

**MONITORING AASE'S ONION (*ALLIUM AASEAE*)
IN THE BOISE FOOTHILLS: 2024 RESULTS**



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ABSTRACT

Aase's onion (*Allium aaseae*) is a rare plant species with a global distribution restricted to southwestern Idaho. The lower Boise foothills support a substantial portion of the species' population. Five City of Boise (COB) Reserves serve as a refuge for Aase's onion in the foothills – Military Reserve, Camels Back Reserve, Hulls Gulch Reserve, Polecat Reserve, and Hillside to Hollow Reserve. In 2021, in response to growing conservation concern for Aase's onion, the COB/Department of Parks and Recreation and the Idaho Native Plant Society teamed up to initiate a long-term monitoring program for the species within these five Reserves. The objective of the monitoring program is to provide conservation status information to COB land resource managers that will help them meet stewardship objectives linked to maintaining populations of Aase's onion on lands they administer. To accomplish this, the monitoring program is designed to collect population, habitat, and disturbance trend information. Baseline monitoring data collected in a series of 23 plots in 2021 indicated Aase's onion was doing well at some subpopulations, but in danger of local extirpation at others. All plots were resampled in 2024, along with the establishment of two new plots.

Aase's onion abundance in 2024 varied greatly in plots, from <10 to >10,000 individuals. Most plots had either approximately the same number of Aase's onion plants, or showed a moderate to substantial decrease compared to 2021. Overall, approximately 36% fewer Aase's onion plants were counted/estimated compared to 2021 (discounting the two new plots established in 2024). Similar to 2021, native species dominated the vegetation at some plots in 2024, but were much less common than associated weed species at other plots. Also similar to 2021, all plots had at least one type of ground disturbance, with most having two or more. Soil mounds from northern pocket gopher digging, weed invasion, and deer tracks were the most commonly recorded disturbances in plots. Monitoring points to plant community-level habitat degradation due to invasive weed species and the associated loss of shrubs, bunchgrasses, and other native plant species to be the biggest threat to the persistence of Aase's onion within COB Reserves.

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INTRODUCTION

Aase's onion (*Allium aaseae*) is a ground-hugging plant with a pretty display of small pink flowers that bloom in early spring (Figure 1). It has a global distribution limited to southwestern Idaho, primarily in the Boise to Emmett foothills, but also with populations further west near Payette and Weiser. Aase's onion occupies dry, relatively sparsely vegetated, well-drained, sandy soil slopes, usually within bitterbrush (*Purshia tridentata*) or bitterbrush - big sagebrush (*Artemisia tridentata*) plant communities. Much of Aase's onion habitat in the Boise foothills has been degraded over time due to weed invasion, wildfires, recreational impacts, and other disturbances. Furthermore, urban expansion and development has destroyed portions of multiple Aase's onion populations in the foothills. Many known Aase's onion locations in the Boise foothills occur fully or partially on private property, but Ada County, City of Boise (COB), State, and Bureau of Land Management lands also support substantial populations. Aase's onion has been a species of conservation concern in Idaho for many years due to its restricted geographic range, the documented loss and degradation of habitat, especially in the Boise foothills, vulnerability of its habitat to multiple, ongoing threats, and the location of many populations on private land where conservation options are typically limited. Aase's onion is considered globally rare and imperiled by the Idaho Native Plant Society, and a globally imperiled/high endangerment special status plant species by the Idaho BLM (Mancuso et al. 2019, Idaho Native Plant Society 2024).

In 1996, The U.S. Fish and Wildlife Service (USFWS), COB, and Ada County developed a Boise Foothills Conservation Agreement (Conservation Agreement) for three rare plant species found in the Boise foothills (Boise Parks and Recreation Department 1996) - Aase's onion, Mulford's milkvetch (*Astragalus mulfordiae*), and slickspot peppergrass (*Lepidium papilliferum*). The Conservation Agreement, revised in 2008, was put in place to help protect and ensure the long-term conservation of the three species and their habitats on property owned by COB, foothill properties with conservation easements held by COB, and the Ada County Sanitary Landfill. The Conservation Agreement recognized the need to have comprehensive and up-to-date conservation information for the three species to be effective. Projects to support the Conservation Agreement included Aase's onion surveys in several COB Reserves in 2008 (Idaho Department of Fish and Game 2008, Mancuso 2008) and in 2009 (Kinter 2009). These surveys updated location, abundance, habitat, and threat information for many previously known Aase's onion populations and documented multiple new locations. Efforts to obtain updated Aase's onion conservation status information anywhere in the Boise foothills were minimal after completing these surveys.

This decade-plus information gap and growing conservation concern led the COB/Department of Parks and Recreation and the Idaho Native Plant Society (INPS) to initiate a long-term monitoring program for Aase's onion in 2021. The collaborative program encompasses the five COB open space reserves where Aase's onion populations are known to occur, including Military, Camels Back, Hulls Gulch, Polecat, and Hillside to Hollow (Figure 2). The monitoring program objective is to provide conservation status information to COB land resource managers to help them meet stewardship objectives linked to maintaining Aase's onion populations on lands they administer within a multiple-use management framework. The goal of the monitoring program is to collect population, habitat, and disturbance trend information for Aase's onion populations in the COB Reserves. Plots were established and baseline Aase's onion monitoring data collected in 2021 (Mancuso and Brabec 2022), with the intent to resample the plots every three years to ensure conservation status information remains up-to-date. Towards this end, the monitoring plots were resampled in 2024. This report reviews the monitoring protocol, summarizes monitoring data collected in 2024, and describes comparisons to the 2021 dataset.

METHODS

Aase's onion is present in five COB open space properties – Military Reserve, Camels Back Reserve, Hulls Gulch Reserve, Polecat Reserve, and Hillside to Hollow Reserve. Each Reserve has a minimum of one monitoring plot. Overall, monitoring consists of a total of 25 monitoring plots; 23 established in 2021, plus two new plots established in 2024. Both new plots are located on BLM land within the large Polecat Reserve and represent the only monitoring sites not directly on COB property. One of the new plots (AA-21) was chosen because of the abundant Aase's onion, the subpopulation's location on a largely undisturbed slope away from any main trail, and the limited weed cover. The other new plot (AA-22) was established because it represents a fairly dense Aase's onion subpopulation on an erosive slope bisected by a popular recreation trail.

All plot center locations are based on coordinates obtained from a hand-held GPS unit at the time of plot establishment. Plot locations have been mapped based on these coordinates (Appendix 1). Plots lack stakes or other hardware to mark their location. Instead, plot center coordinates are relocated using a GPS unit. Photographs from 2021 can also be used to assist and help verify the plot center point location. It is important that plots always be properly relocated each monitoring visit to ensure sampling occurs in the same place. Otherwise, comparing year-to-year results becomes problematic. Mancuso and Brabec (2022) contains more detailed information concerning plot selection and establishment. Data collection consists of counting or estimating the number of Aase's onion plants and recording plant community, weed species, and disturbance factor information within a 1/10 acre (37 ft. radius) circular plot. A set of photographs are also taken at each plot.

Aase's onion census: Census information is collected by counting or estimating the number of Aase's onion plants in the plot. Census estimates use 11 abundance categories: 1-10; 11-50; 51-100; 101-200; 201-300; 301-500; 501-1000; 1001-2000; 3001-5000; 5001-10,000; >10,000. Observers indicate whether the census is based on counting or estimating the number of Aase's onion plants in the plot. Estimating may be aided by counting Aase's onion plants in several representative 1m² subplots, taking the average, and extrapolating for the plot's entire 0.1 acre (405 m²) area.

Vegetation: Plant community habitat information is acquired by visually estimating shrub, native bunchgrass, native forb, and non-native weedy species abundance.

Shrub species: Each shrub species in the plot is assigned to its corresponding abundance canopy cover class: <1%, 1-10%, 10-25%, 25-50%, or >50%. These categories represent a slight modification compared to 2021, when the canopy class categories were <10%, 10-25%, 25-50%, and >50%. In addition, total shrub canopy cover is assigned a cover class value based on the abundance of all shrub species in the plot. Bitterbrush, big sagebrush, and gray rabbitbrush (*Ericameria nauseosa*) are the most likely shrub species to co-occur with Aase's onion in the Boise foothills.

Native bunchgrass species: All native bunchgrass species in the plot are recorded and assigned to its corresponding abundance canopy cover class: <1%, 1-10%, 10-25%, 25-50%, or >50%. These categories represent a slight modification compared to 2021, when the canopy class categories were <10%, 10-25%, 25-50%, and >50%. In addition, total bunchgrass canopy cover is assigned a cover class value based on the abundance of all bunchgrass species in the plot.

Native forb species: At a minimum, the six most common native forb species in the plot are recorded and assigned to the corresponding abundance category: Trace = only a few individuals, easy to overlook; Sparse = spotty and perhaps not seen at first glance, but unlikely to overlook in careful observation; Scattered = widespread, somewhat common, and not overlooked in careful observation; Common = frequent and widespread, obvious at first glance unless very small; and Dominant = very abundant, a community dominant. Compiling a list of other native forb species and their abundance category in the plot is encouraged, but optional. In 2021, the protocol required recording an abundance category for only the four most common native forb species. Recording information for additional native forb species was optional.

Non-native weed species: All non-native weedy species in the plot are recorded and assigned to one of the same abundance categories used for the native forb species - Trace, Sparse, Scattered, Common, and Dominant. In 2021, the protocol required recording an abundance category for only the eight most common weed species. Recording information for additional weed species was optional.

Ground disturbances: Ground disturbance information is collected by recording all disturbance factors detected anywhere within the plot and assigning it to a corresponding abundance category. The categories are the same five used for native forb and weed species abundance – Trace, Sparse, Scattered, Common, and Dominant. The nine main disturbance factors are defined below. Other ground disturbances not included in this list should also be noted on the data form if present.

1. Animal digging - Applies to mounds/piles of soil deposited by a digging animal, and/or burrow holes. These can be recent or old.
2. Wildlife tracks - Applies to animal tracks in the plot other than dog. Deer track are commonly observed in the Boise foothills.
3. Dog tracks - Applies to dog prints in the plot.
4. Animal tracks of uncertain origin - Applies to ill-defined tracks that cannot be confidently identified or distinguished to be from wildlife or from dogs. They typically represent older tracks reduced to divots or irregular soil depressions.
5. Non-motorized recreation - Applies to footprints or bicycle tracks in the plot.
6. Trail - Applies to pathways used by people, whether official and maintained or unofficial and user created.
7. Motorized recreation - Applies to tracks or other disturbances caused by ATVs, motorcycles, or other motorized vehicles.
8. Weed invasion - Applies to situations where non-native weedy species are abundant and appear to be overwhelming the native vegetation.
9. Wildfire - Applies to evidence of past wildfire such as burned shrub skeletons.

Photo point photographs: Photographs provide a visual record of each monitoring site. Repeat photo monitoring can be useful to document site-specific change or lack of change to landscape features of interest (Hall 2001). The plot center point serves as the photo-point reference mark to take photos. Landscape oriented photographs are taken using a digital camera set at wide-angle. Showing the horizon with some sky helps replicate the repeat photo in future monitoring years. A minimum of four photos are taken at each plot using the cardinal direction azimuths, 0°, 90°, 180°, and 270°. Additional photos to show plant close-ups, plant community patterns, disturbances, or other landscape features are optional.

RESULTS

All 23 monitoring plots originally established in 2021 were resampled in 2024. In addition, we established and sampled two new plots in the large Polecat Reserve in 2024. Data collection took place April 9 - April 19, 2024. Plots occupy upper to lower slope positions on southeast to west-facing hillsides ranging in steepness from 10 - 50%, at elevations from approximately 2860 - 3330 ft. (Table 1). All plots have sandy soil, often with a coarse texture. Plot vegetation usually has an open appearance consisting of a sparse to moderately dense shrub layer and a variable mix of native and non-native herbaceous species typically dominated by grasses. Native species dominate the plant community at some plots, but are much less common than associated weed species at other plots. Monitoring data recorded on field data sheets (Appendix 2) were converted to EXCEL spreadsheet format to facilitate compilation and synthesis of the dataset. Field notes taken at plots have been summarized (Appendix 3).

Aase's onion

Aase's onion abundance in plots varied greatly in 2024. One plot (AA-7) had no Aase's onion, with abundance at the others ranging from <10 to 10,000+ individuals (Table 2). Seven plots supported >1000 Aase's onion plants, while six others had <100 plants. Overall, monitoring plots supported >25,000 Aase's onion plants in 2024. Aase's onion density at most plots ranged from <0.1 to 8.6 plants/m². The exception was a new plot established in 2024 at Polecat Reserve (AA-21) with an estimated density of 24.7 plants/m². For Reserves with multiple plots, average plot density was highest at Polecat and lowest at Hulls Gulch. Average Aase's onion density across all plots was approximately 1.8 plants/m². Aase's onion distribution within plots varied from more or less uniform to very spotty or clumped in one or a few clusters.

Aase's onion abundance counts or estimates were largely similar between 2021 and 2024 for most plots in Military Reserve (Table 2). A slight increase in the number of plants from 2021 to 2024 was recorded at the one plot in Camels Back Reserve. Hulls Gulch Reserve included plots with increased, decreased, or similar abundance in 2024 compared to 2021. Aase's onion abundance decreased substantially from 2021 to 2024 at three of four plots in Polecat Reserve. Varying degrees of decreased abundance occurred in Hillside to Hollow Reserve plots. Overall, approximately 36% fewer Aase's onion plants were counted/estimated in the plots for 2024 compared to 2021 (discounting the two new plots established in 2024). The average density for Aase's onion per plot decreased approximately 47% in 2024 compared to 2021 (1.8 vs. 3.4 plants/m²).

Shrubs

All plots contained between 1 and 3 shrub species in 2024 (Table 3). Either bitterbrush or gray rabbitbrush occurred in all plots, with 14 plots (56%) containing both species. Basin big sagebrush was present in 3 plots (12%) and a golden currant (*Ribes aureum*) in one plot. Bitterbrush was the most abundant shrub in each of the Military Reserve plots, but absent from Hillside to Hollow Reserve and Camels Back Reserve plots. Bitterbrush also occurred in all plots at Polecat Reserve and in all but one plot in Hulls Gulch Reserve, but it was less abundant than gray rabbitbrush in some of these plots. Gray rabbitbrush was the most abundant shrub in the Hillside to Hollow Reserve plots. Total shrub canopy ranged between 10 - 25% in 60% of plots (Table 3). It exceeded 25% in one plot (4%) and was <10% in nine plots (36%).

Overall, cover class values for individual shrub species and total shrub cover in 2024 were similar to 2021 (Table 3). Two plots (AA-5, AA-26) estimated at 25-50% total shrub cover in

2021 had estimates of 10-25% in 2024. One other plot (AA-10) had total shrub cover estimated to be 10-25% in 2021, but 1-10% in 2024.

Native bunchgrass species

Five native bunchgrass species were recorded in multiple plots in 2024 (Table 4), including threeawn (*Aristida purpurea* var. *longiseta*), needle-and-thread grass (*Hesperostipa comata*), bluebunch wheatgrass (*Pseudoroegneria spicata*), Sandberg bluegrass (*Poa secunda*), and squirreltail (*Elymus elymoides*). In addition, sand dropseed (*Sporobolus cryptandrus*) was recorded in one plot. Seventeen plots (68%) supported three or more bunchgrass species; all others had one or two species. Threeawn was the only bunchgrass present in every plot. It had canopy cover estimates ranging from <1% to >50%, including 19 plots (76%) with cover exceeding 10%. It was the dominant bunchgrass in 19 plots and co-dominant in the other six plots. Bluebunch wheatgrass and Sandberg bluegrass occurred in >50% of plots, with canopy cover being <10% in most cases for both species. Needle-and-thread grass occurred in Camels Back Reserve and most plots in Military Reserve, but infrequently in the other Reserves. Squirreltail occurred at <1% cover when present in a plot. Total bunchgrass canopy cover was ≥10% in 21 plots (84%), but ranged from <1% to >50%.

Total bunchgrass cover in 2024 was similar to 2021 in the majority of plots (Table 4). Exceptions included decreased total bunchgrass cover value for three plots in Hulls Gulch Reserve and one plot in Military Reserve, Polecat Reserve, and Hillside to Hollow Reserve. Decreases tended to be from 10-25% to <10% cover, or from 25-50% to 10-25% cover. The decrease from 25-50% cover in 2021 to <1 cover in 2024 for threeawn and total bunchgrass cover in Plot AA-14 is likely either a data recording error or due to sampling a location near, but not corresponding to the same location as in 2021. Increased total bunchgrass cover was recorded for the plot in Camels Back Reserve, two plots in Hulls Gulch Reserve, and one plot in Military Reserve. The most common increase in total bunchgrass cover was from <10% in 2021 to 10-25% in 2024.

Native forb species

Monitoring recorded a total of 34 native forb species in 2024, with 26 of them among the set of most common forbs in one or more plots (Table 5, Appendix 4). The total includes 20 perennial and 14 annual native forb species. Common yarrow (*Achillea millefolium*), silverleaf phacelia (*Phacelia hastata*), and large-flower tritelia (*Tritelia grandiflora*) were the only forbs recorded in at least half the monitoring plots. Other native forb species found in five or more plots included arrowleaf balsamroot (*Balsamorhiza sagittata*), sego lily (*Calochortus* sp.), bastard toadflax (*Comandra umbellata*), strict buckwheat (*Eriogonum strictum*), nine-leaf biscuitroot (*Lomatium simplex*), fiddleneck (*Amsinckia* sp.), annual willowherb (*Epilobium brachycarpum*), slender popcorn-flower (*Plagiobothrys tenellus*), and lacepod (*Thysanocarpus curvipes*). Forb diversity in plots ranged from 2-13 species (discounting Aase's onion), but with most plots having <10 species. Military Reserve plots had the highest average forb diversity and Hillside to Hollow Reserve the lowest. Individual forb species abundance was most commonly assessed to be "trace", otherwise usually "scattered" or "sparse". Only four plots had a native forb species recorded as "common".

Most plots had at least one forb species present in 2024 that was not recorded in 2021 (Table 5, Appendix 4). These species were present at the "trace" or "sparse" abundance category in most cases. Multiple plots also had forbs noted in 2021, but not detected in 2024, including examples from all abundance categories.

Non-native weed species

Monitoring recorded a total of 17 weed species in 2024, including 5 grass and 12 forb species (Table 6, Appendix 4). Most are annual species, with bulbous bluegrass (*Poa bulbosa*), rush skeletonweed (*Chondrilla juncea*), and donkey-tail spurge (*Euphorbia myrsinites*) being the only perennials. One species, rush skeletonweed, is on the Idaho noxious weed in list (Idaho State Department of Agriculture 2024). The number of weed species in a plot ranged from 4 – 9, with 19 plots (76%) having at least seven.

Cheatgrass (*Bromus tectorum*) and rush skeletonweed were the only weed species found in every plot (Table 6, Appendix). Other weed species occurring in more than half of all plots included bulbous bluegrass (*Poa bulbosa*), blue bachelor button (*Centaurea cyanus*), desert alyssum (*Alyssum desertorum*), and redstem storksbill (*Erodium cicutarium*). Cheatgrass abundance was recorded as “dominant” or “common” in 84% of plots, including multiple plots in each Reserve (except Camels Back with only a single plot). Rush skeletonweed was recorded as “dominant” or “common” in 48% of plots, including at least one plot all Reserves except Polecat. Rush skeletonweed was present at one plot in Military Reserve (AA-2) in 2024 where absent in 2021. Blue bachelor button occurred in all plots in Hulls Gulch and Camels Back reserves, and nearly all plots in Military Reserve. It was absent from plots in Polecat Reserve and all but one plot at Hillside to Hollow Reserve. Bulbous bluegrass was recorded as “common” in at least one plot in all Reserves except Polecat. Redstem storksbill was recorded as “common” or “dominant” in multiple plots at each Reserve. Desert alyssum was also recorded as “common” or “dominant” in at least one plot in each Reserve. Overall, 16 plots contained >3 weed species recorded in the “common” or “dominant” abundance category, including all plots in Hulls Gulch and Camels Back reserves. Eight plots had 1-2, and one plot had none in these categories. Donkey-tail spurge was present in the same Military Reserve plot in 2024 as in 2021. It was also recorded in one Hulls Gulch plot (AA-10) for the first time. Bur chervil (*Anthriscus caucalis*) was not recorded in any plots in 2021, but present at one plot in Hulls Gulch Reserve (AA-14) in 2024.

Ground disturbance

Seven ground disturbance factors were recorded in 2024, including animal digging, wildlife tracks, dog tracks, unknown animal tracks, trails, non-motorized recreation, and weed invasion (Table 7). All plots had at least one type of disturbance, and most two or more. The most common disturbances included animal digging in 21 plots (84%), weed invasion in 18 plots (72%), and wildlife tracks in 17 plots (68%). Sand piles from tunnel/burrow excavation represented the most common form of animal digging disturbance in the plots. The digging is likely associated with northern pocket gopher (*Thomomys talpoides*) activity in most cases. Plots can have fresh or old mounds, or both. Animal digging abundance was rated “dominant” or “common” in 10 plots (42%) in 2024. Mule deer (*Odocoileus hemionus*) were responsible for most, if not all wildlife tracks observed in the plots. Wildlife track abundance was commonly rated as “sparse” within a plot but varied from the “trace” to “dominant” categories. Five plots had dog tracks disturbance. All but one of these plots had trail disturbance as well. Dog track abundance varied from “sparse” to “common”. Unknown animal tracks that may represent old deer or dog tracks were recorded at three plots. Trail disturbance occurred at eight plots. In some cases, these are official/maintained trails, but in other cases represent social/user-created trails. Abundance categories for trail disturbance ranged from “sparse” to “common”. Non-motorized recreation disturbance was limited to one plot in Polecat Reserve that had footprints upslope and downslope of a popular trail. Weed invasion was listed as a “common” or “dominant” disturbance in plots judged to be presently or in the process of being overrun by

weedy species. Other disturbances related to livestock or motorized recreation use were absent from the monitoring plots.

Most plots had the same disturbance factors in 2024 as in 2021. Exceptions included dog tracks being absent from three plots in 2024 that had them in 2021, although one of these plots had unknown animal tracks in 2024. Also, dog tracks were present in 2024 at two Hillside to Hollow Reserve plots lacking this disturbance in 2021. Trail disturbance recorded for two plots in 2024, was not noted for these plots in 2021. Three plots that had non-motorized recreation disturbance in 2021 lacked this disturbance in 2024.

Photo point photographs

A total of 130 labeled photographs provide visual documentation to supplement the monitoring data (Appendix 5).

DISCUSSION

Monitoring results for 2024 found some plots in Military, Camels Back, and Hulls Gulch reserves with Aase's onion counts/estimates either modestly higher than or similar to 2021. However, 61% of plots showed decreased Aase's onion abundance in 2024 compared to 2021. This included all plots in Polecat and Hillside to Hollow reserves, and a subset of plots in Military and Hulls Gulch reserves. Numerically, the largest declines were for plots that had Aase's onion abundance exceeding 1000 plants in 2021. Although abundance values were substantially less than in 2021 at these plots, most still had at least 500 Aase's onion plants in 2024. Other plots with reduced abundance all had fewer than 200 Aase's onion plants in 2021 and less than 100 plants in 2024. One heavily disturbed plot with high weed cover in Military Reserve (AA-7) had three Aase's onion plants in 2021, but none in 2024. It will require future monitoring visits to determine if Aase's onion has been extirpated from this location.

Life history information about Aase's onion is limited. We do not know to what degree annual abundance of Aase's onion may naturally fluctuate at population or subpopulation scales. We do not know if Aase's onion bulbs produce flowers every year, or if some years they produce leaves but not flowers, or if there are years where at least some bulbs stay dormant and produce no aboveground tissue. The decline in Aase's onion abundance at many plots in 2024 compared to 2021 becomes more difficult to confidently interpret if bulbs can remain dormant some years. This is the case for Munz's onion (*Allium munzii*), a rare California endemic adapted to periodic drought that can survive dry years underground as a bulb (U.S. Fish and Wildlife Service 2009). Dormant Munz's onion bulbs cannot be detected because they lack any above-ground growth. Differences in annual flowering can make it appear Munz's onion populations have shrunk or expanded from one year to the next. Additional monitoring years will be required to determine whether trend for Aase's onion abundance at COB Reserves is stable, increasing, decreasing, or prone to fluctuations.

Although premature to assess abundance trend, two years of monitoring data does tell us that eight plots (subpopulations) contain <100 Aase's onion plants, including several located in Military Reserve, the one in Camels Back Reserve, and one in each of Hulls Gulch, Polecat, and Hillside to Hollow reserve. These subpopulations are likely the most vulnerable to local extirpation in the near term.

Over a century of livestock grazing, wildfires, and other disturbances has altered the original shrub-steppe vegetation of the lower Boise-area foothills to versions marked by an abundance of non-native weedy species and reduced levels of native plant species. Even in areas where

weeds may be less prominent, plant community composition tends to skew towards native species better adapted to the local disturbance history, such as threeawn. All monitoring plots contain multiple weed species intermixed with some combination of remnant native shrub, bunchgrass, and forb species.

Shrub species composition and cover class values in 2024 were similar to 2021 at most plots, indicative of no substantive changes between the two monitoring periods. Exceptions include two plots that had 25-50% total shrub cover in 2021 reduced to 10-25% in 2024, and one plot that had 10-25% total shrub cover in 2021 reduced to 1-10% in 2024. Monitoring data for bunchgrass species in 2024 was also similar to 2021 at most plots. Exceptions included needle- and thread grass, bluebunch wheatgrass, or Sandberg bluegrass being recorded in one or more plots in 2024 for Military Reserve where they were not recorded in 2021. In some cases, they were present at only trace (<1%) cover for 2024, and could have been easily overlooked in 2021, if present. Several plots had either lower or higher total bunchgrass cover estimates in 2024 compared to 2021. Differences were one cover class between the two years, such as <10% in 2021, but 10-25% in 2024.

Differences in shrub or bunchgrass cover class estimates between 2021 and 2024 may well represent actual decreases or increases or may possibly reflect some of the subjectivity built into the data collection protocol. As an example, if the true total shrub or bunchgrass cover at a plot is close to 25%, it would not be difficult for data collectors one year to estimate slightly more than 25% (25-50% category), but slightly less than 25% (10-25% category) the other year. Another issue that could potentially influence differing cover estimates between sampling periods is having plot placement locations that do not sufficiently overlap. Plots are relocated using GPS coordinates, supplemented by plot photographs. Having the plot center point differ by just a few meters in 2024 compared to 2021 could result in different estimates for shrub and bunchgrass canopy cover abundance, or for other measured attributes. A comparison of photo point images (Appendix 5) taken in 2024 compared to those in 2021 indicates 2024 plot centers were shifted several meters for plots AA-10, AA-13, and AA-14. While still near the 2021 locations, these shifts probably account for the bunchgrass cover differences between the two years.

Native forb diversity in plots ranged from 2-13 species but varied from 4-9 species in the majority of cases. In 2021, the monitoring protocol required recording only the four most common native forb species in a plot and assigning an abundance category. This was changed to the six most common forb species for 2024, with the option to list all other native forbs in the plot. Compiling a complete forb list for a plot takes extra time and was done at most, but possibly not fully at all plots in 2024. For future native forb data collection, we recommend noting whether the forb list is partial or complete. A complete list can provide a fuller appreciation of native plant diversity at each plot, information that may be useful for future habitat restoration or other conservation activities. The data collection difference between 2021 and 2024 limits their comparison. In general, most forb species recorded in 2021 were also noted for the same plot in 2024. Major shifts in the native forb component between the two years was not evident for any plot.

The ability of weed species invasion to adversely affect Aase's onion habitat has been known for many years (Prentice 1988). Invasive weeds compete with Aase's onion (and other native plants) for water and other soil resources, and for space and sunlight. Cheatgrass, a common weed at Aase's onion sites greatly increases fine fuel loads and associated wildfire risks. Past wildfires have been a leading cause for the ecological decline of Aase's onion habitat,

characterized by the total or near total loss of native shrubs, reduced abundance of key native grass and forb species, and the further establishment of multiple weed species.

Weed species were a prominent part of the vegetation at most monitoring plots in 2024, similar to 2021. Monitoring has shown cheatgrass, rush skeletonweed, redstem storks-bill, and desert alys-sium to be the most widespread and common weed species on Aase's onion sites in COB foothill Reserves. Blue bachelor button is less widespread, but can be just as common in Military, Camels Back, and Hulls Gulch reserves. There is a tendency for plots with the most Aase's onion to have lower weed abundance, and for plots with less Aase's onion to have higher weed abundance. Most plots with >500 Aase's onion in 2024 contained 0-2 weed species rated "common" and none rated "dominant". However, some had up to five weed species rated "common", but also none rated "dominant". In contrast, most plots with <500 Aase's onion in 2024 contained 3-6 weed species rated "common" and/or "dominant", but some had only two weed species with these abundance categories. Habitat degradation due to invasive weed species and associated declines in native shrubs-steppe vegetation appears to be the biggest threat to the long-term persistence of Aase's onion within the COB Reserves. Monitoring results suggests cheatgrass and rush skeletonweed to be the most consistently consequential weed invaders impacting Aase's onion and its habitat. Other weed species may be equally detrimental to Aase's onion, but they tend to be more sporadic in distribution, such as blue bachelor buttons at some locations in Military Reserve and Hulls Gulch Reserve, and cereal rye (*Secale cereale*) at Camels Back Reserve.

Donkey-tail spurge was found in two plots in 2024. It was recorded as "scattered" in 2021 and "sparse" in 2024 at Plot AA-7 in Military Reserve. The spurge was absent from Plot AA-10 in Hulls Gulch Reserve in 2021 but recorded as "common" in 2024. Bur chervil is a weed species that has quickly become widespread and locally common in the Boise foothills in recent years. It was not recorded in any Aase's onion monitoring plots in 2021, but at "trace" abundance at Plot AA-14 in Hulls Gulch Reserve in 2024.

