

Conservation Strategy for *Allium Aaseae* Ownbey (Aase's Onion)

by

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INTRODUCTION

Allium aaseae (Aase's onion) has been a priority conservation concern for over 15 years, and is a Category 1 candidate for federal listing under the Endangered Species Act. It is endemic to southwestern Idaho, where it is restricted to the lower foothills between Boise and Emmett, plus two disjunct populations near Weiser. Aase's onion occurs on open, dry, coarse-textured sandy slopes within the sagebrush-steppe vegetation zone. Nearly all populations are restricted to soils derived from alluvial deposits of the Glens Ferry Formation.

Foothill habitats also support populations of two other rare plants - *Astragalus mulfordiae* (Mulford's milkvetch), a federal Category 1 candidate, and *Lepidium papilliferum* (Slick-spot peppergrass), a federal Category 2 candidate recently recommended for Category 1 status (Moseley 1994). Although both are more widespread than Aase's onion, the foothills portion of their distributions remains critical for their long-term conservation. Many of the proposed conservation strategies for Aase's onion will also benefit co-occurring Mulford's milkvetch and slick-spot peppergrass.

There are 66 known occurrences for Aase's onion, ranging in size from less than one to greater than 200 acres. Distribution maps are provided (Appendix 1). Occurrences are typically comprised of two to many scattered subpopulations separated by unoccupied, often unsuitable habitat. The majority of populations are located on private lands. Populations are also known from City of Boise, Ada County, Idaho Department of Lands (IDL), and Bureau of Land Management (BLM) lands.

Despite the rather impressive number of sites and large populations, numerous threats still jeopardize the long-term existence of Aase's onion. Throughout its range, urbanization, sand mining, livestock grazing and various recreational activities threaten Aase's onion populations. Permanent habitat loss and fragmentation resulting from urban development, represent the most serious and difficult to resolve threat facing the long-term persistence of Aase's onion.

In 1993, the BLM established six Areas of Critical Environmental Concern (ACEC) to protect populations of Aase's onion. In addition, a disjunct population near Weiser is located on the Rebecca Sand Hill Research Natural Area and is protected. Because of these designations, the western half of the species distribution now seems secure. However, most populations in the eastern half of its distribution, in the Boise Foothills, remain vulnerable, especially in light of the areas urban development patterns. As part of study sponsored by the Boise City Planning and Zoning Department, Boise Foothill populations were assigned a conservation rank based on population size and habitat quality (Moseley *et al.* 1992). This inventory is the logical starting point for assessing and prioritizing conservation options for populations within the Boise Foothills.

Ex-situ conservation methods have been attempted and will likely play an increasingly important conservation role in the future. However, *in-situ* methods remain the most viable and cost-

effective for the species long-term protection (Moseley and Caicco 1989) and are the focus of the Conservation Strategy.

Augmenting this Conservation Strategy is a Habitat Conservation Assessment document (Mancuso 1995) prepared for *Allium aaseae*. It outlines the species taxonomy, conservation history, legal status, geographic range, habitat, population biology and ecology, land ownership and threats. This Conservation Strategy incorporates existing measures already taken on behalf of Aase's onion and outlines additional actions deemed necessary for the species' long-term conservation.

OBJECTIVE

The objective of this Conservation Strategy is to outline specific actions deemed necessary to help insure the rangewide, long-term conservation of *Allium aaseae*.

CONSERVATION STRATEGY RECOMMENDATIONS

This Conservation Agreement identifies six main points for the rangewide conservation of *Allium aaseae*.

1. Minimize further habitat loss and fragmentation.
2. Education.
3. Monitoring.
4. Research.
5. Seed banking.
6. Incorporate an ecosystem approach for the conservation of rare plants in the Boise Foothills.

