UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

ANALYTICAL RESULTS FOR SEDGE SAMPLES COLLECTED ON THE WETLAND RECEIVING ACID MINE DRAINAGE WATERS FROM ST. KEVIN GULCH, LEADVILLE, COLORADO

By

B.M. Erickson,* P.H. Briggs,* K.R. Kennedy,*
and T.R. Peacock*

Open-File Report 91-126

This report is preliminary and has not been reviewed for conformity with U.S. Geological Survey editorial standards and stratigraphic nomenclature. Any use of trade names is for descriptive purposes only and does not imply endorsement by the USGS.

*U.S. Geological Survey, DFC, Box 25046, MS 973, Denver, CO 80225

1991

CONTENTS

ILLUSTRATIONS

ILLUSTRATIONS--(CONTINUED)

page

TABLES

APPENDIX TABLES

page

ANALYTICAL RESULTS FOR SEDGE SAMPLES COLLECTED ON THE WETLAND RECEIVING ACID MINE DRAINAGE WATERS FROM ST. KEVIN GULCH, LEADVILLE, COLORADO

By

B.M. Erickson, P. H., Briggs, K.R. Kennedy, and T.R. Peacock

SUMMARY

The summary statistics indicate there is very little difference between the chemical composition of *Carex utriculata* Boott. (Sedge A) and *Carex canescens* L. (Sedge B), and the ANOV results suggest that most significant variances in Sedge A element concentrations are related to the geographical differences existing between the 400 and 100 m sampling sites. The elevated element clusters at the inflow area illustrate that the wetland vegetation has been impacted by the acid mine drainage waters of St. Kevin Gulch. Elevated element clusters in other areas of the wetland indicate that St. Kevin Gulch is not the only source of contamination. All but two of the elevated areas can be related to surface water input to the wetland. The remaining two areas are probably related to ground water influence or elevated metals in the substrate.

INTRODUCTION

The use of natural or manmade wetlands as treatment systems for water quality is currently being encouraged, however, little research has been conducted on metal uptake by wetland vegetation. In cooperation with Water Resources Division, a study of the vegetation on the 29 hectare (ha) subalpine wetland receiving acid mine drainage from St. Kevin Gulch, Leadville, Colorado, was initiated in the fall of 1988. The wetland is a sedge meadow with two major ecosystem components. The aquatic component is dominated by *Carex utriculata* (Sedge A), and the drier hummock component by *Carex canescens* (Sedge B). Samples of sedges from both components were collected throughout the wetland.

STUDY METHODS

Sampling Design

The wetland was divided into 19 cells (fig. 1), 400 m on a side, for an unbalanced analysis of variance (ANOV) sampling design. Each cell was divided into four sections (200 m on a side), three of the four sections were chosen randomly, and three sample sites established to represent the 200 m level. Randomly, one of the four sections was then divided again into four 100 m sections and two of the 100 m sections chosen for sampling sites. At one sampling site within each of the 19 cells, a duplicate sample was collected to evaluate site variance (fig. 2). The number of possible samples per cell was 6 and a total of 114 for the wetland.

Field Sampling

Samples of both Sedge A and Sedge B were collected at each sampling site wherever possible. Each sample was a composite collected within a 5 m area close to each designated sampling site. The above ground portion needed to fill a 12 cm by 18 cm cloth sampling bag was clipped with stainless steel clippers. Some sites had been heavily grazed by cattle, limiting the amount of sedge that could be collected. Samples of Sedge A were collected at 94 sites and Sedge B at 92 sites of the 114 possible.

Plant Preparation

In the laboratory, the sedge samples were washed in distilled water and dried in a forced air oven at approximately 50 °C for one week. The samples were then pulverized in a Wiley Mill and a small split of the raw material saved for atomic absorption analyses. Splits of the samples were also taken for estimates of variance due to preparation techniques and (or) analytical precision. The sample material was ashed in a muffle furnace at 450 °C. All samples were weighed before and after ashing for percent ash calculations. All samples were processed and analyzed in a random sequence to eliminate any systematic biases.

Analytical Methods

All analyses were performed at the USGS Laboratories, Denver, Colorado. Analyses were performed on the ash for a 40 element inductively coupled plasma-atomic emission spectroscopy (ICP-AES) method developed by Crock and others (1983). Arsenic was determined in the raw material by continuous-flow, hydride-generation atomic absorption spectroscopy (HGAAS) (Crock and Lichte, 1982), and Hg in the raw material by cold vapor atomic absorption (Kennedy and Crock, 1987). Results for Sedge A and Sedge B are listed in appendix tables A2 and A3, respectively.

Statistical Techniques

Preliminary Procedures

Before statistical processing, elements reporting more than one-third of their data below the limit of detection (Ce, C, Ga, Ge, Ho, Li, Nb, Nd, Sc, Sn, Ta, Th, Ti, U, V, W, Y, Yb, Zr) were eliminated with the exception of Ag and Cd. Silver concentrations are known to be elevated in the St. Kevin Gulch waters and Cd is an environmentally important element. The qualified values in the remaining data set were replaced with a real value equal to 0.7 times the lower limit of detection (appendix table A1) according to methods described by Miesch (1976). Elements reported on ash weight basis (ICP analysis) were converted to dry-weight equivalents and all data were converted to logarithms prior to statistical analysis. Statistical analysis of the data was performed using the U.S. Geological Survey's STATPAC library (VanTrump and Miesch, 1977).

Summary Statistics

Summary statistics for both sedges are reported as the geometric mean (GM), geometric deviation (GD), and baseline or expected range (calculated using the formula GM/GD2 to GMXGD2) for twenty-one elements and the ash content in tables 1 and 2. Visually comparing the results on the two tables, there appears to be very little difference between the element concentrations of Sedge A and Sedge B. Factor analysis of the data is pending.

Analysis of Variance

The detailed use of an unbalanced ANOV design for biogeochemical studies is given by Erdman and Gough (1977). In the present study, five levels for the ANOV were used. The design allows estimates of how the element content is affected by geographic location (400 m, 200 m, and 100 m levels), field sampling technique, and preparation techniques and/or analytical precision. Results of the ANOV for 19 elements and ash content in Sedge A (table 3) indicate all elements except Sr and Fe have a significant amount of their variation explained as the difference between the 19 cells (400 m level). Elements with significant differences related to the 200 m level are Fe, Na, P, Pb, and Zn. In addition, all elements expect Cr, Fe, Mg, P, and Sr had a significant amount of their variance explained as the difference between the 100 m sampling sites. Elements with a significant amount of their variance explained by how the samples were collected in the field are Al, Ca, Cu, Fe, Mg, Mn, Mo, Na, Ni, Sr, and Zn. Preparation technique and analytical precision variance percents were all under 30% and not considered significant. Results for the ANOV of Sedge B are not presented in this paper as only four samples were of sufficient size to split for the fifth level.

RESULTS AND DISCUSSION

All data for both sedges were plotted on individual base maps (figs. 3-50) and areas with element concentrations exceeding the GM identified. If the wetland vegetation has been impacted by the waters of St. Kevin Gulch, elevated element concentrations would be expected to cluster in the area of direct contact with the water. St. Kevin flows east from the mountains turns north into the wetland and spreads out in the areas of cells 9, 10, 8, 11, 12, 13, and 14 (figure 1). Both Sedge A and Sedge B have samples with elevated concentrations for Ag, Al, Ba, Cd, Cu, Mn, Mo, Ni, Pb, and Zn clustering in this area. Elevated concentrations for As and Fe in samples of Sedge A and Hg in samples of Sedge B also cluster in this area.

The inflow area for St. Kevin was not the only area identified with clusters of elevated element concentrations in the vegetation. Clusters also occurred in cells at the north end of the wetland (1 and 2), cells 3 and 4, cells 6 and 7 in the middle, cell 19, cells 15 and 17 at the southern end, and at the outflow area or cell 18 (fig. 1). Sources of surface water to the wetland (Temple Gulch, Gleason Gulch, North Spring, and South Spring) probably account for all of the additional clusters except for the areas in cells 3 and 4 and cells 6 and 7. Ground water input and/or elevated metal content in the substrate may explain the element clusters in these areas.

ACKNOWLEDGMENTS

The authors wish to thank Water Resources Division for funding this research study. The authors also wish to thank Katherine Walton/Day (WRD) for all her help in the planning, actual field sampling, and data interpretation.

REFERENCES CITED

Crock, J.G. and Lichte, F.E., 1982, An improved method for determination of trace levels of arsenic and antimony in geologic materials by automated hydride generation-atomic absorption spectroscopy: Analytica Chemica Acta v. 144, p. 223-233.

