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DIVISION OF
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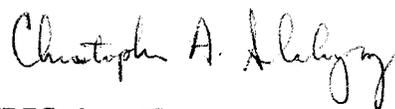
Ms. Mary Ann Wright
DOGM
1588 West North Temple
Salt Lake City, UT 84116

Dear Mary Ann,

Enclosed are the results of my field survey for Davidse buckwheat (Eriogonum corymbosum var. davidsei), which I performed last summer. I enjoyed being in the field again, it reminded me of my fieldwork at Stanford. As indicated in the report, I observed numerous individuals and populations during late August, when Davidse flowers. The plant is apparently thriving in a large part of Carbon County, at a minimum.

Please call me if you have any questions or comments on the report.

Very truly yours,



CHRIS A. SLABOSZEWICZ
Permit Analyst

CAS:hl/20BB

Enclosure

cc: N. Temnikov

Notes on the Geographical Distribution of Eriogonum
corymbosum var. dauidsei in Carbon County, Utah
Christopher Slaboszewicz¹

INTRODUCTION

Eriogonum corymbosum var dauidsei Reveal, commonly called Davidse buckwheat, was first collected near the Price River in Carbon County, Utah in September 1967 (Reveal, 1967). The variety is a member of the Eriogonum corymbosum complex. It is very similar to E. corymbosum var erectum; however, Davidse is known for its unique edaphic requirements. Reveal (1967) noted its preference for exposed, low-rolling Mancos Shale hills.

Interest in Davidse has increased recently with the initiation of new coal mining projects in Carbon and nearby Emery Counties. The U.S. Geological Survey (1979) lists seven major new coal mining facilities to be developed in the two counties. Because one or more of these projects may result in alteration of potential Davidse habitat, both industry representatives and government officials have expressed interest in assessing the distribution of Davidse and its total population size (Wright, 1980, personal communication). The plant has been proposed as an addition to the list of Federal

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Threatened and Endangered Species, since its known distribution was limited to a small area along the Price River in Carbon County (Welsh, 1979). However, Davidse is not on the official U.S. Fish and Wildlife Service list of species proposed as threatened and endangered (Joseph, 1980, personal communication).

A search of the literature reveals that little has been published regarding the distribution of Davidse. Reveal's (1967) account of the type specimen collected along the Price River appears to be the only published account of a Davidse population. However, Greenwood (1980, personal communication) reports several populations in the area north of Wellington, Utah, and Holmgren (Anderson, 1980, personal communication) reports populations of Davidse scattered throughout the Wasatch Plateau (west of Price, Utah). Additional knowledge of its distribution is necessary to establish whether this plant should be proposed as threatened or endangered. The present study examined the distribution of Davidse in Carbon County, Utah, north of Wellington (see Figure 1).

METHODOLOGY

The study area covered approximately 70 square miles in north-central Carbon County (see Figure 2). This area was bounded by U.S. Highway 6 and the Book Cliffs to the south and north, respectively. Pace Creek formed the eastern boundary and Coal Creek the western.

Specimens were collected by Charles Greenwood (1980) of the Utah Division of Wildlife Resources for identification. They were collected beneath the existing power line near the

