



**CHEMICAL COMPOSITION OF PLANTS GROWING ON THE WOOLEY  
VALLEY PHOSPHATE MINE WASTE PILE AND ON SIMILAR ROCKS IN  
NEARBY DAIRY SYNCLINE, CARIBOU COUNTY, SOUTHEAST IDAHO**

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## **CONTENTS**

<b>ABSTRACT</b>	<b>4</b>
<b>INTRODUCTION</b>	<b>5</b>
<b>Background</b>	<b>5</b>
<b>Environmental Concerns—Se and other trace elements</b>	<b>6</b>
<b>Sample Locations and Setting</b>	<b>7</b>
<b>Use of Plants to Assess Trace Element Mobility</b>	<b>9</b>
<b>Experimental Design</b>	<b>9</b>
<b>METHODS</b>	<b>10</b>
<b>Plant Sampling</b>	<b>10</b>
<b>Plant Sample Preparation</b>	<b>10</b>
<b>Analysis</b>	<b>10</b>
<b>RESULTS</b>	<b>11</b>
<b>Observations and Discussion</b>	<b>12</b>
<b>Summary</b>	<b>13</b>
<b>ACKNOWLEDGMENTS</b>	<b>13</b>
<b>REFERENCES CITED</b>	<b>14</b>

## **FIGURES**

Figure 1a. General location of Wooley Valley phosphate mine waste pile.

Figure 1b. Wooley Valley Unit 4 Waste Dump.

Figure 2. Element concentration ranges (maximum, mean, and minimum) in ppm (ash weight in % and Cu/Mo in weight ratio) for all plant samples and various genus groups. Element concentrations are based on the dry weight of the plant sample.

Figure 3. Element concentration ranges (maximum, mean, and minimum) in ppm (ash weight in % and Cu/Mo in weight ratio) in all plant samples for various locations. Element concentrations are based on the dry weight of the plant sample.

Figure 4. Summary of mean concentrations of geoenvironmentally significant trace elements for all samples from a genus group or plant type plotted by location for each of the elements. The location axis for the Cu/Mo mass ratio is reversed from other graphs to display the significant values, in this case the low values, toward the front.

## TABLES

Table 1. Concentrations of major, minor, and trace elements for individual plant samples collected in July, 1999.

Table 2. Minima, maxima, and mean trace element concentrations for selected plant species and genus groups.

Table 3. Minima, maxima, and mean trace element concentrations for all plants at various localities. Omitted elements are below detection limit.

Table 4. Summary of species and genus group mean concentrations of trace elements by location.

Table 5. Summary of mean trace element concentration enrichments relative to reference sites.

## ABSTRACT

This study reports bulk chemical compositions of plant samples collected during July of 1999 from the surface of the Wooley Valley surface phosphate mine Unit 4 waste pile and nearby locations in southeastern Idaho. The waste pile, which has an areal extent of approximately  $1/2 \text{ mi}^2$  (~130 ha), was completed in 1995 but had been in various stages of reclamation, including installation of reclamation plant species, for the previous decade. The waste pile occupies one of two parallel, adjacent valleys that form the headwaters of Angus Creek as it flows down Little Long Valley. The data for the affected areas are compared to two reference sites: an unaffected wetland adjacent to the wetland affected by seeps draining the waste pile; and Dairy Syncline, an area 15 km away where similar plants grow on phosphatic rocks of the same formation but where they have not been disturbed by mining activities. This latter reference site is now under lease option for mining; consequently, plant sampling from this area provides an important baseline should the area be developed.

The data show that trace element concentrations of selected plants growing on the waste pile are elevated by one to two orders of magnitude compared to the reference site located on similar rocks in Dairy Syncline. Of the environmentally significant elements on the waste pile and in the affected wetland, selenium has the greatest enrichment for nearly all plant group types. Other elements of potential contaminant concern are Mo, particularly as it leads to low values of the Cu/Mo ratio, and Tl. Cd, Cr, Ni, V, and Zn all show lesser degrees of enrichment relative to concentrations in plants from the two reference sites.



## INTRODUCTION

### Background

U.S. Geological Survey (USGS) geologists have studied the Permian Phosphoria Formation in southeastern Idaho and the Western U.S. Phosphate Field throughout much of the twentieth century. In response to a request by the U.S. Bureau of Land Management (BLM), a new series of resource and geoenvironmental studies was initiated by the USGS in 1998. Present studies involve many scientific disciplines within the USGS and consist of (1) integrated, multidisciplinary research directed toward resource and reserve estimations of phosphate in selected 7.5-minute quadrangles; (2) elemental phase associations and mineralogical and petrochemical characteristics; (3) mobilization and reaction pathways, transport, and disposition of potentially toxic trace elements associated with the occurrence, development, and use of phosphate rock; (4) geophysical signatures; and, (5) improving the understanding of depositional origin.

To carry out these studies, the USGS has formed cooperative research relationships with: two Federal agencies, the BLM and the U.S. Forest Service (USFS), which are responsible for land management and resource conservation on public lands; and with five private companies currently leasing or developing phosphate resources in southeastern Idaho, including Agrium U.S. Inc. (Rasmussen Ridge mine), Astaris LLC (Dry Valley mine), Rhodia Inc. (Wooley Valley mine-inactive), J.R. Simplot Company (Smoky Canyon mine), and Monsanto Co. (Enoch Valley mine). Because raw data acquired during the project will require time to interpret, the data are released in USGS open-file reports for prompt availability to other workers. The USGS open-file reports associated with this series of resource and geoenvironmental studies are submitted to each of the Federal and industry collaborators for technical comment; however, the USGS is solely responsible for the data contained in the reports.

The mining of the Permian Phosphoria Formation in the northwest United States satisfies approximately 12 percent of the nation's annual demand for phosphate. This formation is a marine sedimentary phosphorite deposit that extends over a 5-state region (McKelvey and others, 1959). Service (1966) provided an evaluation of the western phosphate industry in Idaho and a brief description of the mining history, ore occurrence, and geology. More detailed discussion of the Phosphoria Formation in the Western Phosphate Field is given by McKelvey and others (1959) and by Cressman and Swanson (1964) for the same rock units in nearby southwestern Montana. Gulbrandsen and Krier (1980) discussed general aspects of the large and rich phosphorus resources in the Phosphoria Formation in the vicinity of Soda Springs, Idaho. Past studies of the bulk chemical composition of the Meade Peak include several by Gulbrandsen (1966, 1975, and 1979) that summarized data for various lithologies of the phosphatic intervals in the Phosphoria Formation. Unfortunately, most of the analytical descriptions of the phosphatic and associated waste rock units published in these earlier works include only minimal concentration data on several now-recognized potential contaminant trace elements, notably Se, Cd, and Mo. However, Herring and others (1999, 2000a, 2000b, and 2000c) list bulk chemical compositional data that includes these elements and several other potential toxicant elements for the various lithologies of the Meade Peak.

In the study area in southeastern Idaho, the Phosphoria Formation consists of three members, which in ascending order are the Meade Peak Phosphatic Shale—the phosphatic unit of the Phosphoria—the Rex Chert, and the informally named cherty shale (McKelvey and others, 1959). The Meade Peak directly overlies the Grandeur Tongue of the Permian Park City Formation, a dolomitic unit. Stratigraphy and description of measured sections at each of the four working mines in southeastern Idaho are summarized in reports by Tysdal

and others (1999, 2000a, 2000b, and 2000c). Structurally, the Phosphoria is a folded, often steeply dipping unit with elongate surface or near surface exposures with north to northwest strike. Depending on the dip of the strata, a typical phosphate mine will be up to a few hundred meters deep and several km long.

The Meade Peak is approximately 50 to 55 m thick. It has two phosphate ore zones, a lower and upper one of approximately 10 and 5 m thickness, respectively. The two ore zones are separated by a middle waste unit of shale that is approximately 18 to 20 m thick. When the Meade Peak is mined, the two ore zones are removed and processed, whereas the middle waste shale and other waste rock are removed and backfilled into the mine pit or placed in a nearby gully as cross-valley fill waste pile. Over the 15 to 20 year life of a typical mine, 20 to 40 million tonnes of ore will be extracted and an amount of waste shale and chert of 2 to 5 times this amount will be generated and require disposal.

### **Environmental Concerns—Se and other trace elements**

The geoenvironmental studies of the Western U.S. Phosphate Project consider mobilization and reaction pathways, transport, and disposition of potential contaminant elements associated with the occurrence, development, and mining of phosphate. In particular, the study focuses on the mobilization of selenium and other trace elements from waste rock that is removed from the strip mines during phosphate rock extraction. This waste rock is stored in large piles, either by backfilling the mine pit or is removed and placed into nearby valleys. In this latter case, drainage percolating through the waste rock pile can leach trace elements from the rock and discharge them into streams draining from the waste pile. In particular, this study examines trace element concentrations in plants growing on the waste pile and the affected wetland and compares these with plants growing at the reference wetland and nearby Dairy Syncline sites.

Elevated concentrations of Se and other geoenvironmentally sensitive trace elements (e.g. As, Cd, Cr, Cu, Mo, Ni, Tl, U, V, and Zn) within the middle waste shale of the Meade Peak have raised concerns about the introduction of these trace elements into the ecosystem as a result of mining and disposal of the waste rock. Se and several of these other trace elements, notably Cu, Mo, and Zn, can act either as essential micronutrients at low concentrations or a toxin at elevated concentrations. Gough and others (1979) provide summaries of element concentrations, both bioessential and toxic, to plants, animals, and man.

A table in Piper and others (2000) summarizes concentrations of Se that have been noted to occur in various components of the ecosystem in this part of Idaho. The purpose of the present study is to determine if any detectable enrichments of the Se or any other geoenvironmentally sensitive trace elements in the vicinity of the Unit 4 dump of the Wooley Valley phosphate mine are accumulating in plants growing on the waste pile or in the wetland that is influenced by seeps draining the waste pile. Sufficient enrichment of these contaminant trace elements presents a hazard to any wildlife feeding on the plants. In addition to concern over unusually high concentrations of individual elements, there are also synergistic interactions that can be important even at relatively low concentration enrichments. In the case of forage plants consumed by grazers, it is desirable for the mass ratio of Cu/Mo to be  $>2$  in order to prevent occurrence of molybdenosis (Erdman, 1990).

For the specific case of Se, safe and adequate concentrations in food crops for animals are believed to be around 100 parts per billion (ppb), dry weight, as noted by Kabata-Pendias and Pendias (1984). They further note that a threshold value of 3000 ppb and a minimum requirement concentration of 100 ppb are proposed for grasslands.

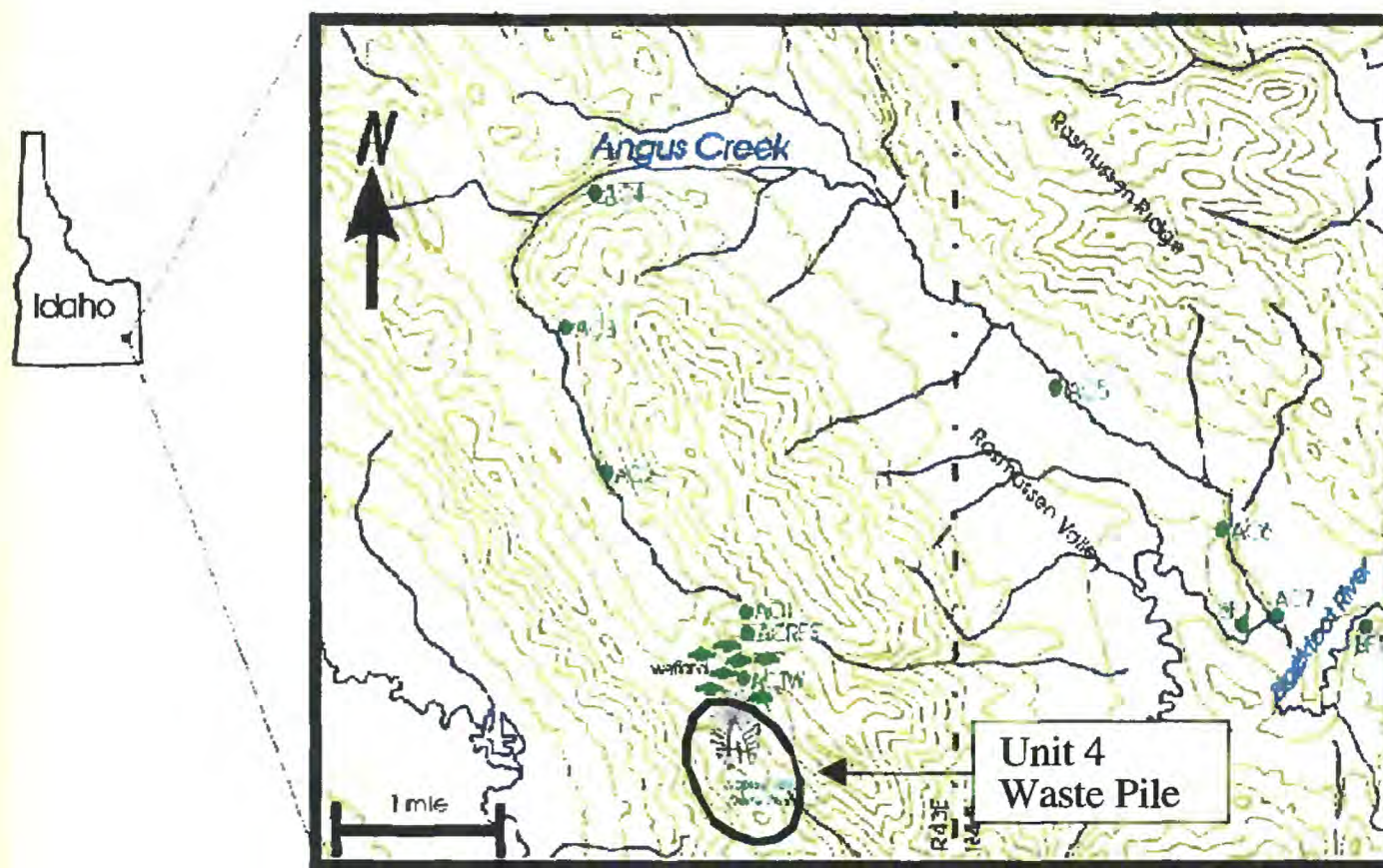


## Sample Locations and Setting

The locations of the sampling stations are shown in figure 1. The general area lies approximately 25 km northeast of Soda Springs, Idaho, in an area of southeastern Idaho that has had extensive phosphate mining over the past several decades and currently has four active phosphate mines. The location for the sampling area at Dairy Syncline is approximately 23 km south-southeast of the waste pile. Dairy Syncline is an occurrence of the Meade Peak where no mining disturbance has occurred to date. As such, the plants growing on the Meade Peak there reflect baseline concentrations of trace elements that are naturally developed on the Meade Peak without the influence of disturbance from mining. Additionally, this reference site is now under lease option for mining. Consequently, plant sampling from this area provides an important baseline should the area be developed in the future. Figure 1b is an air photo that shows the waste dump pile in greater detail and has annotations that correspond to the sampling location terms used in this report. The air photo was taken in approximately 1994 and shows the waste pile with a view to the southeast. There are four terraces to the waste pile: Lift 1 is the lowest in elevation, largest, and closest to the wetland; in numerical order, the other terraces (Lifts 2, 3, and 4) increase in altitude and distance from the wetland and decrease in volume relative to Lift 1. The Slope occurs between Lift 1 and the wetland. Within this slope area there are a number of perennial seeps that drain water from the waste pile. The seeps are enriched in dissolved Se and several other trace elements (Stillings and others, 2000). The reference wetland site, just off the lower left portion of figure 1b, is located about 200 m adjacent to the indicated wetland that drains the seeps at the toe of the waste pile. The reference wetland site is created by a spring that is not affected by seeps flowing from the mine waste pile, and, consequently, plants growing in this wetland should be relatively free of trace elements leached from the waste pile. The seeps and the spring combine to form the headwaters of Angus Creek as it flows down Little Long Valley.

The dump is approximately 4 million m<sup>3</sup> in volume (W. Johnson, BLM, 1999, oral communication; waste dump tonnage is estimated at 6 to 8 megatons at an assumed density of about 1.5 g/cm<sup>3</sup>) and was completed in 1995. The rocks that comprise the waste pile have been extensively sampled and geochemically characterized at the nearby phosphate mine sites (Herring and others, 1999, 2000a, 2000b, and 2000c). In addition, other components of the ecosystem in and proximal to Little Long Valley have been analyzed, including stream sediments and water from Angus Creek and trace element content of introduced and indigenous bryophytes (Stillings and others, 2000; Herring, Castle, and others, 2001). Notable enrichments of Se and other trace elements occur in some samples of all of these ecosystem components at this locale. Air samples were collected in June 2000 from two sites within Little Long Valley and analyzed for volatile Se (Lamothe and Herring, 2000).





**Figure 1a. General location of the Wooley Valley phosphate mine waste pile.**



**Figure 1b. Wooley Valley Unit 4 Waste Dump**



## Use of Plants to Assess Trace Element Mobility

Vascular and nonvascular plants have been used to indicate bioavailability of various trace elements in a variety of settings (see, for example, Kabata-Pendias and Pendias, 1984). Generally, the uptake response in the plant reflects the concentration of the trace elements in the growth substrate. However, it also is determined by many other interactive and complex factors, such as mineral and organic host of the trace elements, ambient pH and Eh, and water solubility of trace elements in host soil phases. It further includes numerous aspects of the plant physiology, toxic element tolerance, and of the growth environment including climate.

## Experimental Design

The ideal study for assessing trace element bioavailability to plants compares the same plant species in both the reference (background) and the disturbed sites to be evaluated. Realistically, it is not often possible to find large assemblages of similar plants in both reclaimed and indigenous, background areas. Often reclamation species are chosen for reasons other than simple replacement of native species. In this study, the plants sampled on the waste are mostly different from indigenous species in the reference wetland or at Dairy Syncline. Fortunately, there are a few similar species that permit direct plant species and genus group comparison between the various terraces of the waste pile and between the waste pile plants and the same species at Dairy Syncline. For example, aspen samples have been taken on one lift, in both reference locales, and in the wetland. Furthermore, although several of the forbs and grasses are not similar at the species level, they are similar at the genus level, especially for wheatgrass (*Agropyron*) and sedge (*Carex*). The reference wetland site serves as an additional baseline location and provides background values to compare with several plant types from the wetland site that is affected by the waste pile and, in the case of willow (*Salix*), on one of the lifts. Willow was not sampled at Dairy Syncline, but the reference wetland site samples provide a baseline for this genus. Tufted hairgrass (*Deschampsia caespitosa*) has been sampled at both Dairy Syncline and in the reference wetland, and these concentrations can be directly compared with the samples of the same species collected from the affected wetland. Another consideration of an ideal plant study involves sampling different plant types in order to examine a range of different plant metabolisms and trace element uptake processes. Here, that was accomplished by selecting at least two each of grass, forb, and woody plants. The final consideration in plant selection was to obtain plants, ideally the same species, from marshy, mostly ever-wet affected areas to contrast trace element uptake with drier, seasonally wet areas on the slopes and terraces of the waste pile. Of the grasses, smooth brome grass (*Bromus inermis*) and orchardgrass (*Dactylis glomerata*) occur in the wetland and on at least one of the lifts, as do the aspen. In addition, some of these plants occur in both the reference and affected wetland sites, which permits assessment of baseline concentrations.

## **METHODS**

### **Plant Sampling**

Transects for sampling above-ground vegetation were established on the slopes and terraces of Lifts 1 through 4 of the Unit 4 mine waste-rock dump at Wooley Valley, within a wetland at the base of the Unit 4 dump, and in the reference wetland nearby to the Unit 4 wetland. This reference wetland exists in an adjacent, parallel drainage to the waste pile wetland, and it is unaffected by the mine or waste pile. An arbitrary starting point for each transect was selected on the right-hand side (facing toward the dump) of Unit 4 and the wetland. Transects on the lift slopes followed the slope contours. Transects on the lift terraces ran parallel to the lift slopes. Transects in the wetland ran parallel to the base of Unit 4. At selected points along each transect, representative plant species that comprised major components of the plant communities were sampled within a 1-2 m radius of each sampling point. Distances along the transects were measured with a hip chain. The latitude and longitude of each sampling location and the starting points of the transects were recorded with a GPS unit. The above-ground portion of each sampled plant species was clipped and placed in labeled paper bags and taken to the lab for pre-analysis preparation. Samples of plant species that could not be identified in the field were also collected and returned to the lab for identification using various plant identification manuals (e.g., Cronquist and others, 1977).

To obtain pre-mining baseline data on the accumulation of trace elements by the above ground biomass of native plant species, plant sampling transects were also established across the Meade Peak in the Dairy Syncline lease area. Four transects were established. The first transect began in the underlying Grandeur dolostone, crossed the Meade Peak, and ended on a Rex Chert outcrop on a ridge above the valley floor. The second transect began in a Rex Chert – Meade Peak transition area, crossed the Meade Peak parallel to a forest road, and ended in Grandeur dolostone. The third and fourth transects had the same starting point adjacent to a forest road, ran along an old exploration trench in the Meade Peak, and ended in Rex Chert. The third transect ran through the native vegetation above and adjacent to an old phosphate exploration trench and the fourth transect ran along the sidewall of the exploration trench. Mechanics of location and transect distance measurement were the same as for the previous localities. Plants were sampled in a manner consistent with the samples collected from the Unit 4 waste pile and wetland.

### **Plant Sample Preparation**

The plant samples were dried in mechanical convection ovens at 60° C for 48 hours and ground to < 20-mesh in a stainless-steel Wiley plant grinding mill. Splits of the material were provided to analysts for the various analyses. All splits were obtained with a riffle splitter to ensure that the splits were representative of the whole sample.

### **Analysis**

Plant samples were analyzed for Se and As using hydride generation followed by atomic absorption (AA) spectroscopy (Arbogast, 1996). Samples also were analyzed for 40 major, minor, and trace elements using 4-acid digestion in conjunction with inductively coupled plasma-atomic emission spectrometry (ICP-AES). An ashed split was dissolved using a low-temperature (<150°C) digestion with concentrated hydrochloric, hydrofluoric,



nitric, and perchloric acids (Arbogast, 1996). The acidic sample solution was taken to dryness and the residue was dissolved with 1 ml of aqua regia and then diluted to 10.0 g with 1% (volume/volume) nitric acid. The reported concentrations based on the ash weight of the sample have been converted to their respective concentrations in the dry plant sample by multiplying the element concentrations in the ash by the ash weight in percent. Also, a subset of 40 of the plant samples was analyzed using inductively coupled plasma-mass spectrometry (ICP-MS) after a 4-acid digestion of the dried plant sample. Lamothe and others (1999) describe the methodology.

## RESULTS

Element concentration data for the plant analyses are listed in table 1. There has been no statistical manipulation of the data or consideration of qualified values. Qualified values of concentration result when elements have concentrations less than their lower detection limit (LDL). They are listed in the data table with "<" preceding the LDL.

For the analysis of As and, especially, Se, the hydride analytical technique is considered to be superior to other analytical techniques that involve heating or exothermic acid digestion during preparation. Consequently, the analytical data for As using acid digestion ICP-AES, for which only two values exceeded the LDL of 20 ppm, have been eliminated from the data set and only those for the hydride technique are reported for all samples. For the other elements in the ICP-AES set, detection limits for the various elements have been reported after correcting to the dry weight of the plant. This produces a variable LDL for a specific element even though only a single LDL concentration is reported for each element in the ash. Of the ICP-MS analyses for As, more than one-half of the samples had qualified data below the LDL and, consequently, this element also was eliminated from the data set. In all ash samples the following elements were reported as below their LDL (listed in parentheses in ppm) and were eliminated from the data table: Ag (4), Au (20), As (20), Be (2), Bi (20), Ce (8), Eu (5), Gd (8), Ho (8), Nb (8), Nd (8), Sc (4), Ta (80), Th (8), U (200), and Yb (2). Those elements eliminated from the ICP-MS data table are Er (0.05), Ho (0.02), K (not reported), Nb (2), Sc (0.3), Ta (0.2), and Ti (40). La, Nd, and Pr had only a single unqualified datum each that barely exceeded the LDL; consequently, determinations of these elements also were eliminated from the data set. Se determination also was eliminated from the listed ICP-MS data set. Usually Se is not reported on organic-rich samples as the Se is mostly volatilized and lost during the 4-acid digestion preparation (P. Lamothe, oral communication, USGS, 2001). Because of the interest in Se in this study, the ICP-MS determinations for Se were reported to note how much was lost during 4-acid preparation. Typically this was 90 percent of the amount of Se reported by the hydride method.

As a measure of combined analytical, experimental, and laboratory precision, the listings in table 1 include a calculated value of the average relative standard difference in percent obtained by averaging the relative standard difference for each of two pairs of duplicated specimens analyzed by ICP-AES. For duplicate sample pairs without any qualified determinations, those precision values are listed at the top of the table. General measures of accuracy of the various analytical methods are discussed by Arbogast (1996).

The abbreviations for analytical techniques in the column headings in table 1 for analytical methodology are:

Hyd.: hydride generation followed by atomic absorption spectroscopy.

ICP-MS: inductively-coupled plasma spectrometry, mass spectrometry, acid digestion.

ICP-AES: inductively-coupled plasma spectrometry, acid digestion.

## Observations and Discussion

Graphical depictions of the concentrations of the geoenvironmentally significant trace elements in the plant samples are shown in figures 2, 3, and 4. The summary data used to generate these figures is in tables 2, 3, and 4, respectively. Concentration ranges showing the maximum, arithmetic mean, and minimum are included for a variety of trace elements, the percent ash content of plants, and the Cu/Mo mass ratio. The few concentration values below detection limits of the data used to generate these figures have been replaced by their LDL values; table 2 lists the percentage of unqualified values for the environmentally significant trace elements. The graphs in figures 2 and 3 have logarithmic scales to accommodate the large range of concentration values. For each figure, all graphs are plotted with the same vertical scale or range of concentrations to facilitate comparisons among various genus groups of locations. In figure 2, the element concentrations for all plant samples from 8 genus groups are shown without separation as to locality. This depicts the regional ranges of concentrations of the various trace elements in the plants from unaffected sites to those suspected to be affected by mining. Se exhibits the greatest concentration range of all elements shown in figure 2. Among genus groups, yarrow exhibits the smallest range of concentrations for all elements. Of the remaining genus groups, the most notable elevations in concentration—defined as an arithmetic mean greater than a factor of two above the individual element mean concentrations for all plant samples from Dairy Syncline (figure 3)—occur in the grasses for Se, Mo, and Tl and to a lesser extent for Cr, V, and U. Se mean concentrations in all genus types, with the exception of yarrow, are elevated by a factor of 50 to 100 over the Dairy Syncline mean for all plants.

The choice of all element concentrations in plants from the Dairy Syncline reference area poses some potential complications. Concentration variability for all plants ranges over a factor of about 100 for most trace elements with the exception of Tl, Th, and U. This variability arises in part from the many different plant types collected from the site, with concomitant variability in physiology. Within genus groups, however, this dispersion is generally less. Also, the Dairy Syncline site lacks several of the specific genus groups that have been introduced onto the mine waste pile as part of reclamation. Nonetheless, if the mean concentration of each element for all collected samples at the Dairy Syncline site is used as a comparer, there are notable elevations in concentration for many geoenvironmentally significant trace elements at the various sampling locations on the mine dump waste pile. These elevations in contaminant trace element concentrations are summarized in table 5 along with the occurrence of notably low Cu/Mo concentration ratios.

Among locations (figure 3), notable elevations in concentrations occur for Se as noted by the mean concentration in all plants collected from the lifts and the wetland. The slope site is notably lower, with a mean concentration of 2 ppm, but this is still well in excess of the two reference sites. We note that it is possible that plants collected from undisturbed sites on the Meade Peak, notably Dairy Syncline and the reference wetland site, may reflect modest increases in element concentration as a result of high concentrations of trace elements in these rocks compared to regional concentrations in similar plants growing in soil overlying different types of rocks. In a previous study (Herring, Castle, and others, 2001), bryophyte specimens collected upstream from the reference wetland and from Dairy Syncline sites have Se concentrations that are elevated between a factor of 2 to 4 over the lab-raised control sample of the same bryophyte. This suggests that there is a slight regional elevation of the concentrations compared to clean laboratory conditions. Indeed, mean Se concentrations for various plant groups from the Dairy Syncline and reference wetland, typically a few hundred ppb dry weight, considerably exceed mean Se concentrations for grasses, clovers, and hay from several countries (Kabata-Pendias and Pendias, 1984), which are typically <150 ppb, dry weight.

Figure 4 depicts means of the geoenvironmentally significant trace element concentrations as a function of both genus group and location. The data for this figure are



listed in table 4 and include the relative standard deviation as a measure of dispersion when there are 10 or more values.

There are few strong correlations among element concentrations for the set of all plants. For all plants from the lifts, slope, and wetland sites, only Cd with Zn and Cr with V have correlation coefficients  $>0.8$ . No other correlations are above 0.7. For the two baseline sites, the Cr with V correlation increases to 0.9, and other correlations between 0.7 and 0.8 are As with Cu, Cd with Zn, and the Cu/Mo ratio with both Ni and Zn.

## Summary

Among plant samples from the lifts, Se shows the greatest range of enrichments relative to the samples at the reference wetland or from Dairy Syncline. The mean enrichments for the lift and wetland sites are typically 100-fold greater than either reference site mean. For all plant samples, there is little difference between element concentrations at the reference wetland and the Dairy Syncline sites. Significant trace element enrichments relative to the reference sites are listed in table 5. Note that yarrow, exhibiting no significant enrichments, was collected only from Dairy Syncline.

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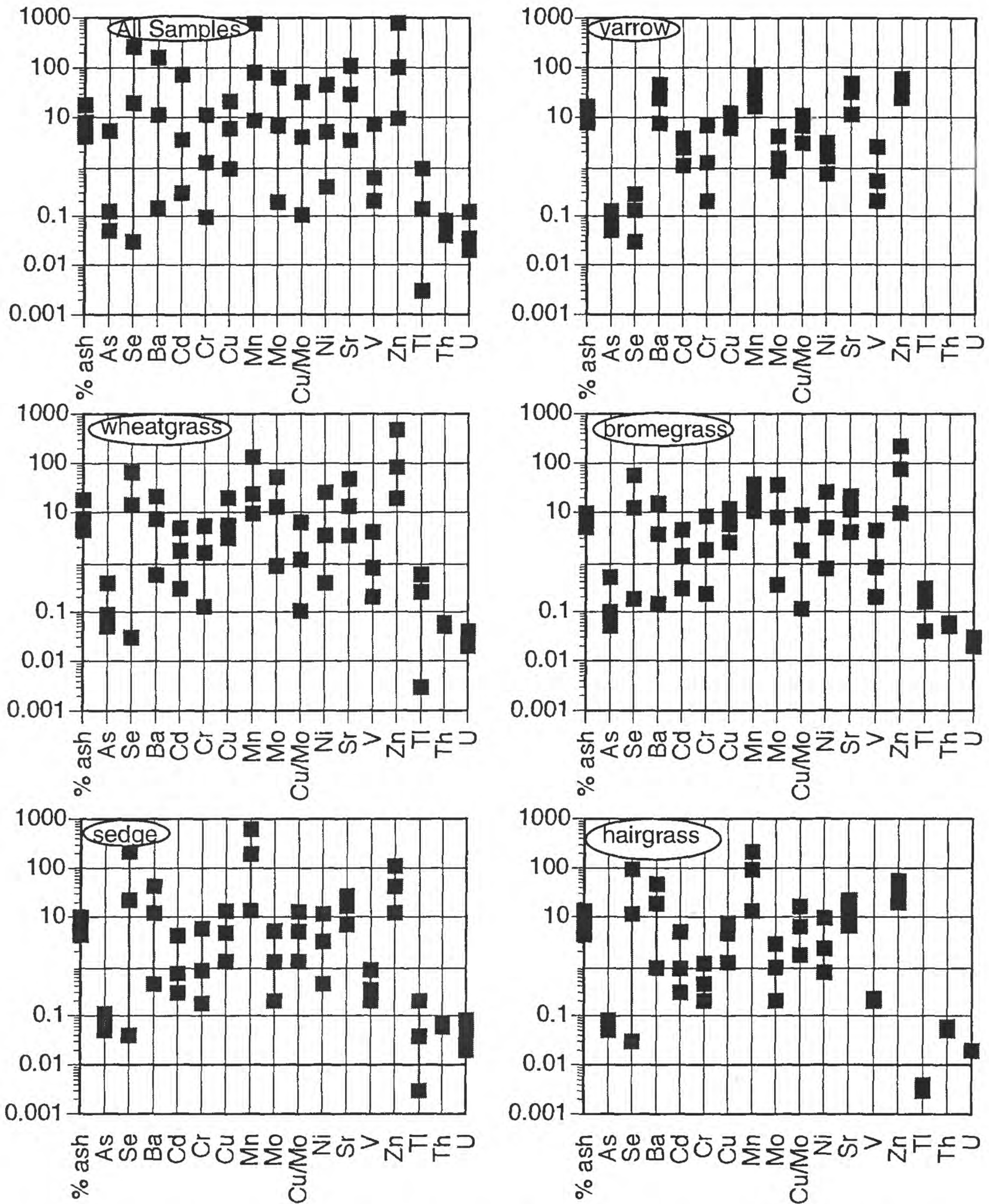


Figure 2. Element concentration ranges (maximum, mean, and minimum) in ppm (ash weight in % and Cu/Mo in weight ratio) for all plant samples and 8 genus groups. All concentrations shown are based on dry weight of the sample.