Disturbances can contribute to the establishment and proliferation of weed species (Hobbs and Huenneke 1992). Like 2021, some level of pocket gopher digging disturbance was present at most plots in 2024. The direct effect of this digging on Aase's onion remains unknown, but indirectly, the soil mounds provide microsites readily colonized by invasive weed species (Kinter 2009). Also similar to 2021, monitoring documented the presence of deer tracks in the majority of plots in 2024. The tracks were commonly rated as "sparse" and probably have minimal direct impact on Aase's onion, although they possibly contribute to weed species establishment or persistence. The COB Reserves support an extensive recreation trail network very popular with hikers, runners, dog walkers, and mountain bikers. Two Aase's onion monitoring plots (both in Polecat Reserve) are bisected by well-used recreation trails and several other plots occur adjacent to or near a trail. Monitoring in 2024 found footprints in only one of these plots and bicycle tracks in none, suggesting people are staying on trails in the vicinity of Aase's onion populations. Several plots near trails had dog tracks ranging in abundance from "sparse" to "common". Disturbances caused by dogs probably most affect Aase's onion by exacerbating erosion and promoting weed establishment or persistence in its habitat.

Identifying factors that adversely affect population persistence and habitat quality is a central emphasis in species conservation efforts (Perrine et al. 2017). Monitoring is one way to help meet this aim. The Aase's onion monitoring program's collection of population, habitat condition, and disturbance information is meant to track factors that challenge the species' long-term conservation. This information is relevant to land managers tasked with formulating

conservation priorities and implementing actions that benefit Aase's onion and its habitat in the COB Reserve system. The Open Space Matters Reserve Management plan, implemented in 2015, provides management framework for Boise City-owned open spaces and outlines a need for protection and enhancement of natural resources like rare plants (Focus Area 3). Monitoring information can be used to prioritize invasive species treatment areas, inform decisions where to place signage, fencing, or other management measures for the benefit Aase's onion and its habitat, and to help evaluate the efficacy of resource protection actions.

CONSERVATION ACTIONS

The Treasure Valley has seen a substantial population increase in recent decades. Between 2000 and 2024, Ada County's population grew by 85.3% from 300,904 to 557,590, with an average annual growth rate of 3.6% (COMPASS 2024). New residents arrive with potentially limited knowledge about local flora and fauna, and public education on rare plants is a crucial aspect of local conservation efforts. Raising awareness can increase community participation and interest in rare plant protection and conservation. In 2022, educational signs (Figure 3) were placed directly adjacent to trailside populations of Aase's onion to inform recreationalists about the species in four open space reserves: Camels Back, Hillside to Hollow, Hulls Gulch and Polecat. Data were not collected on sign effectiveness, and observations of trail users reading signs or scanning QR codes on signs was limited. Signs were not installed again in 2023 or 2024.

Boise Parks and Recreation uses social media (Facebook, Instagram, and TikTok) to communicate with the public. Every spring when Aase's onions are blooming, posts are generated about the onion's rare plant status and include requests for the public to tread lightly in the species' habitat. Additional information on Aase's onion and monitoring efforts can be found on a City website: <https://www.cityofboise.org/departments/parks-and-recreation/open-space/habitat-restoration/rare-plants-of-the-boise-foothills/>.

Specific Aase's onion populations will be targeted for weed management treatments based on trends from the monitoring data. Treatments to remove donkey-tail spurge at plots AA-7 and AA-10, and bur chervil at plot AA-14 will be a management priority. Cheatgrass cover also shifted from common to dominant at these locations, and efforts will be made to hand remove or chemically treat invasive annual grasses while removing other weeds. Finally, disturbance from a social trail was identified as a conservation concern at plot AA-12. Fencing or other physical deterrents will be installed to stop recreational traffic through this sensitive area. These actions are scheduled for spring 2025.

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Figure 1. Image of Aase's onion.
Photo by Robert Moseley.



Figure 2. Map of City of Boise Reserves included in the Aase’s onion monitoring program.

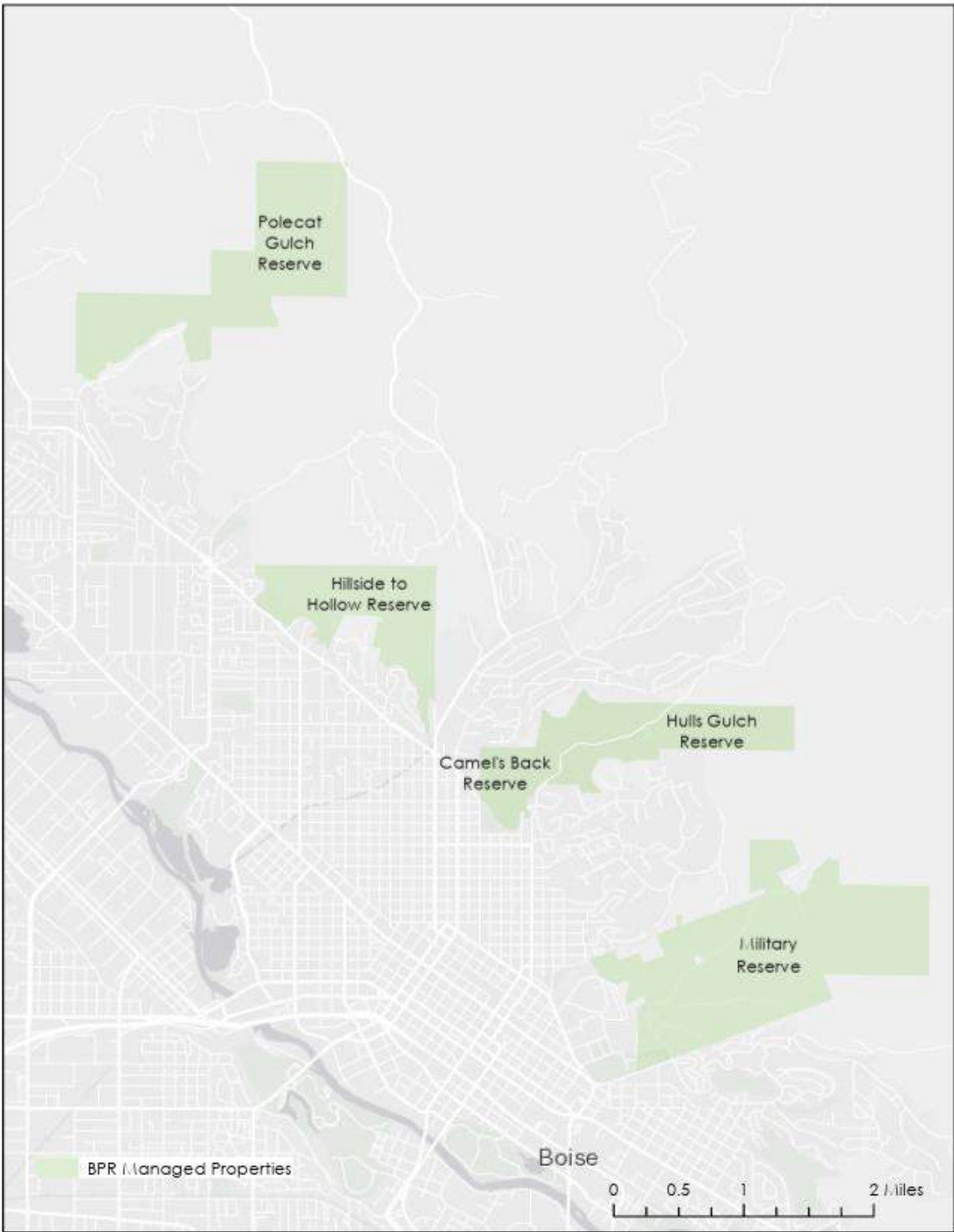


Figure 3: Educational sign posted at Aase's onion populations in 2022.



Table 1. Aase's onion monitoring plot information.

Plot	Location	Aspect	Slope (%)	Elevation (ft.)	Substrate
AA-1	Military Reserve	SSW	12	3080	sandy
AA-2	Military Reserve	WSW	40	3090	coarse sand
AA-3	Military Reserve	SSW	20	3110	sandy
AA-4	Military Reserve	S	38	2960	coarse sand
AA-5	Military Reserve	SSW	15	2900	coarse sand
AA-6	Military Reserve	WSW	50	2970	sandy
AA-7	Military Reserve	SE	25	2950	sandy
AA-8	Military Reserve	S	25	3150	sandy
AA-9	Camels Back Reserve	ESE	41	2860	coarse sand
AA-10	Hulls Gulch Reserve	ESE	15	3000	orangish sand
AA-11	Hulls Gulch Reserve	S	38	3040	sandy
AA-12	Hulls Gulch Reserve	SSE	35	3040	deep sand
AA-13	Hulls Gulch Reserve	S	25	3070	coarse sand
AA-14	Hulls Gulch Reserve	E	20	2960	deep sandy
AA-15	Hulls Gulch Reserve	S	30	3040	deep coarse
AA-17	Polecat Reserve	S	38	3160	coarse sand
AA-18	Polecat Reserve	SSW	41	3280	coarse sand
AA-19	Polecat Reserve	S	16	3320	coarse sand
AA-20	Polecat Reserve	ESE	39	3060	coarse sand
AA-21	Polecat Reserve, BLM	W	25	3290	coarse sand
AA-22	Polecat Reserve, BLM	S	35	3330	coarse sand
AA-23	Hillside to Hollow Reserve	S	38	3110	coarse sand
AA-24	Hillside to Hollow Reserve	WSW	12	2960	coarse sand
AA-25	Hillside to Hollow Reserve	SE	14	3130	coarse sand
AA-26	Hillside to Hollow Reserve	WSW	33	3180	coarse sand

Table 2. Aase's onion abundance in monitoring plots, 2021 and 2024.

Mid-point of estimated range used to calculate plot density and total abundance.

No 2021 data for plots AA-21 and AA-22 established in 2024. Because no comparable values exist for 2021, abundance data for these two new plots not used to calculate 2024 overall density for Polecat Reserve or total abundance across all plots.

Plot	# plants counted		# plants estimated		Density (# plants/m ²)	
	2021	2024	2021	2024	2021	2024
Military Reserve						
AA-1	20	?			0.05	?
AA-2			2001-5000	2001-5000	8.6	8.6
AA-3			2000-3000	2001-5000	6.2	8.6
AA-4	69			11-50	0.2	0.07
AA-5	117			101-200	0.3	0.4
AA-6		9	11-50		0.07	0.02
AA-7	3	0			0.007	0
AA-8			301-500	201-300	1.0	0.6
Mean					2.1	2.3
Camels Back Reserve						
AA-9	17	43			0.04	0.1
Hulls Gulch Reserve						
AA-10			100-200	201-300	0.4	0.6
AA-11			300-500	501-1000	1.0	1.9
AA-12			2001-5000	301-500	8.6	1.0
AA-13			301-500	301-500	1.0	1.0
AA-14	81	18			0.2	0.04
AA-15	144			301-500	0.4	1.0
Mean					1.9	0.9
Polecat Reserve						
AA-17	148	93			0.4	0.2
AA-18		655	3000		7.4	1.6
AA-19			6000	2001-5000	14.8	8.6
AA-20		1560	4000		9.9	3.9
AA-21	x		x	10,000+	x	24.7
AA-22	x		x	501-1000	x	1.9
Mean					8.1	3.6
Hillside to Hollow Reserve						
AA-23			2000	501-1000	4.9	1.9
AA-24	191	17			0.5	0.04
AA-25	2194			1001-2000	5.4	3.7
AA-26			2500	1001-2000	6.2	3.7
Mean					4.2	2.3
Total	2984	2395	26180	16880		

AA-1: Aase's onion leaves present but too late in season to observe flowers making counting or estimating abundance problematic

AA-14: 50-100 Aase's onion present immediately east (within 10 meters) of plot

Table 3. Percent canopy cover for shrub species in Aase's onion monitoring plots, 2021 and 2024.

x = not recorded in plot. No 2021 data for plots AA-21 and AA-22 established in 2024.

Note: the lowest shrub canopy category was <10% in 2021, but <1% in 2024.

	Shrub species % canopy cover							
	Bitterbrush		Big sagebrush		Gray rabbitbrush		Total shrub	
	2021	2024	2021	2024	2021	2024	2021	2024
Military Reserve								
AA-1	10-25	10-25	x	x	<10	1-10	10-25	10-25
AA-2	25-50	25-50	x	x	<10	1-10	25-50	25-50
AA-3	10-25	10-25	<10	<1	<10	1-10	10-25	10-25
AA-4	10-25	10-25	x	x	<10	1-10	10-25	10-25
AA-5	10-25	10-25	x	x	<10	1-10	25-50	10-25
AA-6	10-25	10-25	x	x	<10	1-10	10-25	10-25
AA-7	10-25	10-25	x	x	<10	1-10	10-25	10-25
AA-8	10-25	10-25	x	x	x	x	10-25	10-25
Camels Back Reserve								
AA-9	x	x	x	x	<10	1-10	<10	1-10
Hulls Gulch Reserve								
AA-10	<10	x	x	x	10-25	1-10	10-25	1-10
AA-11	<10	<1	x	x	<10	x	<10	<1
AA-12	10-25	10-25	x	x	x	<1	10-25	10-25
AA-13	<10	<1	<10	x	<10	<1	<10	1-10
AA-14	<10	1-10	x	x	10-25	1-10	10-25	10-25
AA-15	10-25	10-25	x	x	<10	<1	10-25	10-25
Polecat Reserve								
AA-17	<10	1-10	x	x	<10	1-10	<10	1-10
AA-18	<10	1-10	x	v	x	<1	<10	1-10
AA-19	<10	1-10	<10	1-10	10-25	10-25	10-25	10-25
AA-20	10-25	10-25	x	x	x	x	10-25	10-25
AA-21	-	<1	-	x	-	1-10	-	1-10
AA-22	-	10-25	-	x	-	1-10	-	10-25
Hillside to Hollow Reserve								
AA-23	x	x	x	x	<10	1-10	<10	1-10
AA-24	x	x	x	x	10-25	10-25	10-25	10-25
AA-25	x	x	<10	1-10	<10	10-25	10-25	10-25
AA-26	x	x	x	x	25-50	10-25	25-50	10-25

Golden currant with <1% cover in Plot AA-14 in 2024

Gray horsebrush (*Tetradymia canescens*) with <1% cover in Plot AA-25 in 2021

Table 4. Percent canopy cover for native bunchgrass species in Aase's onion monitoring plots, 2021 and 2024.

x = not recorded in plot. No 2021 data for plots AA-21 and AA-22 established in 2024.

Note: the lowest bunchgrass canopy category was <10% in 2021, but <1% in 2024.

Plot	Bunchgrass species % canopy cover											
	Threawn		Needle-and-thread		Bluebunch wheatgrass		Sandberg bluegrass		Squirreltail		Total bunchgrass	
	2021	2024	2021	2024	2021	2024	2021	2024	2021	2024	2021	2024
Military Reserve												
AA-1	25-50	25-50	25-50	25-50	x	10-25	x	x	x	x	>50	>50
AA-2	10-25	10-25	x	10-25	<10	<10	x	<1	x	x	10-25	>50
AA-3	>50	>50	<10	1-10	x	x	x	<1	x	<1	>50	>50
AA-4	10-25	10-25	<10	1-10	<10	1-10	<10	<1	x	x	10-25	10-25
AA-5	10-25	10-25	x	1-10	10-25	10-25	x	<1	x	x	25-50	10-25
AA-6	25-50	1-10	x	10-25	10-25	25-50	x	1-10	x	x	>50	>50
AA-7	25-50	10-25	<10	1-10	x	x	10-25	1-10	x	x	25-50	10-25
AA-8	>50	>50	x	x	<10	1-10	x	x	x	x	>50	>50
Camels Back Reserve												
AA-9	<10	10-25	<10	10-25	x	x	<10	1-10	x	x	<10	10-25
Hulls Gulch Reserve												
AA-10	<10	10-25	x	x	<10	<1	<10	1-10	<10	<1	<10	10-25
AA-11	25-50	10-25	<10	<1	x	<1	<10	<1	<10	<1	25-50	10-25
AA-12	10-25	1-10	x	x	<10	<1	<10	<1	<10	<1	10-25	10-25
AA-13	10-25	1-10	x	x	<10	<1	<10	<1	<10	<1	10-25	1-10
AA-14	25-50	<1	x	x	x	x	x	x	x	<1	25-50	<1
AA-15	<10	10-25	x	x	x	x	x	x	x	x	<10	10-25
Polecat Reserve												
AA-17	<10	1-10	x	x	x	x	<10	x	x	<1	<10	1-10
AA-18	10-25	10-25	<10	<1	x	<1	x	<1	x	x	10-25	10-25
AA-19	10-25	10-25	x	x	x	x	<10	1-10	<10	<1	10-25	10-25
AA-20	10-25	10-25	x	x	<10	1-10	x	<1	x	x	25-50	10-25
AA-21	-	10-25	-	<1	-	<1	-	1-10	-	<1	NS	10-25
AA-22	-	1-10	-	x	-	x	-	x	-	x	NS	1-10
Hillside to Hollow Reserve												
AA-23	25-50	10-25	x	x	x	x	<10	<1	<10	x	25-50	10-25
AA-24	10-25	10-25	x	x	x	x	<10	10-25	x	x	10-25	25-50
AA-25	25-50	25-50	x	x	x	x	<10	1-10	x	x	25-50	25-50
AA-26	<10	25-50	x	x	<10	1-10	<10	10-25	<10	x	25-50	25-50

Sand dropseed was recorded in Plot AA-7 with 1-10% cover in 2024.

Table 5. Abundance category for selected native perennial forb species in Aase's onion monitoring plots, 2021 and 2024.

No 2021 data for plots AA-21 and AA-22 established in 2024.

CM = common; SC = scattered; SP = sparse; TR = trace; x = not recorded in plot.

Plot	Year	Native Forb Species											
		Common yarrow	Pursh' s milkvetch	Arrowleaf balsamroot	Sego-lily	Hawksbeard	Slenderbush buckwheat	Strict buckwheat	Nine-leaf biscuitroot	Hoary aster	Silverleaf phacelia	Bastard toadflax	Large-flower tritelia
Military Reserve													
AA-1	2021	CM	x	CM	x	x	CM	x	x	CM	x	x	x
	2024	x	x	SC	x	x	x	x	x	x	TR	TR	TR
AA-2	2021	SC	x	x	x	x	SC	x	x	SC	SC	x	x
	2024	SP	x	SP	x	x	x	x	x	x	SP	SP	SP
AA-3	2021	x	x	x	x	x	x	x	x	x	SC	x	SC
	2024	SP	x	TR	x	x	x	x	x	x	SC	SP	CM
AA-4	2021	SP	x	x	x	x	x	x	x	SP	SC	x	SC
	2024	SP	x	SP	SC	x	x	x	x	TR	SP	x	SC
AA-5	2021	SP	x	SC	x	x	x	x	x	x	SC	x	SC
	2024	SC	x	SP	x	x	x	x	TR	x	TR	SC	SC
AA-6	2021	SC	x	x	x	x	SC	x	SC	SC	x	x	x
	2024	SP	x	CM	x	TR	x	x	CM	-	x	x	TR
AA-7	2021	TR	x	x	x	x	x	x	x	x	TR	-	TR
	2024	TR	x	TR	x	x	x	x	x	x	x	TR	TR
AA-8	2021	SC	x	x	x	x	x	x	SC	x	x	x	x
	2024	SC	SC	x	x	SC	x	x	TR	x	SP	x	SC
Camels Back Reserve													
AA-9	2021	x	x	TR	x	x	x	x	x	x	SP	x	SP
	2024	x	x	TR	x	x	x	x	x	SC	SP	x	CM
Hulls Gulch Reserve												x	
AA-10	2021	TR	x	x	x	x	x	x	x	x	SP	x	x
	2024	TR	x	x	x	x	x	x	x	x	SP	x	x
AA-11	2021	TR	x	x	x	x	x	x	x	x	TR	x	SC
	2024	TR	x	x	TR	x	x	TR	TR	x	TR	x	TR
AA-12	2021	x	TR	x	x	x	x	x	TR	x	SP	x	SC
	2024	x	x	x	TR	x	x	x	TR	x	TR	x	SP
AA-13	2021	TR	x	x	x	x	x	x	x	TR	SC	x	SC
	2024	TR	x	x	x	x	x	x	x	TR	TR	x	SP
AA-14	2021	TR	x	x	x	x	x	x	x	x	CM	x	SC
	2024	TR	x	x	TR	TR	x	x	x	TR	TR	x	TR
AA-15	2021	SP	x	x	x	x	x	x	x	x	SC	x	SC
	2024	SP	x	x	TR	x	x				SP	x	SC
Polecat Reserve													
AA-17	2021	x	x	x	x	x	SP	SP	x	x	x	x	x
	2024	x	x	x	x	x	x	TR	x	x	x	x	x

Plot	Year	Common yarrow	Pursh' s milkvetch	Arrowleaf balsamroot	Sego-lily	Hawksbeard	Slenderbush buckwheat	Strict buckwheat	Nine-leaf biscuitroot	Hoary aster	Silverleaf phacelia	Bastard toadflax	Large-flower tritelia
AA-18	2021	x	x	x	x	x	x	TR	x	x	TR	x	x
	2024	x	x	x	x	x	x	TR	x	x	SP	x	x
AA-19	2021	x	x	x	x	x	x	x	x	x	x	x	x
	2024	x	TR	x	x	x	x	x	x	x	x	x	x
AA-20	2021	x	x	x	x	x	x	TR	x	x	TR	x	x
	2024	x	TR	SP	x	x	x	TR	TR	x	TR	x	x
AA-21	2021	-	-	-	-	-	-	-	-	-	-	-	-
	2024	TR	x	x	x	SP	-	SC	TR	x	x	x	x
AA-22	2021	-	-	-	-	-	-	-	-	-	-	-	-
	2024	x	TR	x	x	x	x	SP	x	x	SP	x	x
Hillside-Hollow Reserve													
AA-23	2021	x	x	SP	x	x	x	SP	x	x	SC	x	x
	2024	TR	x	CM	x	x	x	SC	x	x	CM	x	x
AA-24	2021	SC	x	x	x	x	x	SC	x	x	SC	x	x
	2024	CM	x	x	x	x	x	SC	x	x	SP	x	x
AA-25	2021	x	x	SP	x	x	x	TR	TR	x	SP	x	x
	2024	x	TR	SC	x	x	x	TR	SC	x	SC	x	x
AA-26	2021	x	x	SC	x	x	x	SC	x	x	SC	x	x
	2024	SC	x	CM	x	SC	x	SC	TR	x	TR	x	x

Appendix 4 includes all native forb species recorded in only one or a few plots and not in this table.

Table 6. Abundance category for selected non-native weed species in Aase's onion monitoring plots, 2021 and 2024.

No 2021 data for plots AA-21 and AA-22 established in 2024.

DO = dominant; CM = common; SC = scattered; SP = sparse; TR = trace; ? = abundance class not recorded for plot; x = not recorded in plot.

Plot	Year	Weed Species											
		Cheatgrass	Bulbous bluegrass	Cereal rye	Medusahead	Desert alyssum	Blue bachelor button	Rush skeletonweed	Redstem storksbill	Donkey-tail spurge	Russian thistle	Tumblemustard	Bur chervil
Military Reserve													
AA-1	2021	CM	x	SC	CM	x	CM	CM	x	x	SC	x	x
	2024	CM	SP	SC	CM	TR	CM	CM	CM	x	x	x	x
AA-2	2021	SP	x	x	x	x	x	x	x	x	x	SP	x
	2024	CM	SP	x	x	SC	x	SP	SP	x	x	SP	x
AA-3	2021	CM	x	x	x	CM	x	CM	SC	x	x	x	x
	2024	CM	SP	x	x	CM	CM	SC	CM	x	x	x	x
AA-4	2021	CM	SC	TR	SP	SC	CM	CM	CM	x	x	SP	x
	2024	CM	SC	TR	SP	SC	CM	CM	CM	x	x	x	x
AA-5	2021	SC	SC	SP	x	SP	SC	CM	SP	x	x	SP	x
	2024	CM	SC	SC	x	SC	SC	CM	x	x	x	x	x
AA-6	2021	SC	x	x	SP	x	SC	CM	x	x	x	x	x
	2024	CM	SC	x	SP	SP	CM	SC	SC	x	x	x	x
AA-7	2021	DO	SP	CM	x	x	SP	SP	x	SC	SC	x	x
	2024	DO	CM	CM	x	x	SC	SC	SP	SP	SP	x	x
AA-8	2021	CM	x	x	CM	CM	CM	CM	CM	x	x	x	x
	2024	SC	SC	x	CM	SC	CM	SC	CM	x	x	x	x
Camels Back Reserve													
AA-9	2021	DO	SC	CM	x	CM	SP	CM	CM	x	SC	SC	x
	2024	CM	CM	DO	x	DO	SC	CM	DO	x	SC	TR	x
Hulls Gulch Reserve													
AA-10	2021	CM	SP	x	x	CM	SC	CM	SC	x	x	SP	x
	2024	DO	CM	x	x	SC	CM	CM	DO	CM	x	x	x
AA-11	2021	CM	SP	x	x	x	SC	CM	CM	x	x	x	x
	2024	CM	CM	x	x	DO	CM	SC	DO	x	x	x	x
AA-12	2021	CM	TR	x	x	DO	CM	CM	SC	x	x	TR	x
	2024	DO	CM	x	x	DO	?	DO	DO	x	x	SP	x
AA-13	2021	CM	TR	x	x	DO	CM	CM	CM	x	x	x	x
	2024	CM	SC	x	x	DO	CM	CM	DO	x	x	TR	x
AA-14	2021	CM	x	x	x	SC	CM	DO	x	x	x	TR	x
	2024	DO	SC	x	x	TR	DO	CM	DO	x	x	SC	TR
AA-15	2021	CM	x	x	x	CM	CM	CM	SC	x	x	SP	x
	2024	DO	x	x	x	DO	SC	CM	CM	x	x	TR	x

		Cheatgrass	Bulbous bluegrass	Cereal rye	Medusahead	Desert alyssum	Blue bachelor button	Rush skeletonweed	Redstem storksbill	Donkey-tail spurge	Russian thistle	Tumblemustard	Bur chervil
Polecat Reserve													
AA-17	2021	SC	SC	x	x	DO	x	CM	SP	x	x	SP	x
	2024	SC	SC	x	x	CM	x	CM	SC	x	x	x	x
AA-18	2021	SC	x	x	x	CM	x	SP	DO	x	x	x	x
	2024	CM	SC	x	x	CM	x	SC	CM	x	x	x	x
AA-19	2021	SP	SP	x	x	SP	x	SC	SC	x	x	x	x
	2024	CM	TR	x	x	SC	x	SP	CM	x	x	x	x
AA-20	2021	SC	x	TR	x	SP	x	SC	CM	x	x	TR	x
	2024	CM	SP	TR	x	SC	x	SC	SC	x	x	x	x
AA-21	2021	-	-	-	-	-	-	-	-	-	-	-	-
	2024	CM	SP	x	x	SP	x	SC	x	x	x	x	x
AA-22	2021	-	-	-	-	-	-	-	-	-	-	-	-
	2024	SC	SP	x	x	SC	x	SP	SP	x	x	SP	x
Hillside-Hollow Reserve													
AA-23	2021	SC	SP	x	x	CM	x	SP	CM	x	x	x	x
	2024	CM	x	x	x	CM	x	TR	CM	x	x	x	x
AA-24	2021	CM	SC	TR	x	SP	SP	CM	CM	x	x	TR	x
	2024	DO	CM	CM	x	-	TR	CM	DO	x	x	x	x
AA-25	2021	SP	CM	x	x	SP	x	SC	DO	x	x	TR	x
	2024	CM	CM	x	x	CM	x	CM	CM	x	x	x	x
AA-26	2021	SP	x	x	x	SP	x	TR	TR	x	x	x	x
	2024	SP	x	x	x	CM	x	SP	CM	x	x	x	x

Appendix 4 includes all weed species recorded in only one or a few plots and not in this table. Spring whitlow grass (*Draba verna*), a tiny non-native ephemeral spring annual, not included in Appendix 4 or this table because it was not consistently recorded on the data sheets. It was present in most, if not all plots in both 2021 and 2024.

Table 7. Abundance category for disturbance factors in Aase's onion monitoring plots, 2021 and 2024.

No 2021 data for plots AA-21 and AA-22 established in 2024. x = not recorded in plot.
DO = dominant; CM = common; SC = scattered; SP = sparse; TR = trace; yes = disturbance present, but abundance class not recorded for plots in 2021, nor at some plots in 2024.