Crock, J.G., Lichte, F.E., and Briggs, P.E., 1983, Determination of elements in National Bureau of Standards Geologic Reference Materials SRM 278 obsidian and SRM 688 basalt by inductively coupled argon plasma-atomic emission spectrometry: Geostandards Newsletter v. 7, p. 335-340.

Erdman, J.A. and Gough, L.P., 1977, Variation in the element content of *Parmelia chlorochroa* from the Powder River Basin of Wyoming and Montana: The Bryologist, v. 80, p. 292-303.

Kennedy, K.R. and Crock, J.G., 1987, Determination of mercury in geologic materials by continuous flow, cold vapor, atomic absorption spectrophotometry--Analytical Letters, v. 20, p. 899-908.

Miesch, A.T., 1976, Geochemical survey of Missouri--Methods of sampling, laboratory analysis, and statistical reduction of data: U.S. Geological Survey Professional Paper 954-A, 39 p.

VanTrump, George, Jr., and Miesch, A.T., 1977, The U.S. Geological Survey RASS-STATPAC system for management and statistical reduction of geochemical data: Computers and Geoscience, v. 3, p. 475-488.

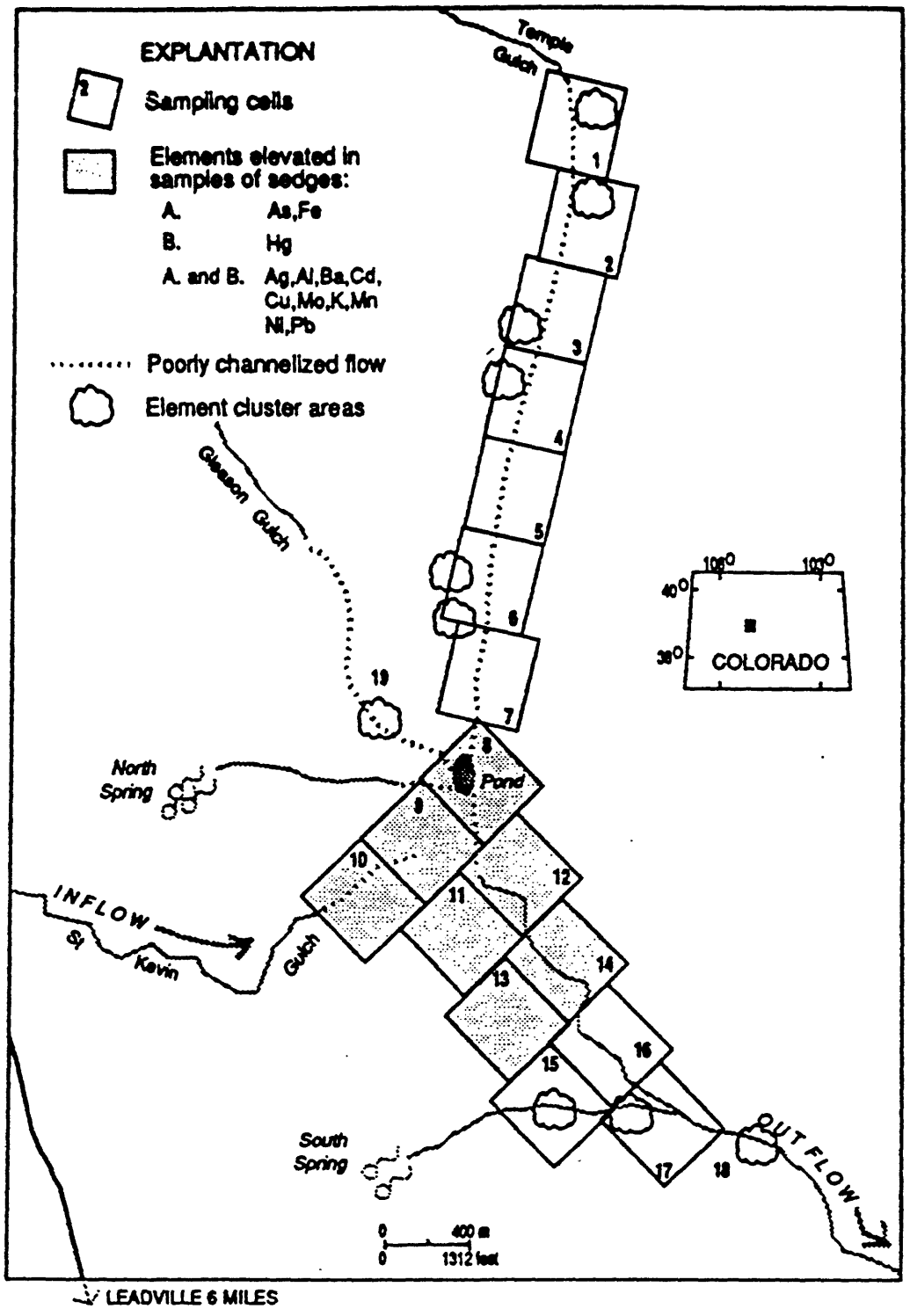

Figure 1.--Location of sampling cells on wetland receiving acid mine drainage waters from St. Kevin Gulch, Leadville, Colorado.

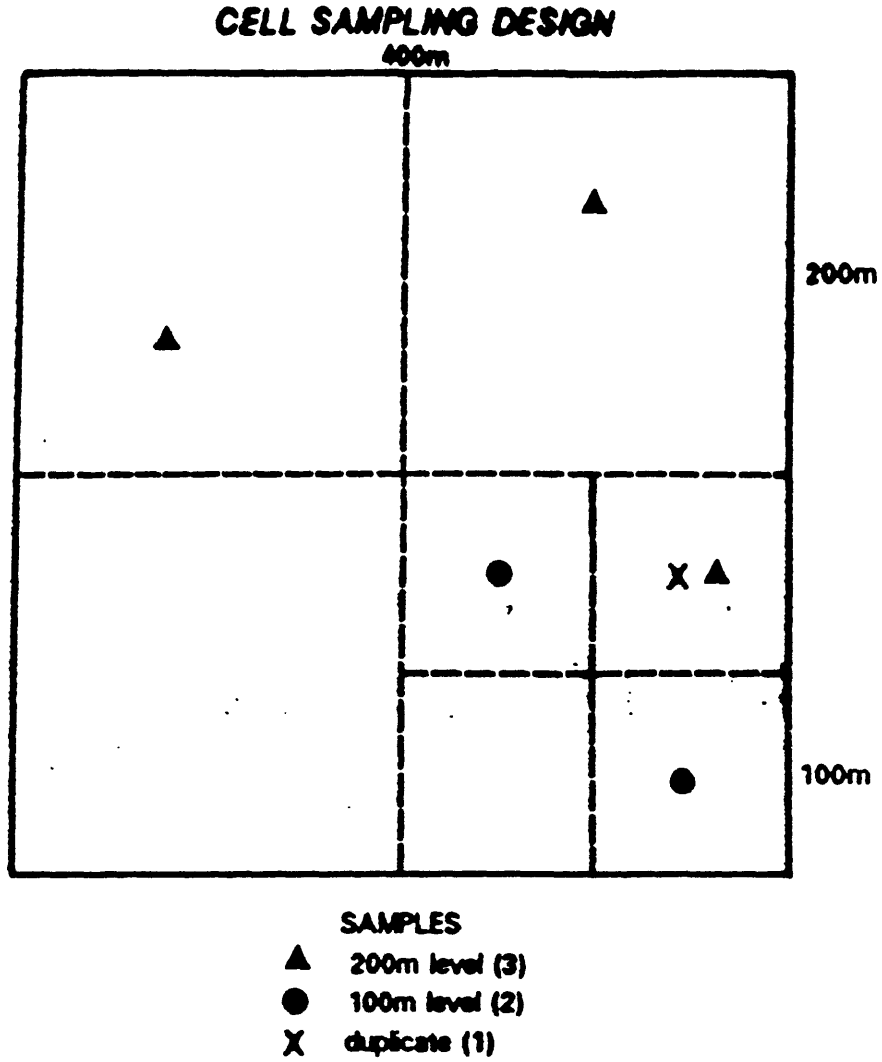

Figure 2.--Unbalanced analysis of variance sampling cell design used for the collection of sedge samples on the Leadville, Colorado wetland.