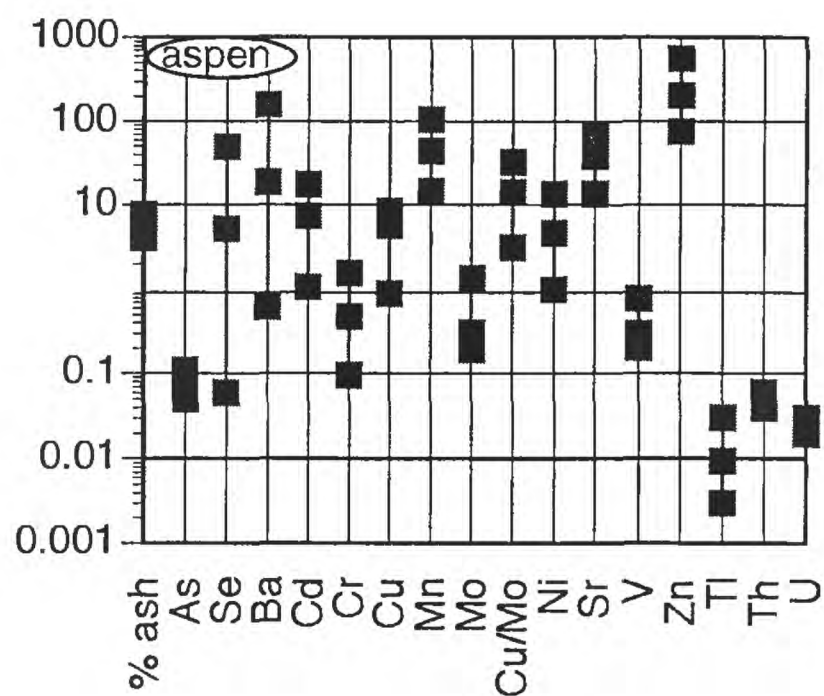
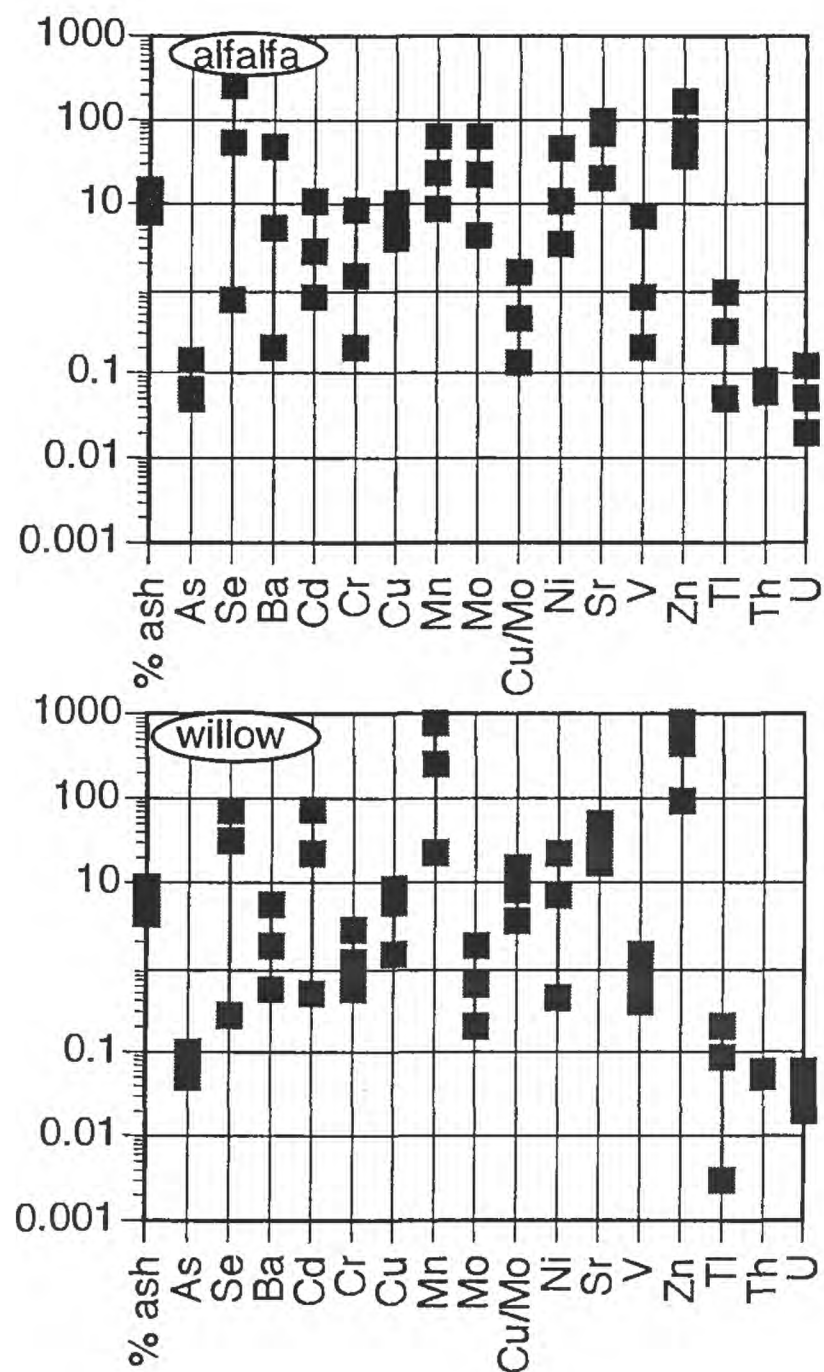


Figure 2, continued. Element concentration ranges (maximum, mean, and minimum) in ppm (ash weight in % and Cu/Mo in weight ratio) for all plant samples and 8 genus groups. All concentrations shown are based on dry weight of the sample.

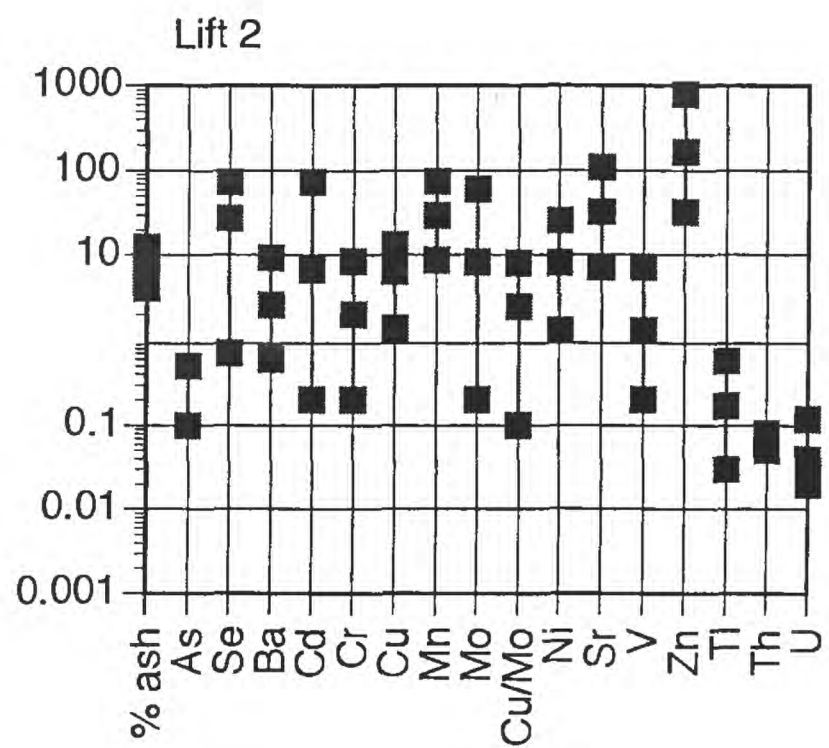
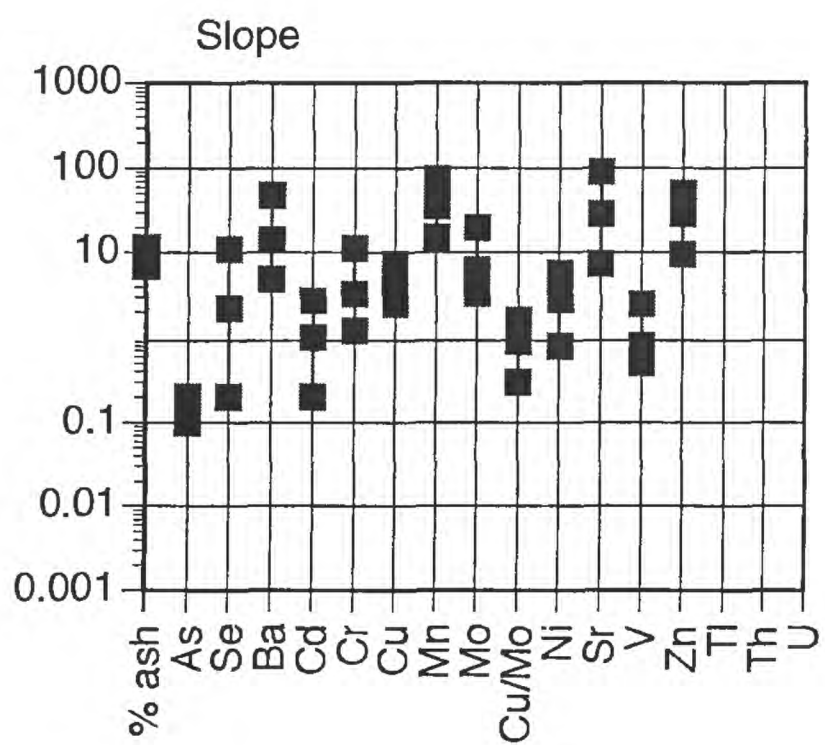
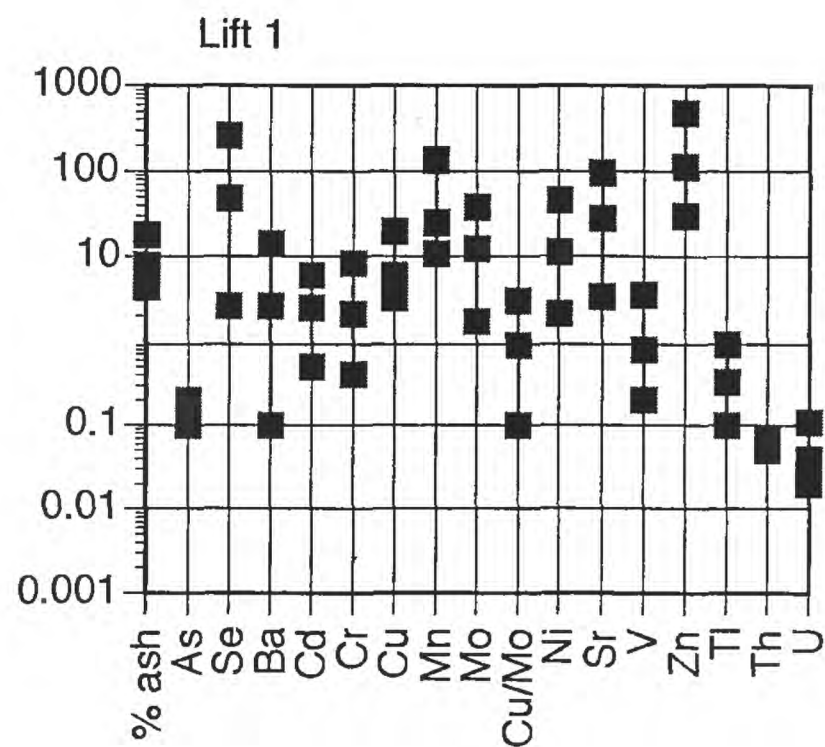
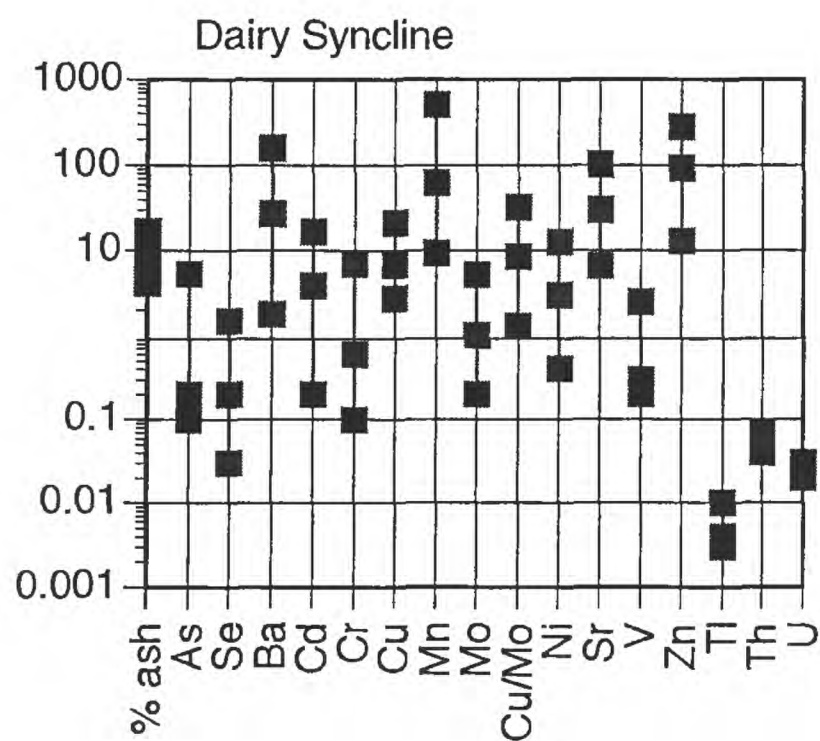


Figure 3. Element concentration ranges (maximum, mean, and minimum) in ppm (ash weight in % and Cu/Mo in weight ratio) in all plant samples for various locations. All concentrations shown are based on dry weight of the sample.

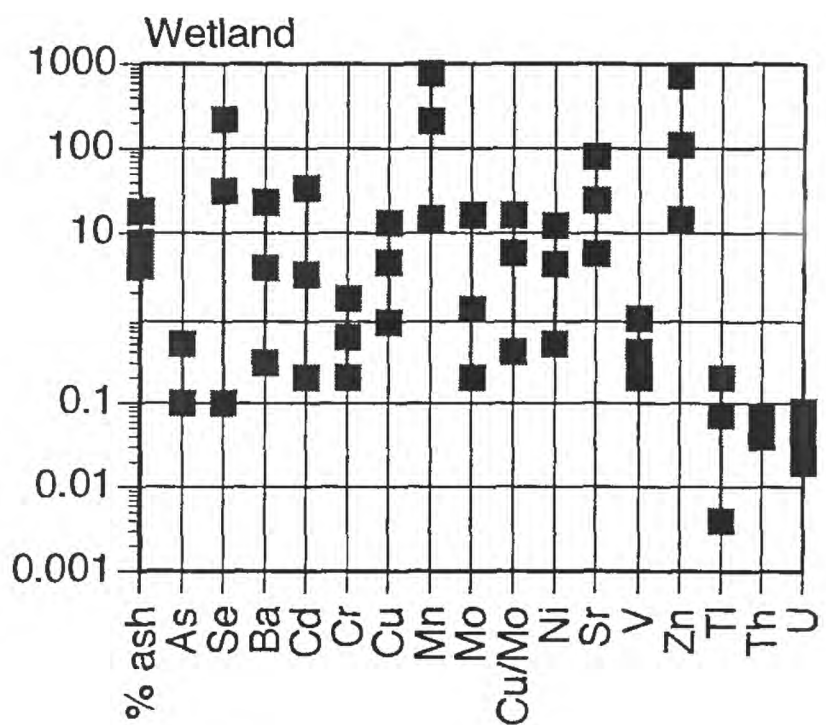
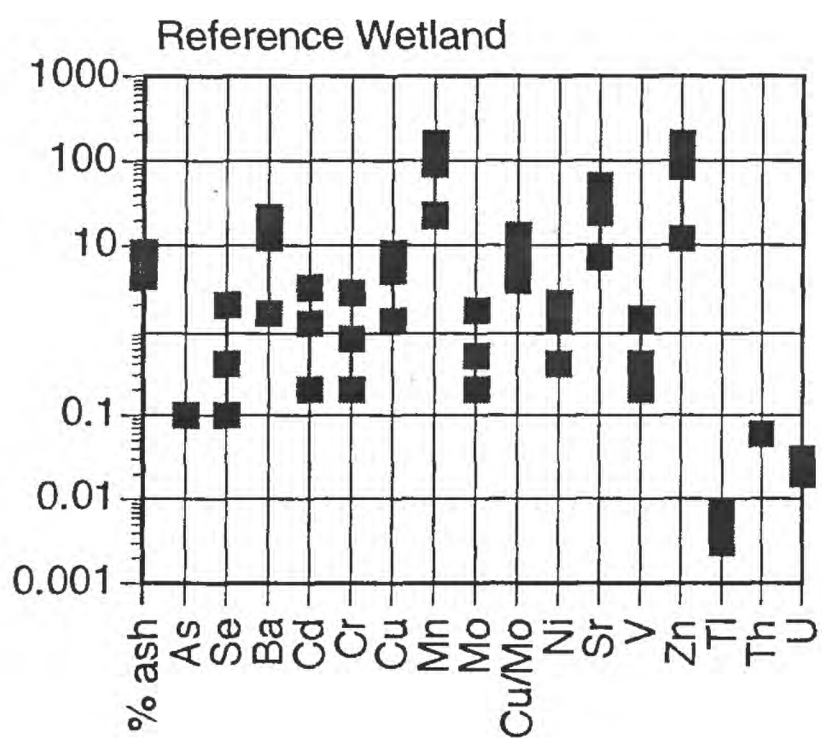
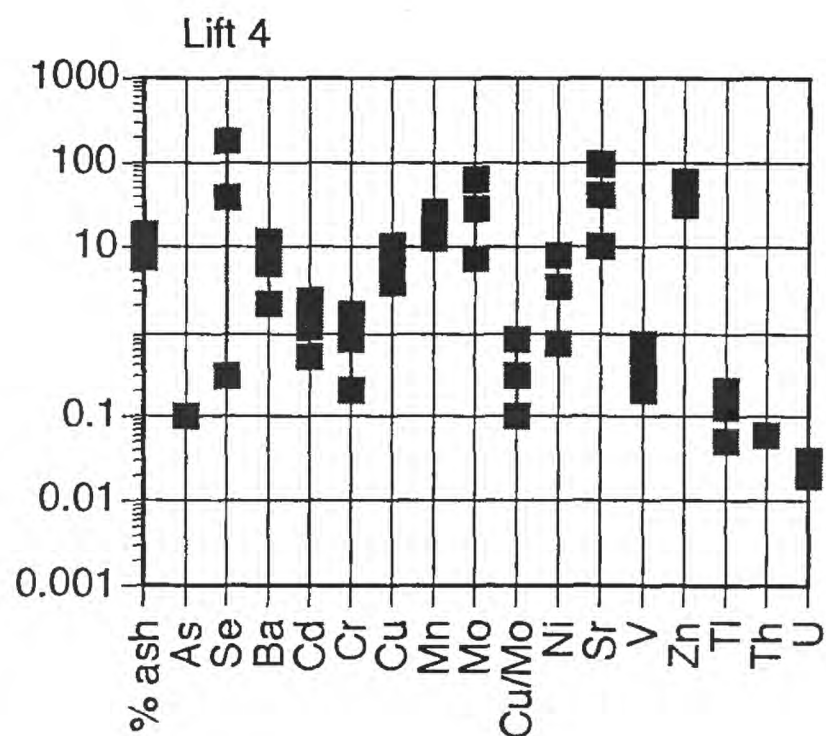
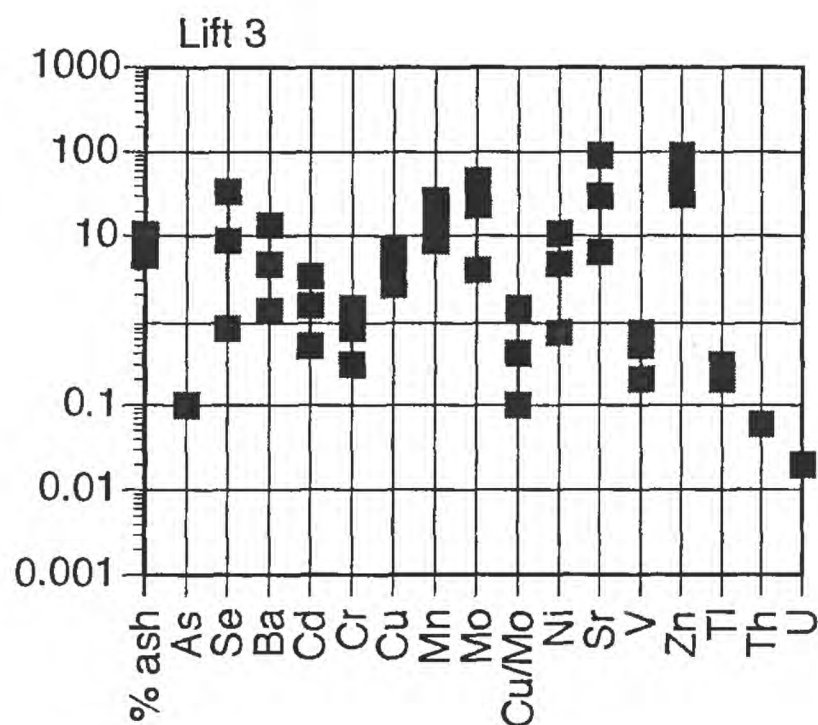


Figure 3, continued. Element concentration ranges (maximum, mean, and minimum) in ppm (ash weight in % and Cu/Mo in weight ratio) in all plant samples for various locations. All concentrations shown are based on dry weight of the sample.



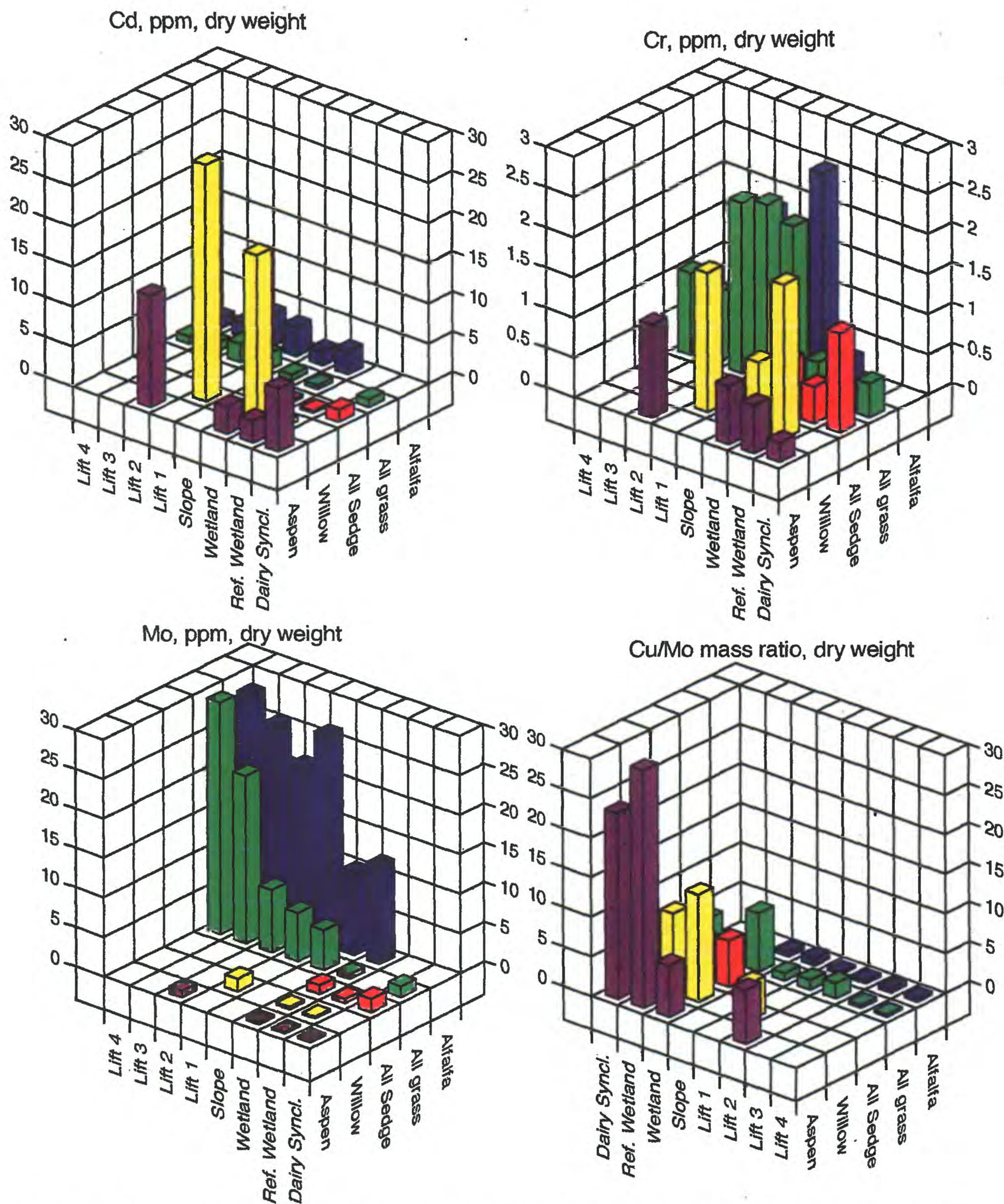


Figure 4. Summary of all samples from a genus group or plant type plotted by location for each element. The location axis for the Cu/Mo mass ratio is reversed from other graphs to display the geoenvironmentally sensitive values, in this case the low values, toward the front.



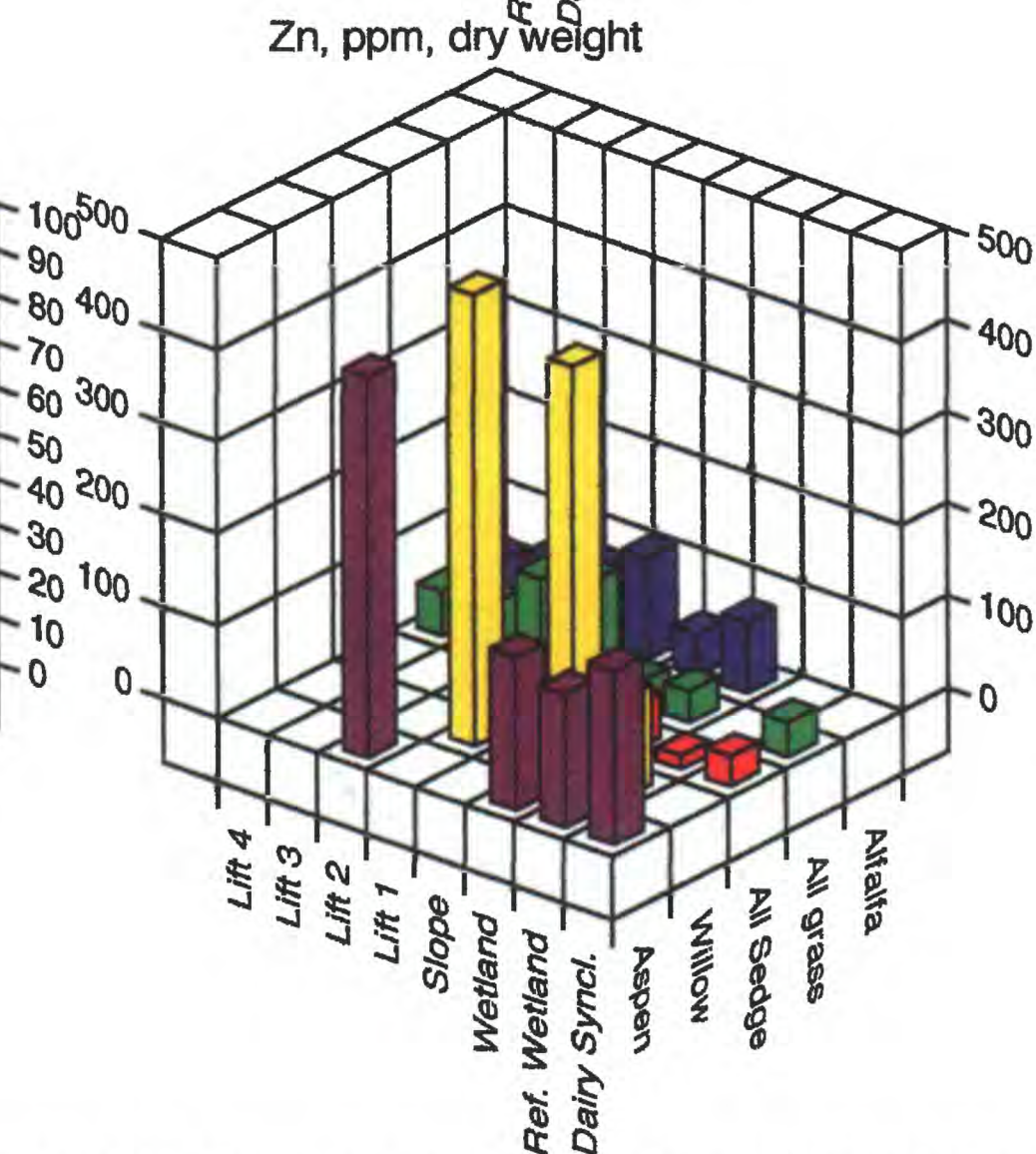
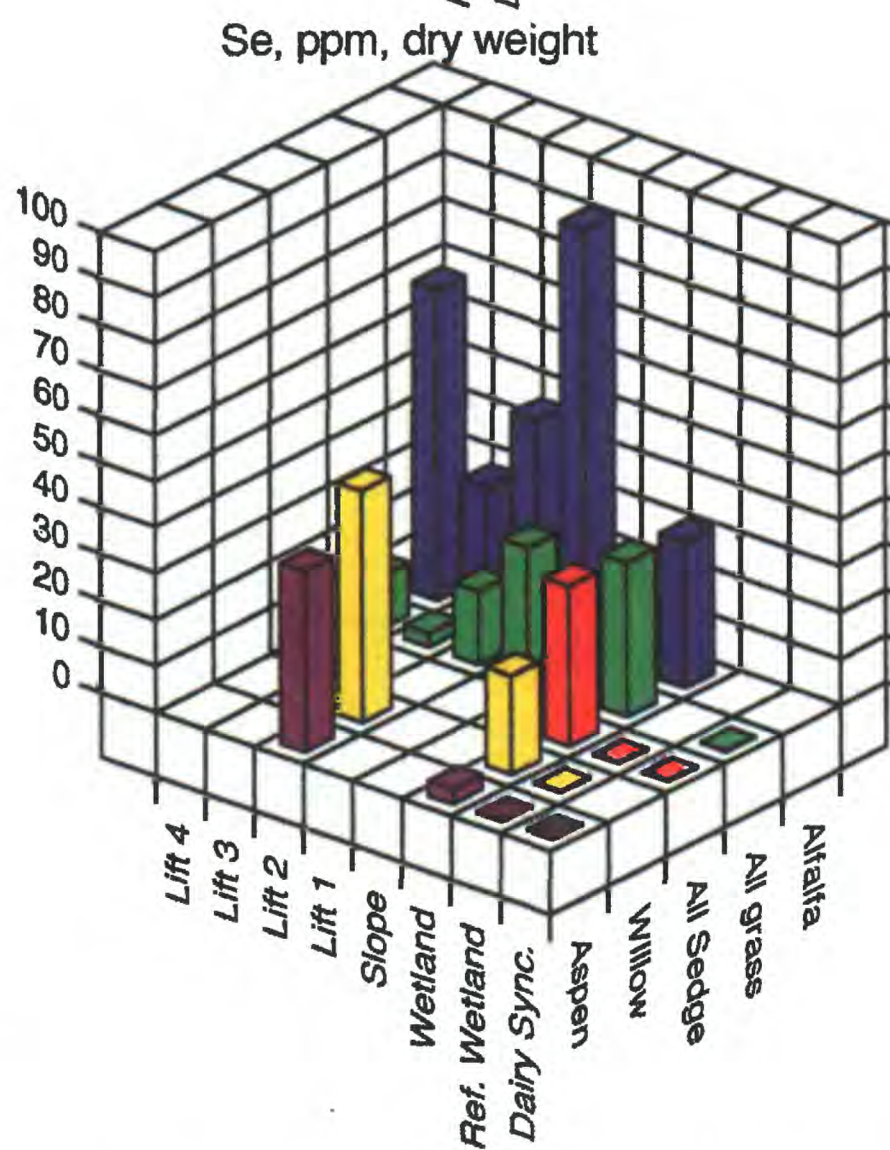
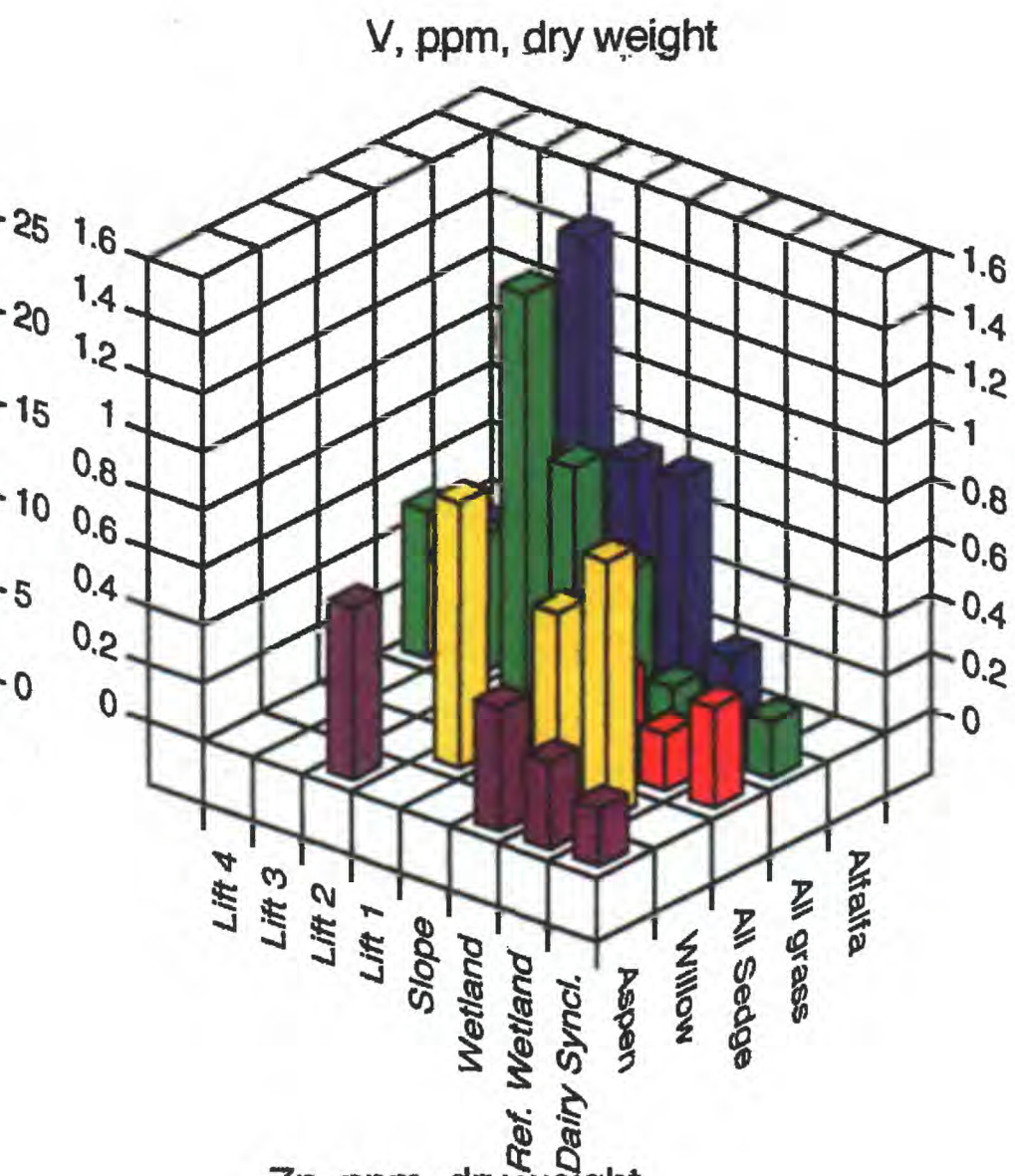
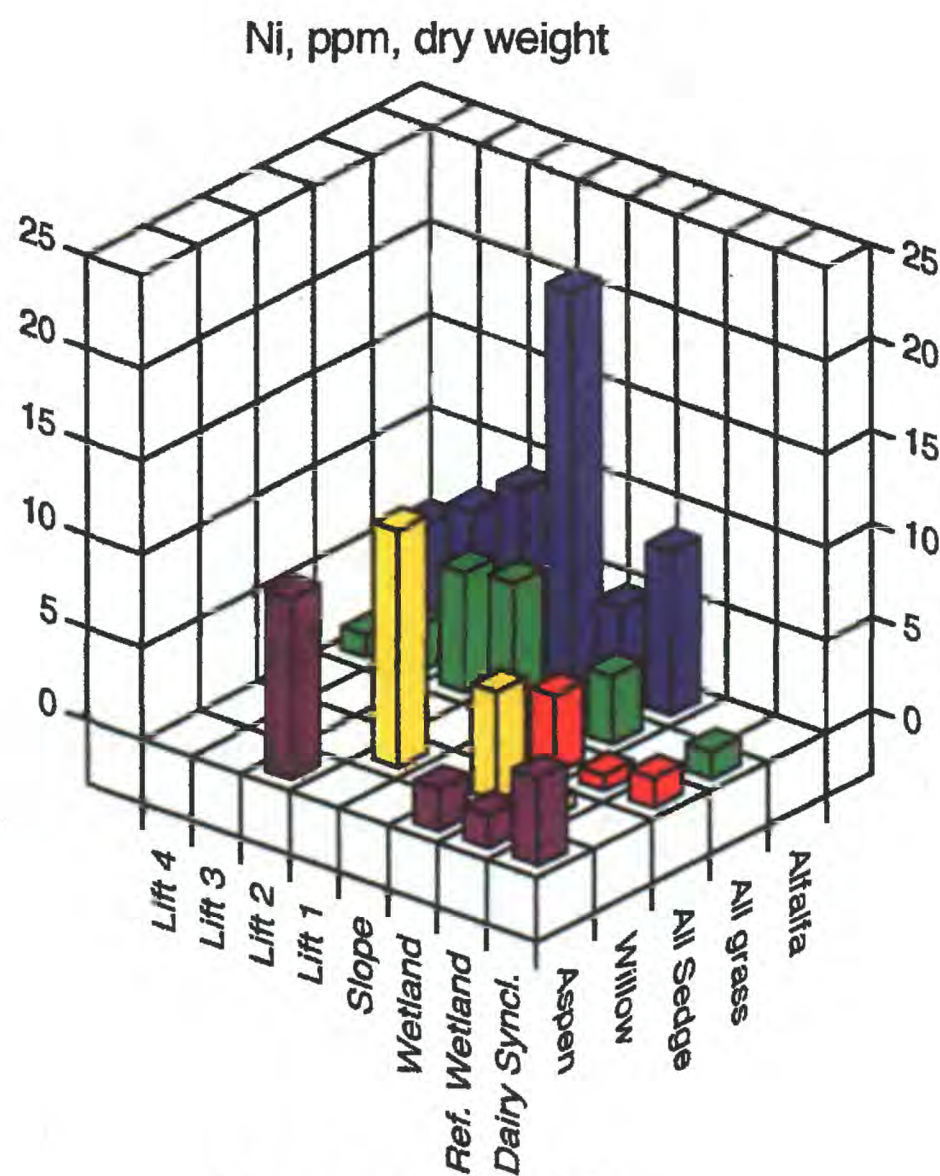


Figure 4 continued. Summary for each element of all samples from a genus group or plant type plotted by location.