Plot	Year	Disturbance factors							
		Animal digging	Wildlife tracks	Dog tracks	Unknown animal tracks	Trail	Non-motor recreation	Weed invasion	Wildfire
Military Reserve									
AA-1	2021	yes	yes	x	x	x	x	yes	x
	2024	SP	TR	x	x	x	x	DO	x
AA-2	2021	yes	yes	x	x	x	x	x	x
	2024	TR	SP	x	x	x	x	x	x
AA-3	2021	yes	x	x	x	x	x	yes	x
	2024	SP	SC	x	x	x	x	CM	x
AA-4	2021	yes	yes	x	x	x	x	x	x
	2024	TR	SP	x	x	x	x	CM	x
AA-5	2021	yes	yes	x	x	x	x	x	x
	2024	SP	SP	x	x	x	x	CM	x
AA-6	2021	yes	yes	x	x	x	x	yes	x
	2024	x	SP	x	x	x	x	CM	x
AA-7	2021	yes	yes	yes	x	yes	yes	yes	yes
	2024	x	x	CM	x	CM	x	CM	-
AA-8	2021	x	x	-	x	x-	x	yes	x
	2024	x	x	x	x	x	x	CM	x
Camels Back Reserve									
AA-9	2021	yes	x	yes	x	yes	x	yes	x
	2024	CM	x	x	x	x	x	DO	x
Hulls Gulch Reserve								CM	
AA-10	2021	yes	yes	x	x	x	x	yes	x
	2024	DO	SP	x	x	x	x	DO	x
AA-11	2021	yes	yes	yes	x	x	x	x	x
	2024	CM	-	x	x	x	x	x	x
AA-12	2021	yes	yes	yes	x	x	x	yes	x
	2024	CM	SP	SP	x	x	x	DO	x
AA-13	2021	yes	x	yes	x	yes	yes	yes	x
	2024	DO	SP	SC	x	CM	x	CM	x
AA-14	2021	yes	yes	x	x	x	x	yes	x
	2024	CM	DO	x	x	x	x	DO	x
AA-15	2021	yes	yes	x	x	x	x	yes	x
	2024	DO	SP	x	x	x	x	DO	x

Plot	Year	Animal digging	Wildlife tracks	Dog tracks	Unknown animal tracks	Trail	Non-motor recreation	Weed invasion	Wildfire
Polecat Reserve									
AA-17	2021	yes	yes	x	x	x	x	yes	x
	2024	CM	SP	x	x	SP	x	yes	x
AA-18	2021	yes	yes	x	x	x	x	yes	x
	2024	SP	SP	x	x	x	x	x	x
AA-19	2021	yes	yes	yes	x	yes	x	x	x
	2024	CM	SP	x	TR	SP	x	x	x
AA-20	2021	yes	yes	x	x	x	x	x	x
	2024	TR	SP	x	x	SP	x	x	x
AA-21	2021	-	-	-	-	-	-	-	-
	2024	x	x	x	SC	x	x	x	x
AA-22	2021	-	-	-	-	-	-	-	-
	2024	SP	x	x	SC	CM	SC	x	x
Hillside-Hollow Reserve									
AA-23	2021	yes	yes	x	x	x	x	x	x
	2024	CM	yes	x	x	x	x	x	x
AA-24	2021	yes	x	x	x	yes	yes	yes	x
	2024	yes	x	yes	x	yes	x	yes	x
AA-25	2021	yes	yes	x	x	yes	x	x	x
	2024	yes	x	yes	x	yes	x	yes	x
AA-26	2021	x	yes	x	x	x	x	x	x
	2024	x	yes	x	x	x	x	x	x

Appendix 1

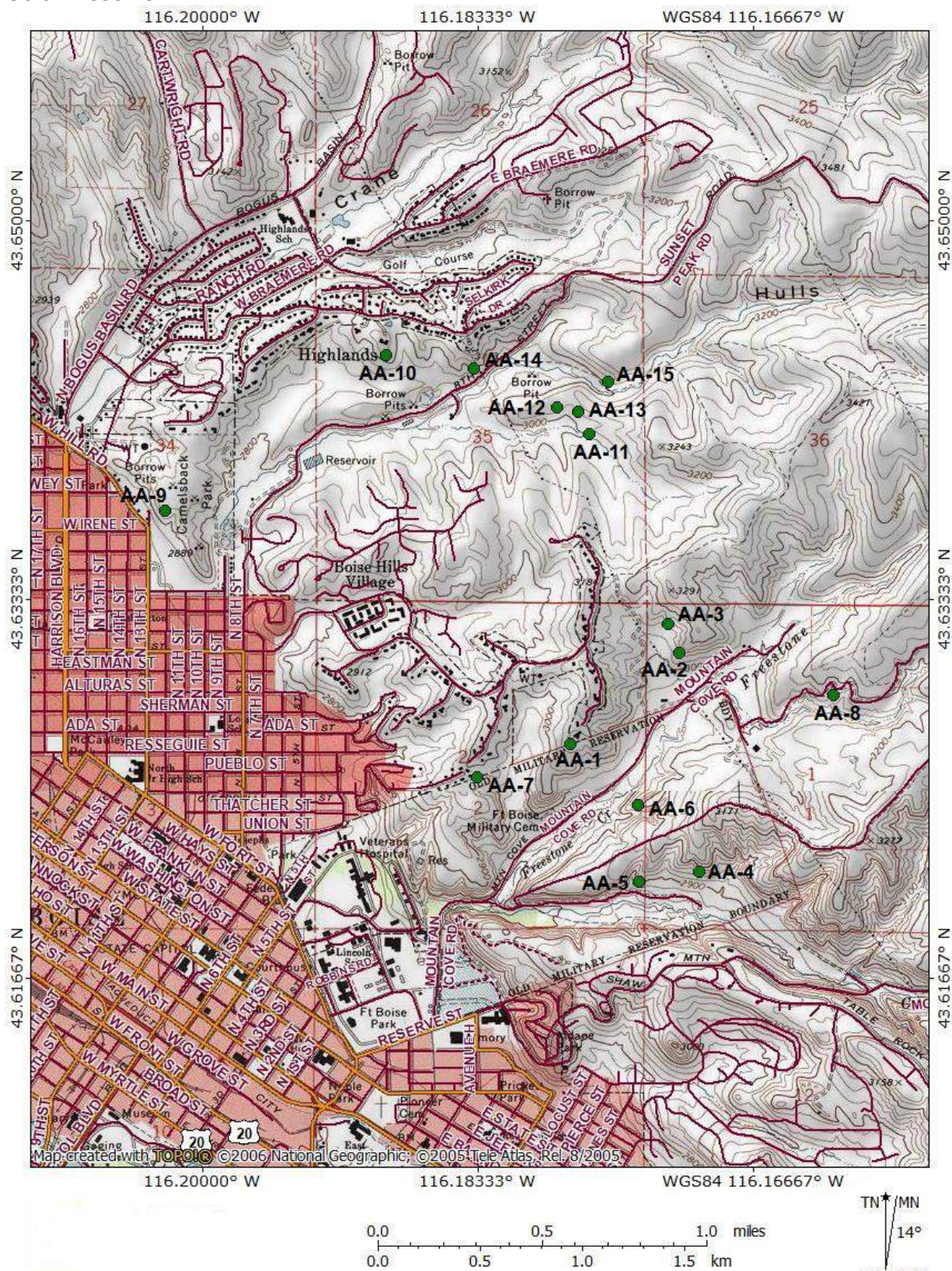
Monitoring plot GPS coordinates and map locations.

Coordinates for Aase's onion monitoring plot center points. WGS84.

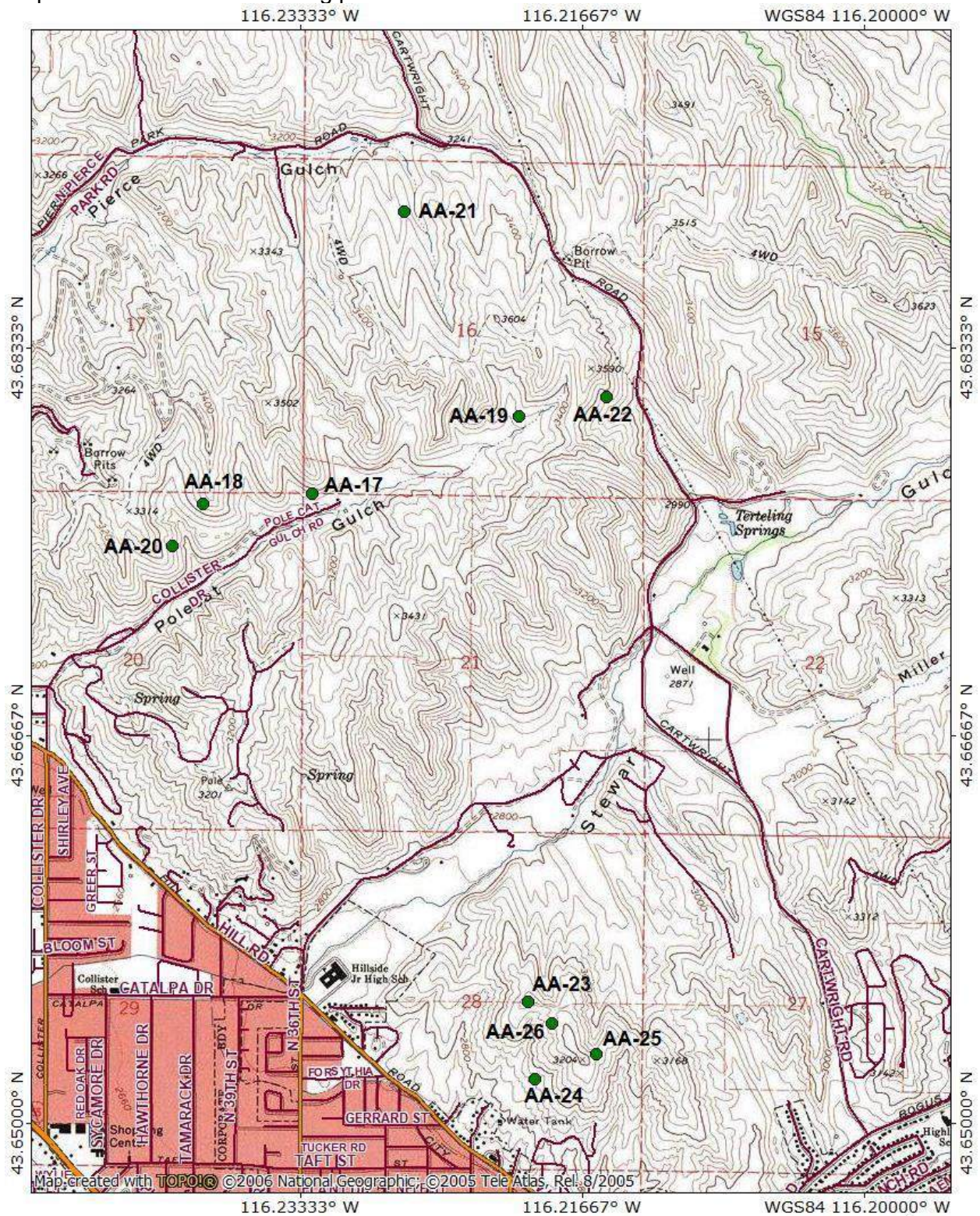
New/updated coordinates were recorded for plots in Military Reserve and Polecat Reserve in 2024. Plots AA-21 and AA-22 established in 2024.

Plot	2021		2024	
	Latitude	Longitude	Latitude	Longitude
Military Reserve				
AA-1	43.62699	116.177753	43.626978	116.177733
AA-2	43.63091	116.171208	43.630895	116.171364
AA-3	43.63223	116.171913	43.632209	116.171893
AA-4	43.62136	116.169917	43.621305	116.169949
AA-5	43.62092	116.173556	43.620904	116.173591
AA-6	43.62426	116.173658	43.624265	116.173693
AA-7	43.62556	116.183333	43.625409	116.183440
AA-8	43.62912	116.161806	43.629141	116.161783
Camels Back Reserve				
AA-9	43.63722	116.202231	same as 2021	same as 2021
Hulls Gulch Reserve				
AA-10	43.64400	116.188842	same as 2021	same as 2021
AA-11	43.64062	116.176558	same as 2021	same as 2021
AA-12	43.64183	116.178547	same as 2021	same as 2021
AA-13	43.64164	116.177194	same as 2021	same as 2021
AA-14	43.64346	116.183514	same as 2021	same as 2021
AA-15	43.64285	116.175444	same as 2021	same as 2021
Polecat Reserve				
AA-17	43.67703	116.232722	43.67706	116.23271
AA-18	43.67658	116.239139	43.67657	116.23905
AA-19	43.68036	116.220417	43.68037	116.22046
AA-20	43.67481	116.240889	43.67484	116.24084
AA-21			43.68908	116.22726
AA-22			43.68121	116.21528
Hillside to Hollow Reserve				
AA-23	43.65514	116.219833	same as 2021	same as 2021
AA-24	43.65189	116.219472	same as 2021	same as 2021
AA-25	43.65292	116.215917	same as 2021	same as 2021
AA-26	43.65428	116.218417	same as 2021	same as 2021

Map for Aase's onion monitoring plots in Military Reserve, Camels Back Reserve, and Hulls Gulch Reserve.



Map for Aase's onion monitoring plots in Polecat Reserve and Hillside to Hollow Reserve.



Map created with TOPO! © 2006 National Geographic; © 2005 Tele Atlas, Rel. 8/2005

0.0 0.5 1.0 miles
0.0 0.5 1.0 1.5 km

TN* MN
14°
11/22/24

Appendix 2

Copies of 2024 monitoring field data sheets.

Aase's Onion Monitoring in the Boise Area Foothills

Location MILITARY

Plot # AA-1 Date 4/17/2024 Observer(s) BRABEC

Plot Center GPS coordinates 43.1026978°N 116.177733°W GPS Datum WGS84

Photograph notes (0, 90, 180, 270 degrees from plot center at minimum. Additional photos to show plot relocation, plant species, disturbances, and other special features as needed): Plot center on dirt mound.

If counted, total # of Aase's onion plants in plot 0 Otherwise, estimated number of individuals: 1-10; 11-50; 51-100; 101-200; 201-300; 301-500; 501-1000; 1001-2000; 2001-5000; 5001-10,000; >10,000.

Comments on Abundance (distribution, density, etc.) onion leaves present, but no flowers detected. Might be too late?

Aspect SSW Slope 10-15 Substrate Sandy

List all shrubs species in the plot and their estimated canopy cover in the plot using the following cover (abundance) categories: >50% 25-50% 10-25% 1-10% <1%: Bitterbrush 10-15%, Grey rabbitbrush 1-10%

Estimated Total Shrub Cover: >50% 25-50% 10-25% 1-10% <1% (circle one)

List all native bunchgrass species and their associated canopy cover (abundance) using the same categories for shrubs: PSPS 10-15, HELD 25-50, ARPU 25-50

Estimated Total Native Bunchgrass Cover: >50% 25-50% 10-25% 1-10% <1% (circle one)

List all weed species and their estimated abundance using the following categories: Trace = only a few individuals, easy to overlook; Sparse = spotty and perhaps not seen at first glance, but unlikely to overlook in careful observation; Scattered = widespread, somewhat common, and not overlooked in careful observation; Common = frequent and widespread, obvious at first glance; Dominant = very abundant, a community dominant. If >12 weed species, list others on back of page.

<u>BPTE - Common</u>	<u>POBU - Sparse</u>
<u>TALA - Common</u>	<u>Amsinckia sp. Sparse</u>
<u>CHDI - Common</u>	<u>Alyssum desertum - trace</u>
<u>CECY - Common</u>	
<u>ERCI - Common</u>	
<u>SECE - Scattered</u>	

List the 6 most common native forb species and their estimated abundance using the above weed species categories; list additional native species on back of page if confident of identification.

<u>BASA - Scattered</u>	<u>Trileta sp. trace</u>
<u>Comandra umbellatum - trace</u>	<u>PIHA - trace</u>
<u>Erigeron orafolium - trace</u>	

Circle each disturbance factor present and its estimated abundance using the same categories as for weed species:

Animal digging Sparse Wildlife tracks Trace Dog tracks 0 Animal tracks of uncertain origin 0
Non-motorized recreation 0 Trails 0 Motorized recreation 0 Weed invasion Dominant Wildfire 0
Other _____

Additional disturbance details (e.g., magnitude, extent): Cereal Rye is encroaching onto site
Pockets of SECE common within site + near private property. Sandy site
is largely stabilized by invasive annual grasses boundary

Conservation recommendations and other comments:
No onions found on site but maybe monitoring is too late?
Treat invasive annual grasses to open sandy pockets for onions.
Russian thistle evidence on site - there is potential for this site to be taken
over by Russian thistle.

Notes on ground disturbances:

1. Animal digging - Applies to mounds/piles of soil deposited by a digging animal, and/or burrow holes. These can be recent or old (can note age in notes).
2. Wildlife tracks - Applies to animal tracks in the plot other than dog. In some cases the tracks may be too ill defined to allow confident species identification (see #4).
3. Dog tracks - Applies to dog prints in the plot.
4. Animal tracks of uncertain origin: Applies to divots or other depressions likely caused by an animal, but too ill defined for confident identification.
5. Non-motorized recreation - Applies to footprints or bicycle tracks in the plot.
6. Trail - Applies to pathways used by people, whether maintained or not.
7. Motorized recreation - Applies to tracks or other disturbances caused by ATVs or motorcycles.
8. Wildfire - Applies to plot areas with evidence of past wildfire such as burned shrub skeletons.
9. Weed invasion - Applies to situations where non-native weedy species are abundant and appear to be overwhelming the native vegetation.

Aase's Onion Monitoring in the Boise Area Foothills

Location Military Reserve Connectivity/ near End

Plot # AA-2 Date 4/17/24 Observer(s) BRABEC

Plot Center GPS coordinates 43.630895, 116.171364 GPS Datum WGS84

Photograph notes (0, 90, 180, 270 degrees from plot center at minimum. Additional photos to show plot relocation, plant species, disturbances, and other special features as needed): dense ALAA in open sandy locations all over steep slope

If counted, total # of Aase's onion plants in plot _____ Otherwise, estimated number of individuals: 1-10; 11-50; 51-100; 101-200; 201-300; 301-500; 501-1000; 1001-2000; 2001-5000; 5001-10,000; >10,000.

Comments on Abundance (distribution, density, etc.) _____

Aspect WSW Slope 40% Substrate sandy, coarse

List all shrubs species in the plot and their estimated canopy cover in the plot using the following cover (abundance) categories: >50% 25-50% 10-25% 1-10% <1%:

PUTR2-25-50%
ERNA10-<10%

Estimated Total Shrub Cover: >50% 25-50% 10-25% 1-10% <1% (circle one)

List all native bunchgrass species and their associated canopy cover (abundance) using the same categories for shrubs:

ARRV1-10-25% POSE-<1%
PSSPS-<10%
HECO-10-25%

Estimated Total Native Bunchgrass Cover: >50% 25-50% 10-25% 1-10% <1% (circle one)

List all weed species and their estimated abundance using the following categories: Trace = only a few individuals, easy to overlook; Sparse = spotty and perhaps not seen at first glance, but unlikely to overlook in careful observation; Scattered = widespread, somewhat common, and not overlooked in careful observation; Common = frequent and widespread, obvious at first glance; Dominant = very abundant, a community dominant. If >12 weed species, list others on back of page.

<u>BLTE - Common</u>	<u>CHIV Sparse</u>
<u>SYSAIT - sparse</u>	<u>POBU Sparse</u>
<u>DESEOP - sparse</u>	<u>VUUY - sparse - var tail / trace.</u>
<u>ALDE - Scattered</u>	
<u>ERLI - sparse</u>	
<u>AMSIN - sparse</u>	

List the 6 most common native forb species and their estimated abundance using the above weed species categories; list additional native species on back of page if confident of identification.

<u>COMUMB Sparse</u>	<u>UNK. Mustard Trace</u>	<u>ERIOVA Trace</u>
<u>Cryptantha sp. Sparse</u>	<u>ACMI Sparse</u>	<u>TRIBRA - Sparse</u>
<u>Plectritis macrocarpa Sparse</u>	<u>PHMA Sparse</u>	<u>BASA - Sparse</u>
<u>HOUN Trace</u>	<u>ERHAN Sparse</u>	<u>CHADOU - Sparse</u>
	<u>Collinsia parviflora trace</u>	
	<u>ambrosia - sparse</u>	

Circle each disturbance factor present and its estimated abundance using the same categories as for weed species:

Animal digging Low Wildlife tracks Spars Dog tracks _____ Animal tracks of uncertain origin _____
Non-motorized recreation _____ Trails _____ Motorized recreation _____ Weed invasion _____ Wildfire _____
Other _____

Additional disturbance details (e.g., magnitude, extent): _____

Deer paths through site

Conservation recommendations and other comments: Very diverse site. Keep dead grass out -
onions dense + slopes steep - may be hard to manage

Notes on ground disturbances:

1. Animal digging - Applies to mounds/piles of soil deposited by a digging animal, and/or burrow holes. These can be recent or old (can note age in notes).
2. Wildlife tracks - Applies to animal tracks in the plot other than dog. In some cases the tracks may be too ill defined to allow confident species identification (see #4).
3. Dog tracks - Applies to dog prints in the plot.
4. Animal tracks of uncertain origin: Applies to divots or other depressions likely caused by an animal, but too ill defined for confident identification.
5. Non-motorized recreation - Applies to footprints or bicycle tracks in the plot.
6. Trail - Applies to pathways used by people, whether maintained or not.
7. Motorized recreation - Applies to tracks or other disturbances caused by ATVs or motorcycles.
8. Wildfire - Applies to plot areas with evidence of past wildfire such as burned shrub skeletons.
9. Weed invasion - Applies to situations where non-native weedy species are abundant and appear to be overwhelming the native vegetation.

Aase's Onion Monitoring in the Boise Area Foothills

Location MILITARY RESERVE CONNECTOR

Plot # AA-3 Date 4/19/24 Observer(s) M. BRABEL

Plot Center GPS coordinates 43.632209°N 116.171893 GPS Datum WGS84

Photograph notes (0, 90, 180, 270 degrees from plot center at minimum. Additional photos to show plot relocation, plant species, disturbances, and other special features as needed):

If counted, total # of Aase's onion plants in plot _____ Otherwise, estimated number of individuals: 1-10; 11-50; 51-100; 101-200; 201-300; 301-500; 501-1000; 1001-2000; 2001-5000; 5001-10,000; >10,000.

Comments on Abundance (distribution, density, etc.) onions everywhere on sandy open slope. They grow up hill slope N and S into invaded flat lands. Too many to count but not more than 3000.

Aspect N Slope 20° Substrate Sandy

List all shrub species in the plot and their estimated canopy cover in the plot using the following cover (abundance) categories: >50% 25-50% 10-25% 1-10% <1%:

ARCT <1% (1 shrub), PUR2-10-25%, Rabbitbrush <10%

Estimated Total Shrub Cover: >50% 25-50% 10-25% 1-10% <1% (circle one)

List all native bunchgrass species and their associated canopy cover (abundance) using the same categories for shrubs:

ARV9- >50% POS6 <1%
HELD- 1-10%
ELEL- <1%

Estimated Total Native Bunchgrass Cover: >50% 25-50% 10-25% 1-10% <1% (circle one)

List all weed species and their estimated abundance using the following categories: Trace = only a few individuals, easy to overlook; Sparse = spotty and perhaps not seen at first glance, but unlikely to overlook in careful observation; Scattered = widespread, somewhat common, and not overlooked in careful observation; Common = frequent and widespread, obvious at first glance; Dominant = very abundant, a community dominant. If >12 weed species, list others on back of page.

<u>ALDE Common</u>	<u>DESD Trace</u>
<u>ERUB Common</u>	<u>POBU Sparse</u>
<u>BUTE Common</u>	
<u>AMSIN Sparse</u>	
<u>CENYA Common</u>	
<u>CHTU Sparse</u>	

List the 6 most common native forb species and their estimated abundance using the above weed species categories; list additional native species on back of page if confident of identification.

<u>PHHA Scattered</u>	<u>ERIOVA Trace</u>	<u>BASA Trace</u>
<u>TRIGRA Common</u>	<u>ERIPVD Trace</u>	<u>PHALIN Trace</u>
<u>Thysanocarpus curvipes - trace</u>	<u>ALANI Sparse</u>	<u>Crypt. Sparse</u>
	<u>UNK. Mustard trace</u>	
	<u>Onumb Sparse</u>	

Circle each disturbance factor present and its estimated abundance using the same categories as for weed species:
Animal digging Sparse Wildlife tracks Scattered Dog tracks 0 Animal tracks of uncertain origin 0
Non-motorized recreation _____ Trails _____ Motorized recreation _____ Weed invasion Common Wildfire _____
Other _____

Additional disturbance details (e.g., magnitude, extent):

Woods common - ATV not yet abundant on site. Evidence of deer.

Conservation recommendations and other comments:

Still lots of open sand present. Consider spraying annual grass?
No cereal rye yet.

Notes on ground disturbances:

1. Animal digging - Applies to mounds/piles of soil deposited by a digging animal, and/or burrow holes. These can be recent or old (can note age in notes).
2. Wildlife tracks - Applies to animal tracks in the plot other than dog. In some cases the tracks may be too ill defined to allow confident species identification (see #4).
3. Dog tracks - Applies to dog prints in the plot.
4. Animal tracks of uncertain origin: Applies to divots or other depressions likely caused by an animal, but too ill defined for confident identification.
5. Non-motorized recreation - Applies to footprints or bicycle tracks in the plot.
6. Trail - Applies to pathways used by people, whether maintained or not.
7. Motorized recreation - Applies to tracks or other disturbances caused by ATVs or motorcycles.
8. Wildfire - Applies to plot areas with evidence of past wildfire such as burned shrub skeletons.
9. Weed invasion - Applies to situations where non-native weedy species are abundant and appear to be overwhelming the native vegetation.

Aase's Onion Monitoring in the Boise Area Foothills

Location N of Cottonwood Creek-MR

Plot # AA-4 Date 4/17/24 Observer(s) M. Brabec

Plot Center GPS coordinates 43.621305°N 116.169949 GPS Datum N6584

Photograph notes (0, 90, 180, 270 degrees from plot center at minimum. Additional photos to show plot relocation, plant species, disturbances, and other special features as needed): *on C. americana*

If counted, total # of Aase's onion plants in plot _____ Otherwise, estimated number of individuals: ** 1 but this # is higher.*
1-10; 11-50; 51-100; 101-200; 201-300; 301-500; 501-1000; 1001-2000; 2001-5000; 5001-10,000; >10,000.

Comments on Abundance (distribution, density, etc.) Plants common on NE edge of plot but very sparse elsewhere. Due to late monitoring, it's difficult to assess population.

Aspect SE Slope 10% Substrate Sandy - with gravel

List all shrubs species in the plot and their estimated canopy cover in the plot using the following cover (abundance) categories: >50% 25-50% 10-25% 1-10% <1%: PUTR2-10-25%, ERNA1-10%

Estimated Total Shrub Cover: >50% 25-50% 10-25% 1-10% <1% (circle one)

List all native bunchgrass species and their associated canopy cover (abundance) using the same categories for shrubs:
HERO-1-107, ARPU-10-257, DUSE-117, PSSPS-1-107.

Estimated Total Native Bunchgrass Cover: >50% 25-50% (10-25%) 1-10% <1% (circle one)

List all weed species and their estimated abundance using the following categories: Trace = only a few individuals, easy to overlook; Sparse = spotty and perhaps not seen at first glance, but unlikely to overlook in careful observation; Scattered = widespread, somewhat common, and not overlooked in careful observation; Common = frequent and widespread, obvious at first glance; Dominant = very abundant, a community dominant. If >12 weed species, list others on back of page.

CNTU - common
CEU - common
DETE - common
DECE - common
SECE - trace
RDE - scattered

PUBU - scattered
TAZAB - sparse

List the 6 most common native forb species and their estimated abundance using the above weed species categories; list additional native species on back of page if confident of identification.

ALMI - spruce
BASA - spruce
ALAC - scattered

Totaka grand. Scattered
C. macrocephalus - scattered
P. m. - sparse
E. m. - trace
M. c. - trace
D. m. - trace

Circle each disturbance factor present and its estimated abundance using the same categories as for weed species:

Animal digging Spars Wildlife tracks Spars Dog tracks 0 Animal tracks of uncertain origin 0
Non-motorized recreation 0 Trails 0 Motorized recreation 0 Weed invasion Common Wildfire 0
Other 0

Additional disturbance details (e.g., magnitude, extent):

3. portion of plot stabilized with invasive annual grasses/legum. CEOT
very common site. SECE in small patches.

Conservation recommendations and other comments:

Weeds common - POBUI seems to be increasing? POSE present but few individuals.
Open areas have onions - weeding? Large rodent mounds on S portion of plot.
Eridillan pedica present on site but past.

Notes on ground disturbances:

1. Animal digging - Applies to mounds/piles of soil deposited by a digging animal, and/or burrow holes. These can be recent or old (can note age in notes).
2. Wildlife tracks - Applies to animal tracks in the plot other than dog. In some cases the tracks may be too ill defined to allow confident species identification (see #4).
3. Dog tracks - Applies to dog prints in the plot.
4. Animal tracks of uncertain origin: Applies to divots or other depressions likely caused by an animal, but too ill defined for confident identification.
5. Non-motorized recreation - Applies to footprints or bicycle tracks in the plot.
6. Trail - Applies to pathways used by people, whether maintained or not.
7. Motorized recreation - Applies to tracks or other disturbances caused by ATVs or motorcycles.
8. Wildfire - Applies to plot areas with evidence of past wildfire such as burned shrub skeletons.
9. Weed invasion - Applies to situations where non-native weedy species are abundant and appear to be overwhelming the native vegetation.

Aase's Onion Monitoring in the Boise Area Foothills

Location MILITARY - toll Road

Plot # AA5 Date 4/17/24 Observer(s) M. BRABER

Plot Center GPS coordinates 43.620904°N 116.173591°W GPS Datum WGS 84

Photograph notes (0, 90, 180, 270 degrees from plot center at minimum. Additional photos to show plot relocation, plant species, disturbances, and other special features as needed):

If counted, total # of Aase's onion plants in plot _____ Otherwise, estimated number of individuals: 1-10; 11-50; 51-100; 101-200; 201-300; 301-500; 501-1000; 1001-2000; 2001-5000; 5001-10,000; >10,000.

Comments on Abundance (distribution, density, etc.) Unable to count, but definitely over 100
Plants common across plot whenever open
Sandy soils present - low density but frequently found

Aspect SW - convex slope 5% Substrate loose sand

List all shrubs species in the plot and their estimated canopy cover in the plot using the following cover (abundance) categories: >50% 25-50% 10-25% 1-10% <1%: PUTR2 - 10-25%
ERNA - 1-10%

Estimated Total Shrub Cover: >50% 25-50% 10-25% 1-10% <1% (circle one)

List all native bunchgrass species and their associated canopy cover (abundance) using the same categories for shrubs: ARPU - 10-25% POSE - 1%
PSSPS - 10-25%
HERD - 1-10%

Estimated Total Native Bunchgrass Cover: >50% 25-50% 10-25% 1-10% <1% (circle one)

List all weed species and their estimated abundance using the following categories: Trace = only a few individuals, easy to overlook; Sparse = spotty and perhaps not seen at first glance, but unlikely to overlook in careful observation; Scattered = widespread, somewhat common, and not overlooked in careful observation; Common = frequent and widespread, obvious at first glance; Dominant = very abundant, a community dominant. If >12 weed species, list others on back of page.

<u>CHTU - common</u>	<u>DESD - scattered</u>
<u>BRTE - common</u>	
<u>POBU - scattered</u>	
<u>SELE - scattered</u>	
<u>ALDE - scattered</u>	
<u>CEUM - scattered</u>	

List the 6 most common native forb species and their estimated abundance using the above weed species categories; list additional native species on back of page if confident of identification.