Note: There is an Element Occurrence Record (formatted data base record) for each occurrence (population, or often a series of subpopulations) of Aase's onion in the Conservation Data Center data base, Boise. Each Record is identified by a three digit code (001, 002, 003, etc.) to facilitate referencing. This three digit number is used as a reference throughout the Conservation Strategy. Copies of each Element Occurrence Record are contained in the Habitat Conservation Assessment (Mancuso 1995).

Minimize further habitat loss and fragmentation

1. One disjunct population (018) of Aase's onion near Weiser is located within the Rebecca Sand Hill Research Natural Area (RNA) and will benefit from the recognition and protection this designation affords. One of the primary reasons this RNA was established in 1987, was because a

large population of Mulford's milkvetch occurs there. Further justifications for establishment included vegetation in good ecological condition and the past, present and probably future minimal livestock grazing (Rosentreter and Mooers 1985). Present BLM management is compatible with the conservation of Aase's onion located within the RNA. A more thorough inventory for Aase's onion within the RNA is recommended.

2. A second disjunct population at Sagebrush Hill (043), on BLM land near Weiser, has no special management designation, but the area has been closed to surface leaseables, surface and subsurface rights-of-ways, and to ORV use since 1987. To maintain protection of Aase's onion and its habitat, these restrictions should remain in place.

3. In 1993, an amendment to the BLM's Cascade Resource Management Plan designated six Areas of Critical Environmental Concern (ACEC's) to protect populations of Aase's onion (Bureau of Land Management 1993). Recent taxonomic studies have determined that the new Hulls Gulch ACEC does not contain Aase's onion, but populations of a putative *Allium aaseae* x *A. simillimum* hybrid instead (Smith 1995). However, the Hulls Gulch ACEC is still an important conservation asset because it protects additional genetic variability. The other five ACEC's (and their associated Element Occurrence Record number) are Cartwright Canyon (037), Sand-capped Knob (049), Sand Hollow (034), Willow Creek (039), and Woods Gulch (053). Special management actions apply to each ACEC and are outlined in the Cascade Resource Management Plan Amendment (Appendix 2). These actions are specifically aimed at reducing disturbances and other threats to Aase's onion. The Amendment also includes maps and boundary information.

4. As outlined in the Cascade Resource Area Management Plan Amendment (Bureau of Land Management 1993), the BLM should continue to pursue acquisition of 400 acres of private land to add to the Sand-capped Knob ACEC, 170 acres of private land to add to the Woods Gulch ACEC, and 40 acres of Idaho Department of Land (IDL) land to add to the Willow Creek ACEC (40 acres of private land identified in the Plan have already been acquired for Willow Creek). Acquisition of the additional acreage at Sand-capped Knob will bring nearly all of this large Aase's onion population under BLM protection. Only a relatively small portion of this population is located within the existing 40 acre boundary of the Sand-capped Knob ACEC. The same situation holds true for the Woods Gulch ACEC, where most of the Aase's onion is located on adjacent private land proposed for acquisition and addition to the existing ACEC. Acquisition of 40 acres of IDL land is important for the integrity and management of the Willow Creek ACEC because it is situated near the center of the ACEC.

5. The USFWS should pursue a Conservation Agreement with Ada County to protect populations of Aase's onion located within the Hidden Hollow Landfill area. Populations in Seaman Gulch and adjacent areas within the Landfill boundaries (026, 027, 056, 057) have been previously mapped (Moseley and Caicco 1989; Moseley *et al.* 1992). Because much of the land is not slated for use, but provides a buffer to surrounding communities, the Hidden Hollow Landfill area has the potential to confer protection to large populations of Aase's onion with minimal expense or infringement on existing operations. It is recommended a subsample of populations be revisited

periodically (every three-five years) to validate habitat conditions and abundance estimates. Although Mulford's milkvetch (036) and slick-spot peppergrass (038) are much less common within the Landfill perimeter, the Conservation Agreement should include these populations as well.