Table 1. Concentrations, based on dry weight, of major, minor, and trace elements for individual plant samples.

Field No.	Location (number of unqualified analyses)	Species (precision)	Common name	Species Code	duplicate of previous analysis	ICP-MS	Lab No.	Latitude	Longitude	Ash Wt., %	As, ppm, Hyd	Se, ppm, Hyd	Al, %, ICP AES	Ca, %, ICP AES	Fe, %, ICP AES	K, %, ICP AES	Mg, %, ICP-AES
										240 1%	143 11%	236 10%	240 4%	240 2%	240 2%	240 1%	240 0%
WPPD11P	DairySync	<i>Achillea millefolium</i>	Western Yarrow	ACMI			C-140433	N42 36.648'	W111 20.157'	10.5	<0.05	0.07	0.005	0.75	0.005	2.5	0.17
WPPD12P	DairySync	<i>Achillea millefolium</i>	Western Yarrow	ACMI			C-140435	N42 36.648'	W111 20.157'	10.1	<0.05	0.27	0.004	0.75	0.004	2.4	0.16
WPPD13P	DairySync	<i>Achillea millefolium</i>	Western Yarrow	ACMI			C-140439	N42 36.648'	W111 20.157'	12.0	<0.05	0.09	0.006	0.88	0.006	2.8	0.18
WPPD14P	DairySync	<i>Achillea millefolium</i>	Western Yarrow	ACMI			C-140442	N42 36.648'	W111 20.157'	9.4	<0.05	0.06	0.004	0.73	0.005	2.3	0.15
WPPD15P	DairySync	<i>Achillea millefolium</i>	Western Yarrow	ACMI			C-140446	N42 36.648'	W111 20.157'	12.5	<0.05	0.08	0.006	0.91	0.006	2.9	0.23
WPPD17P	DairySync	<i>Achillea millefolium</i>	Western Yarrow	ACMI			C-140450	N42 36.648'	W111 20.157'	7.8	<0.05	<0.03	0.004	0.60	0.004	2.0	0.16
WPPD21P	DairySync	<i>Achillea millefolium</i>	Western Yarrow	ACMI			C-140454	N42 37.707'	W111 21.231'	17.0	<0.05	0.03	0.009	0.94	0.009	3.7	0.22
WPPD42P	DairySync	<i>Achillea millefolium</i>	Western Yarrow	ACMI			C-140484	N42 37.549'	W111 21.157'	9.5	0.11	0.32	0.054	0.84	0.026	1.9	0.17
WPPD42PX	DairySync	<i>Achillea millefolium</i>	Western Yarrow	ACMI	x		C-140494	N42 37.549'	W111 21.157'	9.3	0.14	0.24	0.053	0.82	0.026	2.0	0.17
WPPD43P	DairySync	<i>Achillea millefolium</i>	Western Yarrow	ACMI			C-140486	N42 37.549'	W111 21.157'	8.2	0.09	0.28	0.018	0.33	0.016	1.1	0.09
WPPD44P	DairySync	<i>Achillea millefolium</i>	Western Yarrow	ACMI			C-140489	N42 37.549'	W111 21.157'	9.8	0.05	0.14	0.034	0.93	0.020	2.1	0.18
WPPD45P	DairySync	<i>Achillea millefolium</i>	Western Yarrow	ACMI			C-140492	N42 37.549'	W111 21.157'	8.9	<0.05	0.06	0.006	0.82	0.007	2.0	0.21
WPPD12A	DairySync	<i>Agropyron caninum</i>	Bearded wheatgrass	AGCA			C-140334	N42 36.648'	W111 20.157'	6.7	<0.05	0.03	0.004	0.19	0.005	1.5	0.06
WPPD15A	DairySync	<i>Agropyron caninum</i>	Bearded wheatgrass	AGCA	x		C-140293	N42 36.648'	W111 20.157'	6.0	<0.05	0.09	0.001	0.16	0.004	1.3	0.05
WPPD16A	DairySync	<i>Agropyron caninum</i>	Bearded wheatgrass	AGCA			C-140444	N42 36.648'	W111 20.157'	6.5	0.05	0.14	0.001	0.19	0.005	1.5	0.10
WPPD14B	Lift 1	<i>Agropyron intermedium</i>	Intermediate wheatgrass	AGIN			C-140448	N42 36.648'	W111 20.157'	6.8	<0.05	0.08	0.001	0.25	0.005	1.6	0.07
WPPD42B	Lift 1	<i>Agropyron intermedium</i>	Intermediate wheatgrass	AGIN	x		C-140259	N42 49.358'	W111 23.828'	5.6	0.07	4.30	0.005	0.25	0.005	1.4	0.10
WPP441B	Lift 2	<i>Agropyron intermedium</i>	Intermediate wheatgrass	AGIN	x		C-140262	N42 49.283'	W111 23.773'	5.5	0.07	56.0	0.006	0.31	0.006	1.2	0.13
WPP442B	Lift 2	<i>Agropyron intermedium</i>	Intermediate wheatgrass	AGIN			C-140329	N42 49.082'	W111 23.777'	6.6	0.13	5.50	0.007	0.25	0.005	1.3	0.09
WPP443B	Lift 2	<i>Agropyron intermedium</i>	Intermediate wheatgrass	AGIN			C-140337	N42 49.127'	W111 23.729'	4.4	0.24	45.0	0.011	0.33	0.009	0.9	0.14
WPP444B	Lift 2	<i>Agropyron intermedium</i>	Intermediate wheatgrass	AGIN			C-140339	N42 49.106'	W111 23.679'	6.1	0.16	1.30	0.006	0.40	0.006	1.5	0.21
WPP311B	Slope	<i>Agropyron intermedium</i>	Intermediate wheatgrass	AGIN			C-140417	N42 51.040'	W111 25.306'	7.0	0.06	0.17	0.007	0.24	0.007	1.3	0.09
WPP312B	Slope	<i>Agropyron intermedium</i>	Intermediate wheatgrass	AGIN			C-140421	N42 51.109'	W111 25.321'	7.8	<0.05	0.48	0.008	0.18	0.006	1.3	0.09
WPP313B	Slope	<i>Agropyron intermedium</i>	Intermediate wheatgrass	AGIN			C-140425	N42 51.053'	W111 25.255'	8.2	0.09	0.60	0.016	0.40	0.008	1.5	0.15
WPP411C	Lift 1	<i>Agropyron smithii</i>	Western wheatgrass	AGSM			C-140296	N42 49.287'	W111 23.888'	5.9	0.21	5.80	0.012	0.40	0.006	1.1	0.15
WPP412C	Lift 1	<i>Agropyron smithii</i>	Western wheatgrass	AGSM	x		C-140257	N42 49.281'	W111 23.858'	7.6	0.05	22.0	0.005	0.36	0.008	1.7	0.14
WPP413C	Lift 1	<i>Agropyron smithii</i>	Western wheatgrass	AGSM			C-140299	N42 49.313'	W111 23.858'	6.9	0.07	4.00	0.003	0.30	0.006	1.7	0.14
WPP421C	Lift 1	<i>Agropyron smithii</i>	Western wheatgrass	AGSM			C-140304	N42 49.180'	W111 23.834'	6.6	0.06	40.0	0.006	0.32	0.005	1.4	0.12
WPP422C	Lift 1	<i>Agropyron smithii</i>	Western wheatgrass	AGSM			C-140306	N42 49.232'	W111 23.820'	18.2	<0.05	48.0	0.013	1.07	0.015	3.8	0.44
WPP423C	Lift 1	<i>Agropyron smithii</i>	Western wheatgrass	AGSM			C-140309	N42 49.219'	W111 23.823'	5.6	0.12	65.0	0.011	0.34	0.006	1.0	0.11
WPP431C	Lift 2	<i>Agropyron smithii</i>	Western wheatgrass	AGSM	x		C-140264	N42 49.158'	W111 23.809'	7.7	0.06	30.0	0.005	0.46	0.006	1.7	0.13
WPP432C	Lift 2	<i>Agropyron smithii</i>	Western wheatgrass	AGSM			C-140318	N42 49.175'	W111 23.770'	6.3	<0.05	28.0	0.003	0.39	0.004	1.4	0.09
WPP433C	Lift 2	<i>Agropyron smithii</i>	Western wheatgrass	AGSM			C-140322	N42 49.175'	W111 23.770'	7.0	0.07	1.90	0.005	0.57	0.005	1.5	0.13
WPP434C	Lift 2	<i>Agropyron smithii</i>	Western wheatgrass	AGSM			C-140324	N42 49.202'	W111 23.719'	10.6	<0.05	28.0	0.003	0.46	0.004	1.9	0.16
WPP451C	Lift 3	<i>Agropyron smithii</i>	Western wheatgrass	AGSM	x		C-140271	N42 49.038'	W111 23.680'	7.5	0.11	1.80	0.004	0.30	0.005	1.7	0.11
WPP452C	Lift 3	<i>Agropyron smithii</i>	Western wheatgrass	AGSM			C-140350	N42 49.063'	W111 23.883'	7.6	0.06	5.40	0.004	0.32	0.005	1.7	0.11
WPP453C	Lift 3	<i>Agropyron smithii</i>	Western wheatgrass	AGSM			C-140353	N42 49.079'	W111 23.614'	6.8	0.11	1.00	0.006	0.37	0.005	1.8	0.11
WPP463C	Lift 3	<i>Agropyron smithii</i>	Western wheatgrass	AGSM			C-140358	N42 49.061'	W111 23.589'	8.3	0.05	5.30	0.005	1.50	0.006	1.6	0.32
WPP471C	Lift 4	<i>Agropyron smithii</i>	Western wheatgrass	AGSM			C-140361	N42 48.971'	W111 23.554'	9.2	0.06	0.82	0.006	0.40	0.006	2.6	0.14
WPP472C	Lift 4	<i>Agropyron smithii</i>	Western wheatgrass	AGSM	x		C-140274	N42 40.024'	W111 23.518'	7.4	0.06	52.0	0.004	0.29	0.004	1.5	0.11
WPP473C	Lift 4	<i>Agropyron smithii</i>	Western wheatgrass	AGSM			C-140363	N42 48.995'	W111 23.483'	7.6	<0.05	1.10	0.004	0.32	0.005	2.2	0.14
WPP481C	Lift 4	<i>Agropyron smithii</i>	Western wheatgrass	AGSM			C-140365	N42 48.956'	W111 23.535'	7.7	0.05	0.28	0.005	0.30	0.005	2.0	0.11
WPP482C	Lift 4	<i>Agropyron smithii</i>	Western wheatgrass	AGSM			C-140367	N42 48.929'	W111 23.526'	7.8	<0.05	12.0	0.007	0.34	0.006	2.2	0.13
WPP483C	Lift 4	<i>Agropyron smithii</i>	Western wheatgrass	AGSM			C-140369	N42 48.975'	W111 23.454'	8.0	0.06	1.90	0.007	0.33	0.007	2.3	0.11
WPP444Z	Lift 2	<i>Amelanchier alnifolia</i>	Saskatoon serviceberry	AMAL			C-140346	N42 49.106'	W111 23.679'	4.5	<0.05	12.0	0.009	0.77	0.009	1.0	0.14
WPP411D	Lift 1	<i>Bromus inermis</i>	Smooth brome grass	BRIN			C-140297	N42 49.287'	W111 23.888'	6.4	0.13	10.0	0.003	0.39	0.004	1.5	0.12
WPP412D	Lift 1	<i>Bromus inermis</i>	Smooth brome grass	BRIN	x		C-140258	N42 49.281'	W111 23.858'	7.1	0.06	23.0	0.004	0.42	0.004	1.6	0.13
WPP413D	Lift 1	<i>Bromus inermis</i>	Smooth brome grass	BRIN			C-140300	N42 49.313'	W111 23.858'	6.7	<0.05	2.80	0.003	0.35	0.005	1.6	0.11
WPP414D	Lift 1	<i>Bromus inermis</i>	Smooth brome grass	BRIN			C-140302	N42 49.356'	W111 23.828'	7.2	0.06	3.40	0.002	0.29	0.004	1.7	0.12
WPP421D	Lift 1	<i>Bromus inermis</i>	Smooth brome grass	BRIN			C-140305	N42 49.180'	W111 23.834'	6.8	0.05	39.0	0.004	0.38	0.004	1.6	0.12
WPP422D	Lift 1	<i>Bromus inermis</i>	Smooth brome grass	BRIN			C-140307	N42 49.232'	W111 23.820'	7.3	0.07	29.0	0.004	0.44	0.004	1.7	0.15
WPP423D	Lift 1	<i>Bromus inermis</i>	Smooth brome grass	BRIN			C-140310	N42 49.219'	W111 23.823'	6.0	0.18	57.0	0.017	0.60	0.012	1.0	0.17
WPP424D	Lift 1	<i>Bromus inermis</i>	Smooth brome grass	BRIN	x		C-140263	N42 49.263'	W111 23.793'	5.0	0.06	26.0	0.005	0.33	0.005	1.0	0.10
WPP431D	Lift 2	<i>Bromus inermis</i>	Smooth brome grass	BRIN			C-140314	N42 49.158'	W111 23.809'	8.4	0.06	21.0	0.003	0.50	0.005	1.8	0.11
WPP432D	Lift 2	<i>Bromus inermis</i>	Smooth brome grass	BRIN			C-140319	N42 49.136'	W111 23.748'	8.1	<0.05	33.0	0.002	0.42	0.003	1.7	0.11
WPP433D	Lift 2	<i>Bromus inermis</i>	Smooth brome grass	BRIN			C-140323	N42 49.175'	W111 23.770'	9.5	0.08	3.60	0.003	0.68	0.004	2.3	0.12
WPP434D	Lift 2	<i>Bromus inermis</i>	Smooth brome grass	BRIN			C-140325	N42 49.202'	W111 23.719'	9.3	<0.05	27.0	0.002	0.50	0.003	2.0	0.14
WPP441D	Lift 2	<i>Bromus inermis</i>	Smooth brome grass	BRIN	x		C-140269	N42 49.082'	W111 23.777'	6.7	0.10	11.0	0.003	0.21	0.003	1.5	0.06
WPP442D	Lift 2	<i>Bromus inermis</i>	Smooth brome grass	BRIN			C-140333	N42 49.082'	W111 23.734'	6.2	0.20	18.0	0.012	0.46	0.006	1.4	0.22



Table 1 (continued). Concentrations, based on dry weight, of major, minor, and trace elements for individual plant samples.

Field No.	Location	Species	Common name	Species Code	duplicate or previous analysis	ICP-MS	Lab No.	Latitude	Longitude	Ash Wt., %	As, ppm, Hyd	Se, ppm, Hyd	Al, % ICP AES	Ca, % ICP AES	Fe, % ICP AES	K, % ICP AES	Mg, % ICP-AES
WPP443D	Lift 2	<i>Bromus inermis</i>	Smooth bromegrass	BRIN			C-140338	N42 49.127'	W111 23.729'	6.6	0.50	4.30	0.013	0.48	0.007	1.9	0.21
WPP444D	Lift 2	<i>Bromus inermis</i>	Smooth bromegrass	BRIN			C-140340	N42 49.106'	W111 23.679'	7.4	0.15	0.77	0.007	0.48	0.006	2.0	0.24
WPP451D	Lift 3	<i>Bromus inermis</i>	Smooth bromegrass	BRIN			C-140348	N42 49.038'	W111 23.680'	7.8	0.08	0.82	0.002	0.28	0.005	2.3	0.11
WPP452D	Lift 3	<i>Bromus inermis</i>	Smooth bromegrass	BRIN			C-140351	N42 49.063'	W111 23.663'	7.4	0.08	5.70	0.003	0.32	0.004	1.6	0.10
WPP453D	Lift 3	<i>Bromus inermis</i>	Smooth bromegrass	BRIN			C-140354	N42 49.079'	W111 23.614'	6.6	<0.05	1.70	0.003	0.22	0.004	1.9	0.09
WPP461D	Lift 3	<i>Bromus inermis</i>	Smooth bromegrass	BRIN			C-140356	N42 49.037'	W111 23.645'	6.2	0.08	1.10	0.004	0.25	0.004	1.6	0.11
WPP462D	Lift 3	<i>Bromus inermis</i>	Smooth bromegrass	BRIN		x	C-140273	N42 49.038'	W111 23.636'	6.9	0.06	2.50	0.004	0.32	0.004	1.4	0.12
WPP463D	Lift 3	<i>Bromus inermis</i>	Smooth bromegrass	BRIN			C-140359	N42 49.081'	W111 23.589'	5.9	0.07	4.20	0.005	0.26	0.005	1.5	0.11
WPPW23D	Wetland	<i>Bromus inermis</i>	Smooth bromegrass	BRIN			C-140376	N42 49.315'	W111 23.912'	5.8	0.10	9.30	0.001	0.35	0.003	1.3	0.10
WPP311E	Slope	<i>Bromus marginatus</i>	Mountain bromegrass	BRMA			C-140418	N42 51.040'	W111 25.306'	8.0	0.05	0.18	0.016	0.44	0.008	1.4	0.15
WPP312E	Slope	<i>Bromus marginatus</i>	Mountain bromegrass	BRMA			C-140422	N42 51.109'	W111 25.321'	8.2	0.09	0.37	0.016	0.34	0.008	1.9	0.12
WPP313E	Slope	<i>Bromus marginatus</i>	Mountain bromegrass	BRMA			C-140426	N42 51.053'	W111 25.255'	9.3	0.08	0.77	0.009	0.33	0.007	1.8	0.12
WPP314E	Slope	<i>Bromus marginatus</i>	Mountain bromegrass	BRMA			C-140428	N42 51.082'	W111 25.240'	8.4	0.10	0.53	0.020	0.39	0.017	1.7	0.14
WPPRWK	RefWetland	<i>Carex haydeniana</i>	Cloud sedge	CAHA		x	C-140287	N42 49.372'	W111 23.942'	4.5	0.05	0.11	0.002	0.21	0.004	1.0	0.09
WPPW11K	Wetland	<i>Carex haydeniana</i>	Cloud sedge	CAHA			C-140276	N42 49.306'	W111 23.937'	7.4	<0.05	63.0	0.004	0.31	0.005	2.1	0.15
WPPW21K	Wetland	<i>Carex haydeniana</i>	Cloud sedge	CAHA		x	C-140380	N42 49.315'	W111 23.912'	7.3	<0.05	64.0	0.004	0.45	0.007	1.5	0.20
WPPW28K	Wetland	<i>Carex haydeniana</i>	Cloud sedge	CAHA			C-140384	N42 49.460'	W111 24.199'	6.5	0.08	44.0	0.005	0.39	0.006	1.4	0.17
WPPW32K	Wetland	<i>Carex haydeniana</i>	Cloud sedge	CAHA			C-140279	N42 49.460'	W111 24.199'	6.1	0.08	5.70	0.012	0.37	0.012	1.4	0.13
WPPW35K	Wetland	<i>Carex haydeniana</i>	Cloud sedge	CAHA		x	C-140387	N42 49.351'	W111 23.929'	6.4	<0.05	31.0	0.013	0.46	0.006	1.4	0.15
WPPW41K	Wetland	<i>Carex haydeniana</i>	Cloud sedge	CAHA			C-140389	N42 49.351'	W111 23.929'	7.5	0.08	9.70	0.005	0.55	0.007	1.5	0.17
WPPW43K	Wetland	<i>Carex haydeniana</i>	Cloud sedge	CAHA			C-140398	N42 49.351'	W111 23.929'	6.7	0.07	3.10	0.007	0.48	0.007	1.4	0.16
WPPW51K	Wetland	<i>Carex haydeniana</i>	Cloud sedge	CAHA			C-140399	N42 49.392'	W111 23.962'	7.1	0.08	3.10	0.004	0.45	0.006	1.4	0.14
WPPD11L	DairySync	<i>Carex hoodii</i>	Hood sedge	CAHO			C-140432	N42 36.648'	W111 20.157'	9.8	<0.05	0.14	0.004	0.32	0.006	1.6	0.11
WPPD13L	DairySync	<i>Carex hoodii</i>	Hood sedge	CAHO			C-140438	N42 36.648'	W111 20.157'	8.5	0.06	0.11	0.005	0.37	0.005	1.9	0.09
WPPD15L	DairySync	<i>Carex hoodii</i>	Hood sedge	CAHO			C-140445	N42 36.648'	W111 20.157'	10.0	0.05	0.17	0.003	0.29	0.005	2.2	0.09
WPPD18L	DairySync	<i>Carex hoodii</i>	Hood sedge	CAHO			C-140452	N42 36.648'	W111 20.157'	8.9	<0.05	0.04	0.005	0.39	0.005	2.1	0.11
WPPD35M	DairySync	<i>Carex rossii</i>	Ross sedge	CARO			C-140479	N42 37.549'	W111 21.157'	7.9	<0.05	0.29	0.006	0.44	0.007	1.4	0.11
WPPD41M	DairySync	<i>Carex rossii</i>	Ross sedge	CARO			C-140481	N42 37.549'	W111 21.157'	8.4	0.11	0.39	0.039	0.41	0.025	1.3	0.10
WPPD43M	DairySync	<i>Carex rossii</i>	Ross sedge	CARO		x	C-140295	N42 37.549'	W111 21.157'	6.6	<0.05	0.12	0.014	0.63	0.007	1.4	0.16
WPPD44M	DairySync	<i>Carex rossii</i>	Ross sedge	CARO			C-140488	N42 37.549'	W111 21.157'	7.2	0.07	0.56	0.016	0.43	0.014	1.1	0.12
WPPD45M	DairySync	<i>Carex rossii</i>	Ross sedge	CARO			C-140491	N42 37.549'	W111 21.157'	6.5	<0.05	0.17	0.007	0.31	0.007	1.1	0.14
WPPRWN	RefWetland	<i>Carex utricularia</i>	Beaked Sedge	CAUT		x	C-140288	N42 49.372'	W111 23.942'	6.3	0.06	0.24	0.006	0.38	0.006	1.3	0.10
WPPW14N	Wetland	<i>Carex utricularia</i>	Beaked Sedge	CAUT			C-140374	N42 49.306'	W111 23.937'	7.7	<0.05	220	0.004	0.47	0.006	2.1	0.20
WPPW25N	Wetland	<i>Carex utricularia</i>	Beaked Sedge	CAUT			C-140377	N42 49.315'	W111 23.912'	7.0	0.07	34.0	0.003	0.40	0.006	1.3	0.18
WPPW37N	Wetland	<i>Carex utricularia</i>	Beaked Sedge	CAUT		x	C-140280	N42 49.460'	W111 24.199'	5.8	<0.05	6.90	0.004	0.42	0.012	1.0	0.19
WPPW48N	Wetland	<i>Carex utricularia</i>	Beaked Sedge	CAUT			C-140393	N42 49.351'	W111 23.929'	6.8	0.07	14.0	0.004	0.45	0.015	1.3	0.14
WPPW49N	Wetland	<i>Carex utricularia</i>	Beaked Sedge	CAUT			C-140394	N42 49.351'	W111 23.929'	8.1	0.07	6.50	0.008	0.64	0.016	1.4	0.19
WPPW411N	Wetland	<i>Carex utricularia</i>	Beaked Sedge	CAUT			C-140396	N42 49.351'	W111 23.929'	7.4	0.08	18.0	0.005	0.41	0.015	1.5	0.13
WPPW52N	Wetland	<i>Carex utricularia</i>	Beaked Sedge	CAUT		x	C-140282	N42 49.392'	W111 23.962'	7.0	0.08	4.50	0.004	0.43	0.007	1.3	0.17
WPPW53N	Wetland	<i>Carex utricularia</i>	Beaked Sedge	CAUT			C-140400	N42 49.392'	W111 23.962'	7.9	0.08	4.00	0.003	0.43	0.008	1.4	0.16
WPPW55N	Wetland	<i>Carex utricularia</i>	Beaked Sedge	CAUT			C-140402	N42 49.392'	W111 23.962'	7.8	<0.05	2.50	0.005	0.47	0.007	1.5	0.13
WPPW56N	Wetland	<i>Carex utricularia</i>	Beaked Sedge	CAUT			C-140403	N42 49.392'	W111 23.962'	8.3	0.08	16.0	0.003	0.45	0.005	1.6	0.13
WPP444AA	Lift 2	<i>Ceanothus velutinus</i>	Snowbrush, Buckbrush	CEVE			C-140347	N42 49.106'	W111 23.679'	4.1	0.05	15.0	0.008	0.94	0.008	0.7	0.18
WPPW31Q	Wetland	<i>Cirsium arvense</i>	Canada thistle	CIAR		x	C-140383	N42 49.480'	W111 24.199'	15.0	0.05	3.00	0.006	2.70	0.006	2.7	0.24
WPP423F	Lift 1	<i>Dactylis glomerata</i>	Orchardgrass	DAGL			C-140261	N42 49.219'	W111 23.823'	6.4	0.13	58.0	0.013	0.32	0.006	1.4	0.19
WPP441F	Lift 2	<i>Dactylis glomerata</i>	Orchardgrass	DAGL			C-140330	N42 49.082'	W111 23.777'	6.7	0.08	10.0	0.003	0.18	0.005	1.5	0.11
WPP442F	Lift 2	<i>Dactylis glomerata</i>	Orchardgrass	DAGL			C-140334	N42 49.082'	W111 23.734'	5.6	0.35	26.0	0.013	0.35	0.011	1.2	0.22
WPP444F	Lift 2	<i>Dactylis glomerata</i>	Orchardgrass	DAGL			C-140341	N42 49.106'	W111 23.679'	6.4	0.13	0.70	0.004	0.24	0.004	1.7	0.19
WPP311F	Slope	<i>Dactylis glomerata</i>	Orchardgrass	DAGL			C-140419	N42 51.040'	W111 25.306'	9.2	0.09	0.25	0.018	0.31	0.009	1.7	0.16
WPP312F	Slope	<i>Dactylis glomerata</i>	Orchardgrass	DAGL			C-140423	N42 51.109'	W111 25.321'	10.4	0.19	1.70	0.048	0.42	0.027	1.6	0.18
WPP314F	Slope	<i>Dactylis glomerata</i>	Orchardgrass	DAGL			C-140429	N42 51.082'	W111 25.240'	10.5	0.09	0.52	0.021	0.38	0.011	1.9	0.19
WPPW34F	Wetland	<i>Dactylis glomerata</i>	Orchardgrass	DAGL		x	C-140278	N42 49.460'	W111 24.199'	7.6	0.08	19.0	0.004	0.32	0.008	1.7	0.15
WPPD11G	DairySync	<i>Deschampsia caespitosa</i>	Tufted hairgrass	DECA			C-140431	N42 36.648'	W111 20.157'	7.6	<0.05	0.04	0.003	0.19	0.005	1.5	0.09
WPPD12G	DairySync	<i>Deschampsia caespitosa</i>	Tufted hairgrass	DECA		x	C-140292	N42 36.648'	W111 20.157'	6.7	<0.05	0.10	0.002	0.20	0.004	1.2	0.10
WPPD13G	DairySync	<i>Deschampsia caespitosa</i>	Tufted hairgrass	DECA			C-140437	N42 36.648'	W111 20.157'	7.3	<0.05	0.14	0.002	0.23	0.004	1.4	0.09
WPPD14G	DairySync	<i>Deschampsia caespitosa</i>	Tufted hairgrass	DECA			C-140441	N42 36.648'	W111 20.157'	5.5	<0.05	0.06	0.002	0.22	0.006	1.2	0.12
WPPD21G	DairySync	<i>Deschampsia caespitosa</i>	Tufted hairgrass	DECA			C-140453	N42 37.707'	W111 21.231'	8.6	0.08	<0.03	0.006	0.37	0.007	2.0	0.12
WPPD22G	DairySync	<i>Deschampsia caespitosa</i>	Tufted hairgrass	DECA			C-140457	N42 37.707'	W111 21.231'	13.4	0.06	0.23	0.005	0.29	0.008	1.6	0.11
WPPD23G	DairySync	<i>Deschampsia caespitosa</i>	Tufted hairgrass	DECA			C-140460	N42 37.707'	W111 21.231'	12.9	<0.05	0.55	0.006	0.31	0.008	1.7	0.13
WPPD24G	DairySync	<i>Deschampsia caespitosa</i>	Tufted hairgrass	DECA			C-140463	N42 37.707'	W111 21.231'	11.5	<0.05	0.38	0.005	0.35	0.006	1.6	0.15
WPPD25G	DairySync	<i>Deschampsia caespitosa</i>	Tufted hairgrass	DECA			C-140465	N42 37.707'	W111 21.231'	8.7	0.06	0.08	0.005	0.35	0.007	1.6	0.21



Table 1 (continued). Concentrations, based on dry weight, of major, minor, and trace elements for individual plant samples.