<u>BASA - sparse</u>	<u>TRIBRA - scattered</u>
<u>LITSIA - trace</u>	<u>PHMA - trace</u>
<u>COMUMB - scattered</u>	<u>ALMI - scattered</u>
	<u>HOUW, EPBE3, FRIPUD,] TRACE</u>
	<u>COLGRA, ALL AGU</u>

Circle each disturbance factor present and its estimated abundance using the same categories as for weed species:

Animal digging True Wildlife tracks Spars Dog tracks _____ Animal tracks of uncertain origin _____
Non-motorized recreation _____ Trails _____ Motorized recreation _____ Weed invasion Common Wildfire _____
Other _____

Additional disturbance details (e.g., magnitude, extent):

Some deer tracks through site. Very limited animal digging.
Annual grasses are abundant.

Conservation recommendations and other comments:

SEE Involving site + OHV comment.
Annual grasses increasing on site - seemingly coming up slope from trail

Notes on ground disturbances:

1. Animal digging - Applies to mounds/piles of soil deposited by a digging animal, and/or burrow holes. These can be recent or old (can note age in notes).
2. Wildlife tracks - Applies to animal tracks in the plot other than dog. In some cases the tracks may be too ill defined to allow confident species identification (see #4).
3. Dog tracks - Applies to dog prints in the plot.
4. Animal tracks of uncertain origin: Applies to divots or other depressions likely caused by an animal, but too ill defined for confident identification.
5. Non-motorized recreation - Applies to footprints or bicycle tracks in the plot.
6. Trail - Applies to pathways used by people, whether maintained or not.
7. Motorized recreation - Applies to tracks or other disturbances caused by ATVs or motorcycles.
8. Wildfire - Applies to plot areas with evidence of past wildfire such as burned shrub skeletons.
9. Weed invasion - Applies to situations where non-native weedy species are abundant and appear to be overwhelming the native vegetation.

Aase's Onion Monitoring in the Boise Area Foothills

Location MILITARY - Ridge near Freestone Parking Lot

Plot # AA-6 Date 4/17/2024 Observer(s) M. BRABEC

Plot Center GPS coordinates 43.624215°N 116.173693°W GPS Datum WGS-84

Photograph notes (0, 90, 180, 270 degrees from plot center at minimum. Additional photos to show plot relocation, plant species, disturbances, and other special features as needed):

If counted, total # of Aase's onion plants in plot 9 Otherwise, estimated number of individuals: 1-10; 11-50; 51-100; 101-200; 201-300; 301-500; 501-1000; 1001-2000; 2001-5000; 5001-10,000; >10,000.

Comments on Abundance (distribution, density, etc.) Only 9 flowers found - maybe more present? Onion leaves present but majority appear to be Aase (in bud) SW corner of plot only.

Aspect NSW Slope 50% Substrate Sandy - gravel

List all shrubs species in the plot and their estimated canopy cover in the plot using the following cover (abundance) categories: >50% 25-50% 10-25% 1-10% <1%: PUTR 10-25% CHVI 1-10%

Estimated Total Shrub Cover: >50% 25-50% 10-25% 1-10% <1% (circle one)

List all native bunchgrass species and their associated canopy cover (abundance) using the same categories for shrubs: PSSPS 25-50% HELD 10-25% POSE 1-10% ARDU 1-10%

Estimated Total Native Bunchgrass Cover: >50% 25-50% 10-25% 1-10% <1% (circle one)

List all weed species and their estimated abundance using the following categories: Trace = only a few individuals, easy to overlook; Sparse = spotty and perhaps not seen at first glance, but unlikely to overlook in careful observation; Scattered = widespread, somewhat common, and not overlooked in careful observation; Common = frequent and widespread, obvious at first glance; Dominant = very abundant, a community dominant. If >12 weed species, list others on back of page.

<u>BRIE - Common</u>	<u>TARAO - Sparse</u>
<u>CECY - Common</u>	
<u>ERLH - Scattered</u>	
<u>POBU - Scattered</u>	
<u>CHTU - Scattered</u>	
<u>Alyssum desertorum - Sparse</u>	

List the 6 most common native forb species and their estimated abundance using the above weed species categories; list additional native species on back of page if confident of identification.

<u>BASA - Common</u>	<u>PHLO - Sparse</u>	<u>Trileta grandifolia - trace</u>
<u>LOSI - Common</u>	<u>CREPS SP. - trace</u>	<u>Ollaria acuminata - Sparse</u>
<u>ACMI - Sparse</u>	<u>Phacelia linearis - trace</u>	

Circle each disturbance factor present and its estimated abundance using the same categories as for weed species:

Animal digging Sparse Wildlife tracks Sparse Dog tracks 0 Animal tracks of uncertain origin 0
Non-motorized recreation 0 Trails 0 Motorized recreation 0 Weed invasion Immense Wildfire 0
Other 0

Additional disturbance details (e.g., magnitude, extent): Plot on Ridge - S Facing slope open with
BETE/CATT common. N slope stabilized with PSSPS/Shrubs/Forbs. Several
large dead PUTRE present.

Conservation recommendations and other comments: None's
Onion pop. Challenging to assess.
Only 1 flowering individual found, but onion leaves common +
1/2 cup Allium acuminatum - in bed. ACAA found in SW corner of plot only.
Also on N facing slopes

Notes on ground disturbances:

1. Animal digging - Applies to mounds/piles of soil deposited by a digging animal, and/or burrow holes. These can be recent or old (can note age in notes).
2. Wildlife tracks - Applies to animal tracks in the plot other than dog. In some cases the tracks may be too ill defined to allow confident species identification (see #4).
3. Dog tracks - Applies to dog prints in the plot.
4. Animal tracks of uncertain origin: Applies to divots or other depressions likely caused by an animal, but too ill defined for confident identification.
5. Non-motorized recreation - Applies to footprints or bicycle tracks in the plot.
6. Trail - Applies to pathways used by people, whether maintained or not.
7. Motorized recreation - Applies to tracks or other disturbances caused by ATVs or motorcycles.
8. Wildfire - Applies to plot areas with evidence of past wildfire such as burned shrub skeletons.
9. Weed invasion - Applies to situations where non-native weedy species are abundant and appear to be overwhelming the native vegetation.

Aase's Onion Monitoring in the Boise Area Foothills

Location MILITARY - Horizon Drive

Plot # AA-7 Date 4/19/21 Observer(s) M. Brabec

Plot Center GPS coordinates 43.625409°N 116.183440°W GPS Datum WGS84

Photograph notes (0, 90, 180, 270 degrees from plot center at minimum. Additional photos to show plot relocation, plant species, disturbances, and other special features as needed): _____

If counted, total # of Aase's onion plants in plot 0 Otherwise, estimated number of individuals: 1-10; 11-50; 51-100; 101-200; 201-300; 301-500; 501-1000; 1001-2000; 2001-5000; 5001-10,000; >10,000.

Comments on Abundance (distribution, density, etc.) NO AAA detected.

Aspect SE Slope 20% Substrate Sandy

List all shrubs species in the plot and their estimated canopy cover in the plot using the following cover (abundance) categories: >50% 25-50% 10-25% 1-10% <1%: PUTR2 - 10-25%
ERNA - <10%

Estimated Total Shrub Cover: >50% 25-50% 10-25% 1-10% <1% (circle one)

List all native bunchgrass species and their associated canopy cover (abundance) using the same categories for shrubs: ALPU9 - 25-50% SPCY - <10%
HECO - <10%
POSE - <10%

Estimated Total Native Bunchgrass Cover: >50% 25-50% 10-25% 1-10% <1% (circle one)

List all weed species and their estimated abundance using the following categories: Trace = only a few individuals, easy to overlook; Sparse = spotty and perhaps not seen at first glance, but unlikely to overlook in careful observation; Scattered = widespread, somewhat common, and not overlooked in careful observation; Common = frequent and widespread, obvious at first glance; Dominant = very abundant, a community dominant. If >12 weed species, list others on back of page.

<u>SECE common</u>	<u>Salsolatragsus - Sparse</u>
<u>BIRTE - dominant</u>	<u>CYCE - Scattered</u>
<u>POBU - common</u>	
<u>CHIV - scattered</u>	
<u>ERCI6 - Sparse</u>	
<u>myrtle spurge - sparse</u>	

List the 6 most common native forb species and their estimated abundance using the above weed species categories; list additional native species on back of page if confident of identification.

<u>ALAZ - trace</u>	<u>TRI6RA - trace</u>
<u>COMUNB trace</u>	<u>ACMI trace</u>
<u>BASA - trace</u>	

Circle each disturbance factor present and its estimated abundance using the same categories as for weed species:
Animal digging _____ Wildlife tracks _____ Dog tracks Common Animal tracks of uncertain origin _____
Non-motorized recreation _____ Trails Common Motorized recreation _____ Weed invasion Common Wildfire _____
Other _____

Additional disturbance details (e.g., magnitude, extent):

2013 social trails through site. Heavily disturbed area due to dog/human
traffic. Cheatgrass/Canada thistle dominant. Legume sprouts present.

Conservation recommendations and other comments: Heavily disturbed/invaded site

Notes on ground disturbances:

1. Animal digging - Applies to mounds/piles of soil deposited by a digging animal, and/or burrow holes. These can be recent or old (can note age in notes).
2. Wildlife tracks - Applies to animal tracks in the plot other than dog. In some cases the tracks may be too ill defined to allow confident species identification (see #4).
3. Dog tracks - Applies to dog prints in the plot.
4. Animal tracks of uncertain origin: Applies to divots or other depressions likely caused by an animal, but too ill defined for confident identification.
5. Non-motorized recreation - Applies to footprints or bicycle tracks in the plot.
6. Trail - Applies to pathways used by people, whether maintained or not.
7. Motorized recreation - Applies to tracks or other disturbances caused by ATVs or motorcycles.
8. Wildfire - Applies to plot areas with evidence of past wildfire such as burned shrub skeletons.
9. Weed invasion - Applies to situations where non-native weedy species are abundant and appear to be overwhelming the native vegetation.

Aase's Onion Monitoring in the Boise Area Foothills

Location MILITARY - THREE BEARS

Plot # AA 8 Date 4/17/2024 Observer(s) M. BRABEL

Plot Center GPS coordinates 43.629141°N 116.161783°W GPS Datum NAD83

Photograph notes (0, 90, 180, 270 degrees from plot center at minimum. Additional photos to show plot relocation, plant species, disturbances, and other special features as needed): _____

If counted, total # of Aase's onion plants in plot _____ Otherwise, estimated number of individuals: 1-10; 11-50; 51-100; 101-200; 201-300; 301-500; 501-1000; 1001-2000; 2001-5000; 5001-10,000; >10,000.

Comments on Abundance (distribution, density, etc.) They are past + difficult to identify - should probably throw my count out.

Aspect S Slope 20% Substrate Sandy

List all shrubs species in the plot and their estimated canopy cover in the plot using the following cover (abundance) categories: >50% 25-50% 10-25% 1-10% <1%: PUTR 70-85, ARTR 2-10%, Rabbitbrush 0%

Estimated Total Shrub Cover: >50% 25-50% 10-25% 1-10% <1% (circle one)

List all native bunchgrass species and their associated canopy cover (abundance) using the same categories for shrubs: ARPU > 50%
PSSPS < 10 dense @ edge of Plot

Estimated Total Native Bunchgrass Cover: >50% 25-50% 10-25% 1-10% <1% (circle one)

List all weed species and their estimated abundance using the following categories: Trace = only a few individuals, easy to overlook; Sparse = spotty and perhaps not seen at first glance, but unlikely to overlook in careful observation; Scattered = widespread, somewhat common, and not overlooked in careful observation; Common = frequent and widespread, obvious at first glance; Dominant = very abundant, a community dominant. If >12 weed species, list others on back of page.

<u>ERCV Common</u>	<u>AMSIN Scattered</u>
<u>CENYN Common</u>	<u>BETE Scattered</u>
<u>OHV Scattered</u>	
<u>TARAB Common</u>	
<u>POBU Scattered</u>	
<u>ALDE Scattered</u>	

List the 6 most common native forb species and their estimated abundance using the above weed species categories; list additional native species on back of page if confident of identification.

<u>LOMSIN Trace</u>	<u>Tribrom Scattered</u>
<u>PHAMAS Sparse</u>	<u>Curve Prod Scattered</u>
<u>PHOLON Trace</u>	<u>Cropsis Scattered</u>
<u>ALMI Scattered</u>	
<u>ASTPVE Scattered</u>	

Circle each disturbance factor present and its estimated abundance using the same categories as for weed species:

Animal digging _____ Wildlife tracks _____ Dog tracks _____ Animal tracks of uncertain origin _____
Non-motorized recreation _____ Trails _____ Motorized recreation _____ Weed invasion Common Wildfire _____
Other _____

Additional disturbance details (e.g., magnitude, extent): _____

TACA very abundant.

Conservation recommendations and other comments: _____

Notes on ground disturbances:

1. Animal digging - Applies to mounds/piles of soil deposited by a digging animal, and/or burrow holes. These can be recent or old (can note age in notes).
2. Wildlife tracks - Applies to animal tracks in the plot other than dog. In some cases the tracks may be too ill defined to allow confident species identification (see #4).
3. Dog tracks - Applies to dog prints in the plot.
4. Animal tracks of uncertain origin: Applies to divots or other depressions likely caused by an animal, but too ill defined for confident identification.
5. Non-motorized recreation - Applies to footprints or bicycle tracks in the plot.
6. Trail - Applies to pathways used by people, whether maintained or not.
7. Motorized recreation - Applies to tracks or other disturbances caused by ATVs or motorcycles.
8. Wildfire - Applies to plot areas with evidence of past wildfire such as burned shrub skeletons.
9. Weed invasion - Applies to situations where non-native weedy species are abundant and appear to be overwhelming the native vegetation.

Aase's Onion Monitoring in the Boise Area Foothills

Location Camel's Back Park

Plot # AA-9 Date 4/9/2024 Observer(s) DeBolt, Helford

Plot Center GPS coordinates 43.63722, -116.202231 GPS Datum WGS 84

Photograph notes ^{N E S W} (0, 90, 180, 270 degrees from plot center at minimum. Additional photos to show plot relocation, plant species, disturbances, and other special features as needed): 1 normal and 1 wide angle for each cardinal direction - This was done @ all 7 monitoring plots

If counted, total # of Aase's onion plants in plot counted 43 (11-50) Otherwise, estimated number of individuals: 1-10; 11-50; 51-100; 101-200; 201-300; 301-500; 501-1000; 1001-2000; 2001-5000; 5001-10,000; >10,000.

Comments on Abundance (distribution, density, etc.) Many plants are within Aristida clumps. Few to no plants in NE quadrat. First Alaa detected within 20 of barrier fence

Aspect 150-180° Slope 22° Substrate Coarse Sand

List all shrubs species in the plot and their estimated canopy cover in the plot using the following cover (abundance) categories: >50% 25-50% 10-25% 1-10% <1%: Ericaceae 1-10%

Estimated Total Shrub Cover: >50% 25-50% 10-25% 1-10% <1% (circle one)

List all native bunchgrass species and their associated canopy cover (abundance) using the same categories for shrubs:

Doa secunda 1-10%
Aristida purpurea 10-25%
Hesperostina comata 10-25%

Estimated Total Native Bunchgrass Cover: >50% 25-50% 10-25% 1-10% <1% (circle one)

List all weed species and their estimated abundance using the following categories: Trace = only a few individuals, easy to overlook; Sparse = spotty and perhaps not seen at first glance, but unlikely to overlook in careful observation; Scattered = widespread, somewhat common, and not overlooked in careful observation; Common = frequent and widespread, obvious at first glance; Dominant = very abundant, a community dominant. If >12 weed species, list others on back of page.

<u>Bromus tectorum</u>	<u>C</u>	<u>Sisymbrium altissimum</u>	<u>T</u>
<u>Alyssum desertorum</u>	<u>D</u>	<u>Centaurea cyans</u>	<u>Scattered</u>
<u>Erodium cicutarium</u>	<u>D</u>	<u>Pop. bulbosa</u>	<u>Common</u>
<u>Chenopodium juncea</u>	<u>C</u>		
<u>Sesuvium portulacastrum</u>	<u>D</u>		
<u>Salsola tragus</u>	<u>Scattered</u>		

List the 6 most common native forb species and their estimated abundance using the above weed species categories; list additional native species on back of page if confident of identification.

<u>Dracopis laetifolius</u>	<u>Sparse</u>	<u>Epilobium brachycarpum</u>	<u>Scattered</u>
<u>Balsamorhiza hirsuta</u>	<u>Trace</u>	<u>Machaeranthera can.</u>	<u>Scattered</u>
<u>Trifolium gracilentum</u>	<u>Common</u>		

Circle each disturbance factor present and its estimated abundance using the same categories as for weed species:

Animal digging 50% Wildlife tracks _____ Dog tracks _____ Animal tracks of uncertain origin _____
 Non-motorized recreation _____ Trails _____ Motorized recreation _____ Weed invasion Dominant Wildfire _____
 Other _____

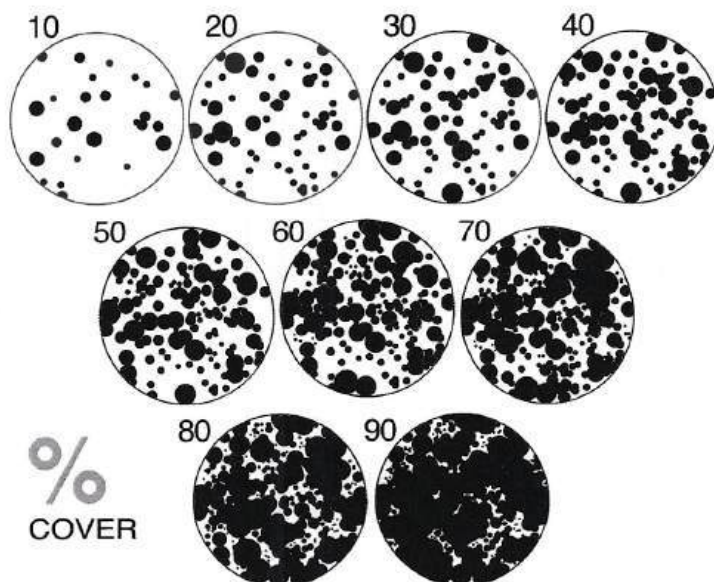
Additional disturbance details (e.g., magnitude, extent): Large gully through plot that comes off of hiking trail above plot. Weed invasion from below. Probable expansion in particular of cereal rye. Gully probably got deeper/wider each year.

Conservation recommendations and other comments: Barrier fence and sign seems to be working but there are several rungs missing. They should be replaced. Broken glass and cans were present within site, we removed some but not all.

Notes on ground disturbances:

1. Animal digging - Applies to mounds/piles of soil deposited by a digging animal, and/or burrow holes. These can be recent or old (can note age in notes).
2. Wildlife tracks - Applies to animal tracks in the plot other than dog. In some cases the tracks may be too ill defined to allow confident species identification (see #4).
3. Dog tracks - Applies to dog prints in the plot.
4. Animal tracks of uncertain origin: Applies to divots or other depressions likely caused by an animal, but too ill defined for confident identification.
5. Non-motorized recreation - Applies to footprints or bicycle tracks in the plot.
6. Trail - Applies to pathways used by people, whether maintained or not.
7. Motorized recreation - Applies to tracks or other disturbances caused by ATVs or motorcycles.
8. Wildfire - Applies to plot areas with evidence of past wildfire such as burned shrub skeletons.
9. Weed invasion - Applies to situations where non-native weedy species are abundant and appear to be overwhelming the native vegetation.

Example of percent cover in 10% Increments:



Aase's Onion Monitoring in the Boise Area Foothills

Location EO 14 Subpop 4- Hells Gulch

Plot # AA-10 Date 4/9/2024 Observer(s) DeBolt, Helford

Plot Center GPS coordinates 43.64400, -116.188842 GPS Datum WGS84

Photograph notes (0, 90, 180, 270 degrees from plot center at minimum. Additional photos to show plot relocation, plant species, disturbances, and other special features as needed): Plot center is approx 90ft behind the wooden fence

If counted, total # of Aase's onion plants in plot 210 ~ Otherwise, estimated number of individuals: 1-10; 11-50; 51-100; 101-200; 201-300; 301-500; 501-1000; 1001-2000; 2001-5000; 5001-10,000; >10,000.

Comments on Abundance (distribution, density, etc.) Majority in NE and SE side of plot, but none in NW, generally distributed throughout plot.

Aspect 180 Slope 15% Substrate Coarse (reddish) sand

List all shrubs species in the plot and their estimated canopy cover in the plot using the following cover (abundance) categories: >50% 25-50% 10-25% 1-10% <1%: Erica namus?

Estimated Total Shrub Cover: >50% 25-50% 10-25% 1-10% <1% (circle one)

List all native bunchgrass species and their associated canopy cover (abundance) using the same categories for shrubs:

Aristida purpurea - 10-25% Elymus elymoides - <1%
Poa secunda - 1-10%
Pssp7 - <1%

Estimated Total Native Bunchgrass Cover: >50% 25-50% 10-25% 1-10% <1% (circle one)

List all weed species and their estimated abundance using the following categories: Trace = only a few individuals, easy to overlook; Sparse = spotty and perhaps not seen at first glance, but unlikely to overlook in careful observation; Scattered = widespread, somewhat common, and not overlooked in careful observation; Common = frequent and widespread, obvious at first glance; Dominant = very abundant, a community dominant. If >12 weed species, list others on back of page.

ALOE - Scattered
CHJU - Common
BRTE - Dom
ERIC - Dom
POBU - Common
Trdu - Trace

Euph. myrsinites - Common
CECV - Common
DRVE - Scattered
Fest. myuros - Common

List the 6 most common native forb species and their estimated abundance using the above weed species categories; list additional native species on back of page if confident of identification.

DHHA - Sparse
ACMI - Trace

Circle each disturbance factor present and its estimated abundance using the same categories as for weed species:

Animal digging dom Wildlife tracks dom Dog tracks sparse Animal tracks of uncertain origin dom
 Non-motorized recreation dom Trails dom Motorized recreation dom Weed invasion dom Wildfire dom
 Other gopher burrows

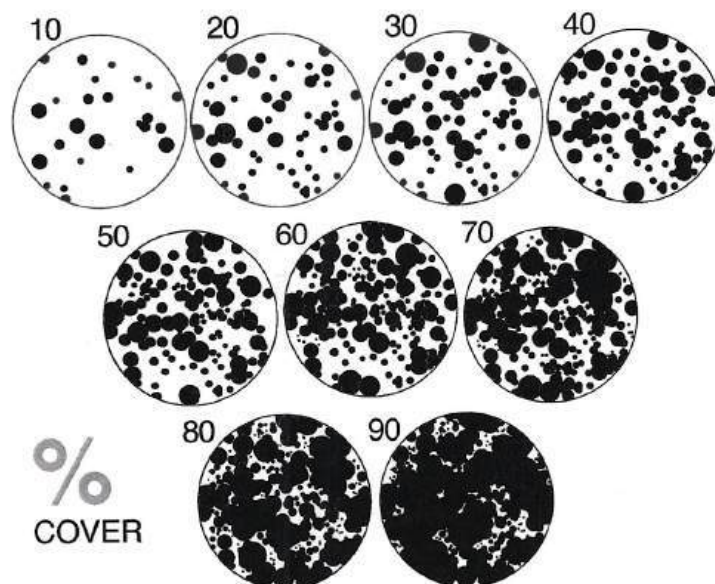
Additional disturbance details (e.g., magnitude, extent): Donkeytail (Euphorbia) has increased drastically on the upper portion of the plot, esp. the NW quadrant.
Not much to no human presence

Conservation recommendations and other comments: Euphorbia m. control is essential & should be done as soon as possible. Would need to spray post Alaa or possibly dig to remove, but this could cause a lot of impacts to the habitat unless done very cautiously.
If dug, use extreme caution w/ milky sap. If spray come back in fall & carefully remove dead veg material.

Notes on ground disturbances:

1. Animal digging - Applies to mounds/piles of soil deposited by a digging animal, and/or burrow holes. These can be recent or old (can note age in notes).
2. Wildlife tracks - Applies to animal tracks in the plot other than dog. In some cases the tracks may be too ill defined to allow confident species identification (see #4).
3. Dog tracks - Applies to dog prints in the plot.
4. Animal tracks of uncertain origin: Applies to divots or other depressions likely caused by an animal, but too ill defined for confident identification.
5. Non-motorized recreation - Applies to footprints or bicycle tracks in the plot.
6. Trail - Applies to pathways used by people, whether maintained or not.
7. Motorized recreation - Applies to tracks or other disturbances caused by ATVs or motorcycles.
8. Wildfire - Applies to plot areas with evidence of past wildfire such as burned shrub skeletons.
9. Weed invasion - Applies to situations where non-native weedy species are abundant and appear to be overwhelming the native vegetation.

Example of percent cover in 10% Increments:



Aase's Onion Monitoring in the Boise Area Foothills

Location Hells Gulch Sub Pop. 3

Plot # AA-11 Date 4/11/24 Observer(s) DeBolt, Helford

Plot Center GPS coordinates 43.64062, -116.176558 GPS Datum WGS 84

Photograph notes (0, 90, 180, 270 degrees from plot center at minimum. Additional photos to show plot relocation, plant species, disturbances, and other special features as needed): See photos attached

If counted, total # of Aase's onion plants in plot estimated ^{maybe middle of this, i.e. 700-800} Otherwise, estimated number of individuals: 1-10; 11-50; 51-100; 101-200; 201-300; 301-500; 501-1000; 1001-2000; 2001-5000; 5001-10,000; >10,000.

Comments on Abundance (distribution, density, etc.) Did not feel comfortable trying to count due to potential trampling impact. Plants in excellent flower. Site still moist from recent big rain, which reduced our impact. Good bit of moss in some areas.
Aspect 185° Slope 10-15% Substrate coarse white sand

List all shrubs species in the plot and their estimated canopy cover in the plot using the following cover (abundance) categories: >50% 25-50% 10-25% 1-10% <1%: Putr <1%

Erica nana just outside plot, esp. to South

Estimated Total Shrub Cover: >50% 25-50% 10-25% 1-10% <1% (circle one)

List all native bunchgrass species and their associated canopy cover (abundance) using the same categories for shrubs:

ARPU - 10-25% POSE - <1%

ELEL - <1% PSSP - <1%

HECO - <1%

Estimated Total Native Bunchgrass Cover: >50% 25-50% 10-25% 1-10% <1% (circle one)

List all weed species and their estimated abundance using the following categories: Trace = only a few individuals, easy to overlook; Sparse = spotty and perhaps not seen at first glance, but unlikely to overlook in careful observation; Scattered = widespread, somewhat common, and not overlooked in careful observation; Common = frequent and widespread, obvious at first glance; Dominant = very abundant, a community dominant. If >12 weed species, list others on back of page.

CHJU - Scattered

ERCI - Dom

CECV - Common

BRTE - Common

DRVE - Scattered

TROU - Trace

HOUM - Sparse

POBU - Common

FEMY - Common

ALDE - Dom

List the 6 most common native forb species and their estimated abundance using the above weed species categories; list additional native species on back of page if confident of identification.

ALME - Trace

PHHA - Trace

PLTE - Sparse

TRGR - Trace

EAST - Trace

Com sp - Trace

Calo - Trace

gopher
Circle each disturbance factor present and its estimated abundance using the same categories as for weed species:

Animal digging Common Wildlife tracks _____ Dog tracks _____ Animal tracks of uncertain origin _____
Non-motorized recreation _____ Trails _____ Motorized recreation _____ Weed invasion Common Wildfire _____
Other _____

Additional disturbance details (e.g., magnitude, extent): Centaurea is increasing - hand control prior to flowering is rec (or spot spray?)

Best site so far Alaa and fewer weeds - no human impacts

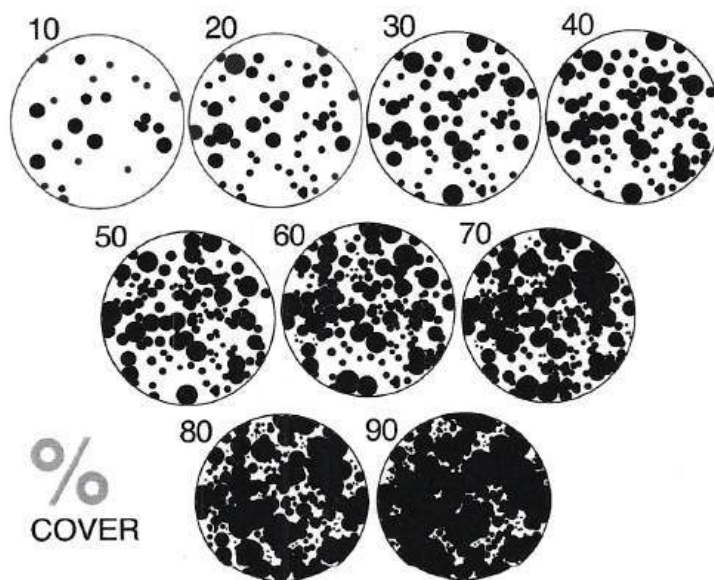
Conservation recommendations and other comments: See above
Spot spray (?) Centaurea before it gets worse

Dogs on leashes please!! Saw so much running cross
habitat & digging

Notes on ground disturbances:

1. Animal digging - Applies to mounds/piles of soil deposited by a digging animal, and/or burrow holes. These can be recent or old (can note age in notes).
2. Wildlife tracks - Applies to animal tracks in the plot other than dog. In some cases the tracks may be too ill defined to allow confident species identification (see #4).
3. Dog tracks - Applies to dog prints in the plot.
4. Animal tracks of uncertain origin: Applies to divots or other depressions likely caused by an animal, but too ill defined for confident identification.
5. Non-motorized recreation - Applies to footprints or bicycle tracks in the plot.
6. Trail - Applies to pathways used by people, whether maintained or not.
7. Motorized recreation - Applies to tracks or other disturbances caused by ATVs or motorcycles.
8. Wildfire - Applies to plot areas with evidence of past wildfire such as burned shrub skeletons.
9. Weed invasion - Applies to situations where non-native weedy species are abundant and appear to be overwhelming the native vegetation.

