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Distribution of Astragalus amnis-amissi (Fabaceae), a plant endemic to east-central Idaho

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Distribution of *Astragalus amnis-amissi* (Fabaceae), a Plant Endemic to East-Central Idaho

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ABSTRACT

Astragalus amnis-amissi (Fabaceae), also known as Lost River milkvetch, is a plant endemic to East-central Idaho for which no published surveys have been completed in the last 17 years. A search of several previously-documented populations in canyons of the Southern Lemhi Range and the Lost River Range, in Butte and Custer Counties, Idaho, documented the species in four canyons. However, it was not relocated in an unnamed canyon in the Southern Lemhi Range, indicating potential extirpation of that population. No new populations of *A. amnis-amissi* were found.

INTRODUCTION

Astragalus amnis-amissi Barneby (Figure 1) is a member of the Fabaceae (the pea or legume family). The species' NatureServe conservation rank in Idaho is S3, or Rare (Idaho Native Plant Society 2020). The first specimen was collected in 1957 and the species was formally scientifically described in 1961 (Hitchcock and Cronquist 1961, Moseley 1989). *Astragalus amnis-amissi* is now known from ten canyons in the Lost River and Lemhi Ranges in Butte and Custer counties in east-central Idaho. It typically grows at the "base of cliffs and in rock crevices" (Hitchcock and Cronquist 1961).

MATERIALS AND METHODS

The database of the Consortium of Pacific Northwest Herbaria (CPNWH 2019) was used to retrieve information on sites of past collections of *A. amnis-amissi*. I targeted sites with potential habitat based on the presence of limestone cliffs and/or talus at elevations near those documented on herbarium specimen labels. I did not employ transects, partly due to the dispersed nature and substrate specificity of *A. amnis-amissi* populations and the intended scope of the study. Rather, in many cases, an untimed version of a meander search (e.g. Goff et al. 1982) was utilized, wherein I searched for *A. amnis-amissi* in apparently appropriate habitat but unsuitable-appearing habitat was largely ignored. At each location where the plants were found, either a count or an estimate of the number of individuals found in the canyon was made. No demographic data, such as proportions of plants flowering, were taken.

For the purposes of this study, *Astragalus* plants were not identified with a key or manual in the field, but rather assumed to be *A. amnis-amissi* when an *Astragalus* species was found in the appropriate habitat, given that no other *Astragalus* species, as currently known, inhabits the same habitat in the region. In two instances I collected small voucher specimens to be deposited in the Herbarium of Brigham Young University-Idaho (RICK [abbreviations following Thiers 2022]), which I subsequently verified as *Astragalus amnis-amissi* at RICK. However, due to lack of collecting permits, no other specimens were collected.

This poster has been adapted from Daines (2022).

RESULTS AND DISCUSSION

Astragalus amnis-amissi was found at four of the historically-collected canyons (Figure 2). Two of the confirmed occurrences were in the Lost River Range in Custer County, Idaho (Canyons 6 and 9) and the other two were in the Southern Lemhi Range in Butte County, Idaho (Canyons 1 and 2). Included in these four canyons is the species' type locality in the Lost River Range, Custer County, Idaho (Canyon 6), which was partially surveyed and confirmed to harbor at least two individuals. However, a more extensive survey of that area may have revealed more individuals. A survey at Canyon 9 (Custer County) revealed at least 15-25 plants. The other two canyons harboring *A. amnis-amissi* (Canyons 1 and 2) were in the Lemhi Range, Butte County, Idaho. Surveys revealed about eight plants in each of these canyons, although a more expansive survey of that general area likely would find more individuals. Individuals in these two populations were less densely concentrated than the population in Canyon 9. Two voucher specimens were taken in the Lemhi Range, Butte County, Idaho: *Daines 16* and *Daines 17*, to be deposited at the Herbarium of Brigham Young University-Idaho (RICK).

For one of the historically-collected canyons where no *A. amnis-amissi* was observed, my data point to the potential extirpation of the species in a portion of a canyon I surveyed in the Southern Lemhi Range (Canyon 3). This canyon is unnamed on maps of the area. Two herbarium specimens (*Henderson 4276* (ID), *Andersen 257* (ID)) demonstrate that the species was present in the canyon in 1978 (CPNWH 2019). One of two surveys I performed in Canyon 3 focused on an area where the canyon bottom constricts to ca. 5-10 m width, with limestone cliffs and ledges. The other surveyed location was nearby along the base of a NNE-facing limestone slope. No specimens were found in either of these areas; thus, *A. amnis-amissi* may be extirpated in Canyon 3. However, additional surveys targeting higher elevations in both survey locations and potentially other, surrounding areas will be needed to definitively confirm or refute extirpation of *A. amnis-amissi* in this canyon.

The historically documented population in Canyon 3 was the lowest-known population observed to date at about 1675 m (5500 ft verbatim) cited on one specimen: *Henderson 4276* (ID) (CPNWH 2019). If *A. amnis-amissi* is no longer present in Canyon 3, then the current lowest elevational limit of the species is approximately 1830 m (6000 ft verbatim), the elevation cited on one specimen collected at Canyon 1 (CPNWH 2019). This information could be important for habitat modeling for *A. amnis-amissi* or studies that focus on areas of potential habitat for the species.

Other drainages historically confirmed to harbor the species (Canyons 4, 5, 7, 8, and 10) were either only partially surveyed or not surveyed at all, due to time constraints and other limitations. Consequently, no *A. amnis-amissi* was found at any of these canyons. Thus, while *A. amnis-amissi* may be present in these locations, determining this for some canyons was beyond the scope of the present work.

Surveys of three areas containing potential but unconfirmed habitat revealed no individuals identifiable as *A. amnis-amissi*. These included areas in the Beaverhead Mountains in Clark and Lemhi Counties, Idaho; portions of Skull Canyon (Canyon 12), Railroad Canyon (Canyon 13), and an area about 2 km SE of Blue Dome, Idaho (Canyon 11) were searched. Moseley (1989) mentioned potentially suitable habitat in the vicinity of Railroad Canyon in the Beaverhead Mountains, which was the reason for the survey in that canyon. All three areas do contain suitable-looking habitat located at suitable elevations for *A. amnis-amissi*, but no specimens were found. However, not all potentially suitable habitat in these areas was visited; thus, there is still a possibility of finding *A. amnis-amissi* in these locations during future surveys. Since the present study was limited in scope, additional field searches at both areas of documented habitat and areas of potential habitat are warranted and could fill in gaps of knowledge about the species' current distribution.

Figure 1. *Astragalus amnis-amissi* Barneby (Fabaceae) in the Lemhi Range, Butte County, Idaho. Photo by M. Daines.

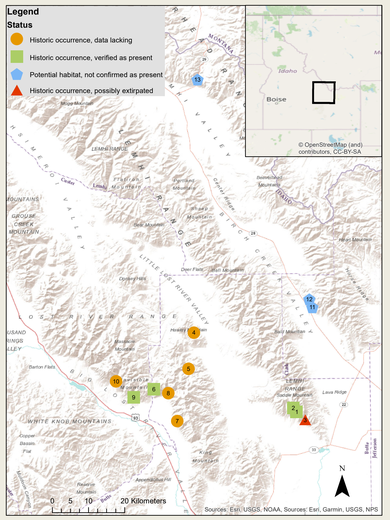

Figure 2. Map of generalized specimen and survey localities for *Astragalus amnis-amissi* Barneby (Fabaceae) in east-central Idaho.

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