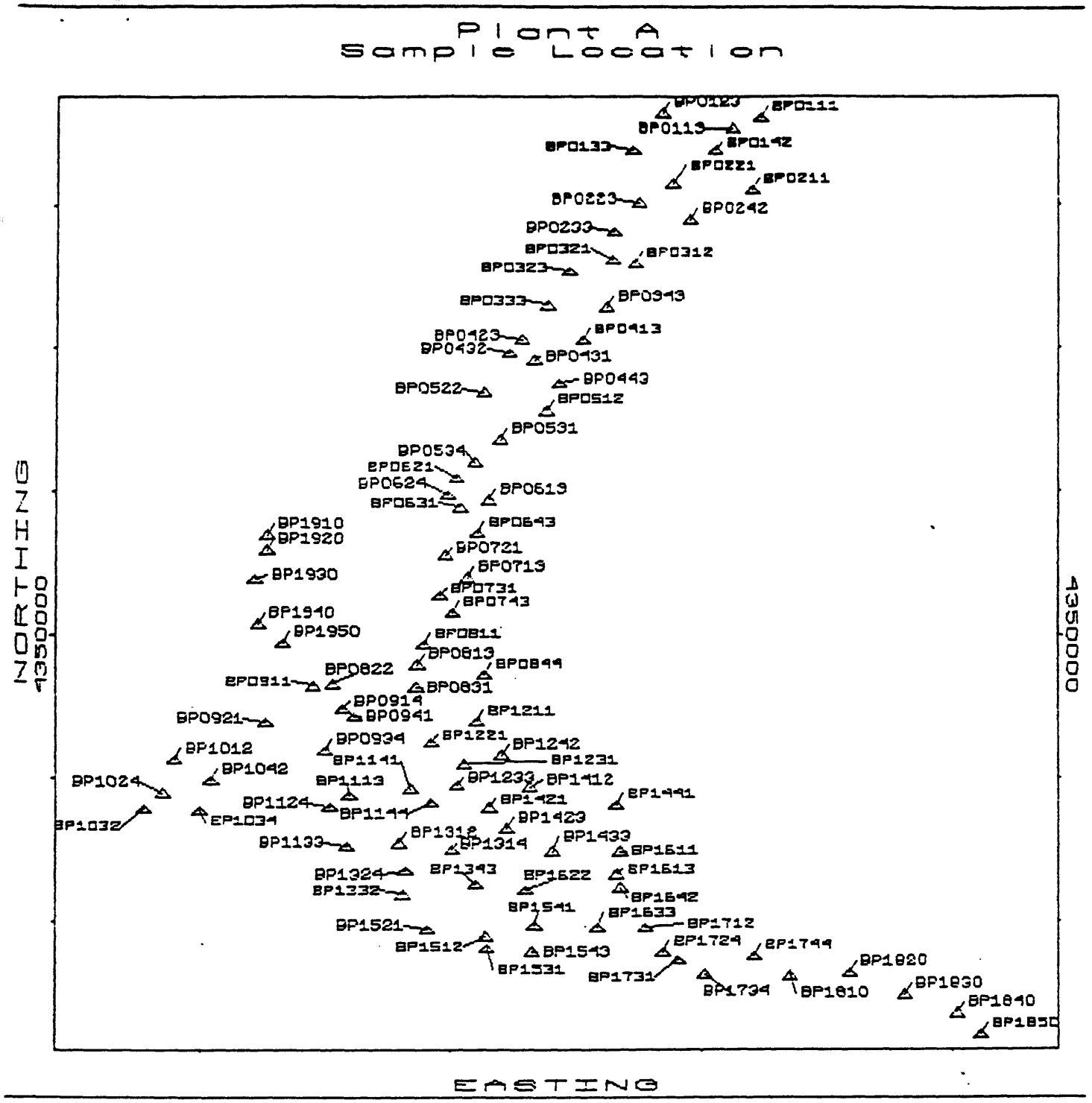

Figure 3.--Individual element plots, dry weight basis, for Sedge A (*Carex utriculata*) on the Leadville, Colorado wetland.

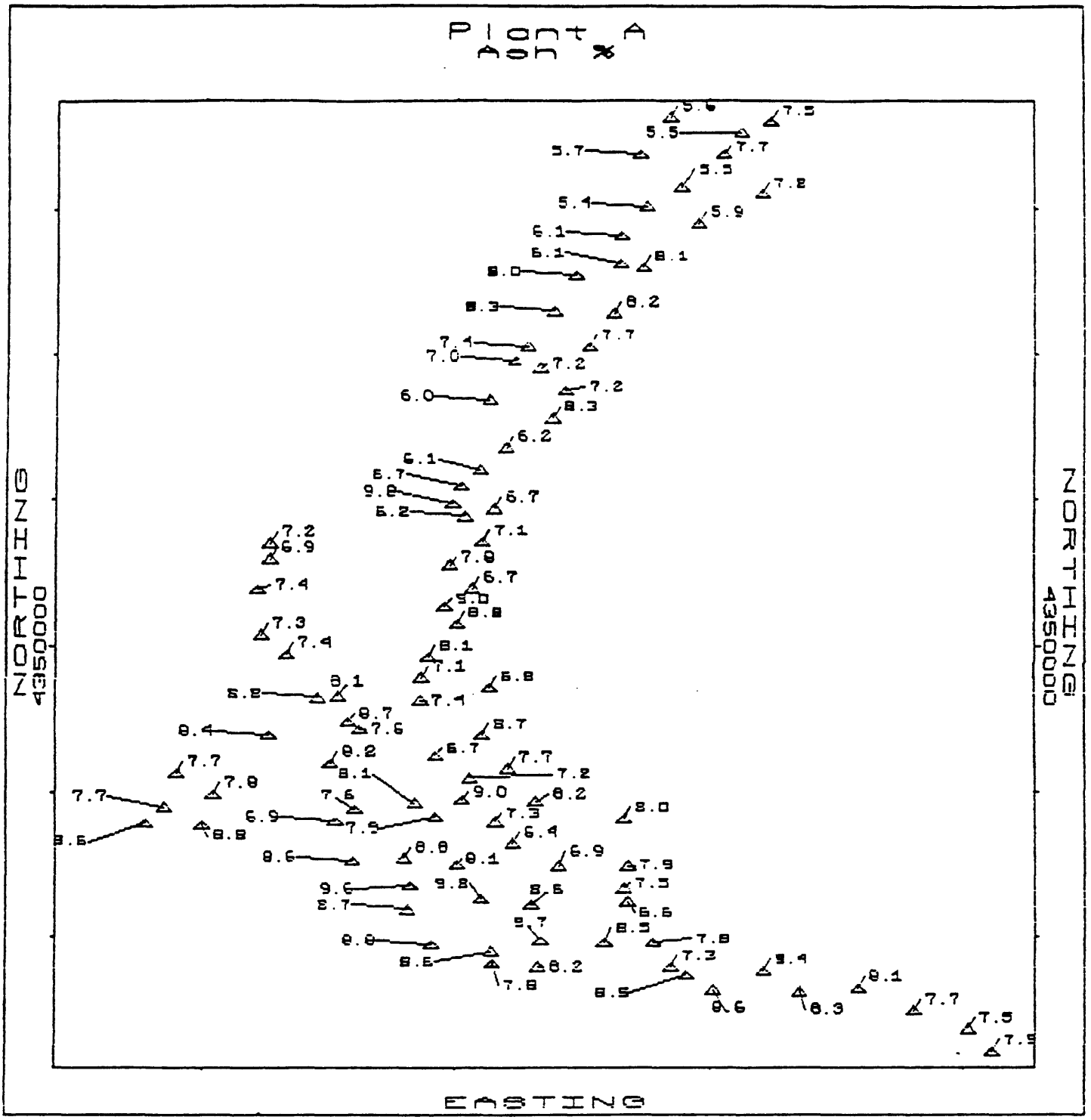

Figure 4.--Individual element plots, dry weight basis, for Sedge A (*Carex utriculata*) on the Leadville, Colorado wetland.