Field No.	Location	Species	Common name	Species Code	duplicate or previous analysis	ICP-MS	Lab No.	Latitude	Longitude	Ash Wt., %	As, ppm, Hyd	Se, ppm, Hyd	Al, %, ICP AES	Ca, %, ICP AES	Fe, %, ICP AES	K, %, ICP AES	Mg, %, ICP-AES
WPPD31G	DairySync	<i>Deschampsia caespitosa</i>	Tufted hairgrass	DECA			C-140468	N42 37.549'	W111 21.157'	10.0	0.06	0.57	0.010	0.36	0.008	1.5	0.10
WPPD32G	DairySync	<i>Deschampsia caespitosa</i>	Tufted hairgrass	DECA			C-140471	N42 37.549'	W111 21.157'	11.5	<0.05	0.24	0.005	0.32	0.007	2.1	0.13
WPPD33G	DairySync	<i>Deschampsia caespitosa</i>	Tufted hairgrass	DECA			C-140474	N42 37.549'	W111 21.157'	12.5	<0.05	0.92	0.003	0.40	0.005	1.8	0.11
WPPD34G	DairySync	<i>Deschampsia caespitosa</i>	Tufted hairgrass	DECA			C-140477	N42 37.549'	W111 21.157'	12.0	<0.05	0.24	0.005	0.38	0.008	1.9	0.14
WPPD42G	DairySync	<i>Deschampsia caespitosa</i>	Tufted hairgrass	DECA			C-140483	N42 37.549'	W111 21.157'	5.8	<0.05	0.06	0.005	0.20	0.005	1.2	0.09
WPPRW2G	RefWetland	<i>Deschampsia caespitosa</i>	Tufted hairgrass	DECA		x	C-140266	N42 49.372'	W111 23.942'	5.6	0.05	2.00	0.002	0.19	0.006	1.1	0.10
WPPW12G	Wetland	<i>Deschampsia caespitosa</i>	Tufted hairgrass	DECA			C-140372	N42 49.306'	W111 23.937'	6.9	<0.05	94.0	0.003	0.23	0.004	1.5	0.09
WPPW29G	Wetland	<i>Deschampsia caespitosa</i>	Tufted hairgrass	DECA			C-140381	N42 49.315'	W111 23.912'	6.1	<0.05	28.0	0.002	0.30	0.006	1.2	0.10
WPPW42G	Wetland	<i>Deschampsia caespitosa</i>	Tufted hairgrass	DECA			C-140388	N42 49.351'	W111 23.929'	5.3	0.06	47.0	0.003	0.23	0.005	1.0	0.10
WPPW45G	Wetland	<i>Deschampsia caespitosa</i>	Tufted hairgrass	DECA			C-140391	N42 49.351'	W111 23.929'	5.8	0.06	13.0	0.006	0.29	0.008	1.2	0.12
WPPW46G	Wetland	<i>Deschampsia caespitosa</i>	Tufted hairgrass	DECA		x	C-140281	N42 49.351'	W111 23.929'	4.4	<0.05	41.0	0.003	0.18	0.004	0.8	0.10
WPPW54G	Wetland	<i>Deschampsia caespitosa</i>	Tufted hairgrass	DECA			C-140401	N42 49.392'	W111 23.962'	7.6	0.06	15.0	0.003	0.23	0.005	1.0	0.12
WPPD31R	DairySync	<i>Epilobium angustifolium</i>	Fireweed	EPAN			C-140469	N42 37.549'	W111 21.157'	7.4	0.13	0.16	0.015	1.04	0.007	1.4	0.51
WPPD32R	DairySync	<i>Epilobium angustifolium</i>	Fireweed	EPAN			C-140472	N42 37.549'	W111 21.157'	7.8	<0.05	0.27	0.003	0.94	0.006	1.6	0.45
WPPW44S	Wetland	<i>Equisetum arvense</i>	Field horsetail	EQAR			C-140390	N42 49.351'	W111 23.929'	16.5	0.47	2.30	0.068	1.98	0.033	2.6	0.41
WPPW47S	Wetland	<i>Equisetum arvense</i>	Field horsetail	EQAR			C-140392	N42 49.351'	W111 23.929'	15.2	0.31	15.0	0.005	1.82	0.015	2.6	0.40
WPPW412S	Wetland	<i>Equisetum arvense</i>	Field horsetail	EQAR			C-140397	N42 49.351'	W111 23.929'	18.1	0.26	1.10	0.013	2.35	0.014	2.7	0.43
WPPW13H	Wetland	<i>Festuca arundinacea</i>	Reed fescue	FEAR			C-140373	N42 49.306'	W111 23.937'	8.0	<0.05	190	0.004	0.31	0.004	1.8	0.10
WPPW26H	Wetland	<i>Festuca arundinacea</i>	Reed fescue	FEAR			C-140378	N42 49.315'	W111 23.912'	7.3	<0.05	97.0	0.003	0.35	0.004	1.2	0.16
WPPW33I	Wetland	<i>Glyceria striata</i>	Fowl manna grass	GLST			C-140385	N42 49.460'	W111 24.199'	7.3	<0.05	5.80	0.003	0.37	0.007	1.2	0.12
WPPRW2O	RefWetland	<i>Juncus ensifolius</i>	Swordleaf rush	JUEN			C-140413	N42 49.372'	W111 23.942'	8.3	<0.05	0.16	0.002	0.13	0.003	1.9	0.14
WPPW27O	Wetland	<i>Juncus ensifolius</i>	Swordleaf rush	JUEN			C-140379	N42 49.315'	W111 23.912'	8.4	<0.05	53.0	0.005	0.40	0.005	2.0	0.23
WPPW210O	Wetland	<i>Juncus ensifolius</i>	Swordleaf rush	JUEN			C-140382	N42 49.315'	W111 23.912'	10.0	0.06	40.0	0.003	0.53	0.007	2.7	0.24
WPPW410O	Wetland	<i>Juncus ensifolius</i>	Swordleaf rush	JUEN			C-140395	N42 49.351'	W111 23.929'	7.7	0.06	6.10	0.003	0.40	0.005	2.0	0.18
WPP411T	Lift 1	<i>Medicago sativa</i>	Alfalfa	MESA		x	C-140256	N42 49.287'	W111 23.866'	10.5	0.05	19.0	0.006	3.05	0.007	0.8	0.57
WPP412T	Lift 1	<i>Medicago sativa</i>	Alfalfa	MESA			C-140298	N42 49.281'	W111 23.858'	9.9	<0.05	70.0	0.005	2.58	0.008	0.8	0.45
WPP413T	Lift 1	<i>Medicago sativa</i>	Alfalfa	MESA			C-140301	N42 49.313'	W111 23.858'	11.2	0.06	22.0	0.004	2.46	0.022	1.1	0.49
WPP414T	Lift 1	<i>Medicago sativa</i>	Alfalfa	MESA			C-140303	N42 49.356'	W111 23.828'	9.8	<0.05	190	0.006	2.35	0.009	1.1	0.42
WPP421T	Lift 1	<i>Medicago sativa</i>	Alfalfa	MESA		x	C-140260	N42 49.180'	W111 23.834'	10.3	0.05	70.0	0.005	2.78	0.007	0.9	0.45
WPP422T	Lift 1	<i>Medicago sativa</i>	Alfalfa	MESA			C-140308	N42 49.232'	W111 23.820'	10.3	<0.05	56.0	0.006	2.58	0.008	1.0	0.50
WPP423T	Lift 1	<i>Medicago sativa</i>	Alfalfa	MESA			C-140312	N42 49.219'	W111 23.823'	11.3	0.06	260	0.011	2.71	0.011	0.8	0.78
WPP424T	Lift 1	<i>Medicago sativa</i>	Alfalfa	MESA			C-140313	N42 49.263'	W111 23.793'	10.6	0.06	48.0	0.010	2.54	0.008	1.1	0.55
WPP431T	Lift 2	<i>Medicago sativa</i>	Alfalfa	MESA			C-140315	N42 49.158'	W111 23.809'	11.2	<0.05	38.0	0.004	2.80	0.007	1.2	0.45
WPP432T	Lift 2	<i>Medicago sativa</i>	Alfalfa	MESA			C-140320	N42 49.136'	W111 23.746'	8.5	0.06	61.0	0.003	1.87	0.006	1.2	0.29
WPP433T	Lift 2	<i>Medicago sativa</i>	Alfalfa	MESA		x	C-140266	N42 49.175'	W111 23.770'	10.4	<0.05	34.0	0.003	2.60	0.006	1.1	0.27
WPP434T	Lift 2	<i>Medicago sativa</i>	Alfalfa	MESA			C-140326	N42 49.202'	W111 23.719'	10.3	0.05	71.0	0.003	1.85	0.006	1.8	0.31
WPP441T	Lift 2	<i>Medicago sativa</i>	Alfalfa	MESA			C-140331	N42 49.082'	W111 23.777'	9.1	0.10	14.0	0.005	1.92	0.008	1.5	0.35
WPP442T	Lift 2	<i>Medicago sativa</i>	Alfalfa	MESA			C-140336	N42 49.082'	W111 23.734'	10.9	0.12	74.0	0.022	2.82	0.011	1.2	0.46
WPP443T	Lift 2	<i>Medicago sativa</i>	Alfalfa	MESA		x	C-140270	N42 49.127'	W111 23.729'	12.4	<0.05	74.0	0.009	2.98	0.010	1.5	0.42
WPP444T	Lift 2	<i>Medicago sativa</i>	Alfalfa	MESA			C-140342	N42 49.106'	W111 23.679'	11.0	0.07	6.90	0.006	2.97	0.008	1.3	0.46
WPP461T	Lift 3	<i>Medicago sativa</i>	Alfalfa	MESA		x	C-140272	N42 49.037'	W111 23.645'	10.6	0.05	21.0	0.008	2.54	0.008	1.3	0.47
WPP462T	Lift 3	<i>Medicago sativa</i>	Alfalfa	MESA			C-140357	N42 49.038'	W111 23.636'	10.1	0.06	34.0	0.004	2.73	0.008	1.0	0.56
WPP463T	Lift 3	<i>Medicago sativa</i>	Alfalfa	MESA			C-140360	N42 49.061'	W111 23.589'	8.0	<0.05	30.0	0.003	1.44	0.008	1.8	0.23
WPP471T	Lift 4	<i>Medicago sativa</i>	Alfalfa	MESA			C-140362	N42 48.971'	W111 23.554'	12.4	<0.05	3.20	0.002	2.85	0.006	2.4	0.35
WPP472T	Lift 4	<i>Medicago sativa</i>	Alfalfa	MESA		x	C-140275	N42 40.024'	W111 23.518'	11.1	0.05	170	0.006	2.44	0.009	1.7	0.32
WPP473T	Lift 4	<i>Medicago sativa</i>	Alfalfa	MESA			C-140364	N42 48.995'	W111 23.483'	10.5	<0.05	40.0	0.004	2.21	0.008	2.1	0.29
WPP481T	Lift 4	<i>Medicago sativa</i>	Alfalfa	MESA			C-140366	N42 48.955'	W111 23.535'	9.5	<0.05	2.10	0.004	1.81	0.007	2.0	0.27
WPP482T	Lift 4	<i>Medicago sativa</i>	Alfalfa	MESA			C-140368	N42 48.929'	W111 23.526'	9.0	<0.05	180	0.007	1.62	0.008	1.9	0.35
WPP483T	Lift 4	<i>Medicago sativa</i>	Alfalfa	MESA			C-140370	N42 48.975'	W111 23.454'	14.4	<0.05	9.30	0.003	3.46	0.010	2.4	0.35
WPP311T	Slope	<i>Medicago sativa</i>	Alfalfa	MESA			C-140420	N42 51.040'	W111 25.306'	11.7	0.06	0.74	0.012	2.93	0.011	1.6	0.55
WPP312T	Slope	<i>Medicago sativa</i>	Alfalfa	MESA			C-140424	N42 51.109'	W111 25.321'	10.0	0.08	10.0	0.010	1.90	0.010	1.9	0.33
WPP313T	Slope	<i>Medicago sativa</i>	Alfalfa	MESA			C-140427	N42 51.053'	W111 25.255'	11.7	0.12	2.90	0.023	2.81	0.012	1.6	0.40
WPP314T	Slope	<i>Medicago sativa</i>	Alfalfa	MESA			C-140430	N42 51.082'	W111 25.240'	10.2	0.14	11.0	0.020	2.65	0.010	1.2	0.36
WPPW24T	Wetland	<i>Medicago sativa</i>	Alfalfa	MESA			C-140277	N42 49.315'	W111 23.912'	14.8	<0.05	29.0	0.004	2.98	0.009	1.3	0.62
WPPW36T	Wetland	<i>Medicago sativa</i>	Alfalfa	MESA		x	C-140386	N42 49.460'	W111 24.199'	10.4	<0.05	34.0	0.004	1.66	0.007	1.8	0.29
WPP451U	Lift 3	<i>Onobrychis viciifolia</i>	Common sainfoin	ONVI			C-140349	N42 49.038'	W111 23.680'	7.4	<0.05	7.00	0.004	1.34	0.007	1.6	0.39
WPP452U	Lift 3	<i>Onobrychis viciifolia</i>	Common sainfoin	ONVI			C-140352	N42 49.063'	W111 23.663'	7.2	0.07	12.0	0.004	1.23	0.005	1.6	0.37
WPP453U	Lift 3	<i>Onobrychis viciifolia</i>	Common sainfoin	ONVI			C-140355	N42 49.079'	W111 23.614'	6.1	<0.05	10.0	0.002	0.85	0.004	1.4	0.32
WPPD21V	DairySync	<i>Pedicularis racemosa</i>	Sickletop lousewort	PERA			C-140455	N42 37.707'	W111 21.231'	11.0	5.40	0.05	0.009	1.87	0.006	2.2	0.29
WPPD22V	DairySync	<i>Pedicularis racemosa</i>	Sickletop lousewort	PERA			C-140458	N42 37.707'	W111 21.231'	10.0	<0.05	0.18	0.021	0.81	0.009	1.7	0.26
WPPD23V	DairySync	<i>Pedicularis racemosa</i>	Sickletop lousewort	PERA			C-140461	N42 37.707'	W111 21.231'	9.4	0.08	0.28	0.045	1.03	0.009	2.1	0.29
WPPD24V	DairySync	<i>Pedicularis racemosa</i>	Sickletop lousewort	PERA			C-140464	N42 37.707'	W111 21.231'	9.0	0.16	0.08	0.080	0.87	0.009	2.0	0.32



Table 1 (continued). Concentrations, based on dry weight, of major, minor, and trace elements for individual plant samples.

Field No.	Location	Species	Common name	Species Code	duplicate or previous analysis	ICP-MS	Lab No.	Latitude	Longitude	Ash Wt., %	As, ppm, Hyd	Se, ppm, Hyd	Al, %, ICP-AES	Ca, %, ICP-AES	Fe, %, ICP-AES	K, %, ICP-AES	Mg, %, ICP-AES
WPPD25V	DairySync	<i>Pedicularis racemosa</i>	Sickletop lousewort	PERA			C-140466	N42 37.707'	W111 21.231'	11.1	2.30	0.05	0.029	1.33	0.010	2.4	0.40
WPPD33V	DairySync	<i>Pedicularis racemosa</i>	Sickletop lousewort	PERA			C-140475	N42 37.549'	W111 21.157'	10.2	4.20	0.23	0.053	1.43	0.009	1.9	0.32
WPP444W	Lift 2	<i>Penstemon rydbergii</i>	Rydberg beardtongue	PERY			C-140343	N42 49.106'	W111 23.679'	5.9	0.09	1.60	0.012	0.89	0.006	1.4	0.26
WPP444X	Lift 2	<i>Phacelia hastata</i>	Phacelia	PHHA			C-140344	N42 49.106'	W111 23.679'	12.2	0.16	1.50	0.024	2.56	0.012	2.2	0.28
WPP423J	Lift 1	<i>Phleum pratense</i>	Timothy	PHPR			C-140311	N42 49.219'	W111 23.823'	4.4	0.11	21.0	0.009	0.23	0.010	1.0	0.10
WPP442J	Lift 2	<i>Phleum pratense</i>	Timothy	PHPR			C-140335	N42 49.082'	W111 23.734'	4.9	0.30	12.0	0.013	0.32	0.010	1.1	0.15
WPPW22J	Wetland	<i>Phleum pratense</i>	Timothy	PHPR			C-140375	N42 49.315'	W111 23.912'	8.2	<0.05	110	0.003	0.22	0.006	2.0	0.12
WPPD11AB	DairySync	<i>Populus tremuloides</i>	Aspen	POTR		x	C-140291	N42 36.648'	W111 20.157'	5.7	<0.05	0.06	0.003	1.25	0.005	0.9	0.21
WPPD12AB	DairySync	<i>Populus tremuloides</i>	Aspen	POTR			C-140436	N42 36.648'	W111 20.157'	5.3	0.05	0.10	0.003	1.33	0.004	0.7	0.25
WPPD13AB	DairySync	<i>Populus tremuloides</i>	Aspen	POTR			C-140440	N42 36.648'	W111 20.157'	5.6	<0.05	0.21	0.003	1.23	0.004	1.0	0.16
WPPD14AB	DairySync	<i>Populus tremuloides</i>	Aspen	POTR			C-140443	N42 36.648'	W111 20.157'	7.5	<0.05	0.18	0.005	1.20	0.006	1.5	0.30
WPPD15AB	DairySync	<i>Populus tremuloides</i>	Aspen	POTR			C-140447	N42 36.648'	W111 20.157'	5.2	0.11	0.39	0.003	0.83	0.005	1.0	0.27
WPPD16AB	DairySync	<i>Populus tremuloides</i>	Aspen	POTR			C-140449	N42 36.648'	W111 20.157'	6.5	<0.05	0.21	0.003	1.17	0.005	1.2	0.30
WPPD17AB	DairySync	<i>Populus tremuloides</i>	Aspen	POTR			C-140451	N42 36.648'	W111 20.157'	4.6	0.06	0.13	0.002	1.05	0.004	0.7	0.31
WPPD21AB	DairySync	<i>Populus tremuloides</i>	Aspen	POTR			C-140456	N42 37.707'	W111 21.231'	6.3	<0.05	0.14	0.003	0.94	0.005	1.3	0.30
WPPD22AB	DairySync	<i>Populus tremuloides</i>	Aspen	POTR			C-140459	N42 37.707'	W111 21.231'	6.2	<0.05	0.24	0.004	0.94	0.006	1.2	0.27
WPPD23AB	DairySync	<i>Populus tremuloides</i>	Aspen	POTR			C-140462	N42 37.707'	W111 21.231'	5.4	<0.05	1.50	0.003	0.81	0.005	1.1	0.21
WPPD24AB	DairySync	<i>Populus tremuloides</i>	Aspen	POTR		x	C-140294	N42 37.707'	W111 21.231'	6.3	<0.05	0.35	0.003	0.88	0.005	1.2	0.28
WPPD25AB	DairySync	<i>Populus tremuloides</i>	Aspen	POTR			C-140467	N42 37.707'	W111 21.231'	5.9	<0.05	0.10	0.005	0.88	0.006	1.2	0.35
WPPD31AB	DairySync	<i>Populus tremuloides</i>	Aspen	POTR			C-140470	N42 37.549'	W111 21.157'	5.8	<0.05	0.25	0.003	0.81	0.005	1.2	0.30
WPPD32AB	DairySync	<i>Populus tremuloides</i>	Aspen	POTR			C-140473	N42 37.549'	W111 21.157'	5.9	<0.05	0.24	0.003	0.83	0.005	1.2	0.21
WPPD33AB	DairySync	<i>Populus tremuloides</i>	Aspen	POTR			C-140476	N42 37.549'	W111 21.157'	6.2	<0.05	0.37	0.002	1.00	0.005	1.2	0.22
WPPD34AB	DairySync	<i>Populus tremuloides</i>	Aspen	POTR			C-140478	N42 37.549'	W111 21.157'	6.2	0.05	0.40	0.003	1.06	0.005	1.1	0.27
WPPD35AB	DairySync	<i>Populus tremuloides</i>	Aspen	POTR			C-140480	N42 37.549'	W111 21.157'	5.5	<0.05	0.48	0.003	0.93	0.004	1.1	0.21
WPPD41AB	DairySync	<i>Populus tremuloides</i>	Aspen	POTR			C-140482	N42 37.549'	W111 21.157'	5.7	<0.05	0.12	0.003	0.97	0.005	1.1	0.21
WPPD42AB	DairySync	<i>Populus tremuloides</i>	Aspen	POTR			C-140485	N42 37.549'	W111 21.157'	4.6	0.06	0.29	0.003	1.01	0.004	0.6	0.23
WPPD43AB	DairySync	<i>Populus tremuloides</i>	Aspen	POTR			C-140490	N42 37.549'	W111 21.157'	4.9	<0.05	0.48	0.004	0.83	0.004	0.9	0.20
WPPD44AB	DairySync	<i>Populus tremuloides</i>	Aspen	POTR			C-140493	N42 37.549'	W111 21.157'	3.9	0.06	0.25	0.002	0.54	0.003	0.7	0.19
WPPD45AB	DairySync	<i>Populus tremuloides</i>	Aspen	POTR			C-140495	N42 37.549'	W111 21.157'	3.7	0.05	0.28	0.002	0.52	0.004	0.7	0.19
WPPD45AX	DairySync	<i>Populus tremuloides</i>	Aspen	POTR	x		C-140316	N42 49.158'	W111 23.809'	7.6	<0.05	43.0	0.008	1.25	0.006	1.4	0.37
WPP431AB	Lift 2	<i>Populus tremuloides</i>	Aspen	POTR			C-140321	N42 49.136'	W111 23.748'	6.1	0.11	29.0	0.012	1.21	0.006	0.8	0.34
WPP433AB	Lift 2	<i>Populus tremuloides</i>	Aspen	POTR		x	C-140267	N42 49.175'	W111 23.770'	6.8	<0.05	49.0	0.007	1.16	0.007	1.2	0.37
WPP434AB	Lift 2	<i>Populus tremuloides</i>	Aspen	POTR			C-140327	N42 49.202'	W111 23.719'	6.1	0.08	35.0	0.006	1.16	0.006	0.9	0.29
WPPRW1AB	RefWetland	<i>Populus tremuloides</i>	Aspen	POTR		x	C-140290	N42 49.493'	W111 23.937'	5.0	0.05	0.15	0.010	1.09	0.010	0.7	0.26
WPPRW2AB	RefWetland	<i>Populus tremuloides</i>	Aspen	POTR			C-140415	N42 49.493'	W111 23.937'	5.2	<0.05	0.10	0.005	1.15	0.005	0.7	0.26
WPPRW3AB	RefWetland	<i>Populus tremuloides</i>	Aspen	POTR			C-140416	N42 49.493'	W111 23.937'	5.1	<0.05	0.13	0.004	0.92	0.005	1.0	0.21
WPPW5AB	Wetland	<i>Populus tremuloides</i>	Aspen	POTR			C-140407	N42 49.357'	W111 23.928'	5.5	0.07	2.10	0.005	0.88	0.004	1.0	0.24
WPPW6AB	Wetland	<i>Populus tremuloides</i>	Aspen	POTR		x	C-140284	N42 49.367'	W111 23.945'	4.1	<0.05	12.0	0.004	0.57	0.004	0.6	0.18
WPPW7AB	Wetland	<i>Populus tremuloides</i>	Aspen	POTR		x	C-140285	N42 49.380'	W111 23.891'	5.1	<0.05	0.08	0.005	0.97	0.005	0.9	0.22
WPPW8AB	Wetland	<i>Populus tremuloides</i>	Aspen	POTR			C-140408	N42 49.360'	W111 23.954'	5.3	0.08	1.80	0.011	0.95	0.005	0.9	0.20
WPPW10AB	Wetland	<i>Populus tremuloides</i>	Aspen	POTR			C-140411	N42 49.369'	W111 23.940'	5.0	<0.05	1.50	0.010	1.01	0.005	0.8	0.18
WPPW11AB	Wetland	<i>Populus tremuloides</i>	Aspen	POTR			C-140412	N42 49.372'	W111 23.942'	5.1	0.07	1.70	0.010	0.87	0.005	0.9	0.17
WPPW9AC	Wetland	<i>Salix spp.</i>	Willow	SA			C-140409	N42 49.368'	W111 23.942'	6.0	0.07	12.0	0.006	0.90	0.006	1.1	0.32
WPPW10AC	Wetland	<i>Salix spp.</i>	Willow	SA			C-140410	N42 49.365'	W111 23.913'	8.8	0.08	36.0	0.008	1.41	0.006	1.6	0.35
WPPW1AD	Wetland	<i>Salix alba</i>	willow	SAAL			C-140404	N42 49.326'	W111 23.913'	8.5	0.10	20.0	0.008	1.44	0.008	1.4	0.36
WPPW2AD	Wetland	<i>Salix alba</i>	willow	SAAL		x	C-140283	N42 49.323'	W111 23.931'	8.5	0.08	35.0	0.008	1.40	0.008	1.3	0.41
WPPW3AD	Wetland	<i>Salix alba</i>	willow	SAAL			C-140405	N42 49.327'	W111 23.917'	8.3	0.08	23.0	0.009	1.60	0.009	1.5	0.36
WPPW4AD	Wetland	<i>Salix alba</i>	willow	SAAL			C-140406	N42 49.366'	W111 23.945'	8.9	0.09	0.27	0.009	0.73	0.009	0.7	0.26
WPPRW4AE	RefWetland	<i>Salix geyeriana</i>	Geyer willow	SAGE		x	C-140289	N42 49.493'	W111 23.937'	4.3	<0.05	62.0	0.017	1.70	0.009	1.1	0.39
WPP434AF	Lift 2	<i>Salix lasioandra</i>	Pacific willow	SALA			C-140328	N42 49.202'	W111 23.719'	8.5	0.07	71.0	0.007	1.29	0.007	0.9	0.35
WPP433AG	Lift 2	<i>Salix lutea</i>	willow	SALU		x	C-140268	N42 49.175'	W111 23.770'	7.1	<0.05	51.0	0.009	1.69	0.006	1.3	0.51
WPP431AH	Lift 2	<i>Salix monticola</i>	willow	SAMO			C-140317	N42 49.158'	W111 23.809'	8.9	0.06	0.40	0.030	1.03	0.018	0.7	0.27
WPPRW4AI	RefWetland	<i>Salix myrtillofolia</i>	Blueberry willow	SAMY			C-140414	N42 49.493'	W111 23.937'	5.4	0.05	0.05	0.007	1.38	0.007	1.0	0.34
WPP432AJ	Lift 2	<i>Salix scouleriana</i>	Scouler willow	SASC		x	C-140265	N42 49.136'	W111 23.748'	7.3	0.10	66.0	0.016	0.99	0.013	1.4	0.39
WPP444Y	Lift 2	<i>Senecio crassulus</i>	Thicketleaf groundsel	SECR			C-140345	N42 49.106'	W111 23.679'	6.6	<0.05	0.77	0.016	0.99	0.013	1.4	0.39



Table 1 (continued). Concentrations, based on dry weight, of major, minor, and trace elements for individual plant samples.

Field No.	Location	Species	Na, % ICP-AES	P, % ICP-AES	Ti, ppm, ICP-AES	Ba, ppm, ICP-AES	Cd, ppm, ICP-AES	Co, ppm, ICP-AES	Cr, ppm, ICP-AES	Cu, ppm, ICP-AES	La, ppm, ICP-AES	Li, ppm, ICP-AES	Mn, ppm, ICP-AES	Mo, ppm, ICP-AES	Cu/Mo, ICP-AES	Ni, ppm, ICP-AES	Pb, ppm, ICP-AES	Sn, ppm, ICP-AES
		(number of unqualified analyses)	240	240	6	239	198	11	228	240	20	21	240	193	193	240	4	10
		(precision)	1%	2%	1%	1%	2%		7%	1%	8%	1%	1%	1%		2%		
WPPD11P	DairySync	Achillea millefolium	0.003	0.41	<10	27.3	1.1	<0.2	0.2	9.2	<0.4	<0.4	54	0.8	11.0	2.1	<0.8	<1
WPPD12P	DairySync	Achillea millefolium	0.003	0.37	<10	24.2	2.6	<0.2	0.2	8.5	<0.4	<0.4	40	0.8	10.5	1.0	<0.8	<1
WPPD13P	DairySync	Achillea millefolium	0.002	0.44	<12	34.8	2.4	<0.24	<0.24	7.7	<0.48	<0.4	38	1.2	6.4	0.7	<0.9	<1.2
WPPD14P	DairySync	Achillea millefolium	0.003	0.41	<9	28.2	3.0	<0.18	<0.18	8.0	<0.36	<0.3	24	0.9	8.5	0.8	<0.7	<0.9
WPPD15P	DairySync	Achillea millefolium	0.004	0.48	<12	30.0	2.5	<0.24	<0.24	6.4	<0.48	<0.5	38	1.1	5.7	0.9	<1	<1.2
WPPD17P	DairySync	Achillea millefolium	0.002	0.41	<7	28.1	1.7	<0.14	<0.14	7.6	<0.28	<0.3	32	1.6	4.9	0.7	<0.6	<0.7
WPPD21P	DairySync	Achillea millefolium	0.003	0.43	<17	45.9	3.4	<0.34	0.3	6.6	<0.68	<0.6	68	0.9	6.0	1.0	<1.3	<1.7
WPPD42P	DairySync	Achillea millefolium	0.009	0.45	19	7.7	1.9	<0.18	7.2	11.3	0.7	0.4	17	1.9	6.0	2.6	<0.7	<0.9
WPPD42PX	DairySync	Achillea millefolium	0.009	0.45	19	7.5	1.9	<0.18	6.6	11.2	0.6	0.4	17	1.9	6.0	2.6	<0.7	<0.9
WPPD43P	DairySync	Achillea millefolium	0.002	0.21	<8	17.2	2.2	<0.16	2.2	6.1	<0.32	<0.3	25	2.0	3.1	2.1	0.7	<0.8
WPPD44P	DairySync	Achillea millefolium	0.008	0.37	<9	18.7	2.4	<0.18	2.0	7.9	<0.36	<0.3	27	1.0	8.0	2.4	<0.7	<0.9
WPPD45P	DairySync	Achillea millefolium	0.003	0.53	<8	9.6	3.7	<0.16	0.4	12.5	<0.32	<0.3	21	4.2	3.0	3.0	<0.7	<0.8
WPPD12A	DairySync	Agropyron caninum	0.001	0.32	<6	8.7	<0.24	<0.12	0.5	4.0	<0.24	<0.2	17	2.2	1.8	0.7	<0.5	<0.6
WPPD14A	DairySync	Agropyron caninum	0.001	0.28	<5	8.3	0.3	<0.1	0.2	3.1	<0.2	<0.2	10	1.9	1.6	0.4	<0.4	<0.5
WPPD15A	DairySync	Agropyron caninum	0.001	0.35	<6	21.3	<0.24	<0.12	0.1	5.3	<0.24	<0.2	14	1.6	3.3	0.4	<0.5	<0.6
WPPD16A	DairySync	Agropyron caninum	0.001	0.34	<6	12.3	<0.24	<0.12	0.7	4.1	<0.24	<0.2	10	2.0	2.0	0.6	<0.5	<0.6
WPP414B	Lift 1	Agropyron intermedium	0.002	0.34	<5	0.6	0.6	<0.1	1.2	4.1	<0.2	<0.2	11	3.7	1.1	2.1	<0.4	<0.5
WPP424B	Lift 1	Agropyron intermedium	0.003	0.24	<5	6.6	2.8	<0.1	2.5	5.5	<0.2	<0.2	14	7.7	0.7	4.7	<0.4	<0.5
WPP441B	Lift 2	Agropyron intermedium	0.003	0.32	<6	9.3	2.6	<0.12	1.5	3.6	<0.24	<0.2	20	4.6	0.7	1.3	<0.5	<0.6
WPP442B	Lift 2	Agropyron intermedium	0.003	0.18	<4	4.0	3.4	<0.08	5.3	4.4	0.2	<0.1	10	11.1	0.4	2.4	<0.3	<0.4
WPP443B	Lift 2	Agropyron intermedium	0.003	0.28	<5	3.9	4.2	<0.1	4.9	6.3	0.3	<0.2	15	23.7	0.3	2.5	<0.4	<0.5
WPP444B	Lift 2	Agropyron intermedium	0.002	0.28	<6	1.2	1.8	<0.12	1.6	7.3	<0.24	<0.2	34	3.9	1.9	3.6	<0.4	<0.6
WPP311B	Slope	Agropyron intermedium	0.002	0.31	<6	13.3	0.7	<0.12	1.7	4.0	<0.24	<0.2	22	3.8	1.1	1.4	<0.5	<0.6
WPP312B	Slope	Agropyron intermedium	0.002	0.36	<7	7.4	0.8	<0.14	2.3	3.6	<0.28	<0.3	16	7.6	0.5	0.6	<0.6	<0.7
WPP313B	Slope	Agropyron intermedium	0.002	0.35	<8	14.0	0.7	<0.16	2.2	4.6	<0.32	<0.3	37	3.6	1.3	0.8	<0.6	<0.8
WPP411C	Lift 1	Agropyron smithii	0.002	0.20	<5	7.0	2.9	<0.1	3.5	5.8	<0.2	<0.2	35	3.9	1.5	8.8	<0.4	<0.5
WPP412C	Lift 1	Agropyron smithii	0.002	0.40	<7	3.5	1.7	<0.14	0.6	5.1	<0.28	<0.3	37	6.7	0.8	3.5	<0.6	<0.7
WPP413C	Lift 1	Agropyron smithii	0.001	0.37	<6	1.4	0.7	<0.12	0.7	4.6	<0.24	<0.2	15	3.5	1.3	2.1	<0.5	<0.6
WPP421C	Lift 1	Agropyron smithii	0.002	0.37	<6	3.0	1.7	<0.12	2.0	4.0	<0.24	<0.2	22	3.4	1.2	2.9	<0.5	0.7
WPP422C	Lift 1	Agropyron smithii	0.005	1.04	<18	14.4	4.9	<0.36	3.6	20.0	<0.72	<0.7	135	23.7	0.8	25.5	<1.4	<1.6
WPP423C	Lift 1	Agropyron smithii	0.003	0.22	<5	5.6	4.0	<0.1	3.5	4.3	<0.2	0.3	11	5.6	0.8	7.3	0.6	1.1
WPP431C	Lift 2	Agropyron smithii	0.002	0.26	<7	4.9	2.2	<0.14	1.7	7.4	<0.28	<0.3	29	17.0	0.4	5.7	<0.6	<0.7
WPP432C	Lift 2	Agropyron smithii	0.001	0.28	<6	3.5	1.3	<0.12	0.6	4.9	<0.24	<0.2	21	2.5	2.0	4.7	<0.5	<0.6
WPP433C	Lift 2	Agropyron smithii	0.002	0.25	<7	7.7	4.9	<0.14	0.7	7.7	<0.28	<0.2	37	2.6	3.0	11.3	<0.5	<0.7
WPP434C	Lift 2	Agropyron smithii	0.002	0.39	<10	7.3	2.3	<0.2	0.3	5.3	<0.4	<0.4	27	0.8	6.3	4.7	<0.6	<1
WPP451C	Lift 3	Agropyron smithii	0.002	0.37	<7	6.0	1.7	<0.14	0.8	4.4	<0.28	<0.3	22	26.3	0.2	0.8	<0.6	<0.7
WPP452C	Lift 3	Agropyron smithii	0.002	0.39	<7	13.6	1.7	<0.14	0.8	4.6	<0.28	<0.3	18	27.2	0.2	1.5	<0.6	0.8
WPP453C	Lift 3	Agropyron smithii	0.003	0.34	<6	10.8	1.7	<0.12	1.4	5.1	<0.24	<0.2	18	27.0	0.2	1.4	<0.5	<0.6
WPP463C	Lift 3	Agropyron smithii	0.003	0.40	<8	2.7	1.7	<0.16	0.6	5.7	<0.32	<0.3	15	24.1	0.2	5.1	<0.6	<0.8
WPP471C	Lift 4	Agropyron smithii	0.002	0.43	<9	3.8	0.8	<0.18	0.8	6.8	<0.36	<0.3	23	52.4	0.1	1.8	<0.7	<0.9
WPP472C	Lift 4	Agropyron smithii	0.002	0.36	<7	11.9	0.5	<0.14	0.7	3.7	<0.28	<0.2	13	12.6	0.3	0.7	<0.5	<0.7
WPP473C	Lift 4	Agropyron smithii	0.002	0.41	<7	7.6	0.6	<0.14	0.6	5.9	<0.28	<0.3	17	37.2	0.2	1.5	<0.6	<0.7
WPP481C	Lift 4	Agropyron smithii	0.002	0.38	<7	5.2	0.8	<0.14	0.6	5.5	<0.28	<0.3	25	15.4	0.4	1.5	<0.6	<0.7
WPP482C	Lift 4	Agropyron smithii	0.003	0.45	<7	8.6	2.0	<0.14	1.6	5.6	<0.28	<0.3	20	7.3	0.8	0.8	<0.6	<0.7
WPP483C	Lift 4	Agropyron smithii	0.002	0.42	<8	8.8	0.8	<0.16	1.6	5.3	<0.32	<0.3	19	51.2	0.1	0.8	<0.6	<0.8
WPP444Z	Lift 2	Amelanchier alnifolia	0.004	0.39	<4	1.0	<0.16	<0.08	1.0	2.4	<0.16	<0.1	38	2.2	1.1	6.4	<0.3	<0.4
WPP411D	Lift 1	Bromus inermis	0.001	0.17	<6	1.3	1.3	<0.12	0.5	5.2	<0.24	0.3	17	3.2	1.6	6.4	<0.5	<0.6
WPP412D	Lift 1	Bromus inermis	0.002	0.34	<7	0.6	0.7	<0.14	0.6	6.3	<0.28	<0.2	28	5.5	1.1	2.9	<0.5	<0.7
WPP413D	Lift 1	Bromus inermis	0.001	0.33	<6	0.4	0.7	<0.12	0.7	4.9	<0.24	<0.2	15	3.0	1.6	2.3	<0.5	<0.6
WPP414D	Lift 1	Bromus inermis	0.001	0.37	<7	0.1	0.7	<0.14	0.7	6.9	<0.28	<0.2	11	4.1	1.7	3.5	<0.5	<0.7
WPP421D	Lift 1	Bromus inermis	0.001	0.25	<6	0.7	0.5	<0.12	1.7	4.4	<0.24	0.5	15	2.4	1.9	3.8	<0.5	<0.6
WPP422D	Lift 1	Bromus inermis	0.002	0.30	<7	0.7	0.7	<0.14	1.6	5.6	<0.28	<0.2	32	5.9	1.0	7.2	<0.5	<0.7
WPP423D	Lift 1	Bromus inermis	0.004	0.24	<5	2.6	3.3	<0.1	8.4	4.9	0.4	0.4	11	6.4	0.6	10.1	<0.4	<0.5
WPP424D	Lift 1	Bromus inermis	0.002	0.20	<5	1.4	2.9	<0.1	1.6	5.0	<0.2	0.5	12	1.7	3.0	7.5	<0.4	<0.5
WPP431D	Lift 2	Bromus inermis	0.002	0.32	<8	1.7	1.6	<0.16	1.7	6.0	<0.32	<0.3	26	6.2	0.7	4.9	<0.6	<0.8
WPP432D	Lift 2	Bromus inermis	0.002	0.30	<8	0.8	0.6	<0.16	0.6	6.3	<0.32	<0.3	23	2.2	2.9	5.7	<0.6	<0.6
WPP433D	Lift 2	Bromus inermis	0.002	0.30	<9	2.1	2.6	<0.18	0.6	7.5	<0.36	0.8	37	5.0	1.5	25.7	<0.7	<0.9
WPP434D	Lift 2	Bromus inermis	0.002	0.39	<9	0.9	0.9	<0.18	0.3	7.0	<0.36	0.8	33	0.9	7.6	3.6	<0.7	<0.9
WPP441D	Lift 2	Bromus inermis	0.001	0.24	<6	1.7	<0.24	<0.12	0.6	5.0	<0.24	<0.2	18	11.4	0.4	1.7	<0.5	<0.6
WPP442D	Lift 2	Bromus inermis	0.002	0.26	<6	1.6	2.5	<0.12	4.5	8.7	<0.24	<0.2	14	6.0	1.5	7.5	<0.4	<0.6



Table 1 (continued). Concentrations, based on dry weight, of major, minor, and trace elements for individual plant samples.