6. A Conservation Agreement between the USFWS and IDL for the large upper Miller Creek (005) population of Aase's onion is recommended. When last visited in 1992, no serious discernable threats were identified for this population. This population is surrounded by mostly private lands where few conservation options are currently available. It is also located within the eastern half of Aase's onion range, a portion presently in need of further conservation. At a minimum, the Conservation Agreement should keep the USFWS abreast of IDL management activities and any proposed changes in these activities. Any future land use changes that may adversely impact Aase's onion should be tailored to minimize these impacts.

The IDL should cooperate in the acquisition and/or management of 40 acres proposed by the BLM to be added to the Willow Creek ACEC southeast of Emmett.

7. A Conservation Agreement between the USFWS and the City of Boise should be completed. This Agreement will extend a level of management protection to populations of Aase's onion occurring within City park reserves, namely Old Military Park Reserve (006, 025, 058, 059), Camelsback Park Reserve (009), and lower Hulls Gulch (011). Periodic monitoring of populations within the Reserves should be part of any Agreement. The Conservation Agreement should be part of a broader conservation effort also involving populations of Mulford's milkvetch (004, 012, 029, 030, 031) and slick-spot peppergrass (012).

8. It is recommended that Unimin Mining Corporation formally commit to a conservation management designation for the fenced Aase's onion transplant research study site at their sand mine near Emmett.

9. The Boise City Planning Commission should include the conservation of rare plant populations as one of their environmental priorities within the Foothills Management Plan - under preparation and review as of February 1995. Because the majority of Aase's onion and other rare plant populations in the Boise Foothills east of Highway 55 occur on private land, support by the Commission is important, as much of this area is susceptible to development. Rare plant populations in the Boise Foothills have been mapped (Moseley *et al.* 1992) and are entered in the Planning and Zoning Department GIS system. These maps should be used for planning purposes. Incentives and other conservation options such as easements should be considered.

10. Negotiations with the owners of the Hackberry Highlands housing subdivision should be undertaken to develop a conservation set-aside area for Aase's onion and other rare plants. A portion (hillside facing the golf course) of the subdivision has been made available for Aase's onion transplants in the past, with the help of the developers. The hillside area supports a large, natural population of Aase's onion and is in relatively good ecological condition. This population (008) was identified by Moseley *et al.* (1992) as one which would contribute greatly to the

species' long-term persistence in the Boise Foothills.

Education

1. A series of interpretive signs focusing attention on the conservation of rare plants in the Boise Foothills have been completed as part of a Cooperative challenge cost-share project between the BLM, Idaho Native Plant Society (INPS) and Boise City Parks Department. Pending completion of the Parks Department planning process, the signs will be prominently displayed within one or more Parks (Hulls Gulch, Camelsback, or Old Military Reserve). The City should consider the purchase of additional signs and other educational material related to conservation in the Boise Foothills.

2. Off-road vehicle (ORV) use has been identified as a threat to several populations of Aase's onion, most significantly at Sand Hollow (034), where large populations are located within the Little Gem Motorcycle Park. Interpretive signs regarding Aase's onion were destroyed soon after being erected in the Park in 1993. Cooperation of the motorcycle and ORV community is important for the conservation of Aase's onion. Educational outreach sponsored by the BLM and ORV clubs is recommended.

Monitoring

Monitoring protocol, location of permanent transects, photoplots, or other monitoring sites, and other pertinent monitoring information should be reported to the Conservation Data Center (CDC) in Boise, to be incorporated into their EcoMonitor data base. The CDC will serve as a clearinghouse for monitoring information regarding Aase's onion.

1. A Monitoring Plan for Aase's onion populations occurring within five Bureau of Land Management ACEC's has been prepared in consultation with the USFWS. Baseline trend and habitat data for Aase's onion was collected at permanent transects in 1991, 1992, and 1994.