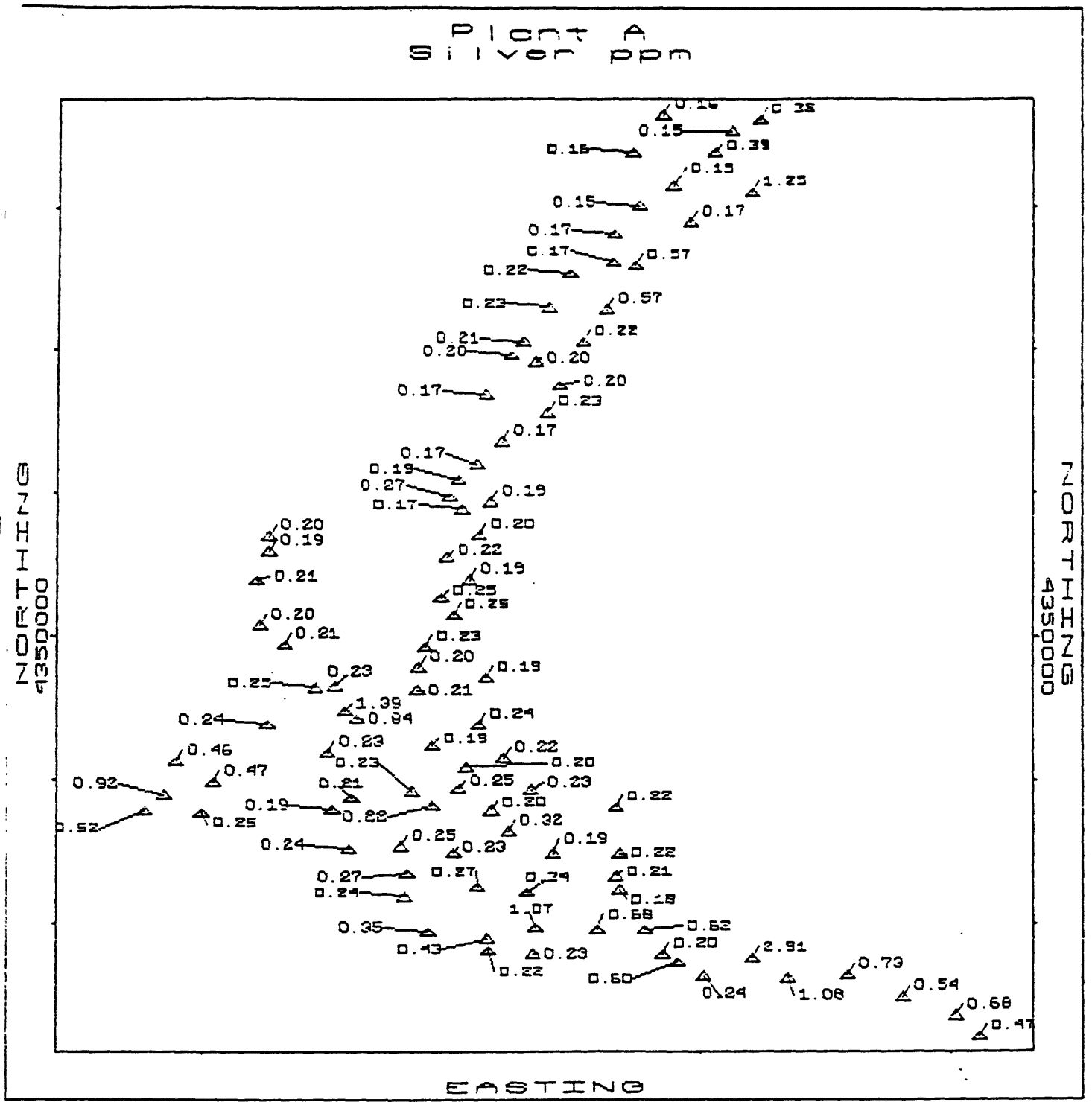

Figure 5.--Individual element plots, dry weight basis, for Sedge A (*Carex utriculata*) on the Leadville, Colorado wetland.

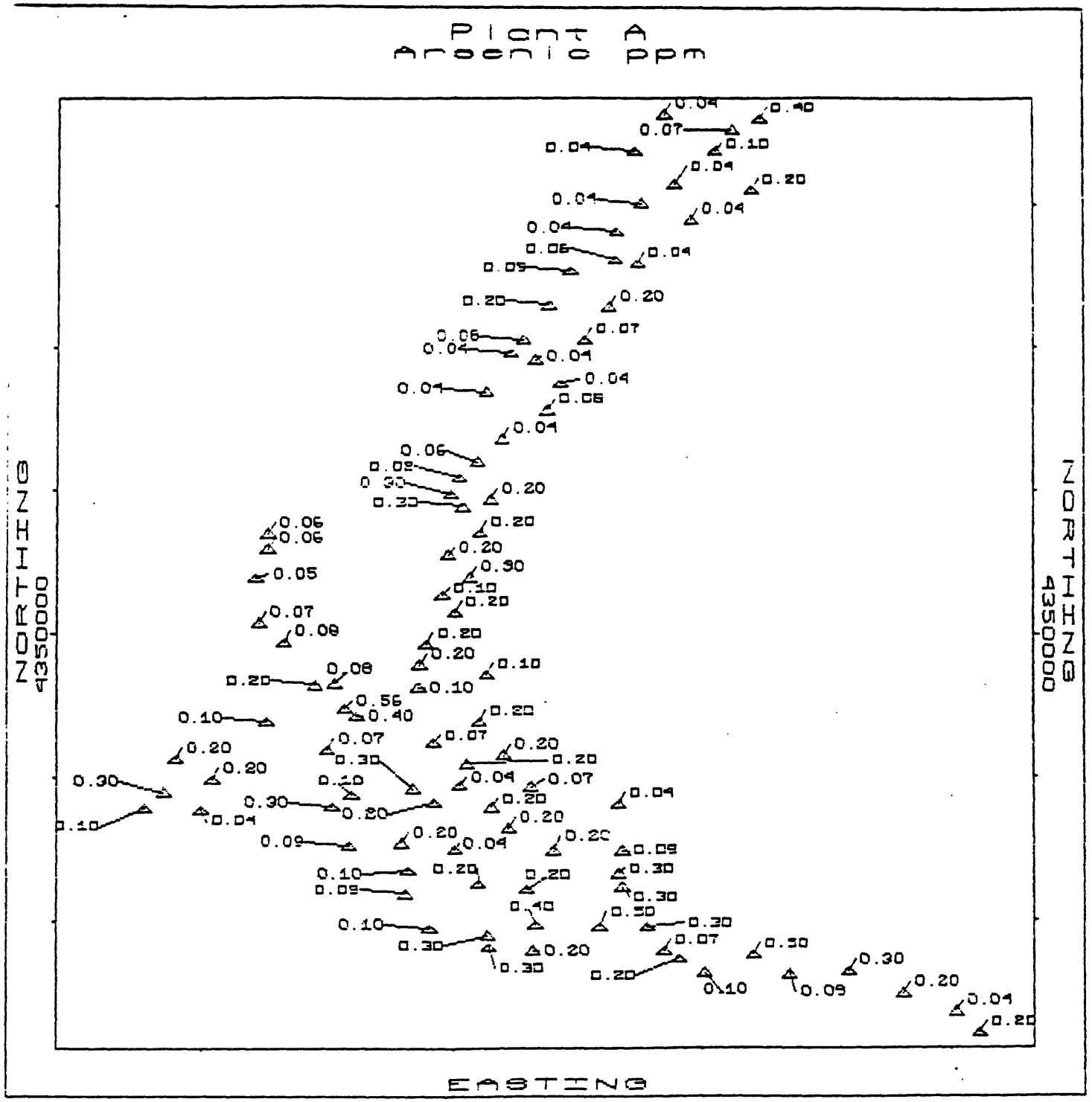

Figure 6.--Individual element plots, dry weight basis, for Sedge A (*Carex utriculata*) on the Leadville, Colorado wetland.