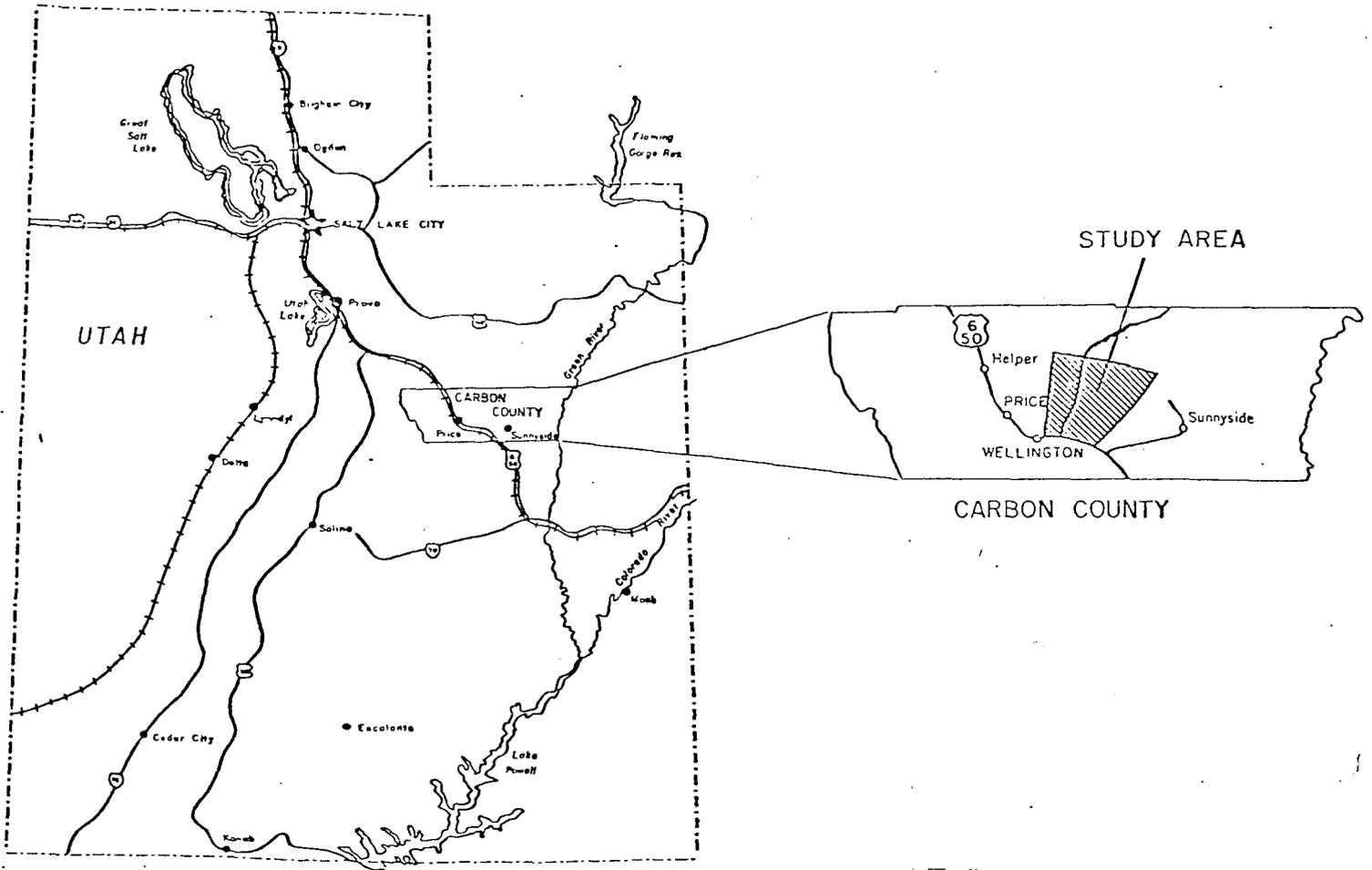


Figure 1. Study location map

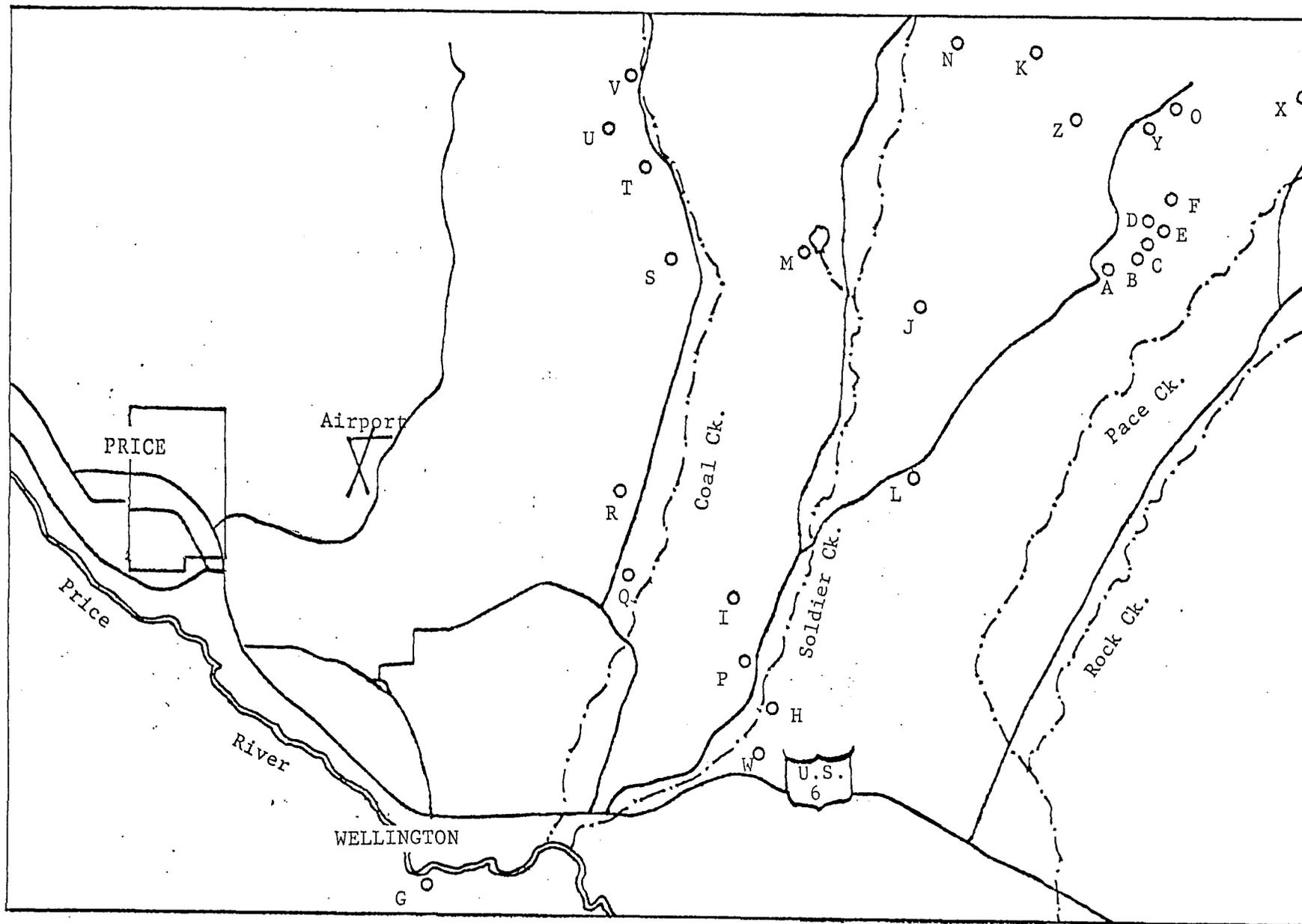


Figure 2. Field sites for Davidse distribution study.

eastern edge of Section 28, T13S, R12E. The specimens were positively identified as E. corymbosum var dauidsei by Professor A. H. Holmgren of Brigham Young University (Greenwood, 1980, personal communication).

Following the identification by Holmgren in mid-August 1980, a field survey was performed by the author between August 25 and August 28, 1980. The field survey consisted of taking photographs and making collections at sites throughout the study area. Individual plants were counted at each site to help estimate the size of each local population. Measurements of height and greatest diameter were taken to help assess the health and vigor of different local populations. Also, visual appearance of the plants was assessed with regard to possible water stress, dessication, and senescence.

A total of 26 sites were examined. The sites were chosen on the basis of a geologic map prepared by Anderson (1978) showing outcrops of Mancos Shale. Additional sites were chosen in the field, where smaller outcrops of Mancos were encountered. In addition, the sites where Greenwood made his collection and where the type was collected (site G on Figure 2) were examined.

Charles Greenwood acted as guide to ensure that identification of Davidse would be correct. He also provided details regarding the collection of the specimen identified by Holmgren.

A single plant of moderate size was dug up to provide information on morphological characteristics.

RESULTS

Davidse occurs throughout the study area wherever climatic and edaphic conditions are suitable. Table 1 lists the location and population estimates for the 26 study sites (see Figure 2). Twenty-one sites, 81% of the total, contained living Davidse individuals. The sites represent 17 geographically distinct populations. Seven populations were too large and extensive to enable an accurate census to be taken. The populations were found as far east as Pace Creek and as far west as Coal Creek. They also ranged from Fish Creek Canyon to the north to the Price River to the south.

Populations were more common in a belt along the base of the Book Cliffs approximately three miles wide. The largest outcrops of Mancos Shale are located in this zone. The sites where Davidse was not found are more arid relative to the other sites. However, the populations are distributed throughout the study area. The numerous healthy populations of Davidse in the study area indicate the plant's success at adapting to the semi-arid climate and high alkalinity of the Mancos Shale.

The frequent occurrence of Mancos Shale outcrops along the Book Cliffs and in the Wasatch Plateau to the west as well as the relatively uniform climate in the region suggest that Davidse occurs throughout the region. Holmgren's report of numerous Davidse in the Wasatch Plateau (Anderson, 1980, personal communication) supports this conclusion.