Example of percent cover in 10% Increments:



Aase's Onion Monitoring in the Boise Area Foothills

Location Hulls Gulch Sub Pop 4

Plot # AA12 Date 4/11/2024 Observer(s) DeBolt, Helford

Plot Center GPS coordinates 43.64183, -116.178547 GPS Datum NGS 84

Photograph notes (0, 90, 180, 270 degrees from plot center at minimum. Additional photos to show plot relocation, plant species, disturbances, and other special features as needed): see photo labels

If counted, total # of Aase's onion plants in plot closer to 500 est Otherwise, estimated number of individuals: 1-10; 11-50; 51-100; 101-200; 201-300; 301-500; 501-1000; 1001-2000; 2001-5000; 5001-10,000; >10,000.

Comments on Abundance (distribution, density, etc.) NE quadrant has the most invasives (Chju, Bete, Erca) and the least Alaa; Alaa most abundant in SE & SW quadrants

Aspect 100° Slope 25% est Substrate Coarse white sand

List all shrub species in the plot and their estimated canopy cover in the plot using the following cover (abundance) categories: >50% 25-50% 10-25% 1-10% <1%: Patr: <1% ; Erca: <1%

Estimated Total Shrub Cover: >50% 25-50% 10-25% 1-10% <1% (circle one)

List all native bunchgrass species and their associated canopy cover (abundance) using the same categories for shrubs:

ARPU: 1-10% ELEL: <1%
PSSP: <1%
POSE: <1%

Estimated Total Native Bunchgrass Cover: >50% 25-50% 10-25% 1-10% <1% (circle one)

List all weed species and their estimated abundance using the following categories: Trace = only a few individuals, easy to overlook; Sparse = spotty and perhaps not seen at first glance, but unlikely to overlook in careful observation; Scattered = widespread, somewhat common, and not overlooked in careful observation; Common = frequent and widespread, obvious at first glance; Dominant = very abundant, a community dominant. If >12 weed species, list others on back of page.

<u>BETE = Dom</u>	<u>PUBL = Common</u>
<u>ALAE = Dom</u>	<u>SIAL = Sparse</u>
<u>CHJU = Dom</u>	
<u>CECY (Centauria cyaneus)</u>	
<u>ERCA = Dom</u>	
<u>DESCURARIA = Trace</u>	

List the 6 most common native forb species and their estimated abundance using the above weed species categories; list additional native species on back of page if confident of identification

<u>PAHA = Trace</u>	<u>Calochortus = T</u>
<u>TRGRCT (Triteleia grandiflora) = sparse</u>	<u>Phlox long = T</u>
<u>LOTR = Trace</u>	<u>AST pur = T</u>

Circle each disturbance factor present and its estimated abundance using the same categories as for weed species:
 Animal digging 9.0 pher Com Wildlife tracks spars Dog tracks fair Animal tracks of uncertain origin _____
 Non-motorized recreation _____ Trails _____ Motorized recreation _____ Weed invasion Dam Wildfire _____
 Other _____

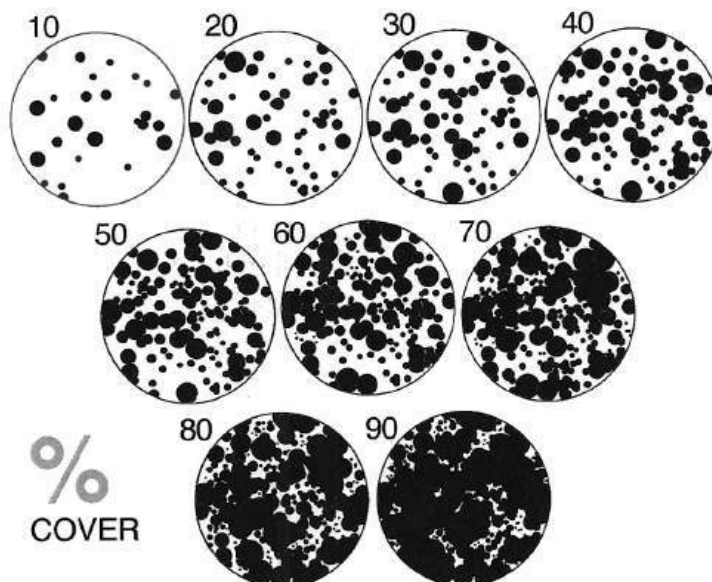
Additional disturbance details (e.g., magnitude, extent): Very close to trail so potential is there

Conservation recommendations and other comments: Biocontrol for Chojun. Consider treating Centaurea w/ spray when A. aa is dormant

Notes on ground disturbances:

1. Animal digging - Applies to mounds/piles of soil deposited by a digging animal, and/or burrow holes. These can be recent or old (can note age in notes).
2. Wildlife tracks - Applies to animal tracks in the plot other than dog. In some cases the tracks may be too ill defined to allow confident species identification (see #4).
3. Dog tracks - Applies to dog prints in the plot.
4. Animal tracks of uncertain origin: Applies to divots or other depressions likely caused by an animal, but too ill defined for confident identification.
5. Non-motorized recreation - Applies to footprints or bicycle tracks in the plot.
6. Trail - Applies to pathways used by people, whether maintained or not.
7. Motorized recreation - Applies to tracks or other disturbances caused by ATVs or motorcycles.
8. Wildfire - Applies to plot areas with evidence of past wildfire such as burned shrub skeletons.
9. Weed invasion - Applies to situations where non-native weedy species are abundant and appear to be overwhelming the native vegetation.

Example of percent cover in 10% Increments:



Aase's Onion Monitoring in the Boise Area Foothills

Location Hulls Gulch E011 Sub Pop 5

Plot # AA-13 Date 4/11/2024 Observer(s) DeBolt, Helford

Plot Center GPS coordinates 43.64164, -116.177194 GPS Datum WGS 84

Photograph notes (0, 90, 180, 270 degrees from plot center at minimum. Additional photos to show plot relocation, plant species, disturbances, and other special features as needed):

If counted, total # of Aase's onion plants in plot Possibly closer to 500 Otherwise, estimated number of individuals: 1-10; 11-50; 51-100; 101-200; 201-300; 301-500; 501-1000; 1001-2000; 2001-5000; 5001-10,000; >10,000.

Comments on Abundance (distribution, density, etc.) Well distributed throughout the site, but esp. in the more open, less invaded sandy areas

Aspect 180° Slope 25° est Substrate Coarse white sand

List all shrubs species in the plot and their estimated canopy cover in the plot using the following cover (abundance) categories: >50% 25-50% 10-25% 1-10% <1%: Patr: <1%; Erna: <1%

Estimated Total Shrub Cover: >50% 25-50% 10-25% 1-10% <1% (circle one)

List all native bunchgrass species and their associated canopy cover (abundance) using the same categories for shrubs:

PSSP7: <1% ARPU: 1-10%
POSE: <1%
ELEL: <1%

Estimated Total Native Bunchgrass Cover: >50% 25-50% 10-25% 1-10% <1% (circle one)

List all weed species and their estimated abundance using the following categories: Trace = only a few individuals, easy to overlook; Sparse = spotty and perhaps not seen at first glance, but unlikely to overlook in careful observation; Scattered = widespread, somewhat common, and not overlooked in careful observation; Common = frequent and widespread, obvious at first glance; Dominant = very abundant, a community dominant. If >12 weed species, list others on back of page.

<u>CHJU</u> - <u>Common</u>	<u>Femy</u> - <u>Sparse</u>
<u>ALDE</u> - <u>Dom</u>	<u>Sisalt</u> - <u>Trace</u>
<u>CECV</u> - <u>Common</u>	<u>Holostium</u> - <u>Trace</u>
<u>ERCI</u> - <u>Dom</u>	
<u>BRTI</u> - <u>Common</u>	
<u>POBU</u> - <u>Scatt.</u>	

List the 6 most common native forb species and their estimated abundance using the above weed species categories; list additional native species on back of page if confident of identification.

<u>TRGR</u> - <u>Sparse</u>	<u>MACA</u> - <u>Trace</u>
<u>ACME</u> - <u>Trace</u>	<u>Thys curv.</u> - <u>Sparse</u>
<u>PIHA</u> - <u>Trace</u>	

Circle each disturbance factor present and its estimated abundance using the same categories as for weed species:

Animal digging Dom Wildlife tracks Sparse Dog tracks Soot Animal tracks of uncertain origin _____
 Non-motorized recreation _____ Trails _____ Motorized recreation _____ Weed invasion Common Wildfire _____
 Other _____

Additional disturbance details (e.g., magnitude, extent):

* Trail (hiking) goes right through
No site and needs to be blocked and signage placed
about the habitat *

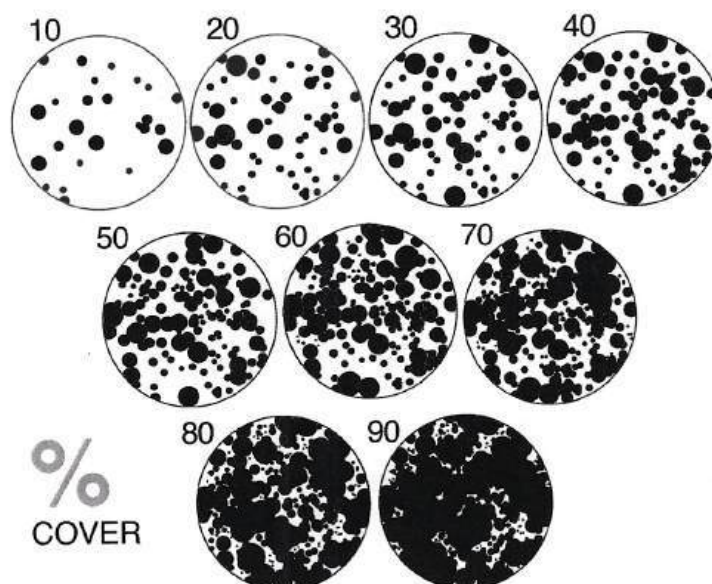
Conservation recommendations and other comments:

* See above - block off side
trail

Notes on ground disturbances:

1. Animal digging - Applies to mounds/piles of soil deposited by a digging animal, and/or burrow holes. These can be recent or old (can note age in notes).
2. Wildlife tracks - Applies to animal tracks in the plot other than dog. In some cases the tracks may be too ill defined to allow confident species identification (see #4).
3. Dog tracks - Applies to dog prints in the plot.
4. Animal tracks of uncertain origin: Applies to divots or other depressions likely caused by an animal, but too ill defined for confident identification.
5. Non-motorized recreation - Applies to footprints or bicycle tracks in the plot.
6. Trail - Applies to pathways used by people, whether maintained or not.
7. Motorized recreation - Applies to tracks or other disturbances caused by ATVs or motorcycles.
8. Wildfire - Applies to plot areas with evidence of past wildfire such as burned shrub skeletons.
9. Weed invasion - Applies to situations where non-native weedy species are abundant and appear to be overwhelming the native vegetation.

Example of percent cover in 10% Increments:



Aase's Onion Monitoring in the Boise Area Foothills

Location Hulls Gulch EO 14 Sohpop 1

Plot # AA-14 Date 4/11/2024 Observer(s) DeBolt, Halford

Plot Center GPS coordinates 43.64346, 716.183514 GPS Datum WGS 84

Photograph notes (0, 90, 180, 270 degrees from plot center at minimum. Additional photos to show plot relocation, plant species, disturbances, and other special features as needed): See photo: 12663.

If counted, total # of Aase's onion plants in plot 18 Otherwise, estimated number of individuals: 1-10; 11-50 51-100; 101-200; 201-300; 301-500; 501-1000; 1001-2000; 2001-5000; 5001-10,000; >10,000. ^{~3-10m}

Comments on Abundance (distribution, density, etc.) Just beyond the E plot edge, between 50 and 100 Aase are present

Aspect 90° Slope 20% ^{est} Substrate Deep coarse sand

List all shrubs species in the plot and their estimated canopy cover in the plot using the following cover (abundance) categories: >50% 25-50% 10-25% 1-10% <1%: Putr: 1-10% ; Ericnan: 1-10%
Putr are large, old ; Ribes aureum: <1%

Estimated Total Shrub Cover: >50% 25-50% 10-25% 1-10% <1% (circle one)

List all native bunchgrass species and their associated canopy cover (abundance) using the same categories for shrubs:
ARPV: <1%
Eiel: <1%

Estimated Total Native Bunchgrass Cover: >50% 25-50% 10-25% 1-10% <1% (circle one)

List all weed species and their estimated abundance using the following categories: Trace = only a few individuals, easy to overlook; Sparse = spotty and perhaps not seen at first glance, but unlikely to overlook in careful observation; Scattered = widespread, somewhat common, and not overlooked in careful observation; Common = frequent and widespread, obvious at first glance; Dominant = very abundant, a community dominant. If >12 weed species, list others on back of page.

<u>CHJU - Com</u>	<u>Ercu - Dom</u>
<u>BRIE - Dom</u>	<u>Poaabul - Scatt</u>
<u>CECV - Dom</u>	<u>Sial - Scatt</u>
<u>Amsinkia - Trace</u>	<u>Druc - scat</u>
<u>ALDE - Com</u>	<u>Galium - Trace</u>
<u>Ferny - Com (dom in some patches)</u>	<u>Anthriscus - Trace</u>

List the 6 most common native forb species and their estimated abundance using the above weed species categories; list additional native species on back of page if confident of identification.

<u>PHAA - Trace</u>	<u>Epilobium brachycarpum - Trace</u>
<u>TRGR - Trace</u>	<u>Colobartus - Trace</u>
<u>ACMI - Trace</u>	<u>Thy curv. - Trace</u>

Crepis occ - Trace

Circle each disturbance factor present and its estimated abundance using the same categories as for weed species:

Animal digging Com Wildlife tracks Dom Dog tracks _____ Animal tracks of uncertain origin _____
 Non-motorized recreation _____ Trails _____ Motorized recreation _____ Weed invasion Dom Wildfire _____
 Other _____

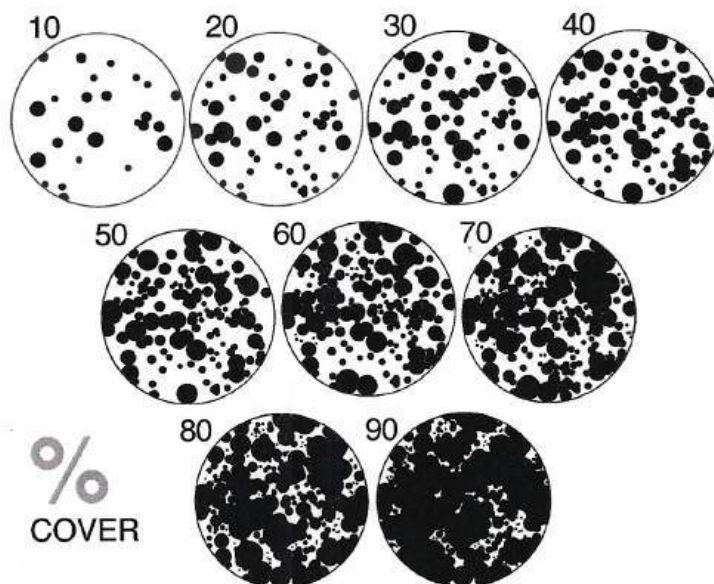
Additional disturbance details (e.g., magnitude, extent): Deer trailing is very dominant due to very good cover of lupin
Digging by gophers and possibly other rodents

Conservation recommendations and other comments: Introduce Chojun biocontrol;
Centaurea is pretty out of control - don't know what can be done

Notes on ground disturbances:

1. Animal digging - Applies to mounds/piles of soil deposited by a digging animal, and/or burrow holes. These can be recent or old (can note age in notes).
2. Wildlife tracks - Applies to animal tracks in the plot other than dog. In some cases the tracks may be too ill defined to allow confident species identification (see #4).
3. Dog tracks - Applies to dog prints in the plot.
4. Animal tracks of uncertain origin: Applies to divots or other depressions likely caused by an animal, but too ill defined for confident identification.
5. Non-motorized recreation - Applies to footprints or bicycle tracks in the plot.
6. Trail - Applies to pathways used by people, whether maintained or not.
7. Motorized recreation - Applies to tracks or other disturbances caused by ATVs or motorcycles.
8. Wildfire - Applies to plot areas with evidence of past wildfire such as burned shrub skeletons.
9. Weed invasion - Applies to situations where non-native weedy species are abundant and appear to be overwhelming the native vegetation.

Example of percent cover in 10% Increments:



Aase's Onion Monitoring in the Boise Area Foothills

Location Hulls Gulch EO 14 Subpop 6

Plot # AA-15 Date 4/11/2024 Observer(s) DeBolt, Helford

Plot Center GPS coordinates 43.64285, -116.175444 GPS Datum NAD83

Photograph notes (0, 90, 180, 270 degrees from plot center at minimum. Additional photos to show plot relocation, plant species, disturbances, and other special features as needed): Lowest Alaa density in SE + SW quadrant

If counted, total # of Aase's onion plants in plot Est closer to 500 Otherwise, estimated number of individuals: 1-10; 11-50; 51-100; 101-200; 201-300; 301-500; 501-1000; 1001-2000; 2001-5000; 5001-10,000; >10,000.

Comments on Abundance (distribution, density, etc.) Highest density Alaa is around plot center

Aspect 185° Slope 30% est Substrate Coarse white sand

List all shrubs species in the plot and their estimated canopy cover in the plot using the following cover (abundance) categories: >50% 25-50% 10-25% 1-10% <1%: Patr: 10-25%; Chma: <1%

Estimated Total Shrub Cover: >50% 25-50% 10-25% 1-10% <1% (circle one)

List all native bunchgrass species and their associated canopy cover (abundance) using the same categories for shrubs: ARPU - 10-25%

Estimated Total Native Bunchgrass Cover: >50% 25-50% 10-25% 1-10% <1% (circle one)

List all weed species and their estimated abundance using the following categories: Trace = only a few individuals, easy to overlook; Sparse = spotty and perhaps not seen at first glance, but unlikely to overlook in careful observation; Scattered = widespread, somewhat common, and not overlooked in careful observation; Common = frequent and widespread, obvious at first glance; Dominant = very abundant, a community dominant. If >12 weed species, list others on back of page.

CHJU - Common - to Dom
CECV - Scattered
BRTE - Dom
ERCI - Common
Amsinkia - Trace
ALDE - Dominant

SIAL - Trace
HOJU - Trace
DRVE - Scattered

List the 6 most common native forb species and their estimated abundance using the above weed species categories; list additional native species on back of page if confident of identification.

PHHA - Sparse
TRGR - Scattered
Microsteris gracilis - Trace

ACMI - Sparse (under Patr)
Epilobium - Trace
Gilia leptomeria - Trace
Calochortus - Trace

Circle each disturbance factor present and its estimated abundance using the same categories as for weed species:

Animal digging Dom Wildlife tracks sparse Dog tracks _____ Animal tracks of uncertain origin _____
 Non-motorized recreation _____ Trails _____ Motorized recreation _____ Weed invasion Dom Wildfire not recent
 Other _____

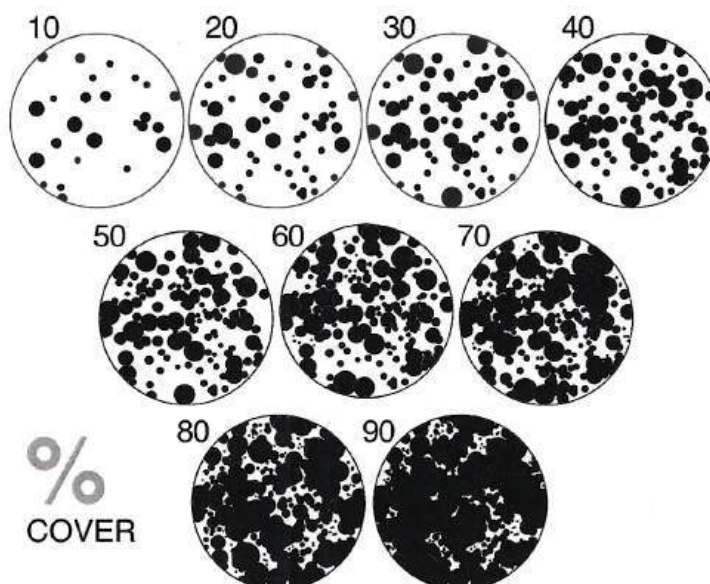
Additional disturbance details (e.g., magnitude, extent): Animal digging on surface at 2 locations
no sign that humans & dogs have been up here

Conservation recommendations and other comments: Some of the Butc are quite tall - a nice stand
Discontinued for Chjun & possibly spray Centaurea - it is not really common but nice to keep it that way

Notes on ground disturbances:

1. Animal digging - Applies to mounds/piles of soil deposited by a digging animal, and/or burrow holes. These can be recent or old (can note age in notes).
2. Wildlife tracks - Applies to animal tracks in the plot other than dog. In some cases the tracks may be too ill defined to allow confident species identification (see #4).
3. Dog tracks - Applies to dog prints in the plot.
4. Animal tracks of uncertain origin: Applies to divots or other depressions likely caused by an animal, but too ill defined for confident identification.
5. Non-motorized recreation - Applies to footprints or bicycle tracks in the plot.
6. Trail - Applies to pathways used by people, whether maintained or not.
7. Motorized recreation - Applies to tracks or other disturbances caused by ATVs or motorcycles.
8. Wildfire - Applies to plot areas with evidence of past wildfire such as burned shrub skeletons.
9. Weed invasion - Applies to situations where non-native weedy species are abundant and appear to be overwhelming the native vegetation.

Example of percent cover in 10% Increments:



Aase's Onion Monitoring in the Boise Area Foothills

Location Fulecat Reserve

Plot # AA-17 Date April 9, 2024 Observer(s) M. Mancuso + B. Reed

Plot Center GPS coordinates N 43.67706 W 116.23271 GPS Datum WGS84

Photograph notes (0, 90, 180, 270 degrees from plot center at minimum. Additional photos to show plot relocation, plant species, disturbances, and other special features as needed): Becky took photos on cell phone for cardinal directions + then from downslope + uphill points looking into plot
AA-17-NORTH, AA-17-SOUTH, AA-17-WEST, AA-17-EAST, AA-17-DISTURBANCE-IMG1-2

If counted, total # of Aase's onion plants in plot count = 93 Otherwise, estimated number of individuals: 1-10; 11-50; 51-100; 101-200; 201-300; 301-500; 501-1000; 1001-2000; 2001-5000; 5001-10,000; >10,000.

Comments on Abundance (distribution, density, etc.) Allium sparse with most in uphill half of plot; very few at downhill end; scattered indiv. or small clusters of 2-3 plants. Many starting to fade color/barely pink

Aspect 180° Slope 20° Substrate Coarse sand

List all shrubs species in the plot and their estimated canopy cover in the plot using the following cover (abundance) categories: >50% 25-50% 10-25% 1-10% <1%: Purshia tridentata = 1-10% (no more than 5%)
Ericameria nauseosa 1-10% (<3%)

Estimated Total Shrub Cover: >50% 25-50% 10-25% 1-10% <1% (circle one)

List all native bunchgrass species and their associated canopy cover (abundance) using the same categories for shrubs: Aristida purpurea = 1-10% (closer to 1%)
Elymus elymoides = <1%

Estimated Total Native Bunchgrass Cover: >50% 25-50% 10-25% 1-10% <1% (circle one)

List all weed species and their estimated abundance using the following categories: Trace = only a few individuals, easy to overlook; Sparse = spotty and perhaps not seen at first glance, but unlikely to overlook in careful observation; Scattered = widespread, somewhat common, and not overlooked in careful observation; Common = frequent and widespread, obvious at first glance; Dominant = very abundant, a community dominant. If >12 weed species, list others on back of page.

Bromus tectorum = scattered
Alyssum desertorum = common
Chenopodium juncea = common
Erodium cicutarium = scattered
Poa bulbosa = scattered
Holsternia umbellatum = sparse

Draba verna - sparse?

List the 6 most common native forb species and their estimated abundance using the above weed species categories; list additional native species on back of page if confident of identification.

Eriogonum strictum = trace (<10 plants) Thysanocarpus curvipes = trace
annual Eriogonum = trace
Amsinckia = trace

Circle each disturbance factor present and its estimated abundance using the same categories as for weed species:

Animal digging Common Wildlife tracks sparse Dog tracks _____ Animal tracks of uncertain origin _____
 Non-motorized recreation _____ Trails deer Motorized recreation _____ Weed invasion yes Wildfire _____
 Other sparse (1 trail)

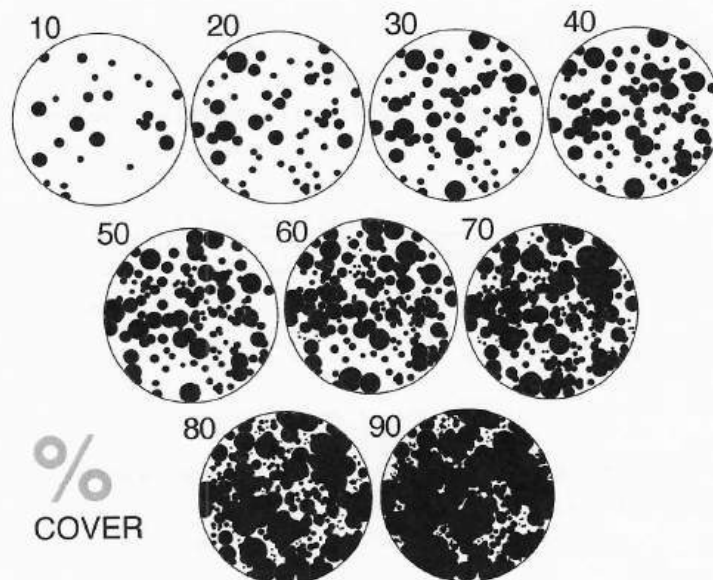
Additional disturbance details (e.g., magnitude, extent): Animal dig mounds common especially in downhill half of plot; deer trail near east margin of plot; fence line along upslope edge of plot; 1 animal dig hole ca 1 ft diameter and deep (dia?); deer tracks + droppings present but not common. Majority of dig piles appear relatively recent.

Conservation recommendations and other comments: Some moss crust present. Rush skeletonweed well established, but less cheatgrass compared to AA-18+20. Probably not a priority conservation site due to weeds, sparse Adiantum and harsh south aspect

Notes on ground disturbances:

1. Animal digging - Applies to mounds/piles of soil deposited by a digging animal, and/or burrow holes. These can be recent or old (can note age in notes).
2. Wildlife tracks - Applies to animal tracks in the plot other than dog. In some cases the tracks may be too ill defined to allow confident species identification (see #4).
3. Dog tracks - Applies to dog prints in the plot.
4. Animal tracks of uncertain origin: Applies to divots or other depressions likely caused by an animal, but too ill defined for confident identification.
5. Non-motorized recreation - Applies to footprints or bicycle tracks in the plot.
6. Trail - Applies to pathways used by people, whether maintained or not.
7. Motorized recreation - Applies to tracks or other disturbances caused by ATVs or motorcycles.
8. Wildfire - Applies to plot areas with evidence of past wildfire such as burned shrub skeletons.
9. Weed invasion - Applies to situations where non-native weedy species are abundant and appear to be overwhelming the native vegetation.

Example of percent cover in 10% Increments:



Aase's Onion Monitoring in the Boise Area Foothills

Location Polocat Reserve

Plot # AA-18 Date April 9, 2021 Observer(s) M. Mancuso, B. Reed

Plot Center GPS coordinates N 43.67657 W 116.23905 GPS Datum WGS 84

Photograph notes (0, 90, 180, 270 degrees from plot center at minimum. Additional photos to show plot relocation, plant species, disturbances, and other special features as needed): Becky has photos on her cell phone

AA-18-NORTH-WITHOUT DECLINATION, AA-18-WEST-WITHOUT DECLINATION

" " - SOUTH - " " , AA-18-GENERAL COND (2), AA-18 INDIVIDUALS

" " EAST - " " , AA-18-ETOW, AA-18-SPON

If counted, total # of Aase's onion plants in plot counted 605 individuals Otherwise, estimated number of individuals: 1-10; 11-50; 51-100; 101-200; 201-300; 301-500; 501-1000; 1001-2000; 2001-5000; 5001-10,000; >10,000.

Comments on Abundance (distribution, density, etc.) some flowers faded, west half more abundant than east. Upwind and downwind pretty equally distributed
recent heavy rains pressed some into ground. scattered individuals and small groups of 2-10.

Aspect 220° Slope 24° Substrate course sand

List all shrubs species in the plot and their estimated canopy cover in the plot using the following cover (abundance) categories: >50% 25-50% 10-25% 1-10% <1%: Eriogonum nauseosa = <1% (2 shrubs, one barely alive); bitterbrush 1-10% (continued to NW margin of plot)

Estimated Total Shrub Cover: >50% 25-50% 10-25% 1-10% <1% (circle one)

List all native bunchgrass species and their associated canopy cover (abundance) using the same categories for shrubs:

Aristida purpurea long. = 10-25%

Poa secunda = <1%

Pseudo. spicata = <1% Hesperostipa comata = <1%

Estimated Total Native Bunchgrass Cover: >50% 25-50% 10-25% 1-10% <1% (circle one)

List all weed species and their estimated abundance using the following categories: Trace = only a few individuals, easy to overlook; Sparse = spotty and perhaps not seen at first glance, but unlikely to overlook in careful observation; Scattered = widespread, somewhat common, and not overlooked in careful observation; Common = frequent and widespread, obvious at first glance; Dominant = very abundant, a community dominant. If >12 weed species, list others on back of page.

Bromus tectorum = Common

Alyssum desertorum = Common

Poa bulbosa = scattered

Chenopodium juncea = scattered

Erodium cicutarium = Common

Holosteum umbellatum = trace

List the 6 most common native forb species and their estimated abundance using the above weed species categories; list additional native species on back of page if confident of identification.

