	<i>Synthyris missurica</i> ssp. <i>stellata</i>	Scrophulariaceae
C	<i>Synthyris schizantha</i>	Scrophulariaceae
C	<i>Tauschia glauca</i>	Apiaceae
C	<i>Trifolium plumosum</i> var. <i>plumosum</i>	Fabaceae
B	<i>Vaccinium coccineum</i>	Ericaceae
C	<i>Vancouveria chrysantha</i>	Berberidaceae
B	<i>Veronica sherwoodii</i>	Scrophulariaceae
B	<i>Viola adunca</i> var. <i>cascadensis</i>	Violaceae



**Published by U.S. Fish and Wildlife Service
with contributions and financial assistance from
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