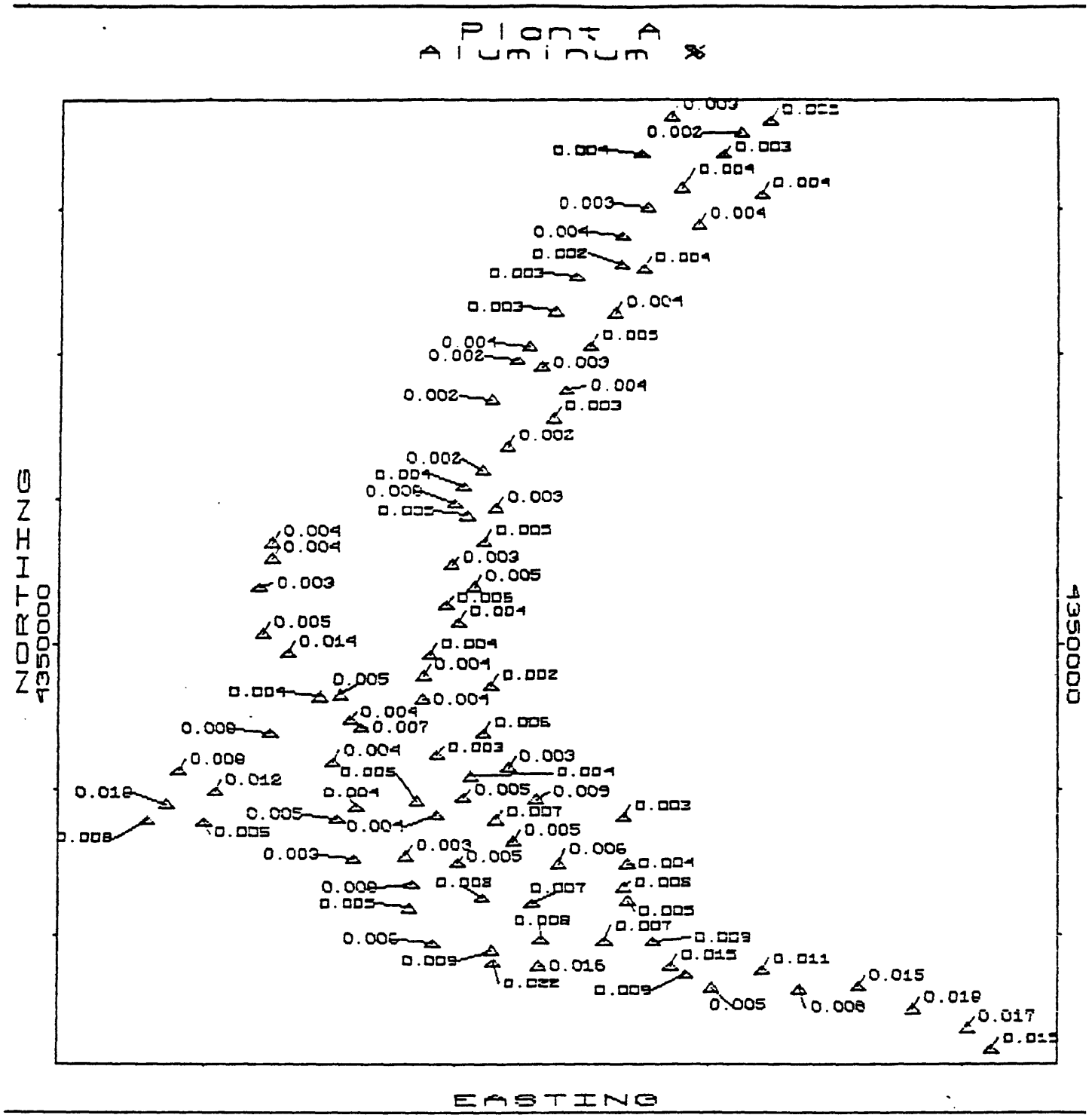

Figure 7.--Individual element plots, dry weight basis, for Sedge A (*Carex utriculata*) on the Leadville, Colorado wetland.

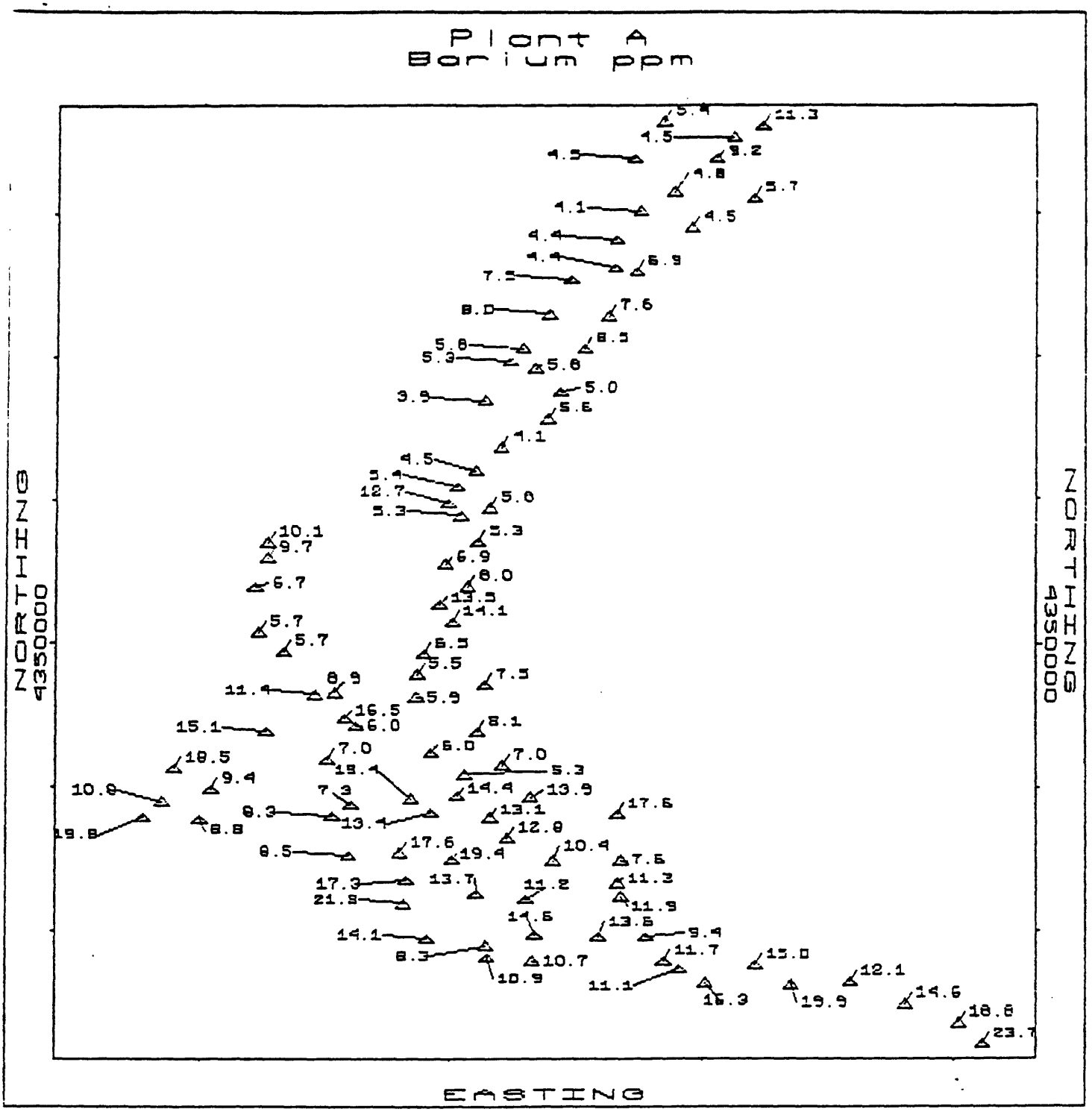

Figure 8.--Individual element plots, dry weight basis, for Sedge A (*Carex utriculata*) on the Leadville, Colorado wetland.