Field No.	Location	Species	Na, % ICP-AES	P, % ICP-AES	Ti, ppm, ICP-AES	Ba, ppm, ICP-AES	Cd, ppm, ICP-AES	Co, ppm, ICP-AES	Cr, ppm, ICP-AES	Cu, ppm, ICP-AES	La, ppm, ICP-AES	Li, ppm, ICP-AES	Mn, ppm, ICP-AES	Mo, ppm, ICP-AES	Cu/Mo, ICP-AES	Ni, ppm, ICP-AES	Pb, ppm, ICP-AES	Sr, ppm, ICP-AES
WPP443D	Lift 2	<i>Bromus inermis</i>	0.002	0.29	<6	1.3	2.5	<0.12	4.8	9.9	0.3	<0.2	11	23.2	0.4	5.9	<0.5	<0.6
WPP444D	Lift 2	<i>Bromus inermis</i>	0.003	0.39	<7	1.5	4.5	<0.14	1.7	11.9	<0.28	<0.2	18	3.3	3.6	7.1	<0.5	<0.7
WPP451D	Lift 3	<i>Bromus inermis</i>	0.002	0.27	<7	3.1	1.6	<0.14	0.6	5.3	<0.28	<0.3	16	17.1	0.3	2.1	<0.6	<0.7
WPP452D	Lift 3	<i>Bromus inermis</i>	0.002	0.38	<7	8.8	0.5	<0.14	0.7	4.1	<0.28	<0.2	17	36.1	0.1	0.7	<0.5	<0.7
WPP453D	Lift 3	<i>Bromus inermis</i>	0.002	0.31	<6	1.3	0.6	<0.12	0.7	6.5	<0.24	<0.2	14	24.3	0.3	3.3	<0.5	<0.6
WPP461D	Lift 3	<i>Bromus inermis</i>	0.002	0.29	<6	6.0	0.6	<0.12	1.2	4.8	<0.24	<0.2	13	6.6	0.7	2.3	<0.4	<0.6
WPP462D	Lift 3	<i>Bromus inermis</i>	0.002	0.29	<6	4.0	1.5	<0.12	0.7	5.1	<0.24	<0.2	27	18.7	0.3	4.5	<0.5	<0.6
WPP463D	Lift 3	<i>Bromus inermis</i>	0.002	0.32	<5	5.2	0.5	<0.1	1.2	5.7	<0.2	<0.2	21	4.0	1.4	3.2	<0.4	<0.5
WPPW23D	Wetland	<i>Bromus inermis</i>	0.001	0.24	<5	0.6	0.6	<0.1	0.2	3.0	<0.2	<0.2	15	0.3	8.7	3.5	<0.4	<0.5
WPP311E	Slope	<i>Bromus marginatus</i>	0.002	0.21	<8	15.2	0.3	<0.16	1.9	2.5	<0.32	3.0	35	5.0	0.5	0.8	<0.6	<0.6
WPP312E	Slope	<i>Bromus marginatus</i>	0.002	0.39	<8	10.7	1.6	<0.16	2.9	3.7	<0.32	1.6	21	3.7	1.0	1.6	<0.6	<0.8
WPP313E	Slope	<i>Bromus marginatus</i>	0.002	0.33	<9	14.0	<0.36	<0.18	2.0	4.1	<0.36	<0.3	30	3.3	1.2	0.9	<0.7	<0.9
WPP314E	Slope	<i>Bromus marginatus</i>	0.003	0.39	<8	8.0	0.8	<0.16	4.4	3.8	<0.32	<0.3	28	3.5	1.1	1.7	<0.6	<0.6
WPPRWK	RefWetland	<i>Carex haydeniana</i>	0.001	0.13	<4	9.0	<0.16	<0.08	0.3	4.1	<0.16	<0.1	134	0.9	4.6	1.3	<0.3	<0.4
WPPW11K	Wetland	<i>Carex haydeniana</i>	0.002	0.19	<7	0.4	<0.28	<0.14	0.7	6.1	<0.28	<0.2	88	1.5	4.2	6.9	<0.5	<0.7
WPPW21K	Wetland	<i>Carex haydeniana</i>	0.005	0.21	<7	2.1	0.3	<0.14	0.7	6.3	<0.28	<0.2	95	3.7	1.7	11.7	<0.5	<0.7
WPPW28K	Wetland	<i>Carex haydeniana</i>	0.004	0.20	<7	1.5	0.4	<0.14	0.6	6.1	<0.28	<0.2	73	4.5	1.4	9.5	<0.5	<0.7
WPPW32K	Wetland	<i>Carex haydeniana</i>	0.003	0.20	<6	1.7	<0.24	<0.12	0.6	4.0	<0.24	<0.2	174	1.3	3.1	9.0	<0.5	<0.6
WPPW35K	Wetland	<i>Carex haydeniana</i>	0.003	0.18	<6	2.3	0.6	<0.12	1.6	7.9	<0.24	<0.2	104	1.3	5.9	8.5	<0.4	<0.6
WPPW41K	Wetland	<i>Carex haydeniana</i>	0.004	0.22	<6	3.0	<0.24	<0.12	1.6	3.3	<0.24	<0.2	232	0.6	5.2	2.8	<0.5	<0.6
WPPW43K	Wetland	<i>Carex haydeniana</i>	0.003	0.26	<7	1.9	<0.28	<0.14	0.5	5.2	<0.28	<0.2	255	0.7	6.9	2.1	<0.5	<0.7
WPPW413K	Wetland	<i>Carex haydeniana</i>	0.003	0.23	<6	6.7	<0.24	<0.12	0.5	3.4	<0.24	<0.2	147	0.5	7.3	1.3	<0.5	<0.6
WPPW51K	Wetland	<i>Carex haydeniana</i>	0.002	0.22	<7	10.7	<0.28	<0.14	0.5	5.4	<0.28	<0.2	178	0.4	12.7	0.7	<0.5	<0.7
WPPD11L	DairySync	<i>Carex hoodii</i>	0.002	0.27	<9	36.3	<0.36	<0.18	0.5	4.7	<0.36	<0.3	36	0.8	6.0	2.0	<0.7	<0.9
WPPD13L	DairySync	<i>Carex hoodii</i>	0.003	0.25	<8	35.5	0.5	<0.16	0.3	3.9	<0.32	<0.3	29	0.8	4.6	1.7	<0.6	<0.8
WPPD15L	DairySync	<i>Carex hoodii</i>	0.002	0.22	<10	26.0	<0.4	<0.16	<0.2	2.7	<0.4	<0.4	17	0.6	4.5	0.6	<0.8	<1
WPPD18L	DairySync	<i>Carex hoodii</i>	0.002	0.20	<8	42.5	0.9	<0.16	0.2	5.2	<0.32	<0.3	22	0.9	5.9	0.7	<0.7	<0.8
WPPD35M	DairySync	<i>Carex rossii</i>	0.004	0.25	<7	32.5	2.3	<0.14	0.8	4.1	<0.28	<0.3	56	1.6	2.6	0.8	<0.6	<0.7
WPPD41M	DairySync	<i>Carex rossii</i>	0.005	0.20	8	15.1	0.8	<0.16	5.9	6.9	<0.32	<0.3	22	1.7	4.1	2.4	<0.6	<0.8
WPPD43M	DairySync	<i>Carex rossii</i>	0.004	0.32	<6	8.1	3.1	<0.12	1.4	8.1	<0.24	<0.2	14	1.8	4.6	2.0	<0.5	<0.6
WPPD44M	DairySync	<i>Carex rossii</i>	0.005	0.23	<7	18.6	4.3	<0.14	1.4	4.9	<0.28	<0.2	17	1.7	2.8	2.6	<0.5	<0.7
WPPD45M	DairySync	<i>Carex rossii</i>	0.002	0.22	<6	18.9	1.7	<0.12	0.7	6.5	<0.24	<0.2	17	5.2	1.3	1.8	0.5	0.7
WPPRW	RefWetland	<i>Carex utriculata</i>	0.005	0.21	<6	9.5	<0.24	<0.12	0.6	1.3	<0.24	<0.2	156	<0.2	>5	0.4	<0.5	<0.6
WPPW14N	Wetland	<i>Carex utriculata</i>	0.017	0.32	<7	3.9	0.6	<0.14	0.8	10.8	<0.28	0.3	332	2.7	4.0	11.6	<0.6	<0.7
WPPW25N	Wetland	<i>Carex utriculata</i>	0.002	0.26	<6	5.6	0.7	<0.12	0.8	13.2	<0.24	<0.2	65	1.6	8.3	7.0	<0.5	<0.6
WPPW37N	Wetland	<i>Carex utriculata</i>	0.002	0.23	<5	2.9	0.5	<0.1	0.6	4.6	<0.2	<0.2	274	0.6	7.9	2.9	<0.4	<0.5
WPPW48N	Wetland	<i>Carex utriculata</i>	0.004	0.23	<6	6.7	<0.24	<0.12	0.5	1.4	<0.24	<0.2	313	0.3	4.0	0.5	<0.5	<0.6
WPPW49N	Wetland	<i>Carex utriculata</i>	0.003	0.27	<8	7.7	<0.32	<0.16	0.7	1.9	<0.32	<0.3	508	<0.3	>5.8	0.8	<0.6	<0.8
WPPW411N	Wetland	<i>Carex utriculata</i>	0.005	0.26	<7	5.3	<0.28	<0.14	0.4	1.5	<0.28	<0.2	430	<0.2	>5	1.5	<0.5	<0.7
WPPW52N	Wetland	<i>Carex utriculata</i>	0.003	0.27	<7	11.3	<0.28	<0.14	0.6	3.1	<0.28	<0.2	591	0.4	8.8	0.6	<0.5	<0.7
WPPW53N	Wetland	<i>Carex utriculata</i>	0.002	0.28	<7	23.6	<0.28	<0.14	0.3	2.0	<0.28	<0.3	629	<0.3	>6.3	0.8	<0.6	<0.7
WPPW55N	Wetland	<i>Carex utriculata</i>	0.004	0.28	<7	8.6	<0.28	<0.14	0.8	2.4	<0.28	<0.3	494	<0.3	>7.8	1.6	<0.6	<0.7
WPPW56N	Wetland	<i>Carex utriculata</i>	0.003	0.30	<8	8.1	<0.32	<0.16	0.3	1.8	<0.32	<0.3	347	<0.3	>5.5	0.5	<0.6	<0.8
WPP444AA	Lift 2	<i>Ceanothus velutinus</i>	0.002	0.21	<4	1.1	<0.16	<0.08	0.8	3.2	<0.16	<0.1	65	0.8	4.0	5.3	0.4	0.4
WPPW31Q	Wetland	<i>Cirsium arvense</i>	0.005	0.36	<15	8.7	6.9	<0.3	0.6	12.3	<0.6	5.6	68	0.8	16.4	3.0	<1.2	<1.5
WPP423F	Lift 1	<i>Dactylis glomerata</i>	0.004	0.26	<6	1.9	4.2	<0.12	3.8	5.1	<0.24	<0.2	27	11.5	0.4	14.7	<0.5	0.6
WPP441F	Lift 2	<i>Dactylis glomerata</i>	0.002	0.28	<6	3.7	0.7	<0.12	1.3	4.4	<0.24	<0.2	38	8.7	0.5	4.7	<0.5	<0.6
WPP442F	Lift 2	<i>Dactylis glomerata</i>	0.006	0.23	<5	3.4	2.7	<0.1	6.8	7.9	0.3	<0.2	15	8.4	0.9	10.1	<0.4	0.6
WPP444F	Lift 2	<i>Dactylis glomerata</i>	0.006	0.36	<6	1.3	1.3	<0.12	0.6	9.6	<0.24	<0.2	49	5.5	1.7	8.3	<0.5	<0.6
WPP311F	Slope	<i>Dactylis glomerata</i>	0.005	0.33	<9	9.0	<0.36	<0.18	2.1	3.8	<0.36	<0.3	75	5.5	0.7	2.4	<0.7	<0.9
WPP312F	Slope	<i>Dactylis glomerata</i>	0.005	0.34	21	7.8	0.8	<0.2	11.4	3.6	0.7	0.5	50	4.2	0.9	5.8	<0.8	<1
WPP314F	Slope	<i>Dactylis glomerata</i>	0.003	0.40	<10	7.5	0.6	<0.2	4.9	3.3	<0.4	<0.4	50	6.2	0.5	3.4	<0.8	<1
WPPW34F	Wetland	<i>Dactylis glomerata</i>	0.003	0.24	<7	3.1	1.5	<0.14	0.6	2.8	<0.28	<0.3	50	1.5	1.9	2.8	<0.6	<0.7
WPPD11G	DairySync	<i>Daschampsia caespitosa</i>	0.002	0.30	<7	20.2	0.4	<0.14	0.8	3.9	<0.28	<0.3	37	1.6	2.5	1.6	<0.6	<0.7
WPPD12G	DairySync	<i>Daschampsia caespitosa</i>	0.001	0.26	<6	28.1	0.7	<0.12	0.2	5.1	<0.24	<0.2	37	2.6	1.9	1.9	<0.5	<0.6
WPPD13G	DairySync	<i>Daschampsia caespitosa</i>	0.002	0.33	<7	27.0	0.7	<0.14	0.2	4.9	<0.28	<0.2	37	2.8	1.7	1.5	<0.5	<0.7
WPPD14G	DairySync	<i>Daschampsia caespitosa</i>	0.002	0.33	<5	25.5	1.8	<0.1	0.2	4.6	<0.2	<0.2	33	1.1	4.2	1.1	<0.4	<0.5
WPPD21G	DairySync	<i>Daschampsia caespitosa</i>	0.003	0.34	<8	47.5	0.4	<0.16	0.5	3.8	<0.32	<0.3	33	0.7	5.5	0.9	<0.6	<0.8
WPPD22G	DairySync	<i>Daschampsia caespitosa</i>	0.003	0.64	<13	30.8	5.0	<0.26	0.5	5.0	<0.52	<0.5	214	<0.5	>9.3	1.3	<1	<1.3
WPPD23G	DairySync	<i>Daschampsia caespitosa</i>	0.003	0.35	<12	18.1	0.8	<0.24	0.4	3.9	<0.48	<0.5	142	0.6	6.0	2.6	<1	<1.2
WPPD24G	DairySync	<i>Daschampsia caespitosa</i>	0.002	0.43	<11	40.3	1.2	<0.22	0.2	5.9	<0.44	<0.4	184	<0.4	>13	2.3	<0.9	<1.1
WPPD25G	DairySync	<i>Daschampsia caespitosa</i>	0.003	0.34	<8	13.8	0.3	<0.16	0.3	6.2	<0.32	<0.3	49	0.5	12.0	0.9	<0.6	<0.8



Table 1 (continued). Concentrations, based on dry weight, of major, minor, and trace elements for individual plant samples.

Field No.	Location	Species	Na, % ICP-AES	P, % ICP-AES	Ti, ppm, ICP-AES	Ba, ppm, ICP-AES	Cd, ppm, ICP-AES	Co, ppm, ICP-AES	Cr, ppm, ICP-AES	Cu, ppm, ICP-AES	La, ppm, ICP-AES	Li, ppm, ICP-AES	Mn, ppm, ICP-AES	Mo, ppm, ICP-AES	Cu/Mo, ICP-AES	Ni, ppm, ICP-AES	Pb, ppm, ICP-AES	Sn, ppm, ICP-AES
WPPD31G	DairySync	Deschampsia caespitosa	0.003	0.33	<9	26.9	0.8	<0.18	0.7	4.6	<0.36	<0.3	84	0.9	5.1	2.0	<0.7	<0.9
WPPD32G	DairySync	Deschampsia caespitosa	0.003	0.41	<11	26.5	1.2	<0.22	0.3	6.1	<0.44	<0.4	127	1.2	5.3	1.2	<0.9	<1.1
WPPD33G	DairySync	Deschampsia caespitosa	0.003	0.36	<12	16.3	1.0	<0.24	0.4	5.6	<0.48	<0.5	188	1.0	5.6	3.0	<1	<1.2
WPPD34G	DairySync	Deschampsia caespitosa	0.004	0.42	<12	38.4	0.7	<0.24	0.2	6.7	<0.48	<0.4	91	0.7	9.3	2.4	<0.9	<1.2
WPPD42G	DairySync	Deschampsia caespitosa	0.002	0.34	<5	16.2	2.1	<0.1	1.2	7.5	<0.2	<0.2	13	2.3	3.3	2.0	<0.4	<0.5
WPPRWG	RefWetland	Deschampsia caespitosa	0.006	0.29	<5	6.8	<0.2	<0.1	0.3	5.2	<0.2	<0.2	141	0.4	13.3	1.2	<0.4	<0.5
WPPW12G	Wetland	Deschampsia caespitosa	0.007	0.26	<6	1.4	<0.24	<0.12	0.6	6.9	<0.24	<0.2	37	1.4	5.0	7.7	<0.5	0.7
WPPW29G	Wetland	Deschampsia caespitosa	0.006	0.19	<6	1.7	<0.24	<0.12	0.4	1.2	<0.24	<0.2	109	0.6	2.0	7.9	<0.4	<0.6
WPPW42G	Wetland	Deschampsia caespitosa	0.005	0.29	<5	3.7	<0.2	<0.1	0.5	3.4	<0.2	<0.2	122	0.3	12.8	2.2	<0.4	<0.5
WPPW45G	Wetland	Deschampsia caespitosa	0.006	0.29	<5	3.3	<0.2	<0.1	0.6	2.0	<0.2	<0.2	145	<0.2	>9	1.1	<0.4	<0.5
WPPW46G	Wetland	Deschampsia caespitosa	0.009	0.21	<4	0.9	<0.16	<0.06	0.4	1.2	<0.16	<0.1	93	0.3	4.7	1.6	<0.3	<0.4
WPPW54G	Wetland	Deschampsia caespitosa	0.002	0.28	<7	4.6	<0.28	<0.14	0.5	5.0	<0.28	<0.3	21	0.3	16.5	0.8	<0.6	<0.7
WPPD31R	DairySync	Epilobium angustifolium	0.004	0.71	<7	26.0	<0.28	<0.14	0.7	4.2	<0.28	<0.2	112	1.5	2.9	1.9	<0.5	<0.7
WPPD32R	DairySync	Epilobium angustifolium	0.002	0.73	<7	11.0	<0.28	<0.14	0.2	5.2	<0.28	<0.3	49	2.7	1.9	2.8	<0.6	<0.7
WPPW44S	Wetland	Equisetum arvense	0.033	0.46	17	10.2	<0.64	<0.32	1.7	4.6	0.7	<0.6	396	<0.6	>7	1.3	<1.3	<1.6
WPPW47S	Wetland	Equisetum arvense	0.015	0.44	<15	1.5	<0.6	<0.3	<0.3	1.5	<0.6	<0.7	289	<0.6	>2.5	1.1	<1.2	<1.5
WPPW412S	Wetland	Equisetum arvense	0.016	0.74	<18	5.4	<0.72	<0.36	0.7	4.2	<0.72	<0.7	217	<0.7	>5.8	1.4	<1.4	<1.6
WPPW13H	Wetland	Festuca arundinacea	0.016	0.27	<7	0.5	0.5	<0.14	0.7	1.8	<0.28	<0.3	60	0.6	2.2	7.4	<0.6	<0.7
WPPW26H	Wetland	Festuca arundinacea	0.015	0.26	<7	0.3	0.5	<0.14	0.4	2.2	<0.28	<0.2	28	3.1	0.7	10.2	<0.5	<0.7
WPPW33I	Wetland	Glyceria striata	0.004	0.22	<7	21.6	0.7	<0.16	0.2	6.5	<0.32	<0.3	133	1.7	3.9	1.7	<0.5	<0.7
WPPRW0	RefWetland	Juncus ensifolius	0.004	0.23	<8	0.3	0.5	<0.14	0.4	1.5	<0.28	<0.2	124	0.4	3.5	0.7	<0.5	<0.7
WPPW27O	Wetland	Juncus ensifolius	0.006	0.30	<8	2.4	1.7	<0.16	0.8	7.0	<0.32	<0.3	125	2.1	3.4	12.5	<0.6	<0.8
WPPW210Q	Wetland	Juncus ensifolius	0.021	0.28	<9	2.0	<0.36	<0.18	0.4	2.4	<0.36	<0.3	279	1.0	2.4	2.6	<0.7	<0.9
WPPW410Q	Wetland	Juncus ensifolius	0.008	0.25	<7	6.4	<0.28	<0.14	0.3	3.1	<0.28	<0.3	306	0.8	4.0	0.6	<0.6	<0.7
WPP411T	Lift 1	Medicago sativa	0.003	0.27	<10	2.6	3.0	<0.2	2.1	6.7	<0.4	<0.4	16	16.8	0.4	31.5	<0.8	<1
WPP412T	Lift 1	Medicago sativa	0.004	0.50	<9	0.6	3.8	<0.18	0.7	7.1	<0.36	<0.3	24	14.9	0.5	10.9	<0.7	<0.9
WPP413T	Lift 1	Medicago sativa	0.003	0.47	<11	<0.2	3.0	<0.22	0.4	6.6	<0.44	<0.4	16	21.3	0.3	10.9	<0.8	<1.1
WPP414T	Lift 1	Medicago sativa	0.005	0.43	<9	1.0	1.0	<0.18	1.0	4.4	<0.36	<0.3	14	33.4	0.1	6.6	<0.7	<0.9
WPP421T	Lift 1	Medicago sativa	0.003	0.31	<10	2.1	3.3	<0.2	0.5	5.6	<0.4	<0.4	24	36.1	0.2	12.4	<0.8	<1
WPP422T	Lift 1	Medicago sativa	0.004	0.38	<10	1.0	3.7	<0.2	0.9	7.0	<0.4	<0.4	27	27.8	0.3	26.8	<0.6	<1
WPP423T	Lift 1	Medicago sativa	0.005	0.41	<11	2.5	6.1	<0.22	5.0	7.5	<0.44	<0.4	25	38.4	0.2	46.3	<0.9	<1.1
WPP424T	Lift 1	Medicago sativa	0.003	0.31	<10	2.3	4.9	<0.2	2.5	5.4	<0.4	<0.4	50	24.4	0.2	21.2	<0.8	<1
WPP431T	Lift 2	Medicago sativa	0.007	0.37	<11	0.9	3.5	<0.22	0.8	4.6	<0.44	<0.4	15	28.0	0.2	17.9	<0.6	<1.1
WPP432T	Lift 2	Medicago sativa	0.005	0.29	<8	0.9	2.1	<0.16	0.3	3.8	<0.32	<0.3	14	9.4	0.4	9.4	<0.6	<0.8
WPP433T	Lift 2	Medicago sativa	0.004	0.34	<10	2.1	2.1	<0.2	0.4	4.8	<0.4	<0.4	18	11.4	0.4	13.5	<0.8	<1
WPP434T	Lift 2	Medicago sativa	0.004	0.47	<10	2.1	2.7	<0.2	0.2	6.0	<0.4	<0.4	9	12.4	0.5	4.5	<0.6	<1
WPP441T	Lift 2	Medicago sativa	0.002	0.36	<9	3.9	4.7	<0.18	0.5	5.4	<0.36	<0.3	16	15.5	0.3	5.5	<0.7	<0.9
WPP442T	Lift 2	Medicago sativa	0.011	0.35	<10	3.2	10.9	<0.2	8.5	7.4	0.5	<0.4	35	22.9	0.3	8.8	<0.6	<1
WPP443T	Lift 2	Medicago sativa	0.011	0.43	<12	2.5	2.7	<0.24	3.2	8.3	<0.48	<0.4	33	60.8	0.1	6.7	<0.9	<1.2
WPP444T	Lift 2	Medicago sativa	0.004	0.41	<11	1.1	3.0	<0.22	0.7	7.8	<0.44	<0.4	45	12.1	0.6	7.7	<0.6	<1.1
WPP461T	Lift 3	Medicago sativa	0.003	0.47	<10	2.8	2.1	<0.2	0.8	4.5	<0.4	<0.4	18	25.4	0.2	7.6	<0.8	<1
WPP462T	Lift 3	Medicago sativa	0.005	0.41	<10	2.2	2.3	<0.2	1.0	6.0	<0.4	<0.4	14	45.5	0.1	8.0	<0.8	<1
WPP463T	Lift 3	Medicago sativa	0.003	0.41	<7	1.6	0.8	<0.14	0.3	7.1	<0.28	<0.3	9	5.8	1.2	5.9	<0.6	<0.7
WPP471T	Lift 4	Medicago sativa	0.004	0.43	<12	5.1	1.2	<0.24	<0.24	10.4	<0.48	<0.4	24	16.1	0.6	4.0	<0.9	<1.2
WPP472T	Lift 4	Medicago sativa	0.006	0.36	<11	9.2	1.1	<0.22	0.6	4.6	<0.44	<0.4	24	34.4	0.1	3.3	<0.8	<1.1
WPP473T	Lift 4	Medicago sativa	0.006	0.47	<10	3.3	1.1	<0.2	0.4	7.4	<0.4	<0.4	14	28.4	0.3	4.4	<0.6	<1
WPP481T	Lift 4	Medicago sativa	0.004	0.37	<9	2.1	2.3	<0.18	0.5	7.4	<0.36	<0.3	14	10.5	0.7	5.6	<0.7	<0.9
WPP482T	Lift 4	Medicago sativa	0.005	0.38	<9	5.6	0.9	<0.18	0.9	7.9	<0.36	<0.3	26	18.0	0.4	7.8	<0.7	<0.9
WPP483T	Lift 4	Medicago sativa	0.007	0.52	<14	4.3	0.9	<0.28	0.4	9.2	<0.56	<0.5	14	63.4	0.1	7.9	<1.1	<1.4
WPP311T	Slope	Medicago sativa	0.005	0.39	<11	48.0	1.1	<0.22	1.2	6.6	1.2	0.7	63	4.2	1.6	5.5	<0.9	<1.1
WPP312T	Slope	Medicago sativa	0.006	0.73	<9	4.9	2.0	<0.18	2.7	7.3	<0.36	<0.3	18	11.0	0.7	4.7	<0.7	<0.9
WPP313T	Slope	Medicago sativa	0.004	0.51	<11	28.1	1.2	<0.22	2.5	6.7	0.5	<0.4	37	19.9	0.3	4.9	<0.9	<1.1
WPP314T	Slope	Medicago sativa	0.022	0.48	<10	13.3	2.7	<0.2	3.8	7.4	0.4	0.4	16	6.2	1.2	4.5	<0.8	<1
WPPW24T	Wetland	Medicago sativa	0.015	0.36	<14	0.7	3.0	<0.28	<0.28	7.0	<0.56	<0.5	21	16.3	0.4	9.5	<1.1	<1.4
WPPW36T	Wetland	Medicago sativa	0.003	0.40	<10	1.0	2.7	<0.2	0.4	5.7	<0.4	<0.4	33	8.3	0.7	8.2	<0.6	<1
WPP451U	Lift 3	Onobrychis viciifolia	0.002	0.36	<7	3.6	2.4	<0.14	0.7	4.2	<0.28	<0.2	20	20.1	0.2	10.4	<0.5	<0.7
WPP452U	Lift 3	Onobrychis viciifolia	0.003	0.43	<7	2.6	3.4	<0.14	0.5	4.0	<0.28	<0.2	19	37.5	0.1	10.8	<0.5	<0.7
WPP453U	Lift 3	Onobrychis viciifolia	0.002	0.37	<6	1.4	1.5	<0.12	0.3	2.6	<0.24	<0.2	15	23.8	0.1	7.9	<0.4	<0.6
WPPD21V	DairySync	Pedicularis racemosa	0.002	0.59	<11	132.0	2.3	<0.22	<0.22	19.6	<0.44	<0.4	86	<0.4	>45	3.6	<0.8	<1.1
WPPD22V	DairySync	Pedicularis racemosa	0.003	0.61	<9	28.0	8.9	<0.18	0.3	11.0	<0.36	<0.3	76	0.8	13.8	4.6	<0.7	<0.9
WPPD23V	DairySync	Pedicularis racemosa	0.004	0.51	<9	20.6	2.8	<0.18	0.4	11.2	<0.36	<0.3	197	0.6	20.0	5.9	<0.7	<0.9
WPPD24V	DairySync	Pedicularis racemosa	0.003	0.49	<8	18.0	3.9	<0.16	<0.16	13.5	<0.32	<0.3	512	<0.3	>38	5.1	<0.7	<0.8



Table 1 (continued). Concentrations, based on dry weight, of major, minor, and trace elements for individual plant samples.

Field No.	Location	Species	Na, % ICP-AES	P, % ICP-AES	Ti, ppm, ICP-AES	Ba, ppm, ICP-AES	Cd, ppm, ICP-AES	Co, ppm, ICP-AES	Cr, ppm, ICP-AES	Cu, ppm, ICP-AES	La, ppm, ICP-AES	Li, ppm, ICP-AES	Mn, ppm, ICP-AES	Mo, ppm, ICP-AES	CuMo, ICP-AES	Ni, ppm, ICP-AES	Pb, ppm, ICP-AES	Sn, ppm, ICP-AES
WPPD25V	DairySync	<i>Pedicularis racemosa</i>	0.003	0.60	<11	92.1	2.2	<0.22	0.2	13.3	<0.44	<0.4	178	0.4	30.0	2.7	<0.8	<1.1
WPPD33V	DairySync	<i>Pedicularis racemosa</i>	0.002	0.55	<10	45.9	8.4	<0.2	<0.2	11.4	<0.4	<0.4	184	0.7	30.0	11.2	<0.8	<1
WPP444W	Lift 2	<i>Penstemon rydbergii</i>	0.003	0.40	<5	3.6	0.3	<0.1	1.3	11.3	<0.2	0.2	27	2.6	4.3	10.1	<0.4	<0.5
WPP444X	Lift 2	<i>Phacelia hastata</i>	0.006	0.66	<12	6.1	<0.48	<0.24	3.7	8.5	0.5	<0.4	24	2.4	3.5	6.7	<0.9	<1.2
WPP423J	Lift 1	<i>Phleum pratense</i>	0.003	0.22	<4	1.0	1.0	<0.08	3.5	3.2	<0.16	<0.1	15	2.7	1.2	12.2	<0.3	0.4
WPP442J	Lift 2	<i>Phleum pratense</i>	0.002	0.23	<4	0.9	1.7	<0.08	6.4	4.0	0.3	<0.1	13	2.6	1.5	8.8	<0.3	<0.4
WPPW22J	Wetland	<i>Phleum pratense</i>	0.004	0.29	<8	8.7	<0.32	<0.16	0.6	2.5	<0.32	<0.3	52	3.0	0.8	9.0	<0.6	<0.8
WPPD11AB	DairySync	<i>Populus tremuloides</i>	0.001	0.26	<5	88.3	2.6	0.57	0.2	6.8	0.5	<0.2	91	<0.2	>30	4.2	<0.4	<0.5
WPPD12AB	DairySync	<i>Populus tremuloides</i>	0.003	0.29	<5	31.4	4.0	<0.1	0.2	6.4	0.2	<0.2	48	<0.2	>30	4.4	<0.4	<0.5
WPPD13AB	DairySync	<i>Populus tremuloides</i>	0.002	0.32	<5	53.1	9.5	<0.1	0.2	5.5	<0.2	<0.2	34	<0.2	>25	2.7	<0.4	<0.5
WPPD14AB	DairySync	<i>Populus tremuloides</i>	0.002	0.59	<7	157.5	1.5	<0.14	0.3	5.9	<0.28	<0.3	105	0.8	7.9	1.5	<0.6	<0.7
WPPD15AB	DairySync	<i>Populus tremuloides</i>	0.002	0.38	<5	23.9	9.3	<0.1	0.2	6.7	<0.2	<0.2	26	<0.2	>33	2.6	<0.4	<0.5
WPPD16AB	DairySync	<i>Populus tremuloides</i>	0.003	0.42	<6	34.5	13.0	<0.12	<0.12	8.5	<0.24	<0.2	21	<0.2	>33	3.4	<0.5	<0.6
WPPD17AB	DairySync	<i>Populus tremuloides</i>	0.001	0.26	<4	37.6	11.9	<0.08	0.1	5.2	<0.16	<0.1	48	0.2	27.5	6.7	<0.3	<0.4
WPPD21AB	DairySync	<i>Populus tremuloides</i>	0.001	0.41	<6	20.1	6.3	<0.12	0.1	6.3	<0.24	<0.2	75	<0.2	>25	7.5	<0.5	<0.6
WPPD22AB	DairySync	<i>Populus tremuloides</i>	0.001	0.40	<6	27.5	16.8	<0.12	0.4	5.0	<0.24	<0.2	42	<0.2	>20	1.7	<0.4	<0.6
WPPD23AB	DairySync	<i>Populus tremuloides</i>	0.002	0.38	<5	7.5	5.9	<0.1	0.3	5.9	<0.2	<0.2	23	0.2	27.5	3.1	<0.4	<0.5
WPPD24AB	DairySync	<i>Populus tremuloides</i>	0.002	0.38	<6	23.2	7.5	<0.12	0.3	5.8	<0.24	<0.2	51	<0.2	>23	2.6	<0.5	<0.6
WPPD25AB	DairySync	<i>Populus tremuloides</i>	0.002	0.33	<5	6.5	2.8	<0.1	0.4	6.5	<0.2	<0.2	32	<0.2	>28	1.8	<0.4	<0.5
WPPD31AB	DairySync	<i>Populus tremuloides</i>	0.001	0.39	<5	9.9	13.3	<0.1	0.3	5.7	<0.2	<0.2	32	<0.2	>25	2.6	<0.4	<0.5
WPPD32AB	DairySync	<i>Populus tremuloides</i>	0.002	0.37	<5	10.0	5.6	<0.1	0.2	5.9	<0.2	<0.2	37	<0.2	>25	3.4	<0.4	<0.5
WPPD33AB	DairySync	<i>Populus tremuloides</i>	0.002	0.37	<6	10.0	15.0	<0.12	0.2	5.1	<0.24	<0.2	41	<0.2	>20	2.2	<0.4	<0.6
WPPD34AB	DairySync	<i>Populus tremuloides</i>	0.001	0.43	<6	16.2	10.0	<0.12	<0.12	4.6	<0.24	<0.2	44	<0.2	>19	4.7	<0.4	<0.6
WPPD35AB	DairySync	<i>Populus tremuloides</i>	0.002	0.33	<5	13.2	7.1	<0.1	0.1	5.3	<0.2	<0.2	32	<0.2	>24	2.1	<0.4	<0.5
WPPD41AB	DairySync	<i>Populus tremuloides</i>	0.001	0.41	<5	3.6	6.9	<0.1	0.3	6.9	<0.2	<0.2	41	<0.2	>30	8.6	<0.4	<0.5
WPPD42AB	DairySync	<i>Populus tremuloides</i>	0.001	0.36	<4	4.0	6.4	1.03	0.5	6.2	<0.2	<0.2	24	<0.2	>30	8.8	<0.4	<0.5
WPPD43AB	DairySync	<i>Populus tremuloides</i>	0.001	0.36	<4	4.0	6.4	<0.08	0.5	5.0	<0.16	<0.1	27	0.2	22.0	12.4	<0.3	<0.4
WPPD44AB	DairySync	<i>Populus tremuloides</i>	0.001	0.35	<4	8.3	13.2	<0.08	0.3	5.4	<0.16	<0.1	23	<0.1	>28	4.7	<0.3	<0.4
WPPD45AB	DairySync	<i>Populus tremuloides</i>	0.002	0.39	<3	2.6	2.8	<0.06	0.1	5.0	<0.12	<0.1	22	<0.1	>33	12.7	<0.3	<0.3
WPPD45AX	DairySync	<i>Populus tremuloides</i>	0.001	0.41	<3	2.6	3.0	<0.06	0.1	5.2	<0.12	<0.1	22	<0.1	>35	13.0	<0.2	<0.3
WPP431AB	Lift 2	<i>Populus tremuloides</i>	0.003	0.42	<7	1.6	7.2	<0.14	1.6	6.2	<0.28	<0.3	21	0.8	8.0	12.5	<0.6	<0.7
WPP432AB	Lift 2	<i>Populus tremuloides</i>	0.004	0.32	<6	1.5	17.6	<0.12	1.2	3.9	<0.24	<0.2	42	0.6	6.5	7.9	<0.4	<0.6
WPP433AB	Lift 2	<i>Populus tremuloides</i>	0.003	0.40	<6	1.4	17.0	<0.12	0.7	6.1	<0.24	<0.2	26	1.4	4.5	13.6	<0.5	<0.6
WPP434AB	Lift 2	<i>Populus tremuloides</i>	0.002	0.34	<6	0.6	14.1	<0.12	1.2	5.0	<0.24	0.3	15	0.6	8.1	5.1	<0.4	<0.6
WPPRW1AB	RefWetland	<i>Populus tremuloides</i>	0.002	0.31	<4	20.3	2.8	<0.08	1.0	6.0	<0.16	<0.1	48	<0.1	>30	1.4	<0.3	<0.4
WPPRW2AB	RefWetland	<i>Populus tremuloides</i>	0.002	0.34	<5	21.4	3.2	<0.1	0.5	6.3	0.2	<0.2	44	<0.2	>30	1.9	<0.4	<0.5
WPPRW3AB	RefWetland	<i>Populus tremuloides</i>	0.002	0.32	<5	16.4	2.4	<0.1	0.3	8.2	<0.2	<0.2	56	<0.2	>40	2.1	<0.4	<0.5
WPPW5AB	Wetland	<i>Populus tremuloides</i>	0.002	0.27	<5	2.2	4.5	<0.1	0.4	3.9	<0.2	<0.2	99	<0.2	>18	2.1	<0.4	<0.5
WPPW6AB	Wetland	<i>Populus tremuloides</i>	0.002	0.29	<4	0.9	1.1	0.20	0.4	0.9	<0.16	<0.1	73	0.3	3.1	4.5	<0.3	<0.4
WPPW7AB	Wetland	<i>Populus tremuloides</i>	0.003	0.27	<5	4.1	6.6	0.15	0.5	4.9	<0.2	<0.2	56	0.5	9.7	3.8	<0.4	<0.5
WPPW8AB	Wetland	<i>Populus tremuloides</i>	0.003	0.34	<5	5.1	2.0	0.32	1.1	7.9	<0.2	<0.2	50	<0.2	>38	1.2	<0.4	<0.5
WPPW10AB	Wetland	<i>Populus tremuloides</i>	0.003	0.32	<5	6.0	4.4	0.30	1.0	7.5	<0.2	<0.2	32	<0.2	>38	1.0	<0.4	<0.5
WPPW11AB	Wetland	<i>Populus tremuloides</i>	0.002	0.32	<5	9.7	2.2	0.20	1.0	7.1	<0.2	<0.2	51	<0.2	>35	1.2	<0.4	<0.5
WPPW9AC	Wetland	<i>Salix spp.</i>	0.003	0.35	<5	0.5	1.2	<0.1	0.5	4.1	<0.2	<0.2	779	<0.2	>17	1.4	<0.4	<0.5
WPPW10AC	Wetland	<i>Salix spp.</i>	0.004	0.38	<4	2.2	11.2	0.19	1.3	6.6	<0.16	<0.1	112	<0.1	>35	2.2	<0.3	<0.4
WPPW1AD	Wetland	<i>Salix alba</i>	0.004	0.53	<8	0.8	33.6	<0.16	0.8	7.9	<0.32	<0.3	238	0.5	14.8	8.8	<0.7	<0.8
WPPW2AD	Wetland	<i>Salix alba</i>	0.004	0.39	<8	2.5	21.2	<0.16	0.8	5.3	<0.32	<0.3	711	<0.3	>16	5.0	<0.6	<0.8
WPPW3AD	Wetland	<i>Salix alba</i>	0.003	0.50	<8	0.8	23.1	<0.16	0.8	6.0	<0.32	<0.3	182	0.5	12.2	9.9	<0.6	<0.8
WPPW4AD	Wetland	<i>Salix alba</i>	0.005	0.38	<8	1.8	32.9	<0.16	0.8	7.6	<0.32	<0.3	702	<0.3	>21	8.3	<0.7	<0.8
WPPRW4AE	RefWetland	<i>Salix geyeriana</i>	0.003	0.31	<4	1.6	0.9	0.26	1.0	3.9	<0.16	<0.1	68	<0.1	>23	0.4	<0.3	<0.4
WPP434AF	Lift 2	<i>Salix lasioandra</i>	0.005	0.67	<8	2.0	31.5	<0.16	1.7	8.5	<0.32	<0.3	37	1.7	5.0	11.1	<0.6	0.9
WPP433AG	Lift 2	<i>Salix lutea</i>	0.004	0.46	<7	0.7	11.4	0.29	0.7	1.4	<0.28	<0.2	69	<0.2	>5	4.6	<0.5	<0.7
WPP431AH	Lift 2	<i>Salix monticola</i>	0.004	0.46	<8	1.8	25.8	<0.16	0.9	6.3	<0.32	<0.3	75	1.8	3.6	22.2	<0.7	<0.8
WPPRW1AI	RefWetland	<i>Salix myrtillofolia</i>	0.011	0.43	5	5.4	0.5	<0.1	2.8	3.8	0.3	0.3	23	<0.2	>18	1.1	<0.4	<0.5
WPP432AJ	Lift 2	<i>Salix scouleriana</i>	0.004	0.51	<7	1.5	72.8	<0.14	1.5	7.1	<0.28	<0.2	35	1.5	4.9	10.2	<0.5	<0.7
WPP444Y	Lift 2	<i>Sanicula crassulifolia</i>	0.005	0.50	<6	1.5	5.8	2.04	3.9	13.2	0.3	0.3	57	2.7	4.9	15.8	<0.5	<0.6