Eriogonum strictum = trace

Amsinckia = trace

Descurainia = trace

Eriogonum (annual; E. vimineum?, no flws) = sparse

Phacelia hastata = sparse

Circle each disturbance factor present and its estimated abundance using the same categories as for weed species:

Animal digging Sparse Wildlife tracks Sparse Dog tracks _____ Animal tracks of uncertain origin _____
Non-motorized recreation _____ Trails _____ Motorized recreation _____ Weed invasion yes Wildfire _____
Other _____

Additional disturbance details (e.g., magnitude, extent): Animal dig = sparse 'recent' but common old remnants of mounds; scattered deer feces and tracks; plus a minor deer trail

Conservation recommendations and other comments: Rush skeleton well established but not as abundant as some places seen en route to plot. Many/most of the three arm clumps appear dead (canopy estimate based on assumption they are alive), but small younger individuals fairly common/widespread. However some of these small clumps may be Has. comata looking at the leaves

Notes on ground disturbances:

1. Animal digging - Applies to mounds/piles of soil deposited by a digging animal, and/or burrow holes. These can be recent or old (can note age in notes).
2. Wildlife tracks - Applies to animal tracks in the plot other than dog. In some cases the tracks may be too ill defined to allow confident species identification (see #4).
3. Dog tracks - Applies to dog prints in the plot.
4. Animal tracks of uncertain origin: Applies to divots or other depressions likely caused by an animal, but too ill defined for confident identification.
5. Non-motorized recreation - Applies to footprints or bicycle tracks in the plot.
6. Trail - Applies to pathways used by people, whether maintained or not.
7. Motorized recreation - Applies to tracks or other disturbances caused by ATVs or motorcycles.
8. Wildfire - Applies to plot areas with evidence of past wildfire such as burned shrub skeletons.
9. Weed invasion - Applies to situations where non-native weedy species are abundant and appear to be overwhelming the native vegetation.

Aase's Onion Monitoring in the Boise Area Foothills

Location Polecat Reservoir, lower section of Quick Draw trail
 Plot # AA-19 Date April 10, 2024 Observer(s) M. Mancuso, L. Rogers, B. Reed
 Plot Center GPS coordinates N 43.68037 W 116.22046 GPS Datum WGS 84

Photograph notes (0, 90, 180, 270 degrees from plot center at minimum. Additional photos to show plot relocation, plant species, disturbances, and other special features as needed): SEE AA-19 "DISTURBANCE" & "GENERAL CONDITION". MIKE TOOK PHOTOS FROM PLOT CENTER

If counted, total # of Aase's onion plants in plot _____ Otherwise, estimated number of individuals: 1-10; 11-50; 51-100; 101-200; 201-300; 301-500; 501-1000; 1001-2000; 2001-5000; 5001-10,000; >10,000.

Comments on Abundance (distribution, density, etc.) Becky counted 1922 plants but knows she missed many due to faded flowers/hard to see. Allium more common here than below trail (est. 2X as common). Many plants faded, some detached or buried. Scattered indivs more common in small clumps of up to 6 plants

Aspect 180° Slope 10° Substrate Coarse sand

List all shrubs species in the plot and their estimated canopy cover in the plot using the following cover (abundance) categories: >50% 25-50% 10-25% 1-10% <1%: Parshia tridentata = 1-10% (1 shrub 2-3%)
Ericamnia nanosea = 10-25% Artemisia tridentata tri = 1-10% (1-2%)
> (<20%)

Estimated Total Shrub Cover: >50% 25-50% 10-25% 1-10% <1% (circle one)

List all native bunchgrass species and their associated canopy cover (abundance) using the same categories for shrubs:

Aristida longiseta = 10-25% (approaching 20%)
Poa serotina = 1-10% (much closer to 1 than 10%)
Elymus elymoides = <1%

Estimated Total Native Bunchgrass Cover: >50% 25-50% 10-25% 1-10% <1% (circle one)

List all weed species and their estimated abundance using the following categories: Trace = only a few individuals, easy to overlook; Sparse = spotty and perhaps not seen at first glance, but unlikely to overlook in careful observation; Scattered = widespread, somewhat common, and not overlooked in careful observation; Common = frequent and widespread, obvious at first glance; Dominant = very abundant, a community dominant. If >12 weed species, list others on back of page.

Bromus tectorum = scattered
Erodium cicutarium = common
Chondrilla juncea = sparse
Helostemum umbellatum = trace
Alyssum desertorum = scattered
Vulpia sp (no fls yet) = scattered

Poa bulbosa = trace

Draba verna = sparse?

List the 6 most common native forb species and their estimated abundance using the above weed species categories; list additional native species on back of page if confident of identification.

Astragalus purshii = trace
Plagiobothrys tenellus = sparse
Epilobium brachycarpum = sparse

Amsinckia = trace
Thysanocarpus curvipes = trace
Galium aparina = beneath the higher brush only
Claytonia perfoliata = " " " "

Circle each disturbance factor present and its estimated abundance using the same categories as for weed species:

Animal digging yes Wildlife tracks deer Dog tracks _____ Animal tracks of uncertain origin X-trace
Non-motorized recreation _____ Trails yes Motorized recreation _____ Weed invasion _____ Wildfire _____
Other bisects plot

Additional disturbance details (e.g., magnitude, ^{some} extent): Animal dig mounds common and appear to be both old and relatively more recent and large; unsure if recent hard rain contributed to partial burial of some Allium on near mounds. Deer tracks = few. Footprints + bike tread not observed in plot; a few small divots in plot perhaps old dog tracks?

Conservation recommendations and other comments: People seem to stay on trail which bisects plot. The Allium count (1922) is certainly an underestimate - so 2000-5000
Category is correct

Notes on ground disturbances:

1. Animal digging - Applies to mounds/piles of soil deposited by a digging animal, and/or burrow holes. These can be recent or old (can note age in notes).
2. Wildlife tracks - Applies to animal tracks in the plot other than dog. In some cases the tracks may be too ill defined to allow confident species identification (see #4).
3. Dog tracks - Applies to dog prints in the plot.
4. Animal tracks of uncertain origin: Applies to divots or other depressions likely caused by an animal, but too ill defined for confident identification.
5. Non-motorized recreation - Applies to footprints or bicycle tracks in the plot.
6. Trail - Applies to pathways used by people, whether maintained or not.
7. Motorized recreation - Applies to tracks or other disturbances caused by ATVs or motorcycles.
8. Wildfire - Applies to plot areas with evidence of past wildfire such as burned shrub skeletons.
9. Weed invasion - Applies to situations where non-native weedy species are abundant and appear to be overwhelming the native vegetation.

Aase's Onion Monitoring in the Boise Area Foothills

Location Polecat Reserve

Plot # AA-20 Date April 9, 2024 Observer(s) M. Mancuso, B. Reed

Plot Center GPS coordinates N 43.67484 W 116.24084 GPS Datum WGS 84

Photograph notes (0, 90, 180, 270 degrees from plot center at minimum. Additional photos to show plot relocation, plant species, disturbances, and other special features as needed): Photos on Becky's cell phone in all cardinal directions, plus plot overview from vantage point south of plot AA-20-NORTH, SOUTH, EAST, WEST, AA-20 sends for general condition, overviews, and individuals.

If counted, total # of Aase's onion plants in plot Counted 1560 Otherwise, estimated number of individuals: 1-10; 11-50; 51-100; 101-200; 201-300; 301-500; 501-1000; 1001-2000; 2001-5000; 5001-10,000; >10,000.

Comments on Abundance (distribution, density, etc.) Allium is evenly distributed except sparse along south margin and absent from north edge. Scattered indiv. but more common in clusters of 2-10 plants. Most flowers still pink, but some faded

Aspect 125° Slope 20° Substrate Course sand

List all shrubs species in the plot and their estimated canopy cover in the plot using the following cover (abundance) categories: >50% 25-50% 10-25% 1-10% <1%: Purshia fr. dentata = 10-25% (mostly in downslope half of plot)

Estimated Total Shrub Cover: >50% 25-50% 10-25% 1-10% <1% (circle one)

List all native bunchgrass species and their associated canopy cover (abundance) using the same categories for shrubs:

Aristida purpurea = 10-25% (approaching 20%)
Pseudo. spicata = 1-10% (<3%)
Poa secunda = <1%

Estimated Total Native Bunchgrass Cover: >50% 25-50% 10-25% 1-10% <1% (circle one)

List all weed species and their estimated abundance using the following categories: Trace = only a few individuals, easy to overlook; Sparse = spotty and perhaps not seen at first glance, but unlikely to overlook in careful observation; Scattered = widespread, somewhat common, and not overlooked in careful observation; Common = frequent and widespread, obvious at first glance; Dominant = very abundant, a community dominant. If >12 weed species, list others on back of page.

Bromus tectorum = common
Chondrilla juncea = scattered
Alyssum desertorum = scattered
Holostem. umbellatum = sparse
Draba vera = sparse?
Erodium cicutarium = scattered

Poa bulbosa = sparse
Secale cereale = trace

List the 6 most common native forb species and their estimated abundance using the above weed species categories; list additional native species on back of page if confident of identification. - all forbs = trace except as marked

Balsamorhiza sagittata = <10
Plagiobothrys tenuiflorus = sparse
Lomatium simplex
Galium aparine = only beneath Purshia
Eriogonum strictum
Descurainia
(not same as AA-18)

Thysanocarpus curvipes = scattered
Lithophragma bulbosa
Ast. purshii

Phacelia hastata
Amsinckia
Descurainia (same as AA-18)
• = forbs restricted to small, more mesic portion near north edge of plot

Circle each disturbance factor present and its estimated abundance using the same categories as for weed species:

Animal digging rare Wildlife tracks deer Dog tracks _____ Animal tracks of uncertain origin _____
Non-motorized recreation _____ Trails deer Motorized recreation _____ Weed invasion _____ Wildfire _____
Other _____

Additional disturbance details (e.g., magnitude, extent): minor deer trail bisects plot, scattered tracks and droppings present in plot. Remnant old animal dig pile barely discernable and uncommon; more recent mound restricted to southern edge of plot in adjacent to draw. No sign human use

Conservation recommendations and other comments: Moss crust fairly common.

Notes on ground disturbances:

1. Animal digging - Applies to mounds/piles of soil deposited by a digging animal, and/or burrow holes. These can be recent or old (can note age in notes).
2. Wildlife tracks - Applies to animal tracks in the plot other than dog. In some cases the tracks may be too ill defined to allow confident species identification (see #4).
3. Dog tracks - Applies to dog prints in the plot.
4. Animal tracks of uncertain origin: Applies to divots or other depressions likely caused by an animal, but too ill defined for confident identification.
5. Non-motorized recreation - Applies to footprints or bicycle tracks in the plot.
6. Trail - Applies to pathways used by people, whether maintained or not.
7. Motorized recreation - Applies to tracks or other disturbances caused by ATVs or motorcycles.
8. Wildfire - Applies to plot areas with evidence of past wildfire such as burned shrub skeletons.
9. Weed invasion - Applies to situations where non-native weedy species are abundant and appear to be overwhelming the native vegetation.

Aase's Onion Monitoring in the Boise Area Foothills

Location Polecat Reserve

Plot # AA-21 Date April 10, 2024 Observer(s) M. Mancuso, B. Reed, L. Rogers

Plot Center GPS coordinates N 43.68908 W 116.22726 GPS Datum WGS 84

Photograph notes (0, 90, 180, 270 degrees from plot center at minimum. Additional photos to show plot relocation, plant species, disturbances, and other special features as needed):

AA-21-NORTH, SOUTH, EAST, WEST. AA-21-INDIVIDUALS, AA-21 RIDGELINE, AA-21
general condition

If counted, total # of Aase's onion plants in plot _____ Otherwise, estimated number of individuals:
1-10; 11-50; 51-100; 101-200; 201-300; 301-500; 501-1000; 1001-2000; 2001-5000; 5001-10,000; >10,000

Comments on Abundance (distribution, density, etc.) Beautiful, dense Allium population, although more
abundant in upper half of plot, but overall fairly even distribution. Flowers still pink. Mostly
scattered indiv + small clumps; numerous plants with leaves but no flowers

Aspect 270° Slope 25° Substrate coarse sand

List all shrubs species in the plot and their estimated canopy cover in the plot using the following cover (abundance) categories: >50% 25-50% 10-25% 1-10% <1%: Ericameria nauseosa = 1-10%
Purshia tridentata = <1%

Estimated Total Shrub Cover: >50% 25-50% 10-25% 1-10% <1% (circle one)

List all native bunchgrass species and their associated canopy cover (abundance) using the same categories for shrubs:

Aristida purpurea = 10-25% Elymus elymoides = <1%
Poa secunda = 1-10% (closer to than 10%, but widespread in plot)
Pseudo. spicata = <1% Hesperostipa comata = <1% (couple plants seen)
Aristida = 15-20%

Estimated Total Native Bunchgrass Cover: >50% 25-50% 10-25% 1-10% <1% (circle one)

List all weed species and their estimated abundance using the following categories: Trace = only a few individuals, easy to overlook; Sparse = spotty and perhaps not seen at first glance, but unlikely to overlook in careful observation; Scattered = widespread, somewhat common, and not overlooked in careful observation; Common = frequent and widespread, obvious at first glance; Dominant = very abundant, a community dominant. If >12 weed species, list others on back of page.

Bromus tectorum = scattered (to sparse)
Chenopodium juncea = scattered
Holsternia umbellatum = sparse
Alyssum desertorum = sparse

Dianthus = sparse?

List the 6 most common native forb species and their estimated abundance using the above weed species categories; list additional native species on back of page if confident of identification.

Eriogonum strictum = scattered Epilobium brachycarpum = trace
Crepis = sparse Lomatium simplex = trace
Thysanocarpus ensipis = trace Achillea millefolium = trace

Circle each disturbance factor present and its estimated abundance using the same categories as for weed species:

Animal digging _____ Wildlife tracks _____ Dog tracks _____ Animal tracks of uncertain origin X
 Non-motorized recreation _____ Trails _____ Motorized recreation _____ Weed invasion _____ Wildfire _____
 Other _____

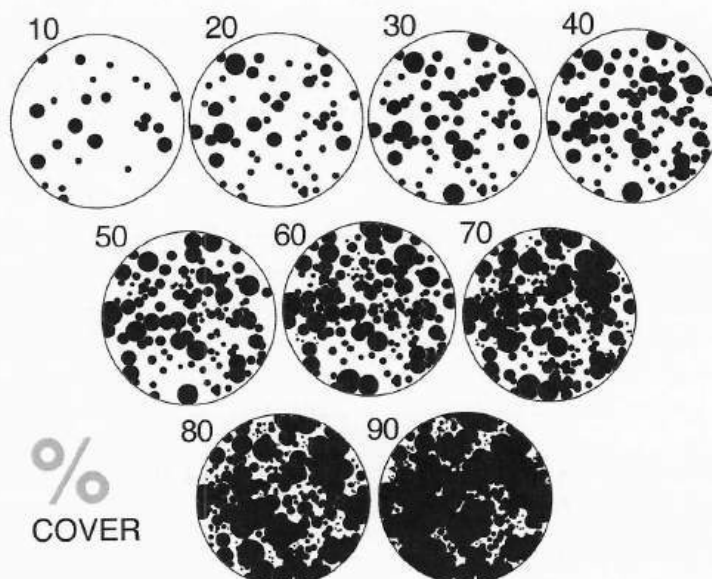
Additional disturbance details (e.g., magnitude, extent): Site is largely undisturbed; scattered old
divots likely represent old deer tracks; no animal digging; no evidence of human
disturbance except for a minor user-created trail along ridgecrest marking upslope
edge of plot

Conservation recommendations and other comments: This area away from any official trails -
keep it that way. Rush skeleton weed well established but with much denser
populations in nearby draw bottom. Very nice moss + lichen crust in places.

Notes on ground disturbances:

1. Animal digging - Applies to mounds/piles of soil deposited by a digging animal, and/or burrow holes. These can be recent or old (can note age in notes).
2. Wildlife tracks - Applies to animal tracks in the plot other than dog. In some cases the tracks may be too ill defined to allow confident species identification (see #4).
3. Dog tracks - Applies to dog prints in the plot.
4. Animal tracks of uncertain origin: Applies to divots or other depressions likely caused by an animal, but too ill defined for confident identification.
5. Non-motorized recreation - Applies to footprints or bicycle tracks in the plot.
6. Trail - Applies to pathways used by people, whether maintained or not.
7. Motorized recreation - Applies to tracks or other disturbances caused by ATVs or motorcycles.
8. Wildfire - Applies to plot areas with evidence of past wildfire such as burned shrub skeletons.
9. Weed invasion - Applies to situations where non-native weedy species are abundant and appear to be overwhelming the native vegetation.

Example of percent cover in 10% Increments:



Aase's Onion Monitoring in the Boise Area Foothills

Location Polecat Reserve

Plot # AA-22 Date April 10, 2024 Observer(s) B. Reed, M. Mancuso

Plot Center GPS coordinates N43.68121 W116.21528 GPS Datum WGS 84

Photograph notes (0, 90, 180, 270 degrees from plot center at minimum. Additional photos to show plot relocation, plant species, disturbances, and other special features as needed):

AA-22 NORTH, SOUTH, EAST, WEST. AA-27 General condition series. AA-21 disturbance + litter

If counted, total # of Aase's onion plants in plot ~800 counted Otherwise, estimated number of individuals: 1-10; 11-50; 51-100; 101-200; 201-300; 301-500; 501-1000; 1001-2000; 2001-5000; 5001-10,000; >10,000.

Comments on Abundance (distribution, density, etc.) Allium ca. 3x more common upslope half compared to downhill half; mostly scattered individuals with some clumps with up to 5 or so plants

Aspect 190° Slope 35° Substrate Coarse sand

List all shrubs species in the plot and their estimated canopy cover in the plot using the following cover (abundance) categories: >50% 25-50% 10-25% 1-10% <1%: Physcia tridentata = 10-25% (closer to 25 than 10%)
Ericameria nauseosa = 1-10% (barely 1%)

Estimated Total Shrub Cover: >50% 25-50% 10-25% 1-10% <1% (circle one)

List all native bunchgrass species and their associated canopy cover (abundance) using the same categories for shrubs: Aristida purpurea = 1-10%

Estimated Total Native Bunchgrass Cover: >50% 25-50% 10-25% 1-10% <1% (circle one)

List all weed species and their estimated abundance using the following categories: Trace = only a few individuals, easy to overlook; Sparse = spotty and perhaps not seen at first glance, but unlikely to overlook in careful observation; Scattered = widespread, somewhat common, and not overlooked in careful observation; Common = frequent and widespread, obvious at first glance; Dominant = very abundant, a community dominant. If >12 weed species, list others on back of page.

Bromus tectorum = scattered - varies from dense patches to sparse

Alyssum desertorum = scattered

Chondrilla juncea = sparse

Erodium cicutarium = sparse

Poa bulbosa = sparse

Sisymbrium altissimum = s

Tragopogon dubius = trace

Draba verna = sparse?

List the 6 most common native forb species and their estimated abundance using the above weed species categories; list additional native species on back of page if confident of identification. Eriogonum (annual) = trace

Astragalus purshii = trace

Thysanocarpus elaeagnifolius = sparse

Descurainia (same as 4/9) = sparse

Galium aparine = sparse (only under)

Claytonia perfoliata = trace (some Patr)

Eriogonum strictum = sparse

Plagiobothrys tenella = sparse

Campanula = trace

Amsinckia sp = sparse

Phacelia hastata = sparse Collomia = trace

Chaenactis douglasii = trace Gilia (annual, no fls) = Tr

Circle each disturbance factor present and its estimated abundance using the same categories as for weed species:

Animal digging ☒ Wildlife tracks _____ Dog tracks _____ Animal tracks of uncertain origin _____
 Non-motorized recreation ☒ Trails ☒ Motorized recreation _____ Weed invasion _____ Wildfire _____
 Other _____

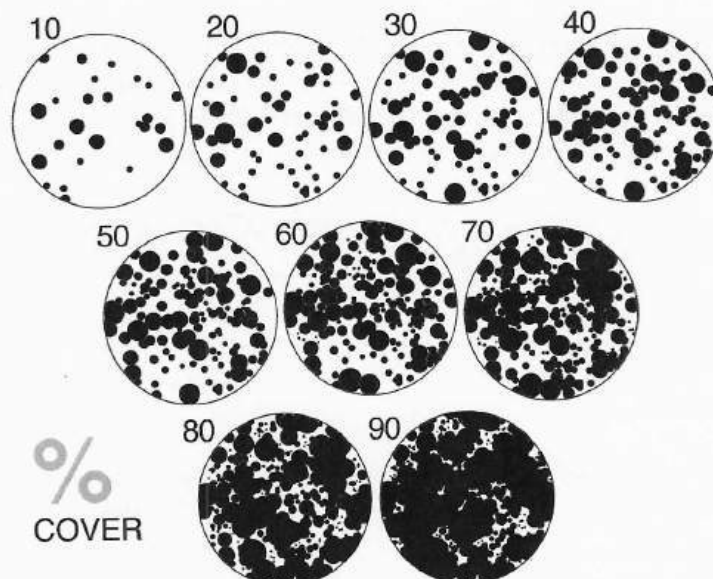
Additional disturbance details (e.g., magnitude, extent): limited animal digging (sparse); footprint
remnants throughout lower half of plot, but none above (scattered); trail
bisects plot in half; scattered small divots could be dog or deer; some
deer droppings in plot; cigarette butts in downhill end of plot

Conservation recommendations and other comments: Slope prone to erosion, slumping; some how
minimize people walking across erosive slope - use signage?

Notes on ground disturbances:

1. Animal digging - Applies to mounds/piles of soil deposited by a digging animal, and/or burrow holes. These can be recent or old (can note age in notes).
2. Wildlife tracks - Applies to animal tracks in the plot other than dog. In some cases the tracks may be too ill defined to allow confident species identification (see #4).
3. Dog tracks - Applies to dog prints in the plot.
4. Animal tracks of uncertain origin: Applies to divots or other depressions likely caused by an animal, but too ill defined for confident identification.
5. Non-motorized recreation - Applies to footprints or bicycle tracks in the plot.
6. Trail - Applies to pathways used by people, whether maintained or not.
7. Motorized recreation - Applies to tracks or other disturbances caused by ATVs or motorcycles.
8. Wildfire - Applies to plot areas with evidence of past wildfire such as burned shrub skeletons.
9. Weed invasion - Applies to situations where non-native weedy species are abundant and appear to be overwhelming the native vegetation.

Example of percent cover in 10% Increments:



Aase's Onion Monitoring in the Boise Area Foothills

Location Hillside to Hollow

Plot # AA-23 Date April 9, 2024 Observer(s) Jim Reed and Dondi Black

Plot Center GPS coordinates 43.65514, -116.219833 GPS Datum _____

Photograph notes (0, 90, 180, 270 degrees from plot center at minimum. Additional photos to show plot relocation, plant species, disturbances, and other special features as needed): 0°, 90°, 180°, 270° from plot center

If counted, total # of Aase's onion plants in plot _____ Otherwise, estimated number of individuals: 1-10; 11-50; 51-100; 101-200; 201-300; 301-500; 501-1000; 1001-2000; 2001-5000; 5001-10,000; >10,000.

Comments on Abundance (distribution, density, etc.) Same notes as last year: on the higher end of the 501-1000 range.

Aspect 180° Slope 21% Substrate coarse sand with loamy component

List all shrubs species in the plot and their estimated canopy cover in the plot using the following cover (abundance) categories: >50% 25-50% 10-25% 1-10% <1%: _____

Ericameria nauseosa 1-10%.

Estimated Total Shrub Cover: >50% 25-50% 10-25% 1-10% <1% (circle one)

List all native bunchgrass species and their associated canopy cover (abundance) using the same categories for shrubs: _____

Aristida purpurea 10-25%

Poa secunda <1%.

Estimated Total Native Bunchgrass Cover: >50% 25-50% 10-25% 1-10% <1% (circle one)

List all weed species and their estimated abundance using the following categories: Trace = only a few individuals, easy to overlook; Sparse = spotty and perhaps not seen at first glance, but unlikely to overlook in careful observation; Scattered = widespread, somewhat common, and not overlooked in careful observation; Common = frequent and widespread, obvious at first glance; Dominant = very abundant, a community dominant. If >12 weed species, list others on back of page.

Alyssum desertorum common

Erodium cicutarium common

Bromus tectorum common

Monarda juncea trace

List the 6 most common native forb species and their estimated abundance using the above weed species categories; list additional native species on back of page if confident of identification.

Phacelia hastata common

Sisymbrium irio common

Eriogonum strictum scattered

Achillea millefolium trace

Circle each disturbance factor present and its estimated abundance using the same categories as for weed species:

Animal digging X Wildlife tracks X Dog tracks _____ Animal tracks of uncertain origin _____
 Non-motorized recreation _____ Trails _____ Motorized recreation _____ Weed invasion _____ Wildfire _____
 Other Burrows / mounds

Additional disturbance details (e.g., magnitude, extent): _____

mounds common on down slope side

Biotic crusts common throughout

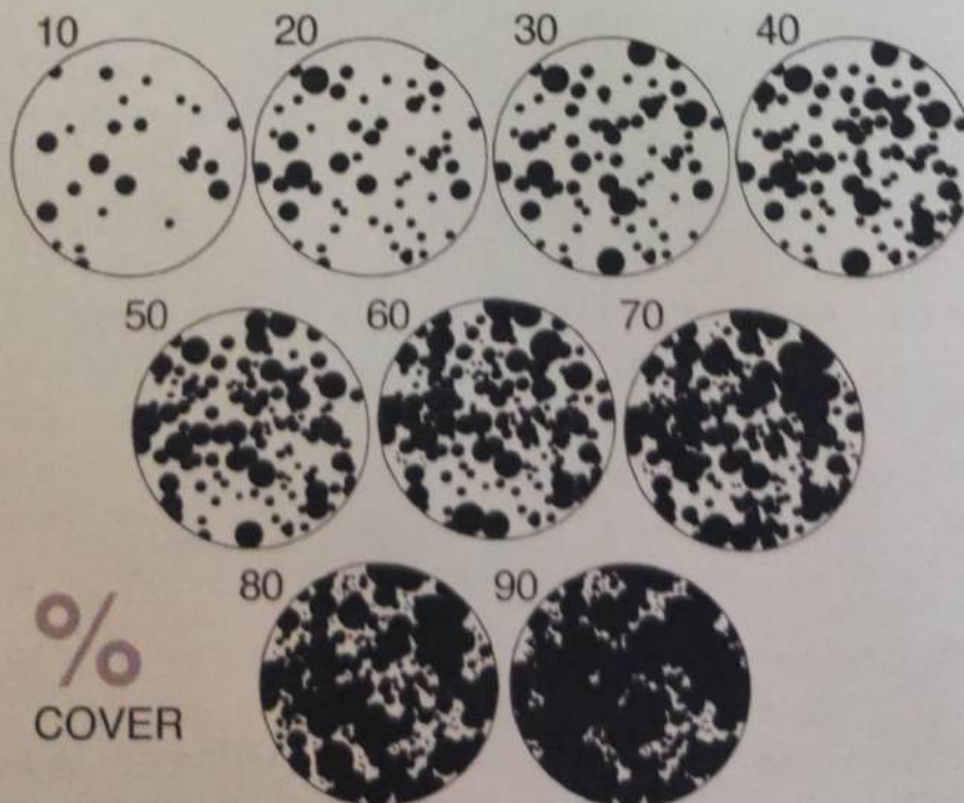
Conservation recommendations and other comments: _____

Myossum may be becoming more dominant

Notes on ground disturbances:

1. Animal digging - Applies to mounds/piles of soil deposited by a digging animal, and/or burrow holes. These can be recent or old (can note age in notes).
2. Wildlife tracks - Applies to animal tracks in the plot other than dog. In some cases the tracks may be too ill defined to allow confident species identification (see #4).
3. Dog tracks - Applies to dog prints in the plot.
4. Animal tracks of uncertain origin: Applies to divots or other depressions likely caused by an animal, but too ill defined for confident identification.
5. Non-motorized recreation - Applies to footprints or bicycle tracks in the plot.
6. Trail - Applies to pathways used by people, whether maintained or not.
7. Motorized recreation - Applies to tracks or other disturbances caused by ATVs or motorcycles.
8. Wildfire - Applies to plot areas with evidence of past wildfire such as burned shrub skeletons.
9. Weed invasion - Applies to situations where non-native weedy species are abundant and appear to be overwhelming the native vegetation.

Example of percent cover in 10% Increments:



Aase's Onion Monitoring in the Boise Area Foothills

Location Hillside to Hollow
 Plot # AA-24 Date April 9, 2024 Observer(s) Jan Reed, Dondi Black
 Plot Center GPS coordinates 43.65514, -116.219833 GPS Datum _____

Photograph notes (0, 90, 180, 270 degrees from plot center at minimum. Additional photos to show plot relocation, plant species, disturbances, and other special features as needed): 0°, 90°, 180°, 270°, Burrows, AA individuals
doesn't match previous photos exactly; animal burrows

If counted, total # of Aase's onion plants in plot 17 Otherwise, estimated number of individuals: 1-10; 11-50; 51-100; 101-200; 201-300; 301-500; 501-1000; 1001-2000; 2001-5000; 5001-10,000; >10,000.

Comments on Abundance (distribution, density, etc.) more down slope (20) of plot
sparse

Aspect 238 Slope 8° Substrate coarse sand

List all shrubs species in the plot and their estimated canopy cover in the plot using the following cover (abundance) categories: >50% 25-50% 10-25% 1-10% <1%: ericameria nanuka 25-50%

Estimated Total Shrub Cover: >50% 25-50% 10-25% 1-10% <1% (circle one)

List all native bunchgrass species and their associated canopy cover (abundance) using the same categories for shrubs: Aristida purpurea 10-25, Poa secunda 10-25, ~~Poa bulbosa~~, ~~Elymus sp.~~ 10-25

Estimated Total Native Bunchgrass Cover: >50% 25-50% 10-25% 1-10% <1% (circle one)

List all weed species and their estimated abundance using the following categories: Trace = only a few individuals, easy to overlook; Sparse = spotty and perhaps not seen at first glance, but unlikely to overlook in careful observation; Scattered = widespread, somewhat common, and not overlooked in careful observation; Common = frequent and widespread, obvious at first glance; Dominant = very abundant, a community dominant. If >12 weed species, list others on back of page.

<u>Erodium cicutarium Dominant</u>	<u>Centauria cyanus trace</u>
<u>Lepidium pectinatum Common</u>	<u>Trigonotis dubius trace</u>
<u>Geranium cheale common</u>	
<u>Poa bulbosa Common</u>	
<u>Bromus tectorum Dominant</u>	
<u>Chondrilla juncea Common</u>	

List the 6 most common native forb species and their estimated abundance using the above weed species categories; list additional native species on back of page if confident of identification.