Table 1
Davidse buckwheat survey sites

Location (map site)	Population (est.)/ Largest individual (dia.)	Comments
T13S, R12E, Sec. 34 (A)	50+/70 cm	
T14S, R12E, Sec. 3 (B)	8/63 cm	
T13S, R12E, Sec. 34 (C)	2/48 cm	Under a juniper
T13S, R12E, Sec. 34 (D)	20+/88 cm	Pure Mancos
T13S, R12E, Sec. 34 (E)	70+/125 cm	Along small streambed
T13S, R12E, Sec. 34 (F)	300+/153 cm*	Observed by Greenwood (1980, personal communication)
T15S, R11E, Sec. 7 (G)	100+/213 cm	Site of type collection
T14S, R11E, Sec. 35 (H)	30+/120 cm	Above Soldier Creek
T14S, R11E, Sec. 26 (I)	70+/150 cm	Near hilltop
T14S, R12E, Sec. 6 (J)	200+/163 cm*	
T13S, R12E, Secs. 20, 21, 28, 29 (K)	1000+/180 cm*	Big Hole Canyon
T14S, R11E, Sec. 13 (L)	20+/50 cm	Collected by Greenwood
T13S, R11E, Sec. 36 (M)	0	Anderson Reservoir
T13S, R12E, Sec. 19 (N)	500+/143 cm*	Above Soldier Creek
T13S, R12E, Sec. 22 (O)	20+/50 cm	In and above roadbank
T14S, R11E, Sec. 26 (P)	0	
T14S, R11E, Sec. 21 (Q)	0	
T14S, R11E, Sec. 15 (R)	0	
T13S, R11E, Sec. 35 (S)	0	
T13S, R11E, Sec. 28 (T)	150+/135 cm	
T13S, R11E, Sec. 21 (U)	1000+/150 cm*	Population ranges several thousand yards to the west
T13S, R11E, Sec. 16 (V)	250+/90 cm	Roadbank
T15S, R12E, Sec. 6 (W)	1000+/135 cm*	Pure Mancos
T13S, R12E, Sec. 25 (X)	250+/143 cm	Pure Mancos
T13S, R12E, Sec. 27 (Y)	100+/90 cm	Observed by Greenwood in and above roadbank
T13S, R12E, Sec. 28 (Z)	500+/113 cm*	Specimen iden- tified by Holmgren (Greenwood, 1980)

*-These populations extend over a broad area. They range from several hundred to several thousand; estimates given are conservative minima

Davidse has successfully adapted to the harsh environment of the Mancos Shale.

The size and general appearance of the plants in the study area indicate healthy, reproducing populations. The reflective, silvery color and narrow, curved shape of the leaves would reduce heating by the sun's rays. The felt-like tomentum on the underside of the leaves would inhibit water loss through stomata. An additional adaptation to the semi-arid climate is a large root:shoot ratio. The Davidse measured had a root:shoot ratio of 3.5:1.

DISCUSSION

The results establish the widespread distribution of Davidse throughout the study area. Its occurrence is limited primarily by the presence of exposed Mancos Shale hills; however, these outcrops are common in the low-lying terrain south of the Book Cliffs. Moreover, observations indicate that Davidse grows well on the otherwise barren slopes; many populations contain large, healthy individuals.

The plant identified as E. corymbosum var. dauidsei by Holmgren (Greenwood, 1980) is widespread in northern Carbon County. It grows successfully on the many Mancos Shale hillsides. Several populations are large in number and geographical extent. Thus, the overall population of Davidse should not be significantly affected by proposed mining operations in the area. The status of Davidse does not appear to be threatened or endangered.

REFERENCES

- Anderson, P.B. 1978. Geology and coal resources of the Pine Canyon quadrangle, Carbon County, Utah. Unpub. M.S. thesis, U. of Utah, 138 pp.
- Anderson, P.B. 1980. District Geologist, Eureka Energy Company. Personal communication.
- Greenwood, C. 1980. Utah Division of Wildlife Resources. Personal communication.
- Joseph, R. 1980. U.S. Fish and Wildlife Service. Personal communication.
- Reveal, James L. 1967. Notes on Eriogonum - V, a revision of the Eriogonum corymbosum complex. Great Basin Naturalist, XXVII: 183-229.
- U.S. Geological Survey, 1979. Final Environmental Statement, Development of Coal Resources in Central Utah. U.S. Dept. of Interior.
- Welsh, S.L. 1979. Illustrated manual of proposed endangered and threatened plants of Utah. U.S. Fish and Wildlife Service. 318 pp.
- Wright, M. 1980. Utah Division of Oil, Gas, and Mining. Personal communication.