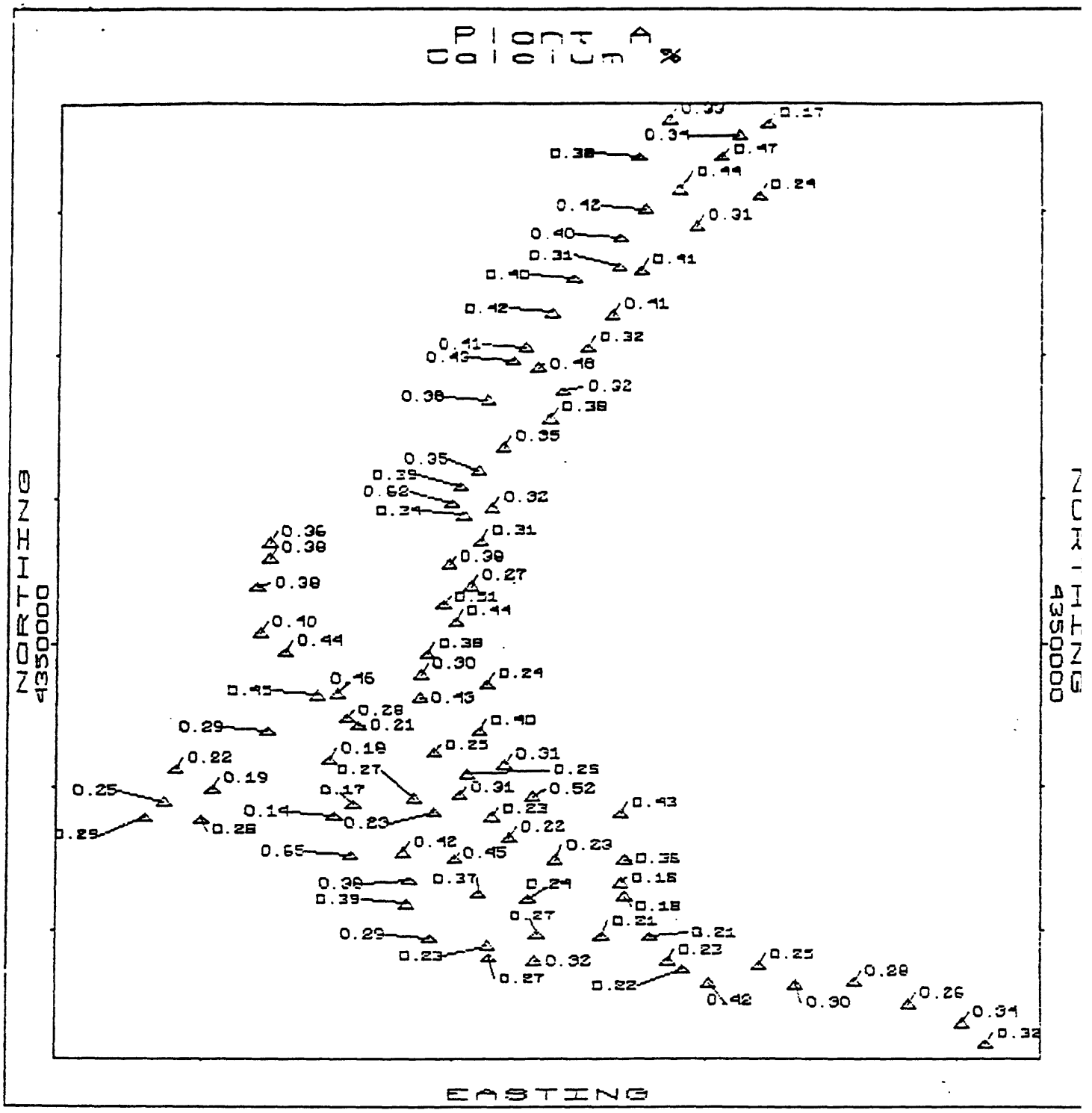

Figure 9.--Individual element plots, dry weight basis, for Sedge A (*Carex utriculata*) on the Leadville, Colorado wetland.

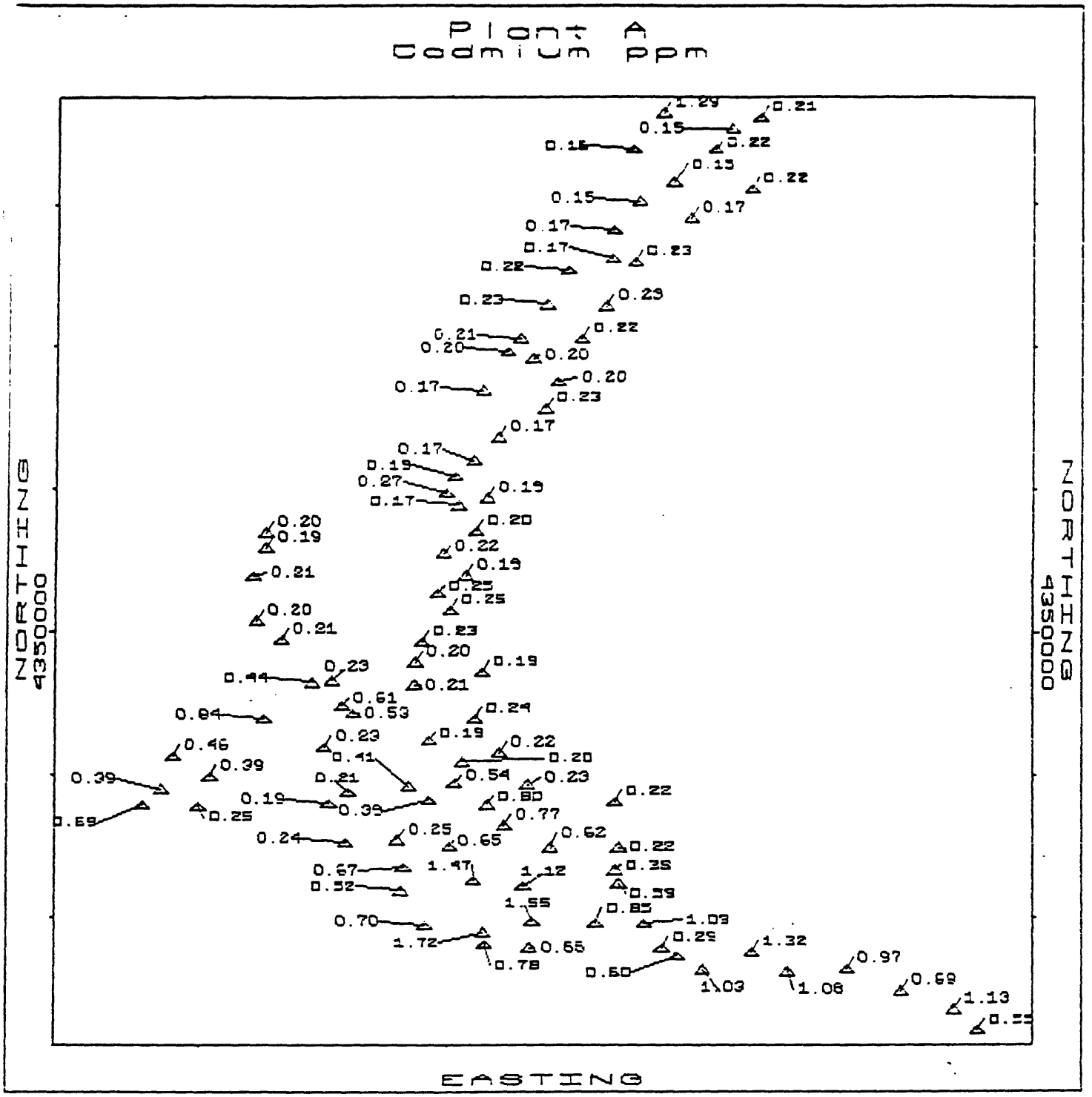

Figure 10.--Individual element plots, dry weight basis, for Sedge A (*Carex utriculata*) on the Leadville, Colorado wetland.

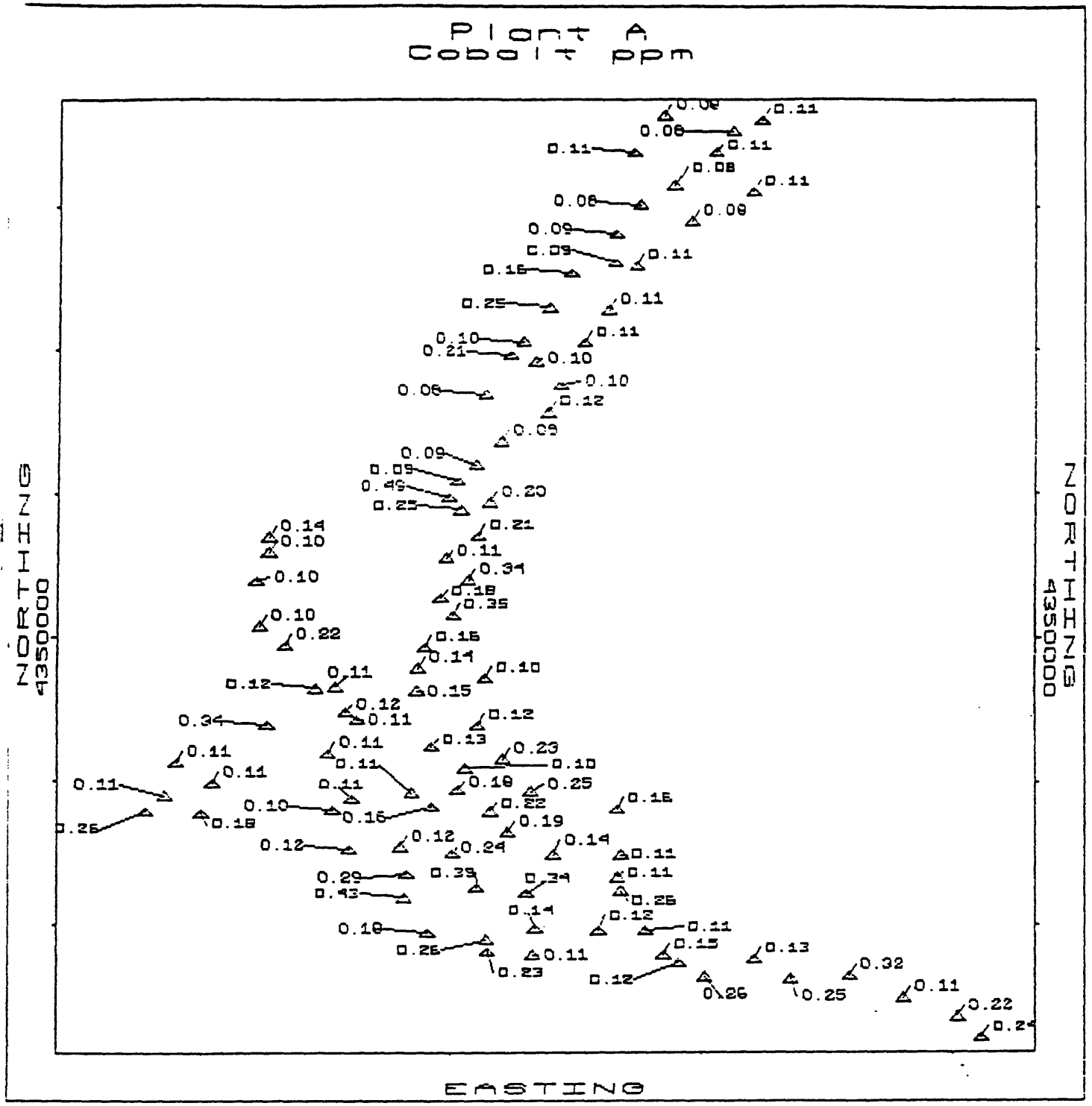

Figure 11.--Individual element plots, dry weight basis, for Sedge A (*Carex utriculata*) on the Leadville, Colorado wetland.