Regarding populations of Aase's onion at the Cartwright Canyon, Sand-capped Knob, Sand Hollow, Willow Creek, and Woods Gulch ACEC's:

a. Continue general population trend and habitat monitoring along permanent transects at regular intervals, at least once every other year. In most cases, qualitative rather than quantitative monitoring methods should be implemented, due to sampling difficulties with this species and the fragility of population sites. Monitoring will entail population estimates and evaluations of physical disturbance, weed invasion and other threat factors. Permanent transect markers/monuments should be checked during monitoring visits and repaired or replaced if necessary. Areas subject to ongoing disturbance and/or threats, such as populations within the Little Gem Motorcycle Park (part of Sand Hollow ACEC) should be identified by the BLM. Annual monitoring at these sites may be warranted.

b. Aase's onion monitoring data already accumulated should be analyzed as soon as practical, and

a determination regarding adequacy of methodology and sampling made. Results should be summarized and reported after each monitoring interval.

c. Validity monitoring of respective special management actions for each ACEC should be conducted concurrently with population and habitat monitoring visits. The results of the validity monitoring should be noted within the population/habitat monitoring report. It may be necessary to conduct validity monitoring more frequently than other monitoring if there is cause to suspect special management actions are being violated. If special management actions are not being adhered to, investigation and remedial action should be undertaken.

2. Monitoring should be a component of a Conservation Agreement between the USFWS and Ada County for Aase's onion populations at Hidden Hollow Landfill. It is recommended that a subsample of populations be revisited periodically (every three years) to validate habitat conditions and abundance estimates. Intensive population monitoring will not be necessary where populations are left undisturbed.

3. Monitoring should be part of the Conservation Agreement between the USFWS and City of Boise. A subset of populations prone to recreational disturbance should be targeted for a level of qualitative monitoring (such as by photoplots), while other populations should at least be periodically checked and reported.

4. Boise Planning and Zoning should inform the USFWS of approved developments in areas known to support Aase's onion. This accountability will be useful for maintaining an overall conservation picture for the species. The USFWS should forward this information to the Conservation Data Center so they can keep records updated.

Seed banking

A seed storage program for Aase's onion should be undertaken. The Salt Lake City Botanical Garden and the Berry Botanical Garden in Portland, are candidate cooperators for this kind of *ex-situ* program.

Research

1. Continue the ongoing propagation and related life history studies sponsored by the Unimin Mining Corporation. This research continues to provide valuable information concerning *ex-situ* conservation options. Such options may be appropriate mitigation for projects destroying Aase's onion populations/habitat. Monitoring of *ex-situ* sites should be part of mitigation packages.

2. Pollination biology research has been identified as a gap in our knowledge of Aase's onion that would be useful for better conservation management (Smith 1995). Some categories of rare plants are expected to be pollinator-vulnerable, although it is unclear if local, but relatively abundant endemics such as Aase's onion necessarily are (Geer *et al.* 1995). As Aase's onion populations and subpopulations become smaller and/or more and more fragmented due to habitat

loss, questions concerning pollination biology, gene flow and genetic diversity become increasingly poignant.

Incorporate an ecosystem approach for the conservation of rare plants in the Boise Foothills

Conservation Strategies have also been prepared for Mulford's milkvetch and slick-spot peppergrass, two other federal candidate plants that often occur in close proximity to Aase's onion, especially in the Boise Foothills. Conservation Agreements between the USFWS and other entities (e.g., BLM, Ada County, Boise City) should be tailored to meet the conservation needs of multiple species wherever possible. In most cases, Aase's onion is the more common and widespread of the three rare plants at a given site. Protection of Aase's onion sites will confer surrogate protection to other rare plants occurring in the same area. Rare community conservation is another concern for the Foothills ecosystem (Moseley *et al.*) and should be incorporated within the Conservation Strategy.

References

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Appendix 1.

General distribution maps for *Allium aaseae*.

Appendix 2.

Copy of the BLM's Cascade Resource Management Plan Amendment.