Table 1 (continued). Concentrations, based on dry weight, of major, minor, and trace elements for individual plant samples.

Field No.	Location	Species	Sr, ppm, ICP-AES	V, ppm, ICP-AES	Y, ppm, ICP-AES	Zn, ppm, ICP-AES	Al, ppm, ICP-MS	Ca, ppm, ICP-MS	Fe, ppm, ICP-MS	Mg, ppm, ICP-MS	Na, ppm, ICP-MS	P, ppm, ICP-MS	Ag, ppm, ICP-MS	Ba, ppm, ICP-MS	Be, ppm, ICP-MS	Bi, ppm, ICP-MS	Cd, ppm, ICP-MS	Co, ppm, ICP-MS
		(number of unqualified analyses)	240	132	21	240	40	40	39	40	40	40	5	40	36	40	40	20
WPPD11P	DairySync	<i>Achillea millefolium</i> (precision)	2%	4%	16%	0%												
WPPD12P	DairySync	<i>Achillea millefolium</i>	32	<0.4	<0.4	25												
WPPD13P	DairySync	<i>Achillea millefolium</i>	27	<0.4	<0.4	30												
WPPD14P	DairySync	<i>Achillea millefolium</i>	40	<0.4	<0.4	29												
WPPD15P	DairySync	<i>Achillea millefolium</i>	37	<0.3	<0.3	36												
WPPD17P	DairySync	<i>Achillea millefolium</i>	43	<0.5	<0.5	40												
WPPD17P	DairySync	<i>Achillea millefolium</i>	34	<0.3	<0.3	30												
WPPD21P	DairySync	<i>Achillea millefolium</i>	48	<0.6	<0.6	60												
WPPD42P	DairySync	<i>Achillea millefolium</i>	23	2.6	0.8	28												
WPPD42PX	DairySync	<i>Achillea millefolium</i>	21	2.4	0.5	28												
WPPD43P	DairySync	<i>Achillea millefolium</i>	11	0.8	<0.3	56												
WPPD44P	DairySync	<i>Achillea millefolium</i>	40	0.6	<0.3	47												
WPPD45P	DairySync	<i>Achillea millefolium</i>	29	<0.3	<0.3	56												
WPPD12A	DairySync	<i>Agropyron caninum</i>	8	<0.2	<0.2	29												
WPPD14A	DairySync	<i>Agropyron caninum</i>	8	<0.2	<0.2	33	17.9	1730	< 50	496	16.0	3300	< 0.02	11	< 0.001	0.01	0.47	< 0.1
WPPD15A	DairySync	<i>Agropyron caninum</i>	11	<0.2	<0.2	26												
WPPD16A	DairySync	<i>Agropyron caninum</i>	12	<0.2	<0.2	54												
WPP414B	Lift 1	<i>Agropyron intermedium</i>	3	0.3	<0.2	30	56.8	2700	70	1010	21.7	3300	< 0.02	1.6	0.002	0.03	0.82	< 0.1
WPP424B	Lift 1	<i>Agropyron intermedium</i>	13	0.6	<0.2	110	64.8	2920	80	1070	23.0	2200	< 0.02	9.8	0.004	0.02	2.6	< 0.1
WPP441B	Lift 2	<i>Agropyron intermedium</i>	11	0.7	<0.2	48												
WPP442B	Lift 2	<i>Agropyron intermedium</i>	11	3.6	0.3	62												
WPP443B	Lift 2	<i>Agropyron intermedium</i>	12	4.0	0.3	58												
WPP444B	Lift 2	<i>Agropyron intermedium</i>	15	1.2	<0.2	109												
WPP311B	Slope	<i>Agropyron intermedium</i>	8	0.5	<0.2	20												
WPP312B	Slope	<i>Agropyron intermedium</i>	7	0.5	<0.3	21												
WPP313B	Slope	<i>Agropyron intermedium</i>	10	0.7	<0.3	36												
WPP411C	Lift 1	<i>Agropyron smithii</i>	15	2.2	<0.2	229												
WPP412C	Lift 1	<i>Agropyron smithii</i>	11	0.4	<0.3	83	86.9	3630	120	1330	23.0	3400	< 0.02	5.2	0.004	0.03	2.1	< 0.1
WPP413C	Lift 1	<i>Agropyron smithii</i>	4	0.3	<0.2	61												
WPP421C	Lift 1	<i>Agropyron smithii</i>	11	0.6	<0.2	92												
WPP422C	Lift 1	<i>Agropyron smithii</i>	36	1.3	<0.7	473												
WPP423C	Lift 1	<i>Agropyron smithii</i>	16	1.5	<0.2	90												
WPP431C	Lift 2	<i>Agropyron smithii</i>	15	0.6	<0.3	224	82.2	5290	100	1210	20.7	2700	< 0.02	7.6	0.004	0.02	2.7	< 0.1
WPP432C	Lift 2	<i>Agropyron smithii</i>	14	0.3	<0.2	76												
WPP433C	Lift 2	<i>Agropyron smithii</i>	14	0.4	<0.2	218												
WPP434C	Lift 2	<i>Agropyron smithii</i>	14	<0.4	<0.4	72												
WPP451C	Lift 3	<i>Agropyron smithii</i>	11	0.5	<0.3	47	47.1	3130	80	1090	21.1	3600	< 0.02	9	0.001	0.03	2.1	< 0.1
WPP452C	Lift 3	<i>Agropyron smithii</i>	14	0.5	<0.3	31												
WPP453C	Lift 3	<i>Agropyron smithii</i>	14	0.7	<0.2	56												
WPP463C	Lift 3	<i>Agropyron smithii</i>	48	0.5	<0.3	54												
WPP471C	Lift 4	<i>Agropyron smithii</i>	14	0.6	<0.3	57												
WPP472C	Lift 4	<i>Agropyron smithii</i>	10	0.3	<0.2	32	43.4	2700	80	861	21.2	3500	< 0.02	16.5	0.003	0.02	0.94	< 0.1
WPP473C	Lift 4	<i>Agropyron smithii</i>	11	0.4	<0.3	46												
WPP481C	Lift 4	<i>Agropyron smithii</i>	11	0.5	<0.3	46												
WPP482C	Lift 4	<i>Agropyron smithii</i>	12	0.5	<0.3	61												
WPP483C	Lift 4	<i>Agropyron smithii</i>	11	0.6	<0.3	48												
WPP444Z	Lift 2	<i>Amelanchier alnifolia</i>	22	0.5	<0.1	32												
WPP411D	Lift 1	<i>Bromus inermis</i>	10	0.3	<0.2	122												
WPP412D	Lift 1	<i>Bromus inermis</i>	12	<0.2	<0.2	57	49.7	4380	70	1220	22.9	3100	< 0.02	1.5	0.001	0.03	1	< 0.1
WPP413D	Lift 1	<i>Bromus inermis</i>	4	<0.2	<0.2	51												
WPP414D	Lift 1	<i>Bromus inermis</i>	4	<0.2	<0.2	51												
WPP421D	Lift 1	<i>Bromus inermis</i>	11	0.5	<0.2	75												
WPP422D	Lift 1	<i>Bromus inermis</i>	10	0.4	<0.2	81												
WPP423D	Lift 1	<i>Bromus inermis</i>	21	3.5	0.4	72												
WPP424D	Lift 1	<i>Bromus inermis</i>	11	0.5	<0.2	170	49.9	3920	80	796	21.5	1900	< 0.02	2.4	0.002	0.02	3.6	0.10
WPP431D	Lift 2	<i>Bromus inermis</i>	13	0.5	<0.3	142												
WPP432D	Lift 2	<i>Bromus inermis</i>	14	<0.3	<0.3	89												
WPP433D	Lift 2	<i>Bromus inermis</i>	15	<0.3	<0.3	219												
WPP434D	Lift 2	<i>Bromus inermis</i>	12	<0.3	<0.3	85												
WPP441D	Lift 2	<i>Bromus inermis</i>	8	0.3	<0.2	35	39.8	2380	50	757	18.5	2600	< 0.02	2.9	0.002	0.02	0.36	< 0.1
WPP442D	Lift 2	<i>Bromus inermis</i>	12	2.8	<0.2	75												

Table 1 (continued). Concentrations, based on dry weight, of major, minor, and trace elements for individual plant samples.

Field No.	Location	Species	Sr, ppm, ICP-AES	V, ppm, ICP-AES	Y, ppm, ICP-AES	Zn, ppm, ICP-AES	Al, ppm, ICP-MS	Ca, ppm, ICP-MS	Fe, ppm, ICP-MS	Mg, ppm, ICP-MS	Na, ppm, ICP-MS	P, ppm, ICP-MS	Ag, ppm, ICP-MS	Ba, ppm, ICP-MS	Be, ppm, ICP-MS	Bi, ppm, ICP-MS	Cd, ppm, ICP-MS	Co, ppm, ICP-MS
WPP443D	Lift 2	<i>Bromus inermis</i>	11	4.3	0.3	66												
WPP444D	Lift 2	<i>Bromus inermis</i>	15	1.5	<0.2	134												
WPP451D	Lift 3	<i>Bromus inermis</i>	9	0.4	<0.3	55												
WPP452D	Lift 3	<i>Bromus inermis</i>	13	0.4	<0.2	33												
WPP453D	Lift 3	<i>Bromus inermis</i>	6	0.4	<0.2	54												
WPP461D	Lift 3	<i>Bromus inermis</i>	12	0.4	<0.2	47												
WPP462D	Lift 3	<i>Bromus inermis</i>	10	0.3	<0.2	90	54.1	3570	80	1260	24.7	2800	<0.02	6.4	0.001	0.02	0.91	<0.1
WPP463D	Lift 3	<i>Bromus inermis</i>	10	0.5	<0.2	59												
WPPW23D	Wetland	<i>Bromus inermis</i>	10	<0.2	<0.2	54												
WPP311E	Slope	<i>Bromus marginatus</i>	12	0.6	<0.3	10												
WPP312E	Slope	<i>Bromus marginatus</i>	16	0.8	<0.3	27												
WPP313E	Slope	<i>Bromus marginatus</i>	9	0.6	<0.3	18												
WPP314E	Slope	<i>Bromus marginatus</i>	13	0.8	0.3	32												
WPPRWK	RefWetland	<i>Carex haydeniana</i>	7	<0.1	<0.1	12	42.3	3220	80	1280	22.4	1900	<0.02	18.7	0.001	0.02	0.15	<0.1
WPPW11K	Wetland	<i>Carex haydeniana</i>	8	0.3	<0.2	103												
WPPW21K	Wetland	<i>Carex haydeniana</i>	13	0.5	<0.2	67	50.3	4090	110	1640	40.2	2000	0.04	3.3	0.001	0.02	0.49	0.17
WPPW28K	Wetland	<i>Carex haydeniana</i>	15	0.4	<0.2	110												
WPPW32K	Wetland	<i>Carex haydeniana</i>	12	0.4	<0.2	78												
WPPW35K	Wetland	<i>Carex haydeniana</i>	11	0.6	<0.2	67												
WPPW41K	Wetland	<i>Carex haydeniana</i>	13	0.6	<0.2	26												
WPPW43K	Wetland	<i>Carex haydeniana</i>	16	0.4	<0.2	33												
WPPW413K	Wetland	<i>Carex haydeniana</i>	19	0.3	<0.2	15												
WPPW51K	Wetland	<i>Carex haydeniana</i>	21	<0.2	<0.2	23												
WPPD11L	DairySync	<i>Carex hoodii</i>	17	<0.3	<0.3	16												
WPPD13L	DairySync	<i>Carex hoodii</i>	19	<0.3	<0.3	19												
WPPD15L	DairySync	<i>Carex hoodii</i>	16	<0.4	<0.4	13												
WPPD18L	DairySync	<i>Carex hoodii</i>	24	<0.3	<0.3	21												
WPPD35M	DairySync	<i>Carex rossii</i>	20	<0.3	<0.3	66												
WPPD41M	DairySync	<i>Carex rossii</i>	16	0.8	<0.3	33												
WPPD43M	DairySync	<i>Carex rossii</i>	22	0.5	<0.2	25	123	6610	130	1510	38.1	3600	<0.02	10.2	0.003	0.01	3.3	<0.1
WPPD44M	DairySync	<i>Carex rossii</i>	19	0.5	<0.2	52												
WPPD45M	DairySync	<i>Carex rossii</i>	13	0.3	<0.2	46												
WPPRWV	RefWetland	<i>Carex utriculata</i>	9	<0.2	<0.2	18	65.1	3940	100	845	47.7	2300	<0.02	13	0.001	0.02	0.05	<0.1
WPPW14N	Wetland	<i>Carex utriculata</i>	11	0.8	<0.3	60												
WPPW25N	Wetland	<i>Carex utriculata</i>	12	<0.2	<0.2	47												
WPPW37N	Wetland	<i>Carex utriculata</i>	13	0.2	<0.2	76	57.2	4530	140	1990	28.0	2400	<0.02	4.4	0.001	0.02	0.64	<0.1
WPPW48N	Wetland	<i>Carex utriculata</i>	17	<0.2	<0.2	21												
WPPW49N	Wetland	<i>Carex utriculata</i>	26	0.3	<0.3	27												
WPPW411N	Wetland	<i>Carex utriculata</i>	18	<0.2	<0.2	30												
WPPW52N	Wetland	<i>Carex utriculata</i>	23	<0.2	<0.2	36	53.5	4960	120	1770	30.6	2800	<0.02	15.7	<0.001	0.02	0.09	<0.1
WPPW53N	Wetland	<i>Carex utriculata</i>	27	<0.3	<0.3	45												
WPPW55N	Wetland	<i>Carex utriculata</i>	23	<0.3	<0.3	44												
WPPW56N	Wetland	<i>Carex utriculata</i>	22	<0.3	<0.3	38												
WPP444AA	Lift 2	<i>Ceanothus velutinus</i>	26	0.4	<0.1	36												
WPPW31Q	Wetland	<i>Cirsium arvense</i>	69	<0.6	<0.6	60	109	3520	100	1810	39.3	2600	<0.02	3.1	0.003	0.03	4.7	<0.1
WPP423F	Lift 1	<i>Dactylis glomerata</i>	10	1.5	<0.2	102												
WPP441F	Lift 2	<i>Dactylis glomerata</i>	7	0.4	<0.2	33												
WPP442F	Lift 2	<i>Dactylis glomerata</i>	11	4.4	0.3	68												
WPP444F	Lift 2	<i>Dactylis glomerata</i>	10	0.4	<0.2	77												
WPP311F	Slope	<i>Dactylis glomerata</i>	9	0.7	<0.3	13												
WPP312F	Slope	<i>Dactylis glomerata</i>	12	2.5	0.8	27												
WPP314F	Slope	<i>Dactylis glomerata</i>	13	1.1	<0.4	25												
WPPW34F	Wetland	<i>Dactylis glomerata</i>	9	<0.3	<0.3	42	51.4	3450	100	1510	28.5	2500	<0.02	4.7	<0.001	0.03	1.3	<0.1
WPPD11G	DairySync	<i>Deschampsia caespitosa</i>	8	<0.3	<0.3	26												
WPPD12G	DairySync	<i>Deschampsia caespitosa</i>	9	<0.2	<0.2	29	29.1	2270	60	946	20.1	3000	<0.02	34.7	<0.001	0.01	0.85	<0.1
WPPD13G	DairySync	<i>Deschampsia caespitosa</i>	12	<0.2	<0.2	34												
WPPD14G	DairySync	<i>Deschampsia caespitosa</i>	11	<0.2	<0.2	55												
WPPD21G	DairySync	<i>Deschampsia caespitosa</i>	22	<0.3	<0.3	40												
WPPD22G	DairySync	<i>Deschampsia caespitosa</i>	13	<0.5	<0.5	40												
WPPD23G	DairySync	<i>Deschampsia caespitosa</i>	14	<0.5	<0.5	34												
WPPD24G	DairySync	<i>Deschampsia caespitosa</i>	13	<0.4	<0.4	48												
WPPD25G	DairySync	<i>Deschampsia caespitosa</i>	7	<0.3	<0.3	34												



Table 1 (continued). Concentrations, based on dry weight, of major, minor, and trace elements for individual plant samples.

Field No.	Location	Species	Sr, ppm, ICP-AES	V, ppm, ICP-AES	Y, ppm, ICP-AES	Zn, ppm, ICP-AES	Al, ppm, ICP-MS	Ca, ppm, ICP-MS	Fe, ppm, ICP-MS	Mg, ppm, ICP-MS	Na, ppm, ICP-MS	P, ppm, ICP-MS	Ag, ppm, ICP-MS	Ba, ppm, ICP-MS	Be, ppm, ICP-MS	Bi, ppm, ICP-MS	Cd, ppm, ICP-MS	Co, ppm, ICP-MS
WPPD31G	DairySync	Deschampsia caespitosa	16	<0.3	<0.3	38												
WPPD32G	DairySync	Deschampsia caespitosa	15	<0.4	<0.4	40												
WPPD33G	DairySync	Deschampsia caespitosa	16	<0.5	<0.5	38												
WPPD34G	DairySync	Deschampsia caespitosa	16	<0.4	<0.4	38												
WPPD42G	DairySync	Deschampsia caespitosa	8	<0.2	<0.2	38												
WPPRWG	RefWetland	Deschampsia caespitosa	9	<0.2	<0.2	28	26.4	1920	70	990	54.2	3000	<0.02	9.1	0.001	0.02	0.12	<0.1
WPPW12G	Wetland	Deschampsia caespitosa	8	<0.2	<0.2	44												
WPPW29G	Wetland	Deschampsia caespitosa	16	<0.2	<0.2	33												
WPPW42G	Wetland	Deschampsia caespitosa	11	0.2	<0.2	33												
WPPW45G	Wetland	Deschampsia caespitosa	13	0.2	<0.2	23												
WPPW46G	Wetland	Deschampsia caespitosa	9	<0.1	<0.1	20	39.2	2270	80	920	66.1	2600	<0.02	1.7	0.002	0.02	0.04	<0.1
WPPW54G	Wetland	Deschampsia caespitosa	10	<0.3	<0.3	24												
WPPD31R	DairySync	Epilobium angustifolium	51	<0.2	<0.2	71												
WPPD32R	DairySync	Epilobium angustifolium	41	<0.3	<0.3	45												
WPPW44S	Wetland	Equisetum arvense	56	1.0	<0.6	28												
WPPW47S	Wetland	Equisetum arvense	52	<0.6	<0.6	33												
WPPW412S	Wetland	Equisetum arvense	80	<0.7	<0.7	45												
WPPW13H	Wetland	Festuca arundinacea	7	0.3	<0.3	41												
WPPW26H	Wetland	Festuca arundinacea	7	<0.2	<0.2	53												
WPPW33I	Wetland	Glyceria striata	15	<0.2	<0.2	31												
WPPRW0	RefWetland	Juncus ensifolius	18	<0.3	<0.3	46												
WPPW27O	Wetland	Juncus ensifolius	18	0.4	<0.3	100												
WPPW210O	Wetland	Juncus ensifolius	31	<0.3	<0.3	56												
WPPW410O	Wetland	Juncus ensifolius	27	<0.3	<0.3	24												
WPP411T	Lift 1	Medicago sativa	95	0.8	<0.4	166	73.1	37800	300	4100	27.6	2400	<0.02	4.6	0.005	0.03	3.4	0.25
WPP412T	Lift 1	Medicago sativa	71	<0.3	<0.3	78												
WPP413T	Lift 1	Medicago sativa	20	<0.4	<0.4	77												
WPP414T	Lift 1	Medicago sativa	48	0.6	<0.3	77												
WPP421T	Lift 1	Medicago sativa	67	0.4	<0.4	96	55.2	31100	260	3700	26.3	2700	0.02	3.4	0.002	0.03	3.6	0.17
WPP422T	Lift 1	Medicago sativa	59	0.5	<0.4	99												
WPP423T	Lift 1	Medicago sativa	89	2.3	<0.4	156												
WPP424T	Lift 1	Medicago sativa	67	1.1	<0.4	127												
WPP431T	Lift 2	Medicago sativa	66	0.4	<0.4	109												
WPP432T	Lift 2	Medicago sativa	63	<0.3	<0.3	71												
WPP433T	Lift 2	Medicago sativa	57	<0.4	<0.4	67	42.8	30800	260	2160	32.0	3000	<0.02	3.3	0.002	0.02	1.7	0.17
WPP434T	Lift 2	Medicago sativa	39	<0.4	<0.4	67												
WPP441T	Lift 2	Medicago sativa	81	0.5	<0.3	62												
WPP442T	Lift 2	Medicago sativa	81	7.2	0.5	96												
WPP443T	Lift 2	Medicago sativa	89	2.6	<0.4	79	80.3	25200	300	3200	71.1	3500	<0.02	4.3	0.004	0.04	3.2	0.20
WPP444T	Lift 2	Medicago sativa	96	0.4	<0.4	80												
WPP461T	Lift 3	Medicago sativa	77	0.5	<0.4	83	51.9	19900	230	3350	30.5	4100	<0.02	5.2	0.002	0.02	3	0.14
WPP462T	Lift 3	Medicago sativa	91	0.4	<0.4	62												
WPP463T	Lift 3	Medicago sativa	38	<0.3	<0.3	62												
WPP471T	Lift 4	Medicago sativa	97	<0.4	<0.4	60												
WPP472T	Lift 4	Medicago sativa	68	0.6	<0.4	41	56.4	20900	250	2520	45.6	3000	<0.02	12.7	0.003	0.02	1.7	0.15
WPP473T	Lift 4	Medicago sativa	61	<0.4	<0.4	50												
WPP481T	Lift 4	Medicago sativa	63	<0.3	<0.3	48												
WPP462T	Lift 4	Medicago sativa	49	0.7	<0.3	41												
WPP483T	Lift 4	Medicago sativa	95	<0.5	<0.5	80												
WPP311T	Slope	Medicago sativa	91	0.5	1.2	37												
WPP312T	Slope	Medicago sativa	61	0.7	<0.3	47												
WPP313T	Slope	Medicago sativa	67	0.9	<0.4	50												
WPP314T	Slope	Medicago sativa	78	0.9	<0.4	45												
WPPW24T	Wetland	Medicago sativa	74	<0.5	<0.5	77	53.5	32600	280	5180	112	3000	<0.02	2.4	0.001	0.02	2.9	0.17
WPPW36T	Wetland	Medicago sativa	42	<0.4	<0.4	78												
WPP451U	Lift 3	Onobrychis viciifolia	49	0.7	<0.2	66												
WPP452U	Lift 3	Onobrychis viciifolia	48	0.4	<0.2	55												
WPP453U	Lift 3	Onobrychis viciifolia	30	0.4	<0.2	48												
WPPD21V	DairySync	Pedicularis racemosa	102	<0.4	<0.4	76												
WPPD22V	DairySync	Pedicularis racemosa	38	<0.3	<0.3	73												
WPPD23V	DairySync	Pedicularis racemosa	39	<0.3	<0.3	80												
WPPD24V	DairySync	Pedicularis racemosa	24	<0.3	<0.3	126												

Table 1 (continued). Concentrations, based on dry weight, of major, minor, and trace elements for individual plant samples.

Field No.	Location	Species	Sr, ppm, ICP-AES	V, ppm, ICP-AES	Y, ppm, ICP-AES	Zn, ppm, ICP-AES	Al, ppm, ICP-MS	Ca, ppm, ICP-MS	Fe, ppm, ICP-MS	Mg, ppm, ICP-MS	Na, ppm, ICP-MS	P, ppm, ICP-MS	Ag, ppm, ICP-MS	Ba, ppm, ICP-MS	Be, ppm, ICP-MS	Bi, ppm, ICP-MS	Cd, ppm, ICP-MS	Co, ppm, ICP-MS
WPPD25V	DairySync	<i>Pedicularis racemosa</i>	36	<0.4	<0.4	73												
WPPD33V	DairySync	<i>Pedicularis racemosa</i>	61	<0.4	<0.4	163												
WPP444W	Lift 2	<i>Penstemon nydbergii</i>	37	0.5	<0.2	43												
WPP444X	Lift 2	<i>Phacelia hastata</i>	110	2.4	0.5	35												
WPP423J	Lift 1	<i>Phleum pratense</i>	7	1.3	<0.1	65												
WPP442J	Lift 2	<i>Phleum pratense</i>	9	4.4	0.4	83												
WPPW22J	Wetland	<i>Phleum pratense</i>	6	<0.3	<0.3	58												
WPPD11AB	DairySync	<i>Populus tremuloides</i>	68	<0.2	0.2	159	30.6	12000	130	1700	16.0	2400	<0.02	74.6	0.010	0.01	2.7	0.73
WPPD12AB	DairySync	<i>Populus tremuloides</i>	46	<0.2	0.3	176												
WPPD13AB	DairySync	<i>Populus tremuloides</i>	67	<0.2	<0.2	134												
WPPD14AB	DairySync	<i>Populus tremuloides</i>	57	<0.3	<0.3	75												
WPPD15AB	DairySync	<i>Populus tremuloides</i>	44	<0.2	<0.2	130												
WPPD16AB	DairySync	<i>Populus tremuloides</i>	56	<0.2	<0.2	267												
WPPD17AB	DairySync	<i>Populus tremuloides</i>	62	<0.1	0.3	205												
WPPD21AB	DairySync	<i>Populus tremuloides</i>	51	<0.2	0.3	169												
WPPD22AB	DairySync	<i>Populus tremuloides</i>	47	<0.2	<0.2	225												
WPPD23AB	DairySync	<i>Populus tremuloides</i>	36	<0.2	<0.2	140												
WPPD24AB	DairySync	<i>Populus tremuloides</i>	44	<0.2	<0.2	238	29.7	8760	110	2090	17.6	3600	<0.02	28.9	0.003	0.01	7.4	0.18
WPPD25AB	DairySync	<i>Populus tremuloides</i>	14	<0.2	<0.2	147												
WPPD31AB	DairySync	<i>Populus tremuloides</i>	27	<0.2	<0.2	191												
WPPD32AB	DairySync	<i>Populus tremuloides</i>	34	<0.2	<0.2	148												
WPPD33AB	DairySync	<i>Populus tremuloides</i>	39	<0.2	<0.2	206												
WPPD34AB	DairySync	<i>Populus tremuloides</i>	40	<0.2	<0.2	280												
WPPD35AB	DairySync	<i>Populus tremuloides</i>	42	<0.2	<0.2	274												
WPPD41AB	DairySync	<i>Populus tremuloides</i>	31	<0.2	<0.2	189												
WPPD42AB	DairySync	<i>Populus tremuloides</i>	22	<0.2	<0.2	211												
WPPD43AB	DairySync	<i>Populus tremuloides</i>	30	<0.1	<0.1	193												
WPPD44AB	DairySync	<i>Populus tremuloides</i>	36	<0.1	<0.1	230												
WPPD45AB	DairySync	<i>Populus tremuloides</i>	22	<0.1	0.2	162												
WPPD45AX	DairySync	<i>Populus tremuloides</i>	22	<0.1	0.2	163												
WPP431AB	Lift 2	<i>Populus tremuloides</i>	33	0.8	<0.3	390												
WPP432AB	Lift 2	<i>Populus tremuloides</i>	32	0.6	<0.2	376	78.5	11900	190	2930	26.8	3800	<0.02	2.3	0.003	0.06	16.6	0.16
WPP433AB	Lift 2	<i>Populus tremuloides</i>	28	0.5	<0.2	564												
WPP434AB	Lift 2	<i>Populus tremuloides</i>	27	0.5	<0.2	325												
WPPRW1AB	RefWetland	<i>Populus tremuloides</i>	47	0.4	<0.1	149	69.8	10800	140	2340	23.9	3100	<0.02	24.1	0.001	0.01	2.7	0.20
WPPRW2AB	RefWetland	<i>Populus tremuloides</i>	50	0.3	<0.2	157												
WPPRW3AB	RefWetland	<i>Populus tremuloides</i>	41	<0.2	<0.2	128												
WPPW5AB	Wetland	<i>Populus tremuloides</i>	31	0.3	<0.2	159												
WPPW6AB	Wetland	<i>Populus tremuloides</i>	14	0.3	<0.1	82	46.5	6150	90	1590	19.2	2700	<0.02	1.6	0.002	0.01	1.1	0.34
WPPW7AB	Wetland	<i>Populus tremuloides</i>	27	0.4	<0.2	249	52.2	10500	140	1870	24.3	2700	<0.02	5.8	0.002	0.01	6.2	0.31
WPPW8AB	Wetland	<i>Populus tremuloides</i>	33	0.5	<0.2	163												
WPPW10AB	Wetland	<i>Populus tremuloides</i>	36	0.5	<0.2	206												
WPPW11AB	Wetland	<i>Populus tremuloides</i>	37	0.5	<0.2	137												
WPPW9AC	Wetland	<i>Salix spp.</i>	24	0.4	<0.2	132												
WPPW10AC	Wetland	<i>Salix spp.</i>	21	0.9	<0.1	267												
WPPW1AD	Wetland	<i>Salix alba</i>	34	0.5	<0.3	724												
WPPW2AD	Wetland	<i>Salix alba</i>	46	0.7	<0.3	551	95.2	14000	190	3000	40.1	3800	<0.02	2.4	0.002	0.01	18.4	0.34
WPPW3AD	Wetland	<i>Salix alba</i>	36	0.6	<0.3	396												
WPPW4AD	Wetland	<i>Salix alba</i>	51	0.8	<0.3	631												
WPPRW4AE	RefWetland	<i>Salix georgiana</i>	17	0.4	<0.1	124	64.2	7770	120	2220	28.4	3200	<0.02	2.4	0.004	0.04	0.89	0.38
WPP434AF	Lift 2	<i>Salix lasiantha</i>	46	0.9	<0.3	784												
WPP433AG	Lift 2	<i>Salix lutea</i>	30	0.6	<0.2	528	73.5	13400	190	2740	29.6	4100	0.02	2	0.002	0.02	9.8	0.37
WPP431AH	Lift 2	<i>Salix monticola</i>	48	0.6	<0.3	507												
WPPRW1AI	RefWetland	<i>Salix myrtilifolia</i>	22	1.4	0.3	92												
WPP432AJ	Lift 2	<i>Salix scouleriana</i>	33	0.7	<0.2	531	86.8	14100	170	2690	37.6	4600	0.02	2.3	0.003	0.02	58.7	0.33
WPP444Y	Lift 2	<i>Senecio crassulus</i>	32	1.8	0.3	99												



Table 1 (continued). Concentrations, based on dry weight, of major, minor, and trace elements for individual plant samples.