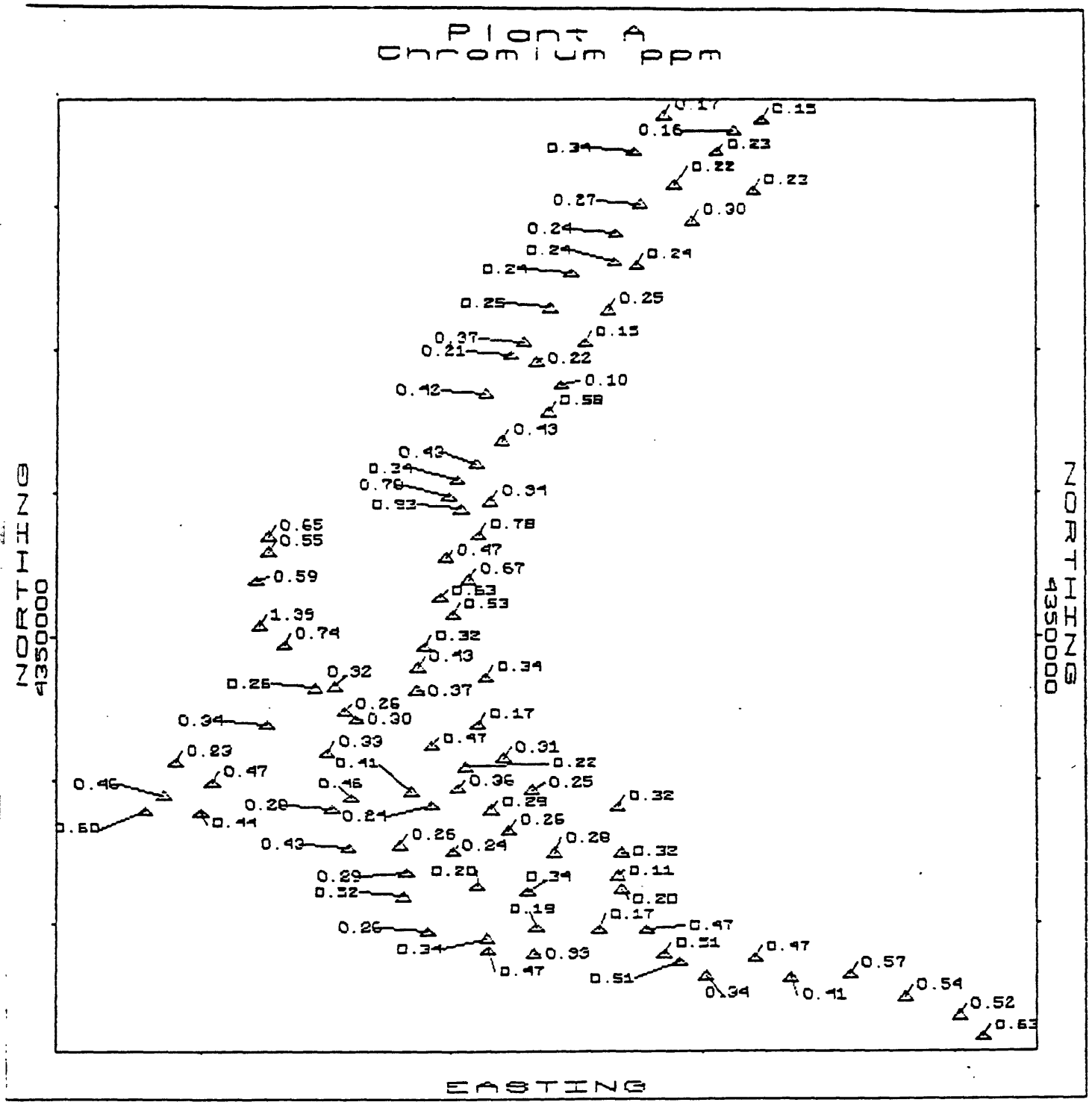

Figure 12.--Individual element plots, dry weight basis, for Sedge A (*Carex utriculata*) on the Leadville, Colorado wetland.

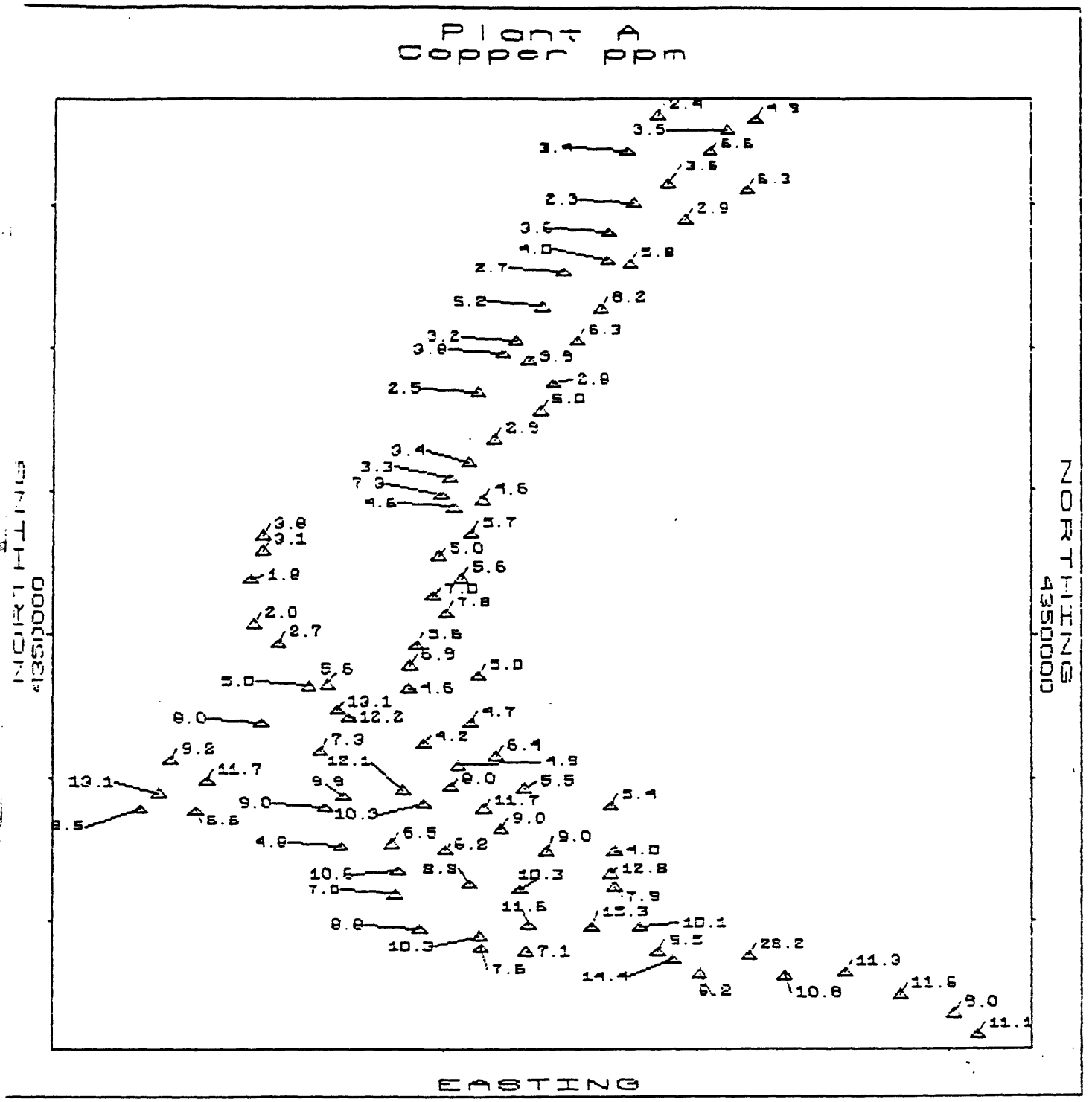

Figure 13.--Individual element plots, dry weight basis, for Sedge A (*Carex utriculata*) on the Leadville, Colorado wetland.