<u>Phacelia hastata sparse</u>	<u>Eriogonum strictum Scattered</u>
<u>Lithophragma sparse</u>	
<u>Arnica montana Common</u>	

Circle each disturbance factor present and its estimated abundance using the same categories as for weed species:

Animal digging ☒ Wildlife tracks _____ Dog tracks ☒ Animal tracks of uncertain origin _____
Non-motorized recreation _____ Trails ☒ Motorized recreation _____ Weed invasion ☒ Wildfire _____
Other _____

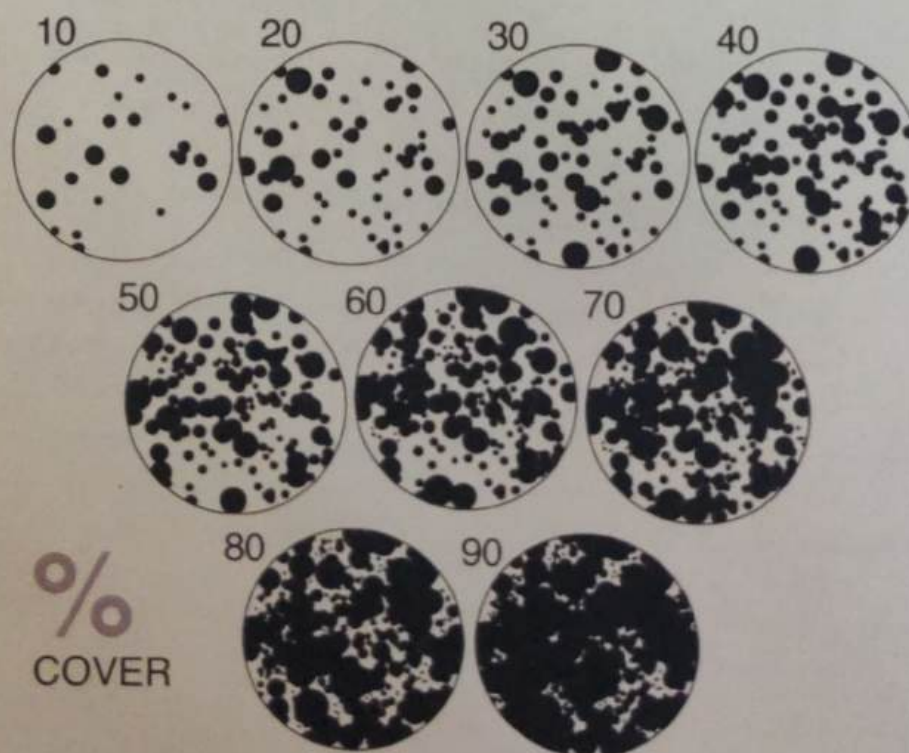
Additional disturbance details (e.g., magnitude, extent): sooner activity seems to have increased since last time. lots of dogs went by us and into plot.

Conservation recommendations and other comments: Site is highly disturbed, but not sure what can be done in this location. There seem to be a lot more rabbit brush than in the plots.

Notes on ground disturbances:

1. Animal digging - Applies to mounds/piles of soil deposited by a digging animal, and/or burrow holes. These can be recent or old (can note age in notes).
2. Wildlife tracks - Applies to animal tracks in the plot other than dog. In some cases the tracks may be too ill defined to allow confident species identification (see #4).
3. Dog tracks - Applies to dog prints in the plot.
4. Animal tracks of uncertain origin: Applies to divots or other depressions likely caused by an animal, but too ill defined for confident identification.
5. Non-motorized recreation - Applies to footprints or bicycle tracks in the plot.
6. Trail - Applies to pathways used by people, whether maintained or not.
7. Motorized recreation - Applies to tracks or other disturbances caused by ATVs or motorcycles.
8. Wildfire - Applies to plot areas with evidence of past wildfire such as burned shrub skeletons.
9. Weed invasion - Applies to situations where non-native weedy species are abundant and appear to be overwhelming the native vegetation.

Example of percent cover in 10% Increments:



Aase's Onion Monitoring in the Boise Area Foothills

Location Hillside to Hollow Reserve
 Plot # AA-25 Date April 9, 2024 Observer(s) Jan Reed + Dondi Black
 Plot Center GPS coordinates 43.65292 -114.215917 GPS Datum _____

Photograph notes (0, 90, 180, 270 degrees from plot center at minimum. Additional photos to show plot relocation, plant species, disturbances, and other special features as needed): 0, 90, 180, 270° from plot center
onion close up

If counted, total # of Aase's onion plants in plot _____ Otherwise, estimated number of individuals: 1-10; 11-50; 51-100; 101-200; 201-300; 301-500; 501-1000; 1001-2000; 2001-5000; 5001-10,000; >10,000.

Comments on Abundance (distribution, density, etc.) pretty abundant in open areas
highly sandy soils ≈ 12 per m²

Aspect 160° Slope 18° Substrate coarse sand

List all shrubs species in the plot and their estimated canopy cover in the plot using the following cover (abundance) categories: >50% 25-50% 10-25% 1-10% <1%:
Ericameria namensis 10-25
Antennaria tridentata 1-10

Estimated Total Shrub Cover: >50% 25-50% 10-25% 1-10% <1% (circle one)

List all native bunchgrass species and their associated canopy cover (abundance) using the same categories for shrubs:
Aristida purpurea 25-50
Poa bulbosa 1-10

Estimated Total Native Bunchgrass Cover: >50% 25-50% 10-25% 1-10% <1% (circle one)

List all weed species and their estimated abundance using the following categories: Trace = only a few individuals, easy to overlook; Sparse = spotty and perhaps not seen at first glance, but unlikely to overlook in careful observation; Scattered = widespread, somewhat common, and not overlooked in careful observation; Common = frequent and widespread, obvious at first glance; Dominant = very abundant, a community dominant. If >12 weed species, list others on back of page.

Bromus tectorum common
Poa bulbosa common
Alyssum desertorum common
Erodium cicutarium Scattered common
Chondrilla juncea Scattered

List the 6 most common native forb species and their estimated abundance using the above weed species categories; list additional native species on back of page if confident of identification.

Lomatium triternatum Scattered Astragalus purshii
Phacelia hastata Scattered Oenothera sp.
Ratibida pinnatifida Scattered Eriogonum

Circle each disturbance factor present and its estimated abundance using the same categories as for weed species:

Animal digging ✓ Wildlife tracks _____ Dog tracks ✓ Animal tracks of uncertain origin _____
Non-motorized recreation _____ Trails ✗ Motorized recreation _____ Weed invasion ✓ Wildfire _____
Other Badger den?

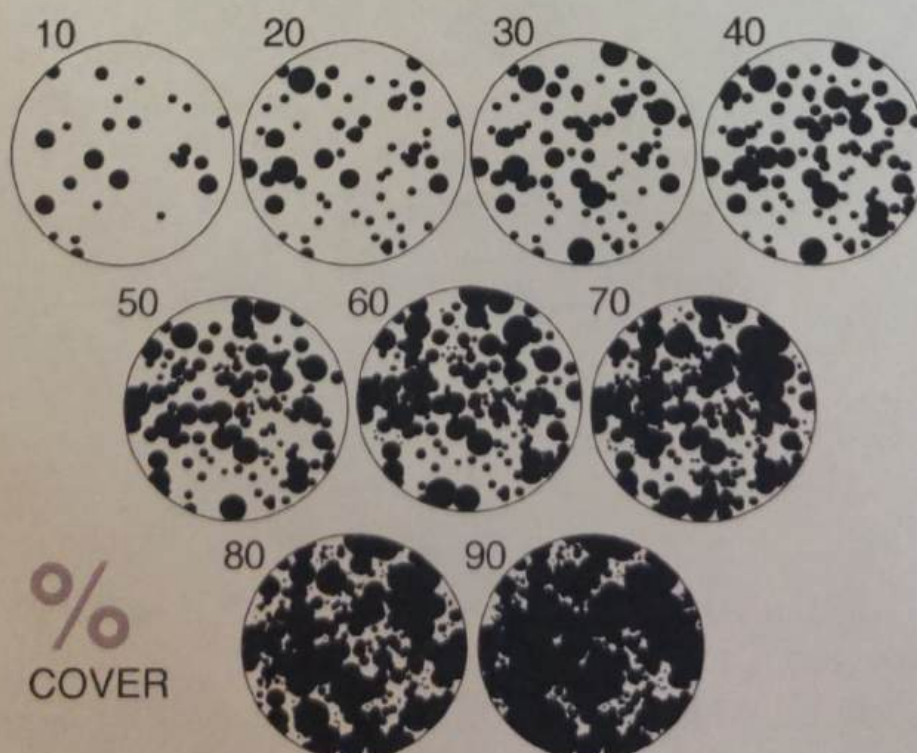
Additional disturbance details (e.g., magnitude, extent): not terribly disturbed, trail is not actually in plot

Conservation recommendations and other comments: _____

Notes on ground disturbances:

1. Animal digging - Applies to mounds/piles of soil deposited by a digging animal, and/or burrow holes. These can be recent or old (can note age in notes).
2. Wildlife tracks - Applies to animal tracks in the plot other than dog. In some cases the tracks may be too ill defined to allow confident species identification (see #4).
3. Dog tracks - Applies to dog prints in the plot.
4. Animal tracks of uncertain origin: Applies to divots or other depressions likely caused by an animal, but too ill defined for confident identification.
5. Non-motorized recreation - Applies to footprints or bicycle tracks in the plot.
6. Trail - Applies to pathways used by people, whether maintained or not.
7. Motorized recreation - Applies to tracks or other disturbances caused by ATVs or motorcycles.
8. Wildfire - Applies to plot areas with evidence of past wildfire such as burned shrub skeletons.
9. Weed invasion - Applies to situations where non-native weedy species are abundant and appear to be overwhelming the native vegetation.

Example of percent cover in 10% Increments:



Aase's Onion Monitoring in the Boise Area Foothills

Location Hillside to Hollow Reserve

Plot # AA-26 Date April 9, 2024 Observer(s) Jan Reed + Dondi Black

Plot Center GPS coordinates 43.65428, -116.218417 GPS Datum _____

Photograph notes (0, 90, 180, 270 degrees from plot center at minimum. Additional photos to show plot relocation, plant species, disturbances, and other special features as needed): 0, 90, 180, 270 degrees from plot center

If counted, total # of Aase's onion plants in plot _____ Otherwise, estimated number of individuals: 1-10; 11-50; 51-100; 101-200; 201-300; 301-500; 501-1000; 1001-2000; 2001-5000; 5001-10,000; >10,000.

Comments on Abundance (distribution, density, etc.) Same holes as last year re: distribution

Aspect 270° Slope 18° Substrate Sandy with a loamy component, corfeat surface

List all shrubs species in the plot and their estimated canopy cover in the plot using the following cover (abundance) categories: >50% 25-50% 10-25% 1-10% <1%: _____

Ericameria nanseosa

Estimated Total Shrub Cover: >50% 25-50% 10-25% 1-10% <1% (circle one)

List all native bunchgrass species and their associated canopy cover (abundance) using the same categories for shrubs:

Archidiza purpurea 25-50%

Poa secunda 10-25

Pseudoroegneria spicata 1-10%

Estimated Total Native Bunchgrass Cover: >50% 25-50% 10-25% 1-10% <1% (circle one)

List all weed species and their estimated abundance using the following categories: Trace = only a few individuals, easy to overlook; Sparse = spotty and perhaps not seen at first glance, but unlikely to overlook in careful observation; Scattered = widespread, somewhat common, and not overlooked in careful observation; Common = frequent and widespread, obvious at first glance; Dominant = very abundant, a community dominant. If >12 weed species, list others on back of page.

Bromus tectorum Sparse

Monarda punctata Sparse

Prossum desertorum ~~Scattered~~ common increasing

Erodium cicutarium Common

List the 6 most common native forb species and their estimated abundance using the above weed species categories; list additional native species on back of page if confident of identification.

Achillea millefolium Scattered

Crepis sp. annua Scattered

Eriogonum strictum scattered

Balsamorhiza hirsuta common

Phacelia verna trace

Lamium strictum trace

Circle each disturbance factor present and its estimated abundance using the same categories as for weed species:

Animal digging _____ Wildlife tracks 2 Dog tracks _____ Animal tracks of uncertain origin _____
Non-motorized recreation _____ Trails _____ Motorized recreation _____ Weed invasion _____ Wildfire _____
Other _____

Additional disturbance details (e.g., magnitude, extent): _____

not too very disturbed, deer tracks

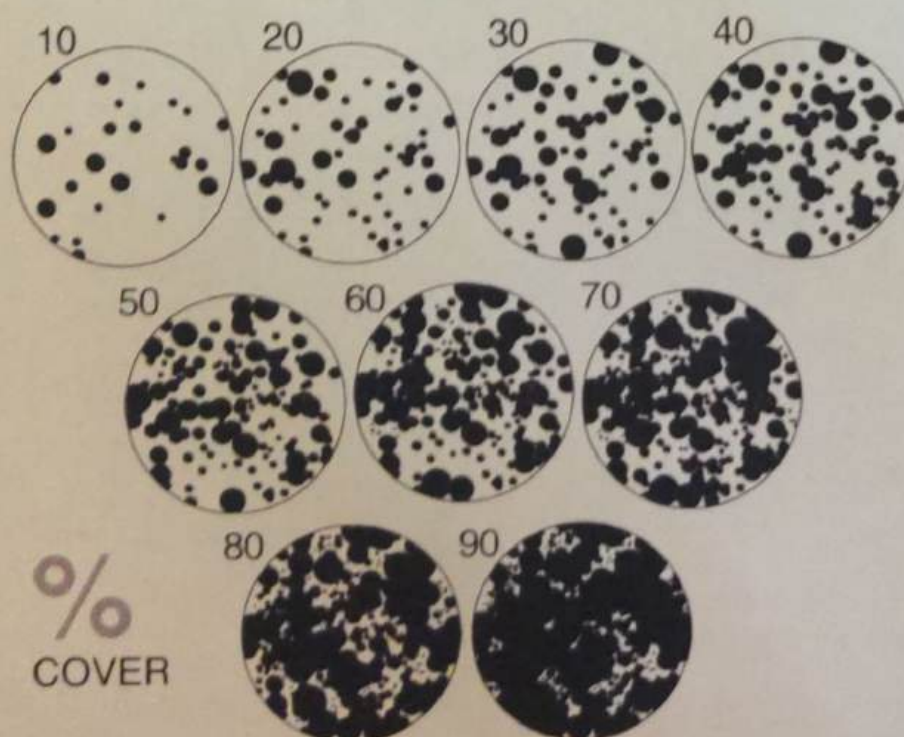
Conservation recommendations and other comments: _____

Alyssum desertorum is increasing, pretty nice otherwise

Notes on ground disturbances:

1. Animal digging - Applies to mounds/piles of soil deposited by a digging animal, and/or burrow holes. These can be recent or old (can note age in notes).
2. Wildlife tracks - Applies to animal tracks in the plot other than dog. In some cases the tracks may be too ill defined to allow confident species identification (see #4).
3. Dog tracks - Applies to dog prints in the plot.
4. Animal tracks of uncertain origin: Applies to divots or other depressions likely caused by an animal, but too ill defined for confident identification.
5. Non-motorized recreation - Applies to footprints or bicycle tracks in the plot.
6. Trail - Applies to pathways used by people, whether maintained or not.
7. Motorized recreation - Applies to tracks or other disturbances caused by ATVs or motorcycles.
8. Wildfire - Applies to plot areas with evidence of past wildfire such as burned shrub skeletons.
9. Weed invasion - Applies to situations where non-native weedy species are abundant and appear to be overwhelming the native vegetation.

Example of percent cover in 10% Increments:



Appendix 3

Comments and notes recorded on field data forms, 2021 and 2024.

AA-1 (Military Reserve)

2021

Abundance comments for Aase's onion: Counted 20 Aase's onion plants, maybe more; mostly near center of plot.

Disturbance comments: Some pocket gopher digging, but not abundant.

General comments: None.

2024

Abundance comments for Aase's onion: *Allium* leaves present but no flowers detected. May be too late in season?

Plant community comments: Bitterbrush = 10-15% cover

Disturbance comments: Cereal rye encroaching into site. Pockets of cereal rye common within site and near private property boundary. Sandy site is largely stabilized by invasive grasses. Russian thistle evidence on site - there is potential for this site to be taken over by Russian thistle.

General comments: Treat invasive grasses to open sandy pockets for the onion. Plot center on ant mound.

AA-2 (Military Reserve)

2021

Abundance comments for Aase's onion: Hard not to step on plants; more common in open spaces; distribution continues uphill of plot.

Disturbance comments: Sparse animal digging in plot.

General comments: None.

2024

Abundance comments for Aase's onion: Dense *Allium* population in open sandy locations all over steep slope.

Plant community comments: None.

Disturbance comments: Deer path through site

General comments: Very diverse site. Keep cheatgrass out. *Allium* dense and slope steep – may be hard to manage.

AA-3 (Military Reserve)

2021

Abundance comments for Aase's onion: Abundance closer to the lower end of the estimated 2000-3000 plants; distribution continues along slope to the north.

Disturbance comments: Sparse animal digging in plot.

General comments: Sparse animal digging in plot.

2024

Abundance comments for Aase's onion: *Allium* everywhere on the open slope, and extending upslope north and south to invaded flatlands. Too many onions to count, but not more than 3000.

Plant community comments: Sagebrush in plot = 1 shrub.

Disturbance comments: Weeds common, but rush skeletonweed not yet abundant at site. No cereal rye yet. Evidence of deer.

General comments: Still lots of open sand present. Consider spraying annual grasses?

AA-4 (Military Reserve)

2021

Abundance comments for Aase's onion: Plants most common in NE quadrant of plot; very sparse elsewhere. Plants continue upslope of plot but not much further downslope as weed density increases, especially medusahead.

Disturbance comments: Animal dig piles scattered but not common; 1 large burrow from fox or coyote. Deer tracks scattered throughout plot. No evidence of human use.

General comments: Total shrub canopy cover closer to 25% than 10%, with bitterbrush slightly <25% and gray rabbitbrush ca 1%. Threeawn cover closer to 10% than 25%. Medusahead is mostly limited to the lower 1/3rd of the plot except for a few small groupings further upslope. It is absent from the very uppermost part of the plot. Ranked "sparse" mainly due to its distribution, even though it is common in several small (few square meters) spots at downslope end of plot.

2024

Abundance comments for Aase's onion: Plants common on NE edge of plot but very sparse elsewhere. Difficult to assess *Allium* abundance due to late date of monitoring visit.

Plant community comments: Sandberg bluegrass present but few individuals. *Fritillaria pudica* present but past.

Disturbance comments: South portion of plot stabilized with invasive annual grasses.

Centaurea very common. Cereal rye in small patches. Large rodent mounds on south part of plot.

General comments: Weeds common; bulbous bluegrass may be increasing? Open areas have *Allium* – weeding?

AA-5 (Military Reserve)

2021

Abundance comments for Aase's onion: Plants at low density throughout plot with scattered individuals or small clusters. Most plant faded to light pink.

Disturbance comments: Animal dig piles and several collapsed burrows fairly common except in western half where more sparse to absent. Divots scattered but common in plot, perhaps deer or maybe some dog.

General comments: Difficulty estimating cheatgrass abundance because very small and without inflorescences. A poor year for this species at this site. The blue bachelor button also small and easy to overlook. Cereal rye limited to a few individuals. Threeawn more common than bluebunch wheatgrass except on westerly aspect segment of plot. Believe the forb with twin +/- succulent leaves (no flowers) is *Fritillaria pudica*. Total shrub cover much closer to 25% than 50%. Southwest aspect (210°) in central portion of plot, but switching to WSW (250°) on west end and SE (130°) on east end.

2024

Abundance comments for Aase's onion: *Allium* common across plot wherever open sandy soils present; low density but frequently found. Unable to count the onions but definitely >100.

Plant community comments: None.

Disturbance comments: Some deer tracks through site. Very limited animal digging. Annual grasses abundant.

General comments: Cereal rye invading the site; rush skeletonweed common; annual grasses encroaching site, seemingly coming upslope from trail.

AA-6 (Military Reserve)

2021

Abundance comments for Aase's onion: Plants mostly in southwest quadrant of plot

Disturbance comments: Weeds not very abundant except for rush skeletonweed. Animal digging on the mild side.

General comments: Recommend mechanical removal of rush skeletonweed. Plot is centered on ridge that runs in westerly direction.

2024

Abundance comments for Aase's onion: Only 9 flowering Aase's onion found – maybe more present? Onion leaves present but majority appear to be for *Allium acuminatum* (in bud). Aase's onion only in southwest corner of plot.

Plant community comments: None.

Disturbance comments: Plot on ridge. South-facing open with cheatgrass and rush skeletonweed common. North slope stabilized with bluebunch wheatgrass/shrubs/forbs. Several large dead bitterbrush present.

General comments: Aase's onion population challenging to assess - *Allium acuminatum* leaves also present.

Author's note: Rabbitbrush in plot recorded as *Chrysothamnus viscidiflorus* in 2024, but was identified as *Ericameria nauseosa* in 2021. Used *E. nauseosa* for purposes of this report.

AA-7 (Military Reserve)

2021

Abundance comments for Aase's onion: 1 robust plant and 2 others clustered next to trail above plot center.

Disturbance comments: Minor trail goes right thru plot – SE/NW.

General comments: Recommend weeding around Aase's onion plants and to consider fencing.

2024

Abundance comments for Aase's onion: No *Allium* detected.

Plant community comments: None

Disturbance comments: Two or three social trails through site. Heavily disturbed area due to dog/human traffic. Cheatgrass and cereal rye dominant. Donkey-tail spurge present.

General comments: Heavily disturbed, invaded site.

AA-8 (Military Reserve)

2021

Abundance comments for Aase's onion: Estimated 300-500, but closer to 500 plants. Abundant in patches (10 plants/ft²), but patches are scattered. Young plants not as apparent as in AA-2.

Disturbance comments: Medusahead becomes more abundant downslope of plot.

General comments: Ridge runs just W of S, gentle slope on ridge axis, but steep on either side. Bitterbrush cover closer to 10% than 25%.

2024

Abundance comments for Aase's onion: The *Allium* is past prime and difficult to identify. Should probably throw out my count.

Plant community comments: Bluebunch wheatgrass dense at edge of plot.

Disturbance comments: Medusahead rye very abundant.

General comments: None.

AA-9 (Camels Back Reserve)

2021

Abundance comments for Aase's onion: Very low density, seems to be barely hanging on at this site. Although 17 plants counted, likely more present, but <50 total for plot.

Disturbance comments: Animal digging common throughout plot. Popular trail passes along uphill edge of plot. No footprints seen in plot, but a few dog tracks at uphill edge near trail.

Vegetation dominated by cheatgrass and other weedy species.

General comments: We moved plot center approximately 25 ft. upslope from original center point coordinates to reduce percentage of plot on steeper portion of slope where likely to cause researcher disturbance. Doing this makes the upslope (north) edge of the plot coincide with the downhill edge of a popular hiking trail. This should help future monitoring visits verify the plot location and delineation. The Sandberg bluegrass estimated <1% cover, but some or all may really be bulbous bluegrass.

2024

Abundance comments for Aase's onion: Many *Allium* are within *Aristida* clumps. Few to no *Allium* plants in NE quadrant. First *Allium* detected within 20 feet of barrier fence.

Plant community comments: None.

Disturbance comments: Large gully through plot that comes off of hiking trail above plot. Weed invasion from below. Probably expansion, in particular for cereal rye. Gully probably gets deeper/wider each year.

General comments: Barrier fence and sign see to be working, but there are several rungs missing and should be replaced. Broken glass and cans present within site. We removed some but all.

Author's note: the large gully mentioned in the "disturbance comments" above for 2024 was located immediately outside (near western edge) the plot as established/sampled in 2021. Sampling in 2024 therefore did not exactly overlap the 2021 sample zone.

AA-10 (Hulls Gulch Reserve)

2021

Abundance comments for Aase's onion: Lowest numbers/density in SE quadrant of plot.

Cheatgrass also with highest density in upper half of plot.

Disturbance comments: Animal dens, pocket gopher activity, deer scat prevalent, especially on east slope.

General comments: Two bitterbrush seedlings in plot.

2024

Abundance comments for Aase's onion: Approximately 210 *Allium* counted (used 200-300 estimate). Majority of *Allium* in NE and SE side of plot; none in NW; generally distributed throughout plot.

Plant community comments: None.

Disturbance comments: Donkey-tail spurge has increased drastically in upper portion of plot, especially the NW quadrant. Not much human presence.

General comments: *Euphorbia* control is essential and should be done as soon as possible. Would need to spray post- *Allium* presence. Or possibly dig to remove, but this could cause a lot of impact to onion habitat unless done very cautiously. Extreme caution needed if digging *Euphorbia* due to caustic milky sap. If spray, come back in fall and carefully remove dead material.

AA-11 (Hulls Gulch Reserve)

2021

Abundance comments for Aase's onion: Upper half of plot has higher abundance; 90° - 180° lowest density.

Disturbance comments: Gopher activity; not as disturbed as other sites; is "safer" because located across a little draw.

General comments: None.

2024

Abundance comments for Aase's onion: Abundance maybe in the middle of 500 -1000 estimate, 700-800 plants. Did not feel comfortable counting plants due to potential trampling impact. Site still moist from recent big rain which reduced our impact. *Allium* in excellent flowering condition.

Plant community comments: Gray rabbitbrush just outside plot, especially to the south.

Disturbance comments: *Centaurea* is increasing – hand control prior to flowering is recommended; or spot spray? Best site so far for *Allium* and fewer weeds. No human impacts.

General comments: Good bit of moss in some areas. Dogs on leash please – saw so much running across habitat and digging.

AA-12 (Hulls Gulch Reserve)

2021

Abundance comments for Aase's onion: Uniform throughout plot.

Disturbance comments: Gopher activity; some dog and human trailing coming downslope towards the plot from the above, very prominent and widening of main ridge trail.

General comments: Squirreltail with 2 plants; annual fescue (*Vulpia* sp.) in plot.

2024

Abundance comments for Aase's onion: Abundance is closer to 500 for the 300-500 estimate. *Allium* most abundant in the SE and SW quadrants. The NW quadrant has the most invasives (rush skeletonweed, cheatgrass, storksbill) and the least *Allium*.

Plant community comments: None.

Disturbance comments: Very close to trail so potential for related disturbances.

General comments: Biocontrol for rush skeletonweed; consider treating *Centaurea* with spray when Aase's onion dormant.

AA-13 (Hulls Gulch Reserve)

2021

Abundance comments for Aase's onion: Abundance closer to 500 than 300 plants. Lowest density between; 90° - 180° due to gopher activity and invasive plant abundance, especially skeletonweed, blue bachelor button, and desert alyssum.

Disturbance comments: Abundant gopher activity, and dog and people activity trailing off the main trail.

General comments: A barrier of some sort is definitely needed at the switchback adjacent to this plot. People and dogs are coming out from the switchback into the Aase's onion population. The steep switchback is becoming a disaster area as people and dogs cut the switchback. We watched this happen repeatedly while sampling the plot. The area is becoming bare of vegetation. The *Lomatium* population and other plants are taking a huge hit. Sagebrush consist of 1 individual.

2024

Abundance comments for Aase's onion: Abundance possibly closer to 500 for the 300-500 estimate. Well distributed throughout the site, but especially in the more open, less invaded sandy areas.

Plant community comments: None.

Disturbance comments: Trail goes right through the site.

General comments: Hiking path goes right through the site and needs to be blocked and signage placed about the sensitive habitat.

AA-14 (Hulls Gulch Reserve)

2021

Abundance comments for Aase's onion: Aase's onion appeared to be more prevalent at first than when we counted plants. Majority of plants upslope of plot center.

Disturbance comments: Gophers fairly active in NE segment of plot, less so in other parts.

Minor deer trailing. No obvious dog, human, livestock trailing.

General comments: Invasive plants such as rush skeletonweed and blue batchlor button are prevalent and seem to be swallowing up the open sand required by Aase's onion.

2024

Abundance comments for Aase's onion: Between 50 and 100 *Allium* present just 3-10 meters beyond the plot's east edge.

Plant community comments: Bitterbrush are large and old.

Disturbance comments: Deer trailing very abundant due to very good cover of bitterbrush.

Digging by gophers and possibly other rodents.

General comments: Introduce rush skeletonweed biocontrol. *Centaurea* is pretty out of control – not sure what can be done.

AA-15 (Hulls Gulch Reserve)

2021

Abundance comments for Aase's onion: Lower density in downhill half of plot, with lowest density in SE quadrant. Highest density between 270° - 90°.

Disturbance comments: Gopher activity prevalent. Some other type of digging also present, but minimal.

General comments: None.

2024

Abundance comments for Aase's onion: Highest density is around plot center. Abundance closer to 500 for the 300-500 estimate.

Plant community comments: None.

Disturbance comments: Animal digging at surface at two locations. No sign that humans or dogs have been on site.

General comments: Some of the bitterbrush are quite tall; a nice stand. Biocontrol for rush skeletonweed and possibly spray *Centaurea* as it is not really common and would be nice to keep it that way.

AA-17 (Polecat Reserve)

2021

Abundance comments for Aase's onion: Low density throughout plot; at least 75% of Aase's onion confined to upper half of plot. The downhill 2-3 meters steeper than the rest of the plot and lacking Aase's onion. Although Aase's onion sparse, there appears more of it in the plot area than anywhere else in the general vicinity. Observed insect visiting Aase's onion flowers.

Disturbance comments: Old and more recent animal dig piles common in plot. Deer tracks somewhat common. Rush skeletonweed common with numerous 2021 rosettes. Cheatgrass sparse in most of plot, but dense along downslope edge.

General comments: Plot center moved downslope of original center point coordinates. Located upslope of junction of Polecat Loop Trail and road to tennants house. Plot is a moderately steep south, lower-facing slope with weedy vegetation and reduced threeawn cover compared to better condition habitat elsewhere in Polecat Reserve. Bitterbrush cover is higher upslope of plot on other side of fenceline. Bitterbrush and gray rabbitbrush canopy cover both estimated to be approximately 5%, with both species confined to the lower 1/3rd of the plot. Threeawn cover no more than 5%, and Sandberg bluegrass cover <1% in plot.

2024

Abundance comments for Aase's onion: *Allium* sparse with most in uphill half of plot; very few at downhill end. Scattered individuals or small clusters of 2-3 plants. Flowers starting to fade color, barely pink.