Field No.	Location (number of unqualified analyses)	Species (precision)	Cr, ppm, ICP-MS 29	Cs, ppm, ICP-MS 39	Cu, ppm, ICP-MS 40	Ga, ppm, ICP-MS 40	Ce, ppm, ICP-MS 40	Sm, ppm, ICP-MS 4	Eu, ppm, ICP-MS 14	Gd, ppm, ICP-MS 9	Tb, ppm, ICP-MS 3	Dy, ppm, ICP-MS 3	Tm, ppm, ICP-MS 2	Yb, ppm, ICP-MS 9	Li, ppm, ICP-MS 2	Mn, ppm, ICP-MS 40	Mo, ppm, ICP-MS 36	Cu/Mo, ICP-MS 36
WPPD11P	DairySync	Achillea millefolium																
WPPD12P	DairySync	Achillea millefolium																
WPPD13P	DairySync	Achillea millefolium																
WPPD14P	DairySync	Achillea millefolium																
WPPD15P	DairySync	Achillea millefolium																
WPPD17P	DairySync	Achillea millefolium																
WPPD21P	DairySync	Achillea millefolium																
WPPD42P	DairySync	Achillea millefolium																
WPPD42PX	DairySync	Achillea millefolium																
WPPD43P	DairySync	Achillea millefolium																
WPPD44P	DairySync	Achillea millefolium																
WPPD45P	DairySync	Achillea millefolium																
WPPD12A	DairySync	Agropyron caninum																
WPPD14A	DairySync	Agropyron caninum																
WPPD15A	DairySync	Agropyron caninum																
WPPD16A	DairySync	Agropyron caninum																
WPP414B	Lift 1	Agropyron intermedium	0.4	0.02	4.3	0.10	1.7	< 0.02	< 0.005	< 0.02	< 0.005	< 0.04	< 0.006	< 0.03	< 0.2	15.0	3.2	1.3
WPP424B	Lift 1	Agropyron intermedium	1.8	0.03	6.6	0.09	1.6	< 0.02	< 0.005	0.02	< 0.005	< 0.04	< 0.006	0.03	< 0.2	16.6	5.3	1.2
WPP441B	Lift 2	Agropyron intermedium																
WPP442B	Lift 2	Agropyron intermedium																
WPP443B	Lift 2	Agropyron intermedium																
WPP444B	Lift 2	Agropyron intermedium																
WPP311B	Slope	Agropyron intermedium																
WPP312B	Slope	Agropyron intermedium																
WPP313B	Slope	Agropyron intermedium																
WPP411C	Lift 1	Agropyron smithii																
WPP412C	Lift 1	Agropyron smithii	< 0.2	0.03	4.8	0.10	1.6	< 0.02	< 0.005	< 0.02	< 0.005	< 0.04	< 0.006	< 0.03	< 0.2	37.7	5.8	0.8
WPP413C	Lift 1	Agropyron smithii																
WPP421C	Lift 1	Agropyron smithii																
WPP422C	Lift 1	Agropyron smithii																
WPP423C	Lift 1	Agropyron smithii																
WPP431C	Lift 2	Agropyron smithii	1.2	0.02	7.9	0.08	1.5	< 0.02	0.005	< 0.02	< 0.005	< 0.04	< 0.006	< 0.03	< 0.2	36.4	14	0.6
WPP432C	Lift 2	Agropyron smithii																
WPP433C	Lift 2	Agropyron smithii																
WPP434C	Lift 2	Agropyron smithii																
WPP451C	Lift 3	Agropyron smithii	0.6	0.008	4.7	0.10	1.6	< 0.02	< 0.005	< 0.02	< 0.005	< 0.04	< 0.006	< 0.03	< 0.2	27.5	22.6	0.2
WPP452C	Lift 3	Agropyron smithii																
WPP453C	Lift 3	Agropyron smithii																
WPP463C	Lift 3	Agropyron smithii																
WPP471C	Lift 4	Agropyron smithii																
WPP472C	Lift 4	Agropyron smithii	< 0.2	0.01	4.2	0.10	1.7	< 0.02	0.005	< 0.02	< 0.005	< 0.04	< 0.006	< 0.03	< 0.2	16.1	9.7	0.4
WPP473C	Lift 4	Agropyron smithii																
WPP481C	Lift 4	Agropyron smithii																
WPP482C	Lift 4	Agropyron smithii																
WPP483C	Lift 4	Agropyron smithii																
WPP444Z	Lift 2	Amelanchier alnifolia																
WPP411D	Lift 1	Bromus inermis																
WPP412D	Lift 1	Bromus inermis	< 0.2	0.01	5.3	0.09	1.6	< 0.02	< 0.005	< 0.02	< 0.005	< 0.04	< 0.006	< 0.03	< 0.2	32.3	4.1	1.3
WPP413D	Lift 1	Bromus inermis																
WPP414D	Lift 1	Bromus inermis																
WPP421D	Lift 1	Bromus inermis																
WPP422D	Lift 1	Bromus inermis																
WPP423D	Lift 1	Bromus inermis																
WPP424D	Lift 1	Bromus inermis	2	0.03	6.6	0.08	1.6	< 0.02	< 0.005	< 0.02	< 0.005	< 0.04	< 0.006	< 0.03	0.5	19.6	1.4	4.7
WPP431D	Lift 2	Bromus inermis																
WPP432D	Lift 2	Bromus inermis																
WPP433D	Lift 2	Bromus inermis																
WPP434D	Lift 2	Bromus inermis																
WPP441D	Lift 2	Bromus inermis	< 0.2	0.007	5.0	0.08	1.6	< 0.02	< 0.005	< 0.02	< 0.005	< 0.04	< 0.006	< 0.03	< 0.2	24.9	9.6	0.5
WPP442D	Lift 2	Bromus inermis																

Table 1 (continued). Concentrations, based on dry weight, of major, minor, and trace elements for individual plant samples.

Field No.	Location	Species	Cr, ppm, ICP-MS	Cs, ppm, ICP-MS	Cu, ppm, ICP-MS	Ga, ppm, ICP-MS	Ce, ppm, ICP-MS	Sm, ppm, ICP-MS	Eu, ppm, ICP-MS	Gd, ppm, ICP-MS	Tb, ppm, ICP-MS	Dy, ppm, ICP-MS	Tm, ppm, ICP-MS	Yb, ppm, ICP-MS	Li, ppm, ICP-MS	Mn, ppm, ICP-MS	Mo, ppm, ICP-MS	Cu/Mo, ICP-MS
WPP443D	Lift 2	<i>Bromus inermis</i>																
WPP444D	Lift 2	<i>Bromus inermis</i>																
WPP451D	Lift 3	<i>Bromus inermis</i>																
WPP452D	Lift 3	<i>Bromus inermis</i>																
WPP453D	Lift 3	<i>Bromus inermis</i>																
WPP461D	Lift 3	<i>Bromus inermis</i>																
WPP462D	Lift 3	<i>Bromus inermis</i>	0.3	0.01	5.1	0.09	1.6	< 0.02	< 0.005	< 0.02	< 0.005	< 0.04	< 0.006	< 0.03	< 0.2	35.0	18.3	0.3
WPP463D	Lift 3	<i>Bromus inermis</i>																
WPPW23D	Wetland	<i>Bromus inermis</i>																
WPP311E	Slope	<i>Bromus marginatus</i>																
WPP312E	Slope	<i>Bromus marginatus</i>																
WPP313E	Slope	<i>Bromus marginatus</i>																
WPP314E	Slope	<i>Bromus marginatus</i>																
WPPRWK	RefWetland	<i>Carex haydeniana</i>	< 0.2	0.005	5.9	0.08	1.7	< 0.02	0.007	< 0.02	< 0.005	< 0.04	< 0.006	< 0.03	< 0.2	198	1	5.9
WPPW11K	Wetland	<i>Carex haydeniana</i>																
WPPW21K	Wetland	<i>Carex haydeniana</i>	< 0.2	0.03	6.0	0.08	1.7	< 0.02	< 0.005	< 0.02	< 0.005	< 0.04	< 0.006	< 0.03	< 0.2	97.3	2.8	2.1
WPPW28K	Wetland	<i>Carex haydeniana</i>																
WPPW32K	Wetland	<i>Carex haydeniana</i>																
WPPW35K	Wetland	<i>Carex haydeniana</i>	1.9	0.03	8.1	0.09	1.7	< 0.02	< 0.005	0.02	< 0.005	< 0.04	< 0.006	< 0.03	< 0.2	107	1.2	6.8
WPPW41K	Wetland	<i>Carex haydeniana</i>																
WPPW43K	Wetland	<i>Carex haydeniana</i>																
WPPW413K	Wetland	<i>Carex haydeniana</i>																
WPPW51K	Wetland	<i>Carex haydeniana</i>																
WPPD11L	DairySync	<i>Carex hoodii</i>																
WPPD13L	DairySync	<i>Carex hoodii</i>																
WPPD15L	DairySync	<i>Carex hoodii</i>																
WPPD18L	DairySync	<i>Carex hoodii</i>																
WPPD35M	DairySync	<i>Carex rossii</i>																
WPPD41M	DairySync	<i>Carex rossii</i>																
WPPD43M	DairySync	<i>Carex rossii</i>	0.9	0.02	7.6	0.10	1.7	0.02	0.007	0.03	< 0.005	< 0.04	< 0.006	0.03	< 0.2	18.7	1.2	6.3
WPPD44M	DairySync	<i>Carex rossii</i>																
WPPD45M	DairySync	<i>Carex rossii</i>																
WPPRWN	RefWetland	<i>Carex utriculata</i>	0.3	0.01	1.6	0.09	1.7	< 0.02	0.007	< 0.02	< 0.005	< 0.04	< 0.006	< 0.03	< 0.2	157	< 0.1	> 16
WPPW14N	Wetland	<i>Carex utriculata</i>																
WPPW25N	Wetland	<i>Carex utriculata</i>																
WPPW37N	Wetland	<i>Carex utriculata</i>	0.2	0.03	4.8	0.10	1.7	< 0.02	< 0.005	< 0.02	< 0.005	< 0.04	< 0.006	0.04	< 0.2	302	0.44	11
WPPW48N	Wetland	<i>Carex utriculata</i>																
WPPW49N	Wetland	<i>Carex utriculata</i>																
WPPW411N	Wetland	<i>Carex utriculata</i>																
WPPW52N	Wetland	<i>Carex utriculata</i>																
WPPW53N	Wetland	<i>Carex utriculata</i>																
WPPW55N	Wetland	<i>Carex utriculata</i>																
WPPW56N	Wetland	<i>Carex utriculata</i>	0.4	0.01	3.7	0.10	1.7	< 0.02	0.006	< 0.02	< 0.005	< 0.04	< 0.006	< 0.03	< 0.2	646	0.24	15
WPP444AA	Lift 2	<i>Ceanothus velutinus</i>																
WPPW31Q	Wetland	<i>Cirsium arvense</i>																
WPP423F	Lift 1	<i>Dactylis glomerata</i>	3.6	0.03	5.3	0.10	1.6	0.03	0.006	0.04	0.006	0.04	0.006	0.04	< 0.2	32.5	9.2	0.6
WPP441F	Lift 2	<i>Dactylis glomerata</i>																
WPP442F	Lift 2	<i>Dactylis glomerata</i>																
WPP444F	Lift 2	<i>Dactylis glomerata</i>																
WPP311F	Slope	<i>Dactylis glomerata</i>																
WPP312F	Slope	<i>Dactylis glomerata</i>																
WPP314F	Slope	<i>Dactylis glomerata</i>																
WPPW34F	Wetland	<i>Dactylis glomerata</i>	< 0.2	0.009	3.3	0.08	1.7	< 0.02	< 0.005	< 0.02	< 0.005	< 0.04	< 0.006	< 0.03	< 0.2	49.3	1.3	2.5
WPPD11G	DairySync	<i>Daschampsia caespitosa</i>																
WPPD12G	DairySync	<i>Daschampsia caespitosa</i>	< 0.2	0.003	5.2	0.09	1.6	< 0.02	0.010	< 0.02	< 0.005	< 0.04	< 0.006	< 0.03	< 0.2	40.2	2.3	2.3
WPPD13G	DairySync	<i>Daschampsia caespitosa</i>																
WPPD14G	DairySync	<i>Daschampsia caespitosa</i>																
WPPD21G	DairySync	<i>Daschampsia caespitosa</i>																
WPPD22G	DairySync	<i>Daschampsia caespitosa</i>																
WPPD23G	DairySync	<i>Daschampsia caespitosa</i>																
WPPD24G	DairySync	<i>Daschampsia caespitosa</i>																
WPPD25G	DairySync	<i>Daschampsia caespitosa</i>																



Table 1 (continued). Concentrations, based on dry weight, of major, minor, and trace elements for individual plant samples.

Field No.	Location	Species	Cr, ppm, ICP-MS	Cs, ppm, ICP-MS	Cu, ppm, ICP-MS	Ga, ppm, ICP-MS	Ce, ppm, ICP-MS	Sm, ppm, ICP-MS	Eu, ppm, ICP-MS	Gd, ppm, ICP-MS	Tb, ppm, ICP-MS	Dy, ppm, ICP-MS	Tm, ppm, ICP-MS	Yb, ppm, ICP-MS	Li, ppm, ICP-MS	Mn, ppm, ICP-MS	Mo, ppm, ICP-MS	Cu/Mo, ICP-MS
WPPD31G	DairySync	Deschampsia caespitosa																
WPPD32G	DairySync	Deschampsia caespitosa																
WPPD33G	DairySync	Deschampsia caespitosa																
WPPD34G	DairySync	Deschampsia caespitosa																
WPPD42G	DairySync	Deschampsia caespitosa																
WPPRWG	RefWetland	Deschampsia caespitosa	< 0.2	0.006	5.4	0.09	1.7	< 0.02	< 0.005	< 0.02	< 0.005	< 0.04	< 0.006	< 0.03	< 0.2	149	0.33	16
WPPW12G	Wetland	Deschampsia caespitosa																
WPPW29G	Wetland	Deschampsia caespitosa																
WPPW42G	Wetland	Deschampsia caespitosa																
WPPW45G	Wetland	Deschampsia caespitosa																
WPPW46G	Wetland	Deschampsia caespitosa																
WPPW54G	Wetland	Deschampsia caespitosa	< 0.2	0.009	1.5	0.09	1.7	< 0.02	< 0.005	< 0.02	< 0.005	< 0.04	< 0.006	< 0.03	< 0.2	96.6	0.2	7.5
WPPD31R	DairySync	Deschampsia caespitosa																
WPPD32R	DairySync	Epilobium angustifolium																
WPPW44S	Wetland	Epilobium angustifolium																
WPPW47S	Wetland	Equisetum arvense																
WPPW412S	Wetland	Equisetum arvense																
WPPW13H	Wetland	Festuca arundinacea																
WPPW26H	Wetland	Festuca arundinacea																
WPPW33I	Wetland	Glyceria striata																
WPPRW0	RefWetland	Juncus ensifolius																
WPPW27O	Wetland	Juncus ensifolius																
WPPW210O	Wetland	Juncus ensifolius																
WPPW410O	Wetland	Juncus ensifolius																
WPP411T	Lift 1	Medicago sativa	2.5	0.06	6.8	0.09	1.8	< 0.02	0.006	0.03	< 0.005	< 0.04	< 0.006	0.04	< 0.2	19.6	17.3	0.4
WPP412T	Lift 1	Medicago sativa																
WPP413T	Lift 1	Medicago sativa																
WPP414T	Lift 1	Medicago sativa																
WPP421T	Lift 1	Medicago sativa	0.8	0.04	4.9	0.08	1.7	< 0.02	< 0.005	< 0.02	< 0.005	< 0.04	< 0.006	< 0.03	< 0.2	27.6	28	0.2
WPP422T	Lift 1	Medicago sativa																
WPP423T	Lift 1	Medicago sativa																
WPP424T	Lift 1	Medicago sativa																
WPP431T	Lift 2	Medicago sativa																
WPP432T	Lift 2	Medicago sativa																
WPP433T	Lift 2	Medicago sativa	0.4	0.03	3.6	0.08	1.8	< 0.02	< 0.005	< 0.02	< 0.005	< 0.04	< 0.006	< 0.03	< 0.2	22.0	10.6	0.3
WPP434T	Lift 2	Medicago sativa																
WPP441T	Lift 2	Medicago sativa																
WPP442T	Lift 2	Medicago sativa																
WPP443T	Lift 2	Medicago sativa																
WPP444T	Lift 2	Medicago sativa																
WPP461T	Lift 3	Medicago sativa																
WPP462T	Lift 3	Medicago sativa	0.9	0.04	3.6	0.10	1.7	< 0.02	< 0.005	< 0.02	< 0.005	< 0.04	< 0.006	< 0.03	< 0.2	36.1	52	0.1
WPP463T	Lift 3	Medicago sativa																
WPP471T	Lift 4	Medicago sativa																
WPP472T	Lift 4	Medicago sativa	1.2	0.02	4.0	0.09	1.7	< 0.02	0.007	< 0.02	< 0.005	< 0.04	< 0.006	0.03	< 0.2	26.3	28	0.1
WPP473T	Lift 4	Medicago sativa																
WPP481T	Lift 4	Medicago sativa																
WPP482T	Lift 4	Medicago sativa																
WPP483T	Lift 4	Medicago sativa																
WPP311T	Slope	Medicago sativa																
WPP312T	Slope	Medicago sativa																
WPP313T	Slope	Medicago sativa																
WPP314T	Slope	Medicago sativa																
WPPW24T	Wetland	Medicago sativa	0.4	0.08	8.9	0.09	1.8	< 0.02	< 0.005	< 0.02	< 0.005	< 0.04	< 0.006	< 0.03	0.3	23.9	15.5	0.6
WPPW36T	Wetland	Medicago sativa																
WPP451U	Lift 3	Onobrychis viciifolia																
WPP452U	Lift 3	Onobrychis viciifolia																
WPP453U	Lift 3	Onobrychis viciifolia																
WPPD21V	DairySync	Pedicularis racemosa																
WPPD22V	DairySync	Pedicularis racemosa																
WPPD23V	DairySync	Pedicularis racemosa																
WPPD24V	DairySync	Pedicularis racemosa																

Table 1 (continued). Concentrations, based on dry weight, of major, minor, and trace elements for individual plant samples.

Field No.	Location	Species	Cr, ppm, ICP-MS	Cs, ppm, ICP-MS	Cu, ppm, ICP-MS	Ga, ppm, ICP-MS	Ce, ppm, ICP-MS	Sm, ppm, ICP-MS	Eu, ppm, ICP-MS	Gd, ppm, ICP-MS	Tb, ppm, ICP-MS	Dy, ppm, ICP-MS	Tm, ppm, ICP-MS	Yb, ppm, ICP-MS	Li, ppm, ICP-MS	Mn, ppm, ICP-MS	Mo, ppm, ICP-MS	Cu/Mo, ICP-MS
WPPD25V	DairySync	<i>Pedicularis racemosa</i>																
WPPD33V	DairySync	<i>Pedicularis racemosa</i>																
WPP444W	Lift 2	<i>Penstemon nybergii</i>																
WPP444X	Lift 2	<i>Phacelia hastata</i>																
WPP423J	Lift 1	<i>Phleum pratense</i>																
WPP442J	Lift 2	<i>Phleum pratense</i>																
WPPW22J	Wetland	<i>Phleum pratense</i>																
WPPD11AB	DairySync	<i>Populus tremuloides</i>	0.8	0.02	5.6	0.08	1.9	0.05	0.040	0.06	0.008	0.04	< 0.006	< 0.03	< 0.2	80.6	< 0.1	>56
WPPD12AB	DairySync	<i>Populus tremuloides</i>																
WPPD13AB	DairySync	<i>Populus tremuloides</i>																
WPPD14AB	DairySync	<i>Populus tremuloides</i>																
WPPD15AB	DairySync	<i>Populus tremuloides</i>																
WPPD16AB	DairySync	<i>Populus tremuloides</i>																
WPPD17AB	DairySync	<i>Populus tremuloides</i>																
WPPD21AB	DairySync	<i>Populus tremuloides</i>																
WPPD22AB	DairySync	<i>Populus tremuloides</i>																
WPPD23AB	DairySync	<i>Populus tremuloides</i>																
WPPD24AB	DairySync	<i>Populus tremuloides</i>	0.8	0.007	4.9	0.09	1.7	< 0.02	0.010	< 0.02	< 0.005	< 0.04	< 0.006	< 0.03	< 0.2	47.8	0.2	25
WPPD25AB	DairySync	<i>Populus tremuloides</i>																
WPPD31AB	DairySync	<i>Populus tremuloides</i>																
WPPD32AB	DairySync	<i>Populus tremuloides</i>																
WPPD33AB	DairySync	<i>Populus tremuloides</i>																
WPPD34AB	DairySync	<i>Populus tremuloides</i>																
WPPD35AB	DairySync	<i>Populus tremuloides</i>																
WPPD41AB	DairySync	<i>Populus tremuloides</i>																
WPPD42AB	DairySync	<i>Populus tremuloides</i>																
WPPD43AB	DairySync	<i>Populus tremuloides</i>																
WPPD44AB	DairySync	<i>Populus tremuloides</i>																
WPPD45AB	DairySync	<i>Populus tremuloides</i>																
WPPD45AX	DairySync	<i>Populus tremuloides</i>																
WPP431AB	Lift 2	<i>Populus tremuloides</i>																
WPP432AB	Lift 2	<i>Populus tremuloides</i>	1.1	0.02	5.8	0.10	1.4	< 0.02	< 0.005	< 0.02	< 0.005	< 0.04	< 0.006	< 0.03	< 0.2	32.0	0.87	6.7
WPP433AB	Lift 2	<i>Populus tremuloides</i>																
WPP434AB	Lift 2	<i>Populus tremuloides</i>	1.6	0.01	5.0	0.09	1.8	< 0.02	0.010	0.02	< 0.005	< 0.04	< 0.006	< 0.03	< 0.2	42.3	< 0.1	>50
WPPRW1AB	RefWetland	<i>Populus tremuloides</i>																
WPPRW2AB	RefWetland	<i>Populus tremuloides</i>																
WPPRW3AB	RefWetland	<i>Populus tremuloides</i>																
WPPW5AB	Wetland	<i>Populus tremuloides</i>																
WPPW6AB	Wetland	<i>Populus tremuloides</i>	1.3	0.006	1.2	0.08	1.7	< 0.02	< 0.005	< 0.02	< 0.005	< 0.04	< 0.006	< 0.03	< 0.2	70.0	0.24	5.0
WPPW7AB	Wetland	<i>Populus tremuloides</i>	1.4	0.006	4.7	0.09	1.6	< 0.02	< 0.005	< 0.02	< 0.005	< 0.04	< 0.006	< 0.03	< 0.2	55.0	0.47	10
WPPW8AB	Wetland	<i>Populus tremuloides</i>																
WPPW10AB	Wetland	<i>Populus tremuloides</i>																
WPPW11AB	Wetland	<i>Populus tremuloides</i>																
WPPW9AC	Wetland	<i>Salix spp.</i>																
WPPW10AC	Wetland	<i>Salix spp.</i>																
WPPW1AD	Wetland	<i>Salix alba</i>																
WPPW2AD	Wetland	<i>Salix alba</i>	1.6	0.02	4.9	0.10	1.7	< 0.02	< 0.005	0.02	< 0.005	< 0.04	< 0.006	0.03	< 0.2	685	0.2	25
WPPW3AD	Wetland	<i>Salix alba</i>																
WPPW4AD	Wetland	<i>Salix alba</i>																
WPPRW4AE	RefWetland	<i>Salix alba</i>																
WPP434AF	Lift 2	<i>Salix georgiana</i>	1.8	0.01	3.9	0.10	1.7	< 0.02	< 0.005	< 0.02	< 0.005	< 0.04	< 0.006	0.03	< 0.2	72.0	< 0.1	>39
WPP433AG	Lift 2	<i>Salix lasiocarpa</i>	2.5	0.01	2.7	0.10	1.5	< 0.02	< 0.005	< 0.02	< 0.005	< 0.04	< 0.006	< 0.03	< 0.2	70.7	0.2	14
WPP431AH	Lift 2	<i>Salix monticola</i>																
WPPRW1AI	RefWetland	<i>Salix myrtilifolia</i>																
WPP432AJ	Lift 2	<i>Salix scouleriana</i>	1.9	0.02	6.8	0.10	1.4	< 0.02	< 0.005	< 0.02	< 0.005	< 0.04	< 0.006	< 0.03	< 0.2	32.6	0.63	11
WPP444Y	Lift 2	<i>Senecio crassulus</i>																



Table 1 (continued). Concentrations, based on dry weight, of major, minor, and trace elements for individual plant samples.

Field No.	Location (number of unqualified analyses)	Species	Ni, ppm, ICP-MS	Pb, ppm, ICP-MS	Rb, ppm, ICP-MS	Sb, ppm, ICP-MS	Sr, ppm, ICP-MS	Th, ppm, ICP-MS	Ti, ppm, ICP-MS	U, ppm, ICP-MS	V, ppm, ICP-MS	Y, ppm, ICP-MS	Zn, ppm, ICP-MS
WPPD11P	DairySync	<i>Achillea millefolium</i>	21	39	40	2	40	40	36	30	28	4	40
WPPD12P	DairySync	<i>Achillea millefolium</i>											
WPPD13P	DairySync	<i>Achillea millefolium</i>											
WPPD14P	DairySync	<i>Achillea millefolium</i>											
WPPD15P	DairySync	<i>Achillea millefolium</i>											
WPPD17P	DairySync	<i>Achillea millefolium</i>											
WPPD21P	DairySync	<i>Achillea millefolium</i>											
WPPD42P	DairySync	<i>Achillea millefolium</i>											
WPPD42PX	DairySync	<i>Achillea millefolium</i>											
WPPD43P	DairySync	<i>Achillea millefolium</i>											
WPPD44P	DairySync	<i>Achillea millefolium</i>											
WPPD45P	DairySync	<i>Achillea millefolium</i>											
WPPD12A	DairySync	<i>Agropyron caninum</i>											
WPPD14A	DairySync	<i>Agropyron caninum</i>	< 1	0.40	2.3	< 0.02	10.1	0.05	0.003	< 0.02	0.6	< 0.3	30.9
WPPD15A	DairySync	<i>Agropyron caninum</i>											
WPPD16A	DairySync	<i>Agropyron caninum</i>											
WPP414B	Lift 1	<i>Agropyron intermedium</i>	< 1	0.76	9.8	< 0.02	5.1	0.06	0.200	0.02	0.4	< 0.3	24.8
WPP424B	Lift 1	<i>Agropyron intermedium</i>	2.1	0.94	8.6	< 0.02	15.7	0.06	0.200	0.04	0.7	< 0.3	81.3
WPP441B	Lift 2	<i>Agropyron intermedium</i>											
WPP442B	Lift 2	<i>Agropyron intermedium</i>											
WPP443B	Lift 2	<i>Agropyron intermedium</i>											
WPP444B	Lift 2	<i>Agropyron intermedium</i>											
WPP311B	Slope	<i>Agropyron intermedium</i>											
WPP312B	Slope	<i>Agropyron intermedium</i>											
WPP313B	Slope	<i>Agropyron intermedium</i>											
WPP411C	Lift 1	<i>Agropyron smithii</i>											
WPP412C	Lift 1	<i>Agropyron smithii</i>	< 1	0.30	12.2	< 0.02	13.3	0.06	0.400	0.02	0.4	< 0.3	68.6
WPP413C	Lift 1	<i>Agropyron smithii</i>											
WPP421C	Lift 1	<i>Agropyron smithii</i>											
WPP422C	Lift 1	<i>Agropyron smithii</i>											
WPP423C	Lift 1	<i>Agropyron smithii</i>											
WPP431C	Lift 2	<i>Agropyron smithii</i>	3.1	0.78	8.8	< 0.02	19.2	0.06	0.570	0.03	0.7	< 0.3	175
WPP432C	Lift 2	<i>Agropyron smithii</i>											
WPP433C	Lift 2	<i>Agropyron smithii</i>											
WPP434C	Lift 2	<i>Agropyron smithii</i>											
WPP451C	Lift 3	<i>Agropyron smithii</i>	< 1	0.70	4.8	< 0.02	13.9	0.06	0.200	0.02	0.4	< 0.3	43.3
WPP452C	Lift 3	<i>Agropyron smithii</i>											
WPP453C	Lift 3	<i>Agropyron smithii</i>											
WPP463C	Lift 3	<i>Agropyron smithii</i>											
WPP471C	Lift 4	<i>Agropyron smithii</i>											
WPP472C	Lift 4	<i>Agropyron smithii</i>	< 1	0.40	5.5	< 0.02	12.9	0.06	0.200	< 0.02	< 0.4	< 0.3	27.5
WPP473C	Lift 4	<i>Agropyron smithii</i>											
WPP481C	Lift 4	<i>Agropyron smithii</i>											
WPP482C	Lift 4	<i>Agropyron smithii</i>											
WPP483C	Lift 4	<i>Agropyron smithii</i>											
WPP444Z	Lift 2	<i>Amelanchier alnifolia</i>											
WPP411D	Lift 1	<i>Bromus inermis</i>											
WPP412D	Lift 1	<i>Bromus inermis</i>	< 1	0.30	7.0	< 0.02	13.6	0.06	0.100	< 0.02	< 0.4	< 0.3	47.2
WPP413D	Lift 1	<i>Bromus inermis</i>											
WPP414D	Lift 1	<i>Bromus inermis</i>											
WPP421D	Lift 1	<i>Bromus inermis</i>											
WPP422D	Lift 1	<i>Bromus inermis</i>											
WPP423D	Lift 1	<i>Bromus inermis</i>											
WPP424D	Lift 1	<i>Bromus inermis</i>											
WPP431D	Lift 2	<i>Bromus inermis</i>	6.0	0.83	10	< 0.02	14.8	0.05	0.300	0.03	0.6	< 0.3	156
WPP432D	Lift 2	<i>Bromus inermis</i>											
WPP433D	Lift 2	<i>Bromus inermis</i>											
WPP434D	Lift 2	<i>Bromus inermis</i>											
WPP441D	Lift 2	<i>Bromus inermis</i>	< 1	0.40	5.2	< 0.02	12.0	0.06	0.040	< 0.02	< 0.4	< 0.3	34.3
WPP442D	Lift 2	<i>Bromus inermis</i>											

Table 1 (continued). Concentrations, based on dry weight, of major, minor, and trace elements for individual plant samples.

Field No.	Location	Species	Ni, ppm, ICP-MS	Pb, ppm, ICP-MS	Rb, ppm, ICP-MS	Sb, ppm, ICP-MS	Sr, ppm, ICP-MS	Th, ppm, ICP-MS	Ti, ppm, ICP-MS	U, ppm, ICP-MS	V, ppm, ICP-MS	Y, ppm, ICP-MS	Zn, ppm, ICP-MS
WPP443D	Lift 2	<i>Bromus inermis</i>											
WPP444D	Lift 2	<i>Bromus inermis</i>											
WPP451D	Lift 3	<i>Bromus inermis</i>											
WPP452D	Lift 3	<i>Bromus inermis</i>											
WPP453D	Lift 3	<i>Bromus inermis</i>											
WPP461D	Lift 3	<i>Bromus inermis</i>											
WPP462D	Lift 3	<i>Bromus inermis</i>	1.7	0.54	4.4	< 0.02	14.6	0.06	0.200	0.02	< 0.4	< 0.3	69.7
WPP463D	Lift 3	<i>Bromus inermis</i>											
WPPW23D	Wetland	<i>Bromus inermis</i>											
WPP311E	Slope	<i>Bromus marginatus</i>											
WPP312E	Slope	<i>Bromus marginatus</i>											
WPP313E	Slope	<i>Bromus marginatus</i>											
WPP314E	Slope	<i>Bromus marginatus</i>											
WPPRWK	RefWetland	<i>Carex haydeniana</i>	< 1	0.56	0.9	< 0.02	13.7	0.08	0.007	< 0.02	< 0.4	< 0.3	15.2
WPPW11K	Wetland	<i>Carex haydeniana</i>											
WPPW21K	Wetland	<i>Carex haydeniana</i>	6.9	0.61	3.3	< 0.02	15.7	0.08	0.010	0.08	0.4	< 0.3	53.5
WPPW28K	Wetland	<i>Carex haydeniana</i>											
WPPW32K	Wetland	<i>Carex haydeniana</i>											
WPPW35K	Wetland	<i>Carex haydeniana</i>											
WPPW41K	Wetland	<i>Carex haydeniana</i>	5.8	0.40	8.6	< 0.02	12.8	0.07	0.030	0.05	0.7	< 0.3	57.4
WPPW43K	Wetland	<i>Carex haydeniana</i>											
WPPW413K	Wetland	<i>Carex haydeniana</i>											
WPPW51K	Wetland	<i>Carex haydeniana</i>											
WPPD11L	DairySync	<i>Carex hoodii</i>											
WPPD13L	DairySync	<i>Carex hoodii</i>											
WPPD15L	DairySync	<i>Carex hoodii</i>											
WPPD18L	DairySync	<i>Carex hoodii</i>											
WPPD35M	DairySync	<i>Carex rossii</i>											
WPPD41M	DairySync	<i>Carex rossii</i>											
WPPD43M	DairySync	<i>Carex rossii</i>	< 1	0.40	2.6	< 0.02	21.7	0.07	0.010	0.03	0.6	< 0.3	23.5
WPPD44M	DairySync	<i>Carex rossii</i>											
WPPD45M	DairySync	<i>Carex rossii</i>											
WPPRWN	RefWetland	<i>Carex utriculata</i>	< 1	0.50	0.64	< 0.02	11.2	0.06	0.003	0.03	0.4	< 0.3	15.5
WPPW14N	Wetland	<i>Carex utriculata</i>											
WPPW25N	Wetland	<i>Carex utriculata</i>											
WPPW37N	Wetland	<i>Carex utriculata</i>	< 1	0.52	6.8	< 0.02	15.2	0.06	0.200	0.04	0.9	< 0.3	65.6
WPPW48N	Wetland	<i>Carex utriculata</i>											
WPPW49N	Wetland	<i>Carex utriculata</i>											
WPPW411N	Wetland	<i>Carex utriculata</i>											
WPPW52N	Wetland	<i>Carex utriculata</i>	< 1	0.30	6.6	< 0.02	24.5	0.06	0.004	0.03	0.4	< 0.3	31.9
WPPW53N	Wetland	<i>Carex utriculata</i>											
WPPW55N	Wetland	<i>Carex utriculata</i>											
WPPW56N	Wetland	<i>Carex utriculata</i>											
WPP444AA	Lift 2	<i>Ceanothus velutinus</i>											
WPPW31Q	Wetland	<i>Cirsium arvense</i>											
WPP423F	Lift 1	<i>Dactylis glomerata</i>	10.7	1.20	11.5	0.03	14.4	0.07	0.200	0.11	1.9	0.45	82.9
WPP441F	Lift 2	<i>Dactylis glomerata</i>											
WPP442F	Lift 2	<i>Dactylis glomerata</i>											
WPP444F	Lift 2	<i>Dactylis glomerata</i>											
WPP311F	Slope	<i>Dactylis glomerata</i>											
WPP312F	Slope	<i>Dactylis glomerata</i>											
WPP314F	Slope	<i>Dactylis glomerata</i>											
WPPW34F	Wetland	<i>Dactylis glomerata</i>	< 1	0.70	8.2	< 0.02	10.8	0.06	0.050	0.02	< 0.4	< 0.3	33.4
WPPD11G	DairySync	<i>Deschampsia caespitosa</i>											
WPPD12G	DairySync	<i>Deschampsia caespitosa</i>	< 1	0.40	2.8	< 0.02	10.9	0.05	< 0.003	< 0.02	< 0.4	< 0.3	26.7
WPPD13G	DairySync	<i>Deschampsia caespitosa</i>											
WPPD14G	DairySync	<i>Deschampsia caespitosa</i>											
WPPD21G	DairySync	<i>Deschampsia caespitosa</i>											
WPPD22G	DairySync	<i>Deschampsia caespitosa</i>											
WPPD23G	DairySync	<i>Deschampsia caespitosa</i>											
WPPD24G	DairySync	<i>Deschampsia caespitosa</i>											
WPPD25G	DairySync	<i>Deschampsia caespitosa</i>											



Table 1 (continued). Concentrations, based on dry weight, of major, minor, and trace elements for individual plant samples.