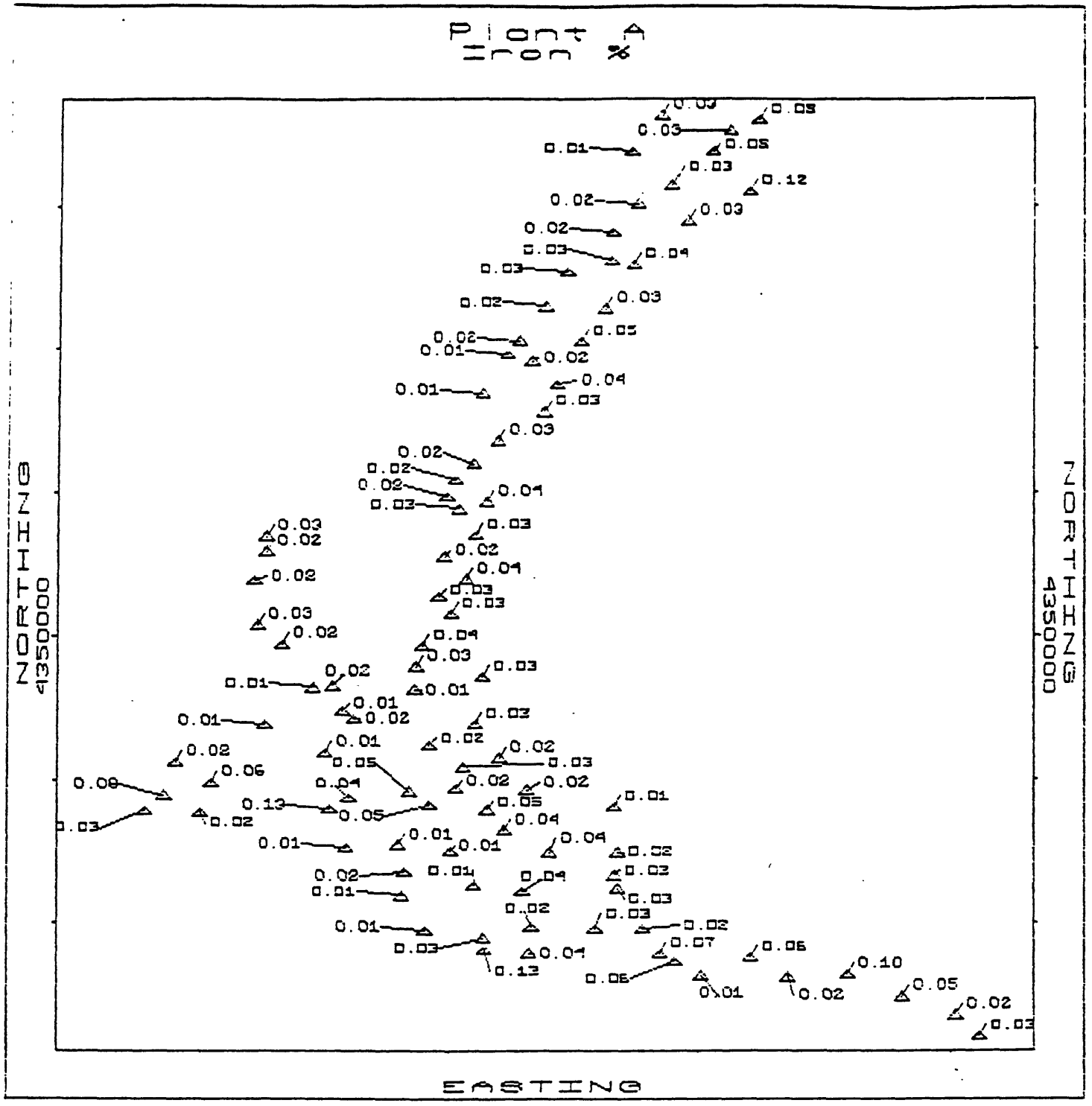

Figure 14.--Individual element plots, dry weight basis, for Sedge A (*Carex utriculata*) on the Leadville, Colorado wetland.

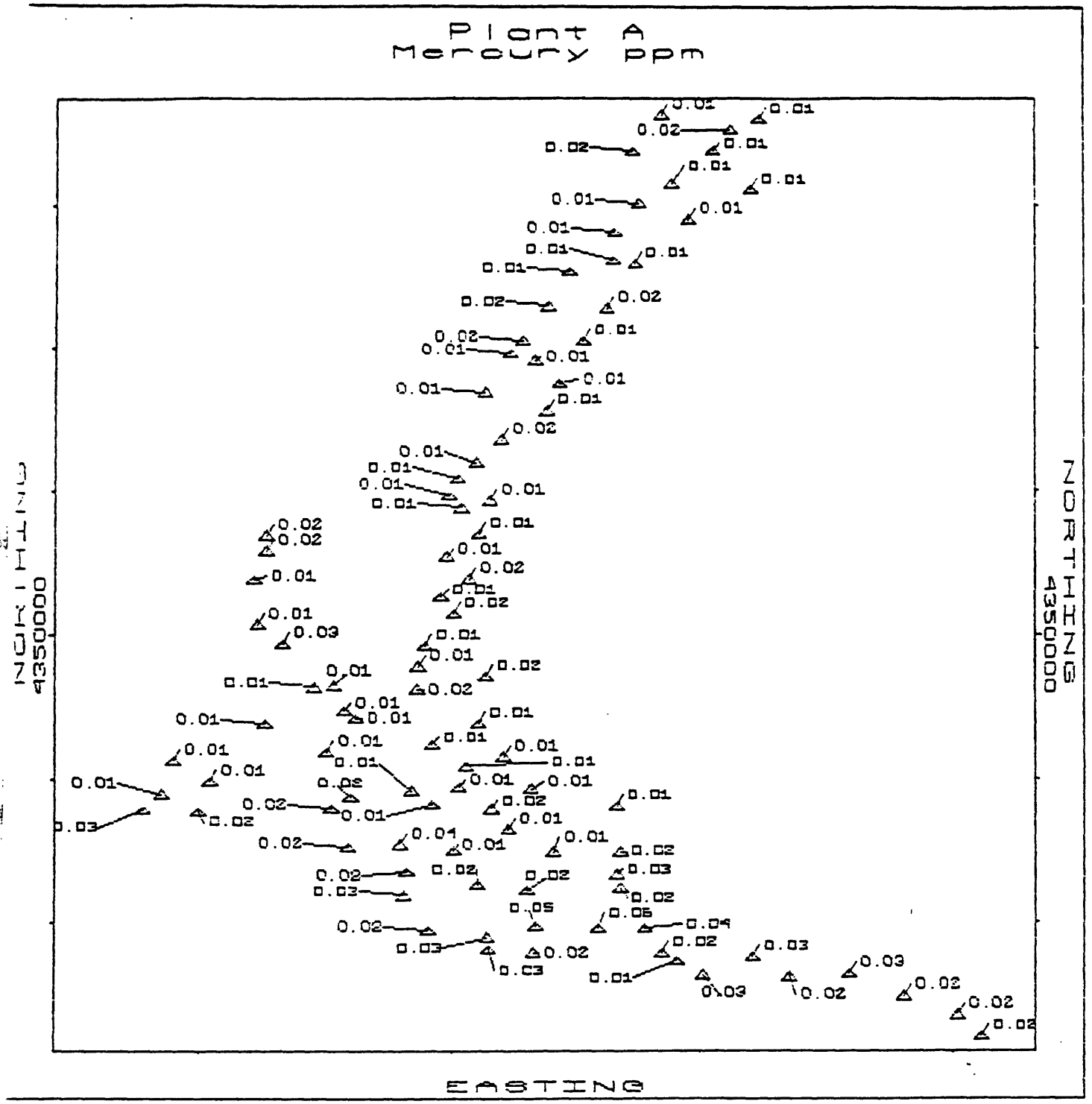

Figure 15.--Individual element plots, dry weight basis, for Sedge A (*Carex utriculata*) on the Leadville, Colorado wetland.