Plant community comments: Bitterbrush 1-10% cover category, estimated to be no more than 5% cover. Rabbitbrush 1-10% cover category, estimated to be <3%. Threeawn 1-10%, estimated to be closer to 1%.

Disturbance comments: Animal dig mounds common, especially in downhill half of plot; one hole about 1 foot in diameter and deep (unsure of source). Majority of dig piles appear relatively recent. Deer trail near east margin of plot; deer tracks and droppings present but not common. Fenceline along uphill edge of plot.

General comments: Some moss crust present. Rush skeletonweed well established but less cheatgrass compared to AA-18 and AA-20. Probably not a priority conservation site due to weeds, sparse *Allium* and harsh south aspect.

AA-18 (Polecat Reserve)

2021

Abundance comments for Aase's onion: Density varies from roughly 5 – 25 plants/m², with average at approximately 15 plants/m². Plants most common in downslope 1/3rd of plot; scattered dense clumps, but also patches with few or no Aase's onion. Most Aase's onion flowers still pink, but some faded to white.

Disturbance comments: A few scattered, older animal dig piles and a least 1 old collapsed burrow. Deer tracks common. Site probably receives few to no regular human visitors.

General comments: Moved location of plot approximately 200 ft. WNW from original center point coordinates, to an area with more Aase's onion. The onion was very sparse at original coordinates. The plot is an open slope dominated by threeawn with bitterbrush more common to the north and west. A clump of rush skeletonweed close to plot center, otherwise only a few scattered individuals; but more common upslope of plot. Cheatgrass widespread but no dense patches, with <10% cover overall (probably <5%) this year. Aase's onion seems to be most sparse where redstem storksbill is most dense. Bitterbrush canopy cover estimated to be 5%. Threeawn cover 20+%. Needle-and-thread grass probably <1% cover. Except for Aase's onion, all forbs occur at trace cover. Lots of Aase's onion observed while walking from AA-20 to AA-18.

2024

Abundance comments for Aase's onion: *Allium* consist of scattered individuals and small groups of 2-10 plants - more abundant in west half of plot than east half, but pretty equally distributed between uphill and downhill halves. Recent heavy rains pressed some plants into the ground.

Plant community comments: Bitterbrush confined to NW margin of plot. Gray rabbitbrush cover from 2 shrubs, one barely alive.

Disturbance comments: Recent animal dig piles sparse but old remnant common. Scattered deer tracks and droppings; plus a minor deer trail.

General comments: Rush skeletonweed well established but not as abundant as some places seen enroute to the plot. Many/most of the threeawn clumps appear dead, but canopy estimate based on assumption they are alive. Small/younger individuals fairly common, however, some of these small clumps may be *Hesperostipa* not just threeawn.

AA-19 (Polecat Reserve)

2021

Abundance comments for Aase's onion: Plants approximately 3x more common above than below trail. Trail bisects plot, a few plants along the trail edge. Visually estimated roughly 3000 Aase's onion for the plot, but took five 1m² samples above and then below the trail. Average for entire plot calculated to approximately 6000 plants, which was recorded on data sheet.

Disturbance comments: Only a few (<5) animal dig piles; scattered deer and dog tracks, although many divots unsure if wildlife or dog. Footprints rare off-trail.

General comments: Quick Draw Trail bisects plot into lower and upper halves. Plot center placed at downslope edge of trail. The trail runs east-west thru the plot. Low plant species diversity overall. Bitterbrush common upslope of plot. Rush skeletonweed abundant east and west of plot. No real evidence of off-trail traffic from hikers or bicycles, only from some dogs. All forbs not included in the list of 4 most common forb species for plot found at trace cover. Rabbitbrush cover approaching 15%. Bitterbrush limited to 1 large shrub with approximately 3% canopy cover. Sagebrush cover approximately 1%. Squirreltail and Sandberg bluegrass both with cover <1%.

2024

Abundance comments for Aase's onion: Becky counted 1922 *Allium* but knows she missed many due to faded flowers on many plants making the plants harder to see; also some plants detached or buried. Estimate of 2000-5000 accounts for this. *Allium* estimated to be 3-times more common above than below the trail.

Plant community comments: Bitterbrush cover related to one large shrub that has 2-3% cover. Rabbitbrush 10-25% cover category, estimated to be <20%. Sagebrush 1-10% cover category estimated to be 1-2%. Sandberg bluegrass 1-10% cover category much closer to 1% than 10%.

Disturbance comments: Animal dig mounds common and appear to be both old and relatively recent; some large. Deer tracks few. Footprints and bike tread not observed in plot; a few small divots in plot perhaps old dog tracks.

General comments: People seem to stay on the trail that bisects the plot

AA-20 (Polecat Reserve)

2021

Abundance comments for Aase's onion: Variable density, with Aase's onion most dense in upper and central parts of plot; decreasing as approach the north and south ends of plot where aspect shifts to east versus southeast. Estimated 25 plants/m² in many places.

Disturbance comments: Deer tracks common in plot, which is bisected by a very minor wildlife path. Several animal dig piles. This plot location probably sees very little human visitation. May be some elk tracks mixed in with the deer tracks.

General comments: Most of plot is an open SE-facing mid-slope dominated by threeawn. The northern and southern edges of the plot slip onto the adjoining eastern aspect with much less, or in spots, no Aase's onion. Rush skeletonweed scattered in plot, but abundant in the minor drainage pathway along south margin of plot. Cheatgrass also common in this pathway, and in dense patches beneath bitterbrush. Much less dense on the open slope. Bitterbrush cover approximately 15%, confined to eastern and downhill (southern) parts of plot, and averaging

approximately 6 ft. tall. Total bunchgrass cover close to 25%. All forbs not included in the list of 4 most common forb species in plot found at trace cover.

2024

Abundance comments for Aase's onion: *Allium* more or less evenly distributed in plot except sparse along south margin and absent from north edge. Scattered individuals but more commonly in clusters of 2-10 plants. Most flowers still pink, but some faded. Counted 1560 *Allium* in plot, so estimate of 1000-2000 chosen.

Plant community comments: Bitterbrush mostly in downslope half of plot. Bluebunch wheatgrass 1-10% cover category estimated to be <3%.

Disturbance comments: Minor deer trail bisects plot; scattered deer tracks and droppings present in plot. Remnant old animal dig piles barely discernable and uncommon; more recent mounds restricted to southern edge of plot in and adjacent to minor draw. No human sign.

General comments: Moss crust fairly common.

AA-21 (Polecat Reserve; new plot established in 2024)

2024

Abundance comments for Aase's onion: Beautiful, dense *Allium* population; more abundant in upper half of plot but overall fairly even distribution. Flowers still pink. Numerous plants with leaves but no flowers (these included in the census abundance estimate for the plot).

Plant community comments: Sandberg bluegrass 1-10% cover category much closer to 1% than 10%.

Disturbance comments: Site is largely undisturbed; scattered old divots likely represent old deer tracks. No animal digging; no evidence of human disturbance except for a minor user-created trail along ridgecrest marking upslope edge of plot.

General comments: Plot is away from any official trail – keep it that way. Occasional equestrian use on ridgecrest. Rush skeletonweed well established but with much denser population in nearby draw bottom. Very nice moss/lichen crust in places.

AA-22 (Polecat Reserve; new plot established in 2024)

2024

Abundance comments for Aase's onion: Estimate of 500-1000 *Allium* based on counting approximately 800 plants. *Allium* about 3-times more common in upslope half compared to downslope half. Mostly scattered individuals with some clumps of up to 5-10 plants.

Plant community comments: Bitterbrush 10-25% cover category estimated to be closer to 25%. Rabbitbrush 1-10% cover category estimated to be barely more than 1%.

Disturbance comments: Popular trail bisects plot in half. Limited animal digging. Footprint remnants throughout lower half of plot (below trail), but rare/scattered above. Scattered small divots in plot could be from dog or deer. Some deer droppings in plot. Multiple cigarette butts in downhill end of plot.

General comments: Slope prone to erosion, slumping. Somehow minimize people walking across the erosive slope – use signage?

AA-23 (Hillside to Hollow Reserve)

2021

Abundance comments for Aase's onion: Estimated abundance closer to 2000 than 1000 plants. Fairly consistent density with average near 10 plants/m²; however, some areas with sparse Aase's onion mixed with clumps of higher density.

Disturbance comments: Animal dig mounds common in west and uphill parts of plot but minimal elsewhere. One burrow in the plot. Scattered deer tracks, but a lot of them. Some divots cannot

differentiate/identify, so perhaps not all from wildlife. No footprints, but few pieces of litter (beer can, broken glass) present.

General comments: Plot is an open, southerly-facing upper slope dominated by threeawn; with lots of redstem stroksbill and desert alyssum. Aase's onion is the most abundant and widespread native forb. Biotic crust is common. Rush skeletonweed rated "sparse", but approaching a more "scattered" distribution. Cheatgrass plants all small and without inflorescences, making it relatively difficult to judge abundance – a situation similar to other plots this year. Unsure of the origin of a hole used to reference plot center - perhaps human, not animal. A Ridge to Rivers revegetation effort in place near plot marked with a barrier fence and sign. Total shrub cover approximately 5%. Total bunchgrass cover no more than 30%.

2024

Abundance comments for Aase's onion: Abundance on the higher end of the 500-1000 estimated plants.

Plant community comments: None.

Disturbance comments: Mounds common on downslope side. Desert alyssum may be becoming more dominant.

General comments: Biotic crust common throughout.

AA-24 (Hillside to Hollow Reserve)

2021

Abundance comments for Aase's onion: Low density overall, with no large clusters of plants. Aase's onion more common in east half compared to west half of plot.

Disturbance comments: Scattered animal dig piles more abundant in west half of plot. Buena Vista Trail close to north edge of plot, but <5 footprints and no bicycle tracks observed directly in plot. A few dog feces in plot.

General comments: Rush skeletonweed far and away the most common forb in the plot, but not really dominant abundance. Other weed species noted in plot, but not among the 8 listed on the data sheet include spring whitlow grass (common), desert alyssum (sparse), jagged chickweed (sparse). Gray rabbitbrush cover 20-25%. Total bunchgrass cover right around 25%. Difficult to consistently distinguish Sandberg bluegrass from bulbous bluegrass (perhaps all bulbous bluegrass) due to lack of inflorescences.

2024

Abundance comments for Aase's onion: Twenty more *Allium* downslope of plot; sparse.

Plant community comments: None.

Disturbance comments: Gopher activity seems to have increased compared to 2021. Lots of dogs went by us and into plot.

General comments: Site is highly disturbed, but not sure what can be done about it in this location. There seems to be a lot more rabbitbrush than in 2021 photos.

AA-25 (Hillside to Hollow Reserve)

2021

Abundance comments for Aase's onion: Plants throughout plot but more dense in uphill portion; some large-sized flowering heads. Aase's onion is the most common native forb in the plot. Plants beginning to fade color.

Disturbance comments: Trail (Kemper Ridge?) located approximately 5 meters north of uphill edge of plot. Minimal (sparse) animal digging disturbance. Some scattered small divots most likely from deer, but perhaps some dog too. Clear footprints of bicycle tracks absent from plot, although trail close by.

General comments: Total shrub cover does not exceed 15%, a single small horsebrush (*Tetradymia canescens*) present in plot. Sandberg bluegrass cover <1%, but difficult to consistently distinguish from bulbous bluegrass which is common. Red storksbill very common, but hard to rate as a community dominant due to its small size. Forbs not included in the 4 most common all with only trace cover.

2024

Abundance comments for Aase's onion: Pretty abundant in open area with estimated abundance of 12 plants/m².

Plant community comments: None.

Disturbance comments: Not terribly disturbed. Trail is near but not in plot.

General comments: Highly sandy soil.

AA-26 (Hillside to Hollow Reserve)

2021

Abundance comments for Aase's onion: Fairly consistent density, but with scattered more dense or less dense patches. Plants mostly still bright pink color.

Disturbance comments: Scattered deer tracks in plot. No sign of recent human activity/disturbance.

General comments: This plot supports relatively good condition vegetation with only sparse cheatgrass and other weed species. Upper (or upper part of mid-slope) position, west aspect except for near southern end which angles to a southwest aspect. The southwest-facing section has more threeawn and little/no bluebunch wheatgrass. It is also the only part of plot with desert alyssum and red storksbill, but neither common. No sign of recent human or dog disturbance. Total shrub cover closer to 25% than 50%; total bunchgrass cover approximately 25%. Rush skeletonweed limited to 2 skeletons in plot and only very widely scattered in general area.

2024

Abundance comments for Aase's onion: Same distribution comments as in 2021.

Plant community comments: None.

Disturbance comments: Not very disturbed; some deer tracks.

General comments: Desert alyssum increasing, but pretty nice otherwise.

Appendix 4

Native forb and non-native weedy forb species in Aase's onion monitoring plots, 2021 and 2024.

Native forb species in Aase's onion monitoring plots, 2021 and 2024.
x = present in either 2021 or 2024; **X** = present in both 2021 and 2024

	AA-1	AA-2	AA-3	AA-4	AA-5	AA-6	AA-7	AA-8	AA-9	AA-10	AA-11	AA-12	AA-13	AA-14	AA-15	AA-17	AA-18	AA-19	AA-20	AA-21	AA-22	AA-23	AA-24	AA-25	AA-26
Achmil	x	X	x	X	X	X	X	X		X	X		X	X	X					x		X	X		X
Alilep															X						x				
Allacu				x	x	x	x																		
Amsinc	x	x	x									x		x	x	X	X	X	X		x				
Astpur								X				x						x	X		x			x	
Balsag	X	x	X	X	X	x	x		X										X			X		X	X
Caulan																					x				
Caloch				x							x	x		X	x				x						x
Chadou		x		x	x																x	x			
Claper																	x				x				
Colpar		x																							
Colgra					x																				
Comumb	x	x	x		X		x																		
Crepis						x								x							x	x		x	X
Descur																	X		x		x				
Diecan	x	x		X	x	x			x				X	x										x	
Epibra					X		x	x						x	X			X	x	x		x		x	x
Eripum																								x	
Eriova	X	X	x			x																			
Eriogo																X	x				x	x			
Eristr											x					X	X		X	x	x	X	X	X	X
Erilan		x		X																					
Fripud			x	x	X								x												
Galapa														x				x	x		x				
Litgla																			X				X		
Litrud			x																						
Lomsim					X	X		X			x	X							X	x		x		X	X
Micgra															X				x						
Oenoth																								x	
Phahas	x	X	X	X	X		x	x	X	X	X	X	X	X	X		X		X		x	X	X	X	X
Phalin			x			x																			
Phllon						x		X				x													
Platen		x	x								X							X	X		x				x
Plemac		x																							
Trigra	x	x	X	X	X	x	X	x	X		X	X	X	X	X										
Thycur		x	x					x					x	x		x		x	X	x	x				

Achmil = Achillea millefolium, Alilep = Aliciella leptomeria, Allacu = Allium acuminatum, Amsinc= Amsinckia sp.,
Astpur = Astragalus purshii, Balsag = Balsamorhiza sagittata, Caulan = Caulanthus sp., Coloch = Calochortus sp.,
Chadou = Chaenactis douglassii, Claper = Claytonia perfoliata, Colpar = Collinsia parviflora,
Colgra = Collomia grandiflora, Comumb = Comandra umbellata, Crepis = Crepis sp., Descur = Descurainia sp.,
Diecan = Dieteria canescens, Epibra = Epilobium brachycarpum, Eripum = Erigeron pumilus,

Eriova = *Eriogonum ovalifolium*, Eriogo = *Eriogonum* sp. (annual), Eistr = *Eriogonum strictum*,
 Erilan = *Eriophyllum lanatum*, Fripud = *Fritillaria pudica*, Galapa = *Galium aparine*, Litgla = *Lithophragma glabrum*,
 Litrud = *Lithospermum ruderae*, Lomsim = *Lomatium simplex*, Micgra = *Microsteris gracilis*, Oenoth = *Oenothera* sp.,
 Phahas = *Phacelia hastata*, Phalin = *Phacelia linearis*, Phllon = *Phlox longifolia*, Platen = *Plagiobothrys tenellus*,
 Plemac = *Plectritis macrocera*, Trigma = *Tritelia grandiflora*, Thycur = *Thysanocarpus curvipes*

Non-native weed species in Aase's onion monitoring plots, 2021 and 2024.

x = present in either 2021 or 2024; **X** = present in both 2021 and 2024.

	AA-1	AA-2	AA-3	AA-4	AA-5	AA-6	AA-7	AA-8	AA-9	AA-10	AA-11	AA-12	AA-13	AA-14	AA-15	AA-17	AA-18	AA-19	AA-20	AA-21	AA-22	AA-23	AA-24	AA-25	AA-26
Alydes	x	x	X	X	X	x		X	X	X	x	X	X	X	X	X	X	X	X	x	x	X	x	X	X
Antcau														x											
Brotec	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	x	x	X	X	X	X
Cencya	X		x	X	X	X	X	X	X	X	X	X	X	X	X								X		
Chojun	X	x	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	x	x	X	X	X	X
Dessop		x	x	x	x																				
Erocic	x	x	X	X	x	x	x	X	X	X	X	X	X	x	X	X	X	X	X		x	X	X	X	X
Eupmry							X			x															
Holumb					x						X		x		X	x	X	x	x	x					
Lacser						x												x							x
Lepper																							x		
Poabul	x	x	x	X	X	x	X	x	X	X	X	X	X	x		X	x	X	x		x	x	X	X	x
Saltra	x						X		X																
Seccer	X			X	X		X		X										X				X		
Sisalt		X		x	x				X	x		X		X	X	x					x		x	x	
Taecap	X			X		X		X																	
Tradub	x			x	x	x				X	X							x			x		X		
Vulpia		x								x	x		x	x				x							

Alydes = *Alyssum desertorum*, Antcau = *Anthriscus caucalis*, Brotec = *Bromus tectorum*,
 Cencya = *Centaurea cyanus*, Chojun = *Chondrilla juncea*, Dessop = *Descurainia sophia*,
 Erocic = *Erodium cicutarium*, Eupmry = *Euphorbia myrsinites*, Holumb = *Holosteum umbellatum*
 Lacser = *Lactuca serriola*, Lepper = *Lepidium perfoliatum*, Poabul = *Poa bulbosa*, Saltra = *Salsola tragus*,
 Seccer = *Secale cereale*, Sisalt = *Sisymbrium altissimum*, Taecap = *Taeniatherum caput-medusae*,
 Tradub = *Tragopogon dubius*, Vulpia = non-native *Vulpia* sp.

Appendix 5

Aase's onion monitoring plot photographs.

Aase's Onion Monitoring Project – Boise Foothills, Military Reserve EO 6, Subpop “1”, 2024



Photo 1 Plot: AA-1 0 ° 4/17/2024



Photo 2 Plot: AA-1 90 ° 4/17/2024



Photo 3 Plot: AA-1 180 ° 4/17/2024



Photo 4 Plot: AA-1 270 ° 4/17/2024

Aase's Onion Monitoring Project – Boise Foothills, Military Reserve EO 12, Subpop “2”, 2024



Photo 5 Plot: AA-2 0 ° 4/19/2024



Photo 6 Plot: AA-2 90 ° 4/19/2024



Photo 7 Plot: AA-2 180 ° 4/19/2024



Photo 8 Plot: AA-2 270 ° 4/19/2024

Aase's Onion Monitoring Project – Boise Foothills, Military Reserve EO 12, Subpop “6”, 2024



Photo 9 Plot: AA-3 0 ° 4/19/2024



Photo 10 Plot: AA-3 90 ° 4/19/2024

Photo missing.



Photo 11 Plot: AA-3 180 ° 4/19/2024

Photo 12 Plot: AA-3 270 ° 4/19/2024

Aase's Onion Monitoring Project – Boise Foothills, Military Reserve EO 25, Subpop “2”, 2024



Photo 13 Plot: AA-4 0 ° 4/17/2024



Photo 14 Plot: AA-4 90 ° 4/17/2024



Photo 15 Plot: AA-4 180 ° 4/17/2024



Photo 16 Plot: AA-4 270 ° 4/17/2024

Aase's Onion Monitoring Project – Boise Foothills, Military Reserve EO 25, Subpop “2”, 2024



Photo 17 Plot: AA-4

4/17/2024

Animal digging at the plot.



Photo 18 Plot: AA-4

4/17/2024

Fritillaria pudica leaves. Flowers are past.

Aase's Onion Monitoring Project – Boise Foothills, Military Reserve EO 25, Subpop “5”, 2024



Photo 19 Plot: AA-5 0 ° 4/17/2024



Photo 20 Plot: AA-5 90 ° 4/17/2024



Photo 21 Plot: AA-5 180 ° 4/17/2024



Photo 22 Plot: AA-5 270 ° 4/17/2024

Aase's Onion Monitoring Project – Boise Foothills, Military Reserve EO 58, 2024



Photo 23 Plot: AA-6 0 ° 4/17/2024



Photo 24 Plot: AA-6 90 ° 4/17/2024



Photo 25 Plot: AA-6 180 ° 4/17/2024



Photo 26 Plot: AA-6 270 ° 4/17/2024

Aase's Onion Monitoring Project – Boise Foothills, Military Reserve EO 59, Subpop “2”, 2024



Photo 27 Plot: AA-7 0 ° 4/19/2024



Photo 28 Plot: AA-7 90 ° 4/19/2024



Photo 29 Plot: AA-7 180 ° 4/19/2024



Photo 30 Plot: AA-7 270 ° 4/19/2024

Aase's Onion Monitoring Project – Boise Foothills, Military Reserve EO 59, Subpop “4”, 2024



Photo 31 Plot: AA-8 0 ° 4/19/2024



Photo 32 Plot: AA-8 90 ° 4/19/2024



Photo 33 Plot: AA-8 180 ° 4/19/2024



Photo 34 Plot: AA-8 270 ° 4/19/2024

Aase's Onion Monitoring Project – Boise Foothills, Camelsback EO 9, Subpop “4”, 2024



Photo 35 Plot: AA-9 0 ° 04/09/2024



Photo 36 Plot: AA-9 90 ° 04/09/2024



Photo 37 Plot: AA-9 180 ° 04/09/2024



Photo 38 Plot: AA-9 270 ° 04/09/2024



Photo 40 Plot: AA-9 4/9/2024
Gully at the plot.



Photo 41 Plot: AA-9 4/9/2024
Overview plot from Camelsback Park.



Photo 42 Plot: AA-9 4/9/2024
Fence needing repair by the plot.

Aase's Onion Monitoring Project – Boise Foothills, Hulls Gulch EO 14, Subpop “4”, 2024



Photo 43 Plot: AA-10 0 ° 04/09/2024



Photo 44 Plot: AA-10 90 ° 04/09/2024



Photo 45 Plot: AA-10 180 ° 04/09/2024



Photo 46 Plot: AA-10 270 ° 04/09/2024

Aase's Onion Monitoring Project – Boise Foothills, Hulls Gulch EO 14, Subpop “3”, 2024



Photo 47 Plot: AA-11 0 ° 4/11/2024



Photo 48 Plot: AA-11 90 ° 4/11/2024



Photo 49 Plot: AA-11 180 ° 4/11/2024



Photo 50 Plot: AA-11 270 ° 4/11/2024



Photo 51 Plot: AA-11 4/11/2024
Cereal rye encroaching into sandy microsites.



Photo 52 Plot: AA-11 4/11/2024
Aase's onion thriving in open sandy microsite.

Aase's Onion Monitoring Project – Boise Foothills, Hulls Gulch EO 11, Subpop “4”, 2024



Photo 53 Plot: AA-12 0 ° 4/11/2024



Photo 54 Plot: AA-12 90 ° 4/11/2024



Photo 55 Plot: AA-12 180 ° 4/11/2024



Photo 56 Plot: AA-12 270 ° 4/11/2024

Aase's Onion Monitoring Project – Boise Foothills, Hulls Gulch EO 11, Subpop “5”, 2024



Photo 57 Plot: AA-13 0 ° 4/11/2024



Photo 58 Plot: AA-13 90 ° 4/11/202



Photo 59 Plot: AA-13 180 ° 4/11/202



Photo 60 Plot: AA-13 270 ° 4/11/202

Aase's Onion Monitoring Project – Boise Foothills, Hulls Gulch EO 14, Subpop “1”, 2024



Photo 61 Plot: AA-14 0 ° 4/11/2024



Photo 62 Plot: AA-14 90 ° 4/11/2024



Photo 63 Plot: AA-14 180 ° 4/11/2024



Photo 64 Plot: AA-14 270 ° 4/11/2024

Aase's Onion Monitoring Project – Boise Foothills, Hulls Gulch EO 14, Subpop “6”, 2024



Photo 65 Plot: AA-15 0 ° 4/11/2024



Photo 66 Plot: AA-15 90 ° 4/11/2024



Photo 67 Plot: AA-15 180 ° 4/11/2024



Photo 69 Plot: AA-15 270 ° 4/11/2024

Aase's Onion Monitoring Project – Boise Foothills, Polecat Gulch EO 4, Subpop “1”, 2024



Photo 70 Plot: AA-17 0 ° 4/19/2024



Photo 71 Plot: AA-17 90 ° 4/19/2024



Photo 72 Plot: AA-17 180 ° 4/19/2024



Photo 73 Plot: AA-17 270 ° 4/19/2024

Aase's Onion Monitoring Project – Boise Foothills, Polecat Gulch EO 4, Subpop “2”, 2024



Photo 74 Plot: AA-18 0 ° 4/19/2024



Photo 75 Plot: AA-18 90 ° 4/19/2024



Photo 76 Plot: AA-18 180 ° 4/19/2024



Photo 77 Plot: 270 270 ° 4/19/2024



Photo 78

Plot: AA-18

4/19/2024

Aase's onion at plot.



Photo 79

Plot:AA-18

4/19/2024

Plot center at decaying shrub.

Aase's Onion Monitoring Project – Boise Foothills, Polecat Gulch EO 4, Subpop “3”, 2024



Photo 80 Plot: AA-19 0 ° 4/10/2024



Photo 81 Plot: AA-19 90 ° 4/10/2024



Photo 82 Plot: AA-19 180 ° 4/10/2024



Photo 83 Plot: AA-19 270 ° 4/10/2024



Photo 84 Plot: AA-19 4/10/2024
Aase's onion at plot.



Photo 85 Plot: AA-19 4/10/2024
Animal digging disturbance.



Photo 86 Plot: AA-19 4/10/2024
Soil deposition disturbance burying Aase's onion.



Photo 87 Plot: AA-19 4/10/2024
Recent animal digging disturbance.

Aase's Onion Monitoring Project – Boise Foothills, Polecat Gulch EO 4, Subpop “4”, 2024



Photo 89 Plot: AA-20 0 ° 4/09/2024



Photo 90 Plot: AA-20 90 ° 4/09/2024



Photo 91 Plot: AA-20 180 ° 4/09/2024



Photo 92 Plot: AA-20 270 ° 4/09/2024



Photo 93 Plot: AA-20 4/09/2024
Aase's onion.



Photo 94 Plot: AA-20 4/09/2024
View N from the S edge of the plot.

Aase's Onion Monitoring Project – Boise Foothills, Polecat Gulch EO 4, Subpop “5”, 2024



Photo 95 Plot: AA-21 0 ° 4/10/2024



Photo 96 Plot: AA-21 90 ° 4/10/2024



Photo 97 Plot: AA-21 180 ° 4/10/2024



Photo 98 Plot: AA-21 270 ° 4/10/2024



Photo 99 Plot: AA-21 4/10/2024
Aase's onion at plot.



Photo 100 Plot: AA-21 4/10/2024
View to plot center from uphill end of plot.



Photo 101 Plot: AA-21 4/10/2024
View W along ridge at upslope edge of plot.



Photo 102 Plot: AA-21 4/10/2024
Aase's onion and soil biocrust at plot.

Aase's Onion Monitoring Project – Boise Foothills, Polecat Gulch EO 24, Subpop “1”, 2024



Photo 103 Plot: AA-22 0 ° 4/10/2024



Photo 104 Plot: AA-22 90 ° 4/10/2024



Photo 105 Plot: AA-22 180 ° 4/10/2024

Photo missing.

Photo 106 Plot: AA-22 270 ° 4/10/2024



Photo 107 Plot: AA-22 4/10/2024
Cigarette litter in plot.



Photo 108 Plot: AA-22 4/10/2024
Footprint disturbance in plot.



Photo 109 Plot: AA-22 4/10/2024
Trail bisecting plot.



Photo 110 Plot: AA-22 4/10/2024
Sandy habitat in plot.

Aase's Onion Monitoring Project – Boise Foothills, Hillside to Hollow EO 65, 2024



Photo 111 Plot: AA-23 0 ° 4/9/2024



Photo 112 Plot: AA-23 90 ° 4/9/2024



Photo 113 Plot: AA-23 180 ° 4/9/2024



Photo 114 Plot: AA-23 270 ° 4/9/2024



Photo 115 Plot: AA-23 4/9/2024
Aase's onion at plot.



Photo 116 Plot: AA-23 4/9/2024
Biological crust on soil surface at plot.



Photo 117 Plot: AA-23 4/9/2024
Large hole.



Photo 118 Plot: AA-23 4/9/2024
Burrows at plot.

Aase's Onion Monitoring Project – Boise Foothills, Hillside to Hollow EO 65, 2024



Photo 119 Plot: AA-24 0 ° 4/9/2024



Photo 120 Plot: AA-24 90 ° 4/9/2024



Photo 121 Plot: AA-24 180 ° 4/9/2024



Photo 122 Plot: AA-24 270 ° 4/9/2024

Aase's Onion Monitoring Project – Boise Foothills, Hillside to Hollow EO 65, 2024



Photo 123 Plot: AA-25 0 ° 4/09/2024



Photo 124 Plot: AA-25 90 ° 4/09/2024



Photo 125 Plot: AA-25 180 ° 4/09/2024



Photo 126 Plot: AA-25 270 ° 4/09/2024

Aase's Onion Monitoring Project – Boise Foothills, Hillside to Hollow EO 65, 2024



Photo 127 Plot: AA-26 0 ° 4/09/2024



Photo 128 Plot: AA-26 90 ° 4/09/2024



Photo 129 Plot: AA-26 180 ° 4/09/2024



Photo 130 Plot: AA-26 270 ° 4/09/2024