Field No.	Location	Species	Ni, ppm, ICP-MS	Pb, ppm, ICP-MS	Rb, ppm, ICP-MS	Sb, ppm, ICP-MS	Sr, ppm, ICP-MS	Th, ppm, ICP-MS	Tl, ppm, ICP-MS	U, ppm, ICP-MS	V, ppm, ICP-MS	Y, ppm, ICP-MS	Zn, ppm, ICP-MS
WPPD31G	DairySync	Deschampsia caespitosa											
WPPD32G	DairySync	Deschampsia caespitosa											
WPPD33G	DairySync	Deschampsia caespitosa											
WPPD34G	DairySync	Deschampsia caespitosa											
WPPD42G	DairySync	Deschampsia caespitosa											
WPPRWG	RefWetland	Deschampsia caespitosa	< 1	0.30	9.9	< 0.02	10.6	0.06	< 0.003	< 0.02	< 0.4	< 0.3	24.7
WPPW12G	Wetland	Deschampsia caespitosa											
WPPW29G	Wetland	Deschampsia caespitosa											
WPPW42G	Wetland	Deschampsia caespitosa											
WPPW45G	Wetland	Deschampsia caespitosa											
WPPW46G	Wetland	Deschampsia caespitosa	< 1	0.40	14.5	< 0.02	11.8	0.05	0.004	< 0.02	< 0.4	< 0.3	21.1
WPPW54G	Wetland	Deschampsia caespitosa											
WPPD31R	DairySync	Epilobium angustifolium											
WPPD32R	DairySync	Epilobium angustifolium											
WPPW44S	Wetland	Equisetum arvense											
WPPW47S	Wetland	Equisetum arvense											
WPPW412S	Wetland	Equisetum arvense											
WPPW13H	Wetland	Festuca arundinacea											
WPPW26H	Wetland	Festuca arundinacea											
WPPW33I	Wetland	Glyceria striata											
WPPRW0	RefWetland	Juncus ensifolius											
WPPW27O	Wetland	Juncus ensifolius											
WPPW210O	Wetland	Juncus ensifolius											
WPPW410O	Wetland	Juncus ensifolius											
WPP411T	Lift 1	Medicago sativa	25.8	0.30	7.7	< 0.02	91.1	0.07	0.920	0.05	0.8	0.41	118
WPP412T	Lift 1	Medicago sativa											
WPP413T	Lift 1	Medicago sativa											
WPP414T	Lift 1	Medicago sativa											
WPP421T	Lift 1	Medicago sativa	10.7	0.77	6.8	< 0.02	61.8	0.07	0.300	0.03	0.5	< 0.3	64.4
WPP422T	Lift 1	Medicago sativa											
WPP423T	Lift 1	Medicago sativa											
WPP424T	Lift 1	Medicago sativa											
WPP431T	Lift 2	Medicago sativa											
WPP432T	Lift 2	Medicago sativa											
WPP433T	Lift 2	Medicago sativa	9.2	0.30	6.9	< 0.02	54.9	0.06	0.100	0.02	< 0.4	< 0.3	43.3
WPP434T	Lift 2	Medicago sativa											
WPP441T	Lift 2	Medicago sativa											
WPP442T	Lift 2	Medicago sativa											
WPP443T	Lift 2	Medicago sativa	6.2	1.60	14.3	0.02	81.3	0.08	0.300	0.12	2.9	0.58	49.5
WPP444T	Lift 2	Medicago sativa											
WPP461T	Lift 3	Medicago sativa	6.3	0.58	11.1	< 0.02	66.8	0.06	0.300	0.02	0.6	< 0.3	55.6
WPP462T	Lift 3	Medicago sativa											
WPP463T	Lift 3	Medicago sativa											
WPP471T	Lift 4	Medicago sativa											
WPP472T	Lift 4	Medicago sativa	3.2	0.30	5.4	< 0.02	61.2	0.06	0.050	0.03	0.8	< 0.3	27.3
WPP473T	Lift 4	Medicago sativa											
WPP481T	Lift 4	Medicago sativa											
WPP482T	Lift 4	Medicago sativa											
WPP483T	Lift 4	Medicago sativa											
WPP311T	Slope	Medicago sativa											
WPP312T	Slope	Medicago sativa											
WPP313T	Slope	Medicago sativa											
WPP314T	Slope	Medicago sativa											
WPPW24T	Wetland	Medicago sativa	8.2	0.50	9.5	< 0.02	61.3	0.06	0.200	0.08	0.5	< 0.3	50.4
WPPW36T	Wetland	Medicago sativa											
WPP451U	Lift 3	Onobrychis viciifolia											
WPP452U	Lift 3	Onobrychis viciifolia											
WPP453U	Lift 3	Onobrychis viciifolia											
WPPD21V	DairySync	Pedicularis racemosa											
WPPD22V	DairySync	Pedicularis racemosa											
WPPD23V	DairySync	Pedicularis racemosa											
WPPD24V	DairySync	Pedicularis racemosa											

Table 1 (continued). Concentrations, based on dry weight, of major, minor, and trace elements for individual plant samples.

Field No.	Location	Species	Ni, ppm, ICP-MS	Pb, ppm, ICP-MS	Rb, ppm, ICP-MS	Sb, ppm, ICP-MS	Sr, ppm, ICP-MS	Th, ppm, ICP-MS	Ti, ppm, ICP-MS	U, ppm, ICP-MS	V, ppm, ICP-MS	Y, ppm, ICP-MS	Zn, ppm, ICP-MS
WPPD25V	DairySync	<i>Pedicularis racemosa</i>											
WPPD33V	DairySync	<i>Pedicularis racemosa</i>											
WPP444W	Lift 2	<i>Penstemon nydbergii</i>											
WPP444X	Lift 2	<i>Phacelia hastata</i>											
WPP423J	Lift 1	<i>Phleum pratense</i>											
WPP442J	Lift 2	<i>Phleum pratense</i>											
WPPW22J	Wetland	<i>Phleum pratense</i>											
WPPD11AB	DairySync	<i>Populus tremuloides</i>	2.4	0.20	5.6	< 0.02	50.3	0.04	< 0.003	< 0.02	< 0.4	0.33	120
WPPD12AB	DairySync	<i>Populus tremuloides</i>											
WPPD13AB	DairySync	<i>Populus tremuloides</i>											
WPPD14AB	DairySync	<i>Populus tremuloides</i>											
WPPD15AB	DairySync	<i>Populus tremuloides</i>											
WPPD16AB	DairySync	<i>Populus tremuloides</i>											
WPPD17AB	DairySync	<i>Populus tremuloides</i>											
WPPD21AB	DairySync	<i>Populus tremuloides</i>											
WPPD22AB	DairySync	<i>Populus tremuloides</i>											
WPPD23AB	DairySync	<i>Populus tremuloides</i>											
WPPD24AB	DairySync	<i>Populus tremuloides</i>	< 1	0.20	6.6	< 0.02	38.5	0.05	< 0.003	< 0.02	< 0.4	< 0.3	175
WPPD25AB	DairySync	<i>Populus tremuloides</i>											
WPPD31AB	DairySync	<i>Populus tremuloides</i>											
WPPD32AB	DairySync	<i>Populus tremuloides</i>											
WPPD33AB	DairySync	<i>Populus tremuloides</i>											
WPPD34AB	DairySync	<i>Populus tremuloides</i>											
WPPD35AB	DairySync	<i>Populus tremuloides</i>											
WPPD41AB	DairySync	<i>Populus tremuloides</i>											
WPPD42AB	DairySync	<i>Populus tremuloides</i>											
WPPD43AB	DairySync	<i>Populus tremuloides</i>											
WPPD44AB	DairySync	<i>Populus tremuloides</i>											
WPPD45AB	DairySync	<i>Populus tremuloides</i>											
WPPD45AX	DairySync	<i>Populus tremuloides</i>											
WPP431AB	Lift 2	<i>Populus tremuloides</i>											
WPP432AB	Lift 2	<i>Populus tremuloides</i>											
WPP433AB	Lift 2	<i>Populus tremuloides</i>	10.2	0.50	7.7	< 0.02	27.1	0.06	0.030	0.03	0.9	< 0.3	373
WPP434AB	Lift 2	<i>Populus tremuloides</i>											
WPPRW1AB	RefWetland	<i>Populus tremuloides</i>	< 1	0.40	1.0	< 0.02	36.5	0.06	0.004	0.03	0.9	< 0.3	110
WPPRW2AB	RefWetland	<i>Populus tremuloides</i>											
WPPRW3AB	RefWetland	<i>Populus tremuloides</i>											
WPPW5AB	Wetland	<i>Populus tremuloides</i>											
WPPW6AB	Wetland	<i>Populus tremuloides</i>	2.1	< 0.2	4.6	< 0.02	13.9	0.04	0.008	0.02	0.8	< 0.3	67.5
WPPW7AB	Wetland	<i>Populus tremuloides</i>	2.4	0.20	3.9	< 0.02	25.2	0.05	0.009	0.03	0.8	< 0.3	196
WPPW8AB	Wetland	<i>Populus tremuloides</i>											
WPPW10AB	Wetland	<i>Populus tremuloides</i>											
WPPW11AB	Wetland	<i>Populus tremuloides</i>											
WPPW9AC	Wetland	<i>Salix spp.</i>											
WPPW10AC	Wetland	<i>Salix spp.</i>											
WPPW1AD	Wetland	<i>Salix alba</i>											
WPPW2AD	Wetland	<i>Salix alba</i>	3.6	0.20	6.0	< 0.02	39.0	0.06	0.200	0.06	1.1	< 0.3	363
WPPW3AD	Wetland	<i>Salix alba</i>											
WPPW4AD	Wetland	<i>Salix alba</i>											
WPPRW4AB	RefWetland	<i>Salix alba</i>											
WPPRW4AB	RefWetland	<i>Salix alba</i>											
WPP434AF	Lift 2	<i>Salix lasiocarpa</i>	< 1	0.30	6.4	< 0.02	16.9	0.06	0.003	0.02	0.8	< 0.3	105
WPP433AG	Lift 2	<i>Salix lutea</i>	3.4	0.86	6.1	< 0.02	29.0	0.06	0.090	0.04	1.0	< 0.3	365
WPP431AH	Lift 2	<i>Salix monticola</i>											
WPPRW1AI	RefWetland	<i>Salix myrtilifolia</i>											
WPP432AJ	Lift 2	<i>Salix scouleriana</i>	7.8	0.56	6.5	< 0.02	31.8	0.05	0.050	0.04	1.0	< 0.3	349
WPP444Y	Lift 2	<i>Senecio crassulus</i>											



Table 2. Minima, maxima, and mean concentration for selected species and genus groups

Parameter	Ash Wt., %	As, ppm, Hyd	Se, ppm, Hyd	Ba, ppm, ICP-AES	Cd, ppm, ICP-AES	Cr, ppm, ICP-AES	Cu, ppm, ICP-AES	Mn, ppm, ICP-AES	Mo, ppm, ICP-AES	Cu/Mo, ICP-AES	Ni, ppm, ICP-AES	Sr, ppm, ICP-AES	V, ppm, ICP-AES	Zn, ppm, ICP-AES	Ti, ppm, MS	Th, ppm, ICP-MS	U, ppm, ICP-MS
unqualified/total	100%	60%	99%	100%	83%	95%	100%	100%	80%	80%	100%	100%	55%	100%	90%	100%	75%
LDL, ppm																	
all set min	4.08	0.05	0.03	0.1444	0.292	0.0952	0.8976	9	0.1904	0.103	0.387	3.4343	0.2	9.612	0.003	0.04	0.02
all set max	18.2	5.4	260	157.5	72.8	11.44	21.42	779	63.36	33	46.33	109.8	7.194	783.84	0.003	0.08	0.12
all set mean	8.0	0.1	19.7	11.4	3.5	1.2	5.8	79	6.8	4.0	5.1	29.3	0.6	101.9	0.14	0.06	0.03
yarrow min	7.8	0.05	0.0	7.6	1.1	0.2	6.1	17	0.8	3.0	0.7	11.5	0.2	25	0.00	0.00	0.00
yarrow max	17.0	0.13	0.3	45.9	3.7	7.0	12.5	68	4.2	11.0	3.0	47.6	2.5	60	0.00	0.00	0.00
yarrow mean	10.5	0.06	0.1	24.7	2.4	1.2	8.4	35	1.5	6.8	1.6	32.9	0.5	40	0.00	0.00	0.00
wheatgrass min	4.4	0.05	0.0	0.6	0.3	0.1	3.1	10	0.8	0.1	0.4	3.4	0.2	20	0.00	0.05	0.02
wheatgrass max	18.2	0.38	65.0	21.3	4.9	5.3	20.0	135	52.4	6.3	25.5	48.2	4.0	473	0.57	0.06	0.04
wheatgrass mean	7.4	0.09	14.3	7.5	1.7	1.6	5.5	24	13.0	1.1	3.5	13.2	0.8	83	0.25	0.06	0.02
bromegrass min	5.0	0.05	0.2	0.1	0.3	0.2	2.5	11	0.3	0.1	0.7	4.0	0.2	10	0.04	0.05	0.02
bromegrass max	9.5	0.50	57.0	15.2	4.5	8.4	11.9	37	36.1	8.7	25.7	21.5	4.3	219	0.30	0.06	0.03
bromegrass mean	7.2	0.10	12.4	3.6	1.3	1.7	5.7	21	8.0	1.7	4.8	11.3	0.8	74	0.16	0.06	0.02
sedge min	4.5	0.05	0.0	0.4	0.3	0.2	1.3	14	0.2	1.3	0.4	7.2	0.2	12	0.00	0.06	0.02
sedge max	10.0	0.11	220.0	42.5	4.3	5.9	13.2	629	5.2	12.7	11.7	26.7	0.8	110	0.20	0.07	0.08
sedge mean	7.4	0.06	22.1	12.2	0.7	0.8	4.8	195	1.2	5.1	3.2	16.7	0.3	42	0.04	0.06	0.04
hairgrass min	4.4	0.05	0.0	0.9	0.3	0.2	1.2	13	0.2	1.7	0.8	6.6	0.2	20	0.00	0.05	0.02
hairgrass max	13.4	0.08	94.0	47.5	5.0	1.2	7.5	214	2.8	16.5	9.7	22.5	0.2	55	0.00	0.06	0.02
hairgrass mean	8.4	0.06	11.6	18.9	0.9	0.4	4.7	92	0.9	6.5	2.3	12.2	0.2	35	0.00	0.05	0.02
alfalfa min	8.0	0.05	0.7	0.2	0.8	0.2	3.8	9	4.2	0.1	3.3	20.2	0.2	37	0.05	0.06	0.02
alfalfa max	14.8	0.14	260.0	48.0	10.9	8.5	10.4	63	63.4	1.6	46.3	96.7	7.2	168	0.92	0.08	0.12
alfalfa mean	10.7	0.06	54.4	5.2	2.8	1.4	6.6	23	22.5	0.4	10.7	69.0	0.8	76	0.31	0.07	0.05
aspen min	4.1	0.05	0.1	0.6	1.1	0.1	0.9	15	0.2	3.1	1.0	13.5	0.2	75	0.00	0.04	0.02
aspen max	7.8	0.11	49.0	157.5	17.6	1.6	8.5	105	1.4	32.5	13.6	68.3	0.8	564	0.03	0.06	0.03
aspen mean	5.6	0.06	5.2	18.9	7.5	0.5	5.8	44	0.3	14.3	4.6	38.6	0.3	207	0.01	0.05	0.03
willow min	4.3	0.05	0.3	0.5	0.5	0.5	1.4	23	0.2	3.6	0.4	17.1	0.4	92	0.00	0.05	0.02
willow max	8.9	0.10	71.0	5.4	72.8	2.8	8.5	779	1.8	14.8	22.2	50.7	1.4	784	0.20	0.06	0.06
willow mean	7.2	0.07	31.6	1.8	22.2	1.1	5.7	253	0.6	8.1	7.1	33.9	0.7	439	0.09	0.06	0.04

Table 3. Minima, maxima, and mean concentrations for all plants at various localities

Location	Ash Wt., %	As, ppm, Hyd	Se, ppm, Hyd	Ba, ppm, AES	ICP Cd, ppm, AES	ICP Cr, ppm, AES	ICP Cu, ppm, AES	Mn, ppm, ICP-AES	Mo, ppm, ICP-AES	Cu/Mo, ICP-AES	Ni, ppm, ICP-AES	Sr, ppm, ICP-AES	V, ppm, ICP-AES	Zn, ppm, ICP-AES	Ti, ppm, ICP-MS	Th, ppm, ICP-MS	U, ppm, ICP-MS
Dairy Synd., max	17.0	5.4	1.5	157.5	16.8	7.0	21.4	512.4	5.2	32.5	12.8	102.3	2.5	279.9	0.010	0.07	0.03
Dairy Synd., min	4.2	0.1	0.03	1.8	0.2	0.1	2.7	9.5	0.2	1.3	0.4	6.6	0.2	13.0	0.003	0.04	0.02
Dairy Synd., mean	8.1	0.2	0.2	27.6	3.9	0.6	6.7	62.4	1.0	8.5	3.0	30.2	0.3	92.0	0.004	0.05	0.02
Lift 1, max	16.2	0.2	260.0	14.4	8.1	8.4	20.0	134.7	38.4	3.0	46.3	94.5	3.5	473.2	0.920	0.07	0.11
Lift 1, min	4.4	0.1	2.6	0.1	0.5	0.4	3.2	10.7	1.7	0.1	2.1	3.4	0.2	30.4	0.100	0.05	0.02
Lift 1, mean	8.0	0.1	48.0	2.6	2.5	2.1	6.0	25.3	12.3	0.9	11.3	27.9	0.8	111.3	0.328	0.06	0.04
Slope, max	11.7	0.2	11.0	48.0	2.7	11.4	7.4	75.4	19.9	1.6	5.8	91.3	2.5	50.3	0.000	0.00	0.00
Slope, min	7.0	0.1	0.2	4.9	0.2	1.2	2.5	15.5	3.3	0.3	0.8	7.4	0.5	9.6	0.000	0.00	0.00
Slope, mean	9.3	0.1	2.2	14.3	1.0	3.3	4.6	35.7	6.3	0.9	2.6	29.0	0.8	29.1	0.570	0.08	0.12
Lift 2, max	12.4	0.5	74.0	9.3	72.8	8.5	13.2	74.7	60.8	8.1	25.7	109.8	7.2	783.8	0.030	0.05	0.02
Lift 2, min	4.1	0.1	0.7	0.6	0.2	0.2	1.4	8.8	0.2	0.1	1.3	7.3	0.2	32.2	0.169	0.06	0.04
Lift 2, mean	7.7	0.1	27.4	2.6	6.6	2.0	6.5	29.3	8.4	2.5	8.2	32.1	1.3	167.2	0.300	0.06	0.02
Lift 3, max	10.6	0.1	34.0	13.6	3.4	1.4	7.1	27.0	45.5	1.4	10.8	90.9	0.7	90.0	0.200	0.06	0.02
Lift 3, min	5.9	0.1	0.8	1.3	0.5	0.3	2.6	8.8	4.0	0.1	0.7	6.5	0.2	31.0	0.233	0.06	0.02
Lift 3, mean	7.5	0.1	9.0	4.7	1.5	0.8	5.0	17.2	23.1	0.4	4.7	30.2	0.5	56.5	0.200	0.06	0.02
Lift 4, max	14.4	0.1	180.0	11.9	2.3	1.6	10.4	26.1	63.4	0.8	7.9	96.7	0.7	81.2	0.050	0.06	0.03
Lift 4, min	7.4	0.1	0.3	2.1	0.5	0.2	3.7	12.6	7.3	0.1	0.7	10.4	0.2	31.9	0.125	0.06	0.02
Lift 4, mean	9.6	0.1	39.4	6.3	1.1	0.8	6.6	19.5	26.9	0.3	3.4	41.8	0.4	49.1	0.007	0.06	0.03
Ref. Wetland, max	8.3	0.1	2.0	21.6	3.2	2.8	8.2	157.5	1.7	13.3	2.1	50.1	1.4	156.6	0.003	0.06	0.03
Ref. Wetland, min	4.3	0.1	0.1	1.8	0.2	0.2	1.3	22.8	0.2	3.9	0.4	7.2	0.2	12.1	0.003	0.06	0.02
Ref. Wetland, mean	5.5	0.1	0.4	12.4	1.2	0.8	5.0	89.4	0.5	7.2	1.3	24.4	0.4	83.8	0.004	0.06	0.02
Wetland, max	18.1	0.5	220.0	23.6	33.6	1.7	13.2	778.7	16.3	16.5	12.5	79.8	1.0	724.1	0.200	0.07	0.08
Wetland, min	4.1	0.1	0.1	0.3	0.2	0.2	0.9	15.0	0.2	0.4	0.5	5.8	0.2	14.7	0.004	0.04	0.02
Wetland, mean	7.8	0.1	31.9	4.0	3.3	0.6	4.6	211.6	1.3	5.9	4.4	24.6	0.4	107.7	0.072	0.06	0.04



**Table 4, continued. Summary of species and genus group mean concentrations of trace elements by location**

Genus group(s); location; (number)	Ash Wt., %	As, ppm, Hyd	Se, ppm, Hyd	Ba, ppm, ICP-AES	Cd, ppm, ICP-AES	Cr, ppm, ICP-AES	Cu, ppm, ICP-AES	Mn, ppm, ICP-AES	Mo, ppm, ICP-AES	Cu/Mo, ICP		Ni, ppm, ICP-AES	Sr, ppm, ICP-AES	V, ppm, ICP-AES		Zn, ppm, ICP-AES
										AES						
<b>Yarrow</b>																
mean, Dairy Sync. (11)	10.51	0.06	0.13	24.71	2.45	1.20	8.35	34.88	1.49	6.82		1.59	32.91	0.50		39.75
rel. std. dev.	25%	41%	78%	45%	31%	171%	24%	43%	66%	39%		55%	31%	140%		32%
<b>Wheatgrass</b>																
mean, Dairy Sync. (4)	6.48	0.05	0.09	12.65	0.30	0.38	4.13	12.52	1.94	2.18		0.52	9.90	0.20		35.63
<b>Intermed. Wheatgrass</b>																
mean, Lift 1 (2)	5.57	0.07	30.15	3.59	1.69	1.86	4.81	12.24	5.71	0.91		3.41	8.33	0.44		70.30
mean, Lift 2 (4)	5.73	0.23	14.18	4.60	2.98	3.35	5.41	19.64	10.87	0.82		2.46	12.30	2.39		69.31
mean, Slope (3)	7.66	0.07	0.42	11.54	0.71	2.05	4.08	24.96	5.05	0.93		1.00	8.54	0.54		25.56
<b>Western Wheatgrass</b>																
mean, Lift 1 (6)	8.45	0.09	30.80	5.80	2.66	2.34	7.30	42.61	7.79	1.06		8.33	15.39	1.04		171.22
mean, Lift 2 (4)	7.92	0.06	21.98	5.87	2.71	0.84	6.35	28.13	5.74	2.90		6.60	14.11	0.36		147.51
mean, Lift 3 (4)	7.53	0.09	3.33	8.29	1.44	0.92	4.98	18.27	26.14	0.19		2.17	21.81	0.56		47.07
mean, Lift 4 (6)	7.96	0.06	11.35	7.65	0.95	1.02	5.47	19.67	29.36	0.30		1.20	11.55	0.51		48.30
<b>Smooth Bromegr.</b>																
mean, Lift 1 (8)	6.57	0.09	23.75	1.00	1.35	2.00	5.41	17.58	4.26	1.56		5.46	10.46	0.72		84.74
mean, Lift 2 (8)	7.78	0.15	14.83	1.48	1.97	1.84	7.80	22.50	7.53	2.32		7.76	12.45	1.25		105.76
mean, Lift 3 (6)	6.78	0.07	2.67	4.73	0.89	0.85	5.25	17.91	17.84	0.52		2.69	10.31	0.41		56.19
wetland	5.77	0.10	9.30	0.58	0.58	0.23	3.00	15.00	0.35	8.67		3.52	9.81	0.20		54.24
<b>Mtn. Bromegr.</b>																
mean, Slope (4)	8.47	0.08	0.46	11.95	0.77	2.78	3.51	28.50	3.88	0.95		1.26	12.39	0.71		21.55
<b>Orchardgrass</b>																
Lift 1	6.40	0.13	58.00	1.86	4.16	3.84	5.06	26.88	11.52	0.44		14.72	10.24	1.47		102.40
mean, Lift 2 (3)	6.24	0.18	12.23	2.78	1.55	2.91	7.30	34.03	7.55	1.06		7.74	9.22	1.75		59.32
mean, Slope (3)	10.03	0.12	0.82	8.09	0.59	6.16	3.56	58.59	5.29	0.69		3.86	11.43	1.43		21.71
wetland	7.64	0.06	19.00	3.13	1.53	0.61	2.83	49.66	1.53	1.85		2.83	9.17	0.20		42.02
<b>Tufted hairgrass</b>																
mean, Dairy Sync. (14)	9.58	0.05	0.26	26.83	1.22	0.44	5.27	90.67	1.18	5.20		1.75	12.82	0.20		37.96
rel. std. dev.	28%	9%	101%	37%	98%	63%	21%	75%	73%	58%		38%	33%	0%		19%
mean, Wetland (6)	5.99	0.06	39.67	2.60	0.30	0.48	3.29	87.84	0.50	8.18		3.88	11.12	0.21		29.28
<b>All grass</b>																
mean, Dairy Sync. (18)	8.89	0.05	0.22	23.68	1.02	0.43	5.01	73.30	1.35	4.45		1.48	12.17	0.20		37.44
rel. std. dev.	31%	8%	109%	46%	110%	62%	23%	93%	61%	66%		53%	33%	0%		23%
mean, Slope (3)	7.66	0.07	0.42	11.54	0.71	2.05	4.08	24.96	5.05	0.93		1.00	8.54	0.54		25.56
mean, Lift 1 (17)	7.10	0.09	29.01	3.05	2.02	2.21	5.99	26.33	6.11	1.24		6.78	11.94	0.84		114.60
rel. std. dev.	42%	53%	76%	119%	73%	89%	62%	111%	85%	50%		87%	65%	106%		91%
mean, Lift 2 (19)	7.13	0.15	15.79	3.27	2.27	2.12	6.91	24.90	7.86	1.93		6.40	12.26	1.38		99.54
rel. std. dev.	21%	86%	86%	76%	58%	96%	31%	44%	87%	105%		84%	19%	114%		61%
mean, Lift 3 (10)	7.08	0.08	2.93	6.15	1.11	0.88	5.14	18.06	21.16	0.39		2.48	14.91	0.47		52.55
rel. std. dev.	11%	29%	68%	63%	49%	30%	14%	23%	46%	104%		61%	80%	20%		31%
mean, Lift 4 (6)	7.96	0.06	11.35	7.65	0.95	1.02	5.47	19.67	29.36	0.30		1.20	11.55	0.51		48.30
mean, Wetland (8)	6.17	0.07	33.29	2.41	0.49	0.47	3.20	73.96	0.61	7.35		3.70	10.71	0.20		33.99
<b>Swordleaf rush</b>																
ref. Wetland	8.30	0.05	0.16	21.58	0.75	0.25	6.47	132.80	1.66	3.90		1.74	18.26	0.20		46.48
mean, Wetland (3)	8.66	0.06	33.03	3.59	0.76	0.49	4.16	236.99	1.28	3.25		5.37	25.37	0.27		59.97

**Table 4, continued. Summary of species and genus group mean concentrations of trace elements by location**

Genus group(s); location; (number)	Ash Wt., %	As, ppm, Hyd	Se, ppm, Hyd	Ba, ppm, ICP-AES	Cd, ppm, ICP-AES	Cr, ppm, ICP-AES	Cu, ppm, ICP-AES	Mn, ppm, ICP-AES	Mo, ppm, ICP-AES	Cu/Mo, ICP AES	Ni, ppm, ICP-AES	Sr, ppm, ICP-AES	V, ppm, ICP-AES	Zn, ppm, ICP-AES
<b>Cloud Sedge</b>														
ref. Wetland	4.48	0.05	0.11	8.96	0.30	0.31	4.08	134.40	0.90	4.55	1.25	7.17	0.20	12.10
mean, Wetland (9)	6.92	0.06	37.07	3.37	0.35	0.83	5.31	149.54	1.62	5.37	5.84	14.20	0.41	57.93
<b>Hood Sedge</b>														
mean, Dairy Sync. (4)	9.28	0.05	0.12	35.06	0.50	0.28	4.13	26.03	0.78	5.25	1.24	18.79	0.20	17.13
<b>Ross Sedge</b>														
mean, Dairy Sync. (5)	7.36	0.07	0.31	18.66	2.42	2.02	6.11	25.17	2.39	3.08	1.93	17.96	0.47	44.78
<b>Beaked Sedge</b>														
ref. Wetland	6.30	0.06	0.24	9.45	0.30	0.63	1.26	157.50	0.20	>5	0.44	9.45	0.20	17.64
mean, Wetland (10)	7.38	0.07	32.64	8.36	0.39	0.56	4.27	398.26	0.66	6.59	2.78	19.09	0.27	42.41
rel. std. dev.	10%	19%	204%	70%	39%	30%	99%	42%	127%	36%	132%	30%	66%	38%
<b>All Sedge</b>														
mean, Dairy Sync. (9)	8.21	0.06	0.22	25.95	1.57	1.25	5.23	25.55	1.68	4.04	1.63	18.33	0.35	32.49
mean, ref. Wetland (2)	5.39	0.06	0.18	9.21	0.30	0.47	2.67	145.95	0.55	4.55	0.85	8.31	0.20	14.87
mean, Wetland (19)	7.16	0.07	34.74	5.99	0.37	0.68	4.76	280.44	1.11	5.80	4.23	16.78	0.34	49.76
rel. std. dev.	0.09	0.20	1.53	0.89	0.35	0.51	0.67	0.64	1.12	0.53	0.97	0.33	0.52	0.55
<b>Alfalfa</b>														
mean, Lift 1 (8)	10.49	0.06	91.88	1.56	3.60	1.65	6.28	24.27	26.63	0.27	20.82	64.38	0.76	109.93
mean, Lift 2 (8)	10.48	0.07	46.61	2.07	3.96	1.83	5.98	23.17	21.55	0.36	9.25	71.53	1.47	78.80
mean, Lift 3 (3)	9.56	0.05	28.33	2.19	1.75	0.73	5.84	13.65	25.57	0.51	7.17	68.86	0.38	68.84
mean, Lift 4 (6)	11.15	0.05	67.43	4.92	1.24	0.50	7.81	19.40	28.45	0.39	5.51	71.95	0.35	49.92
mean, Slope (4)	10.90	0.10	6.16	23.55	1.72	2.52	6.99	33.73	10.33	0.94	4.90	74.10	0.76	44.90
mean, Wetland (2)	12.60	0.05	31.50	0.89	2.83	0.31	6.34	27.00	12.30	0.56	8.84	57.80	0.20	77.48
<b>Aspen</b>														
mean, Dairy Sync. (22)	5.67	0.05	0.31	25.93	8.02	0.25	5.89	41.69	0.23	23.48	4.75	41.62	0.20	188.55
rel. std. dev.	13%	24%	96%	131%	54%	46%	15%	53%	53%	40%	70%	35%	0%	27%
mean, Lift 2 (4)	6.70	0.07	39.00	1.25	13.96	1.17	5.30	25.85	0.84	6.76	9.76	29.77	0.60	413.63
mean, Ref. Wetland (3)	5.10	0.05	0.13	19.38	2.81	0.61	6.81	49.30	0.20		1.79	45.75	0.30	144.55
mean, Wetland (6)	5.00	0.06	3.20	4.67	3.47	0.74	5.39	60.24	0.27	6.42	2.29	29.64	0.43	165.98
<b>All willow</b>														
mean, Ref. Wetland (2)	4.86	0.05	0.34	3.51	0.67	1.93	3.83	45.64	0.20		0.76	19.42	0.90	108.22
mean, Wetland (6)	7.52	0.08	21.43	1.42	20.53	0.85	6.23	454.16	0.30	13.50	5.94	35.22	0.66	450.14
mean, Lift 2 (5)	7.68	0.07	50.15	1.48	29.46	1.74	7.31	54.58	1.57	4.58	12.79	37.67	0.92	489.81



Table 5. Summary of mean concentration enrichments relative to reference sites

Parameter	As, ppm, Hyd	Se, ppm, Hyd	Ba, ppm, ICP-AES	Cd, ppm, ICP-AES	Cr, ppm, ICP-AES	Cu, ppm, ICP-AES	Mn, ppm, ICP-AES	Mo, ppm, ICP-AES	Cu/Mo, ICP-AES	Ni, ppm, ICP-AES	Sr, ppm, ICP-AES	V, ppm, ICP-AES	Zn, ppm, ICP-AES	Th, ICP-MS	U, ICP-MS
<b>Plant Groups</b>															
All samples		+++		+				++		++			++		
yarrow															
wheatgrass		+++		+	+		+	++	+			+			
bromegrass		+++		+				++	+			+			
sedge		+++					+								
hairgrass		+++													
alfalfa		+++			+			++	++			+		++	
aspen		+++		+						+					
willow		+++		++			+			+					
<b>Locations</b>															
Wetland	+	+++					+							++	
Slope		++			+			+	++						
Lift 1		+++			+			+	++	+				++	
Lift 2		+++		+	+			++		+		+	+	++	
Lift 3		+++						++	+					++	
Lift 4		+++						++	++					++	
<b>Key</b>															
+ enrichment over background concentrations up to factor of 10; mean Cu/Mo between 1 and 2															
++ enrichment over background concentrations by several factors of 10; mean Cu/Mo between 0.1 and 1															
+++ enrichment over background concentrations up to factor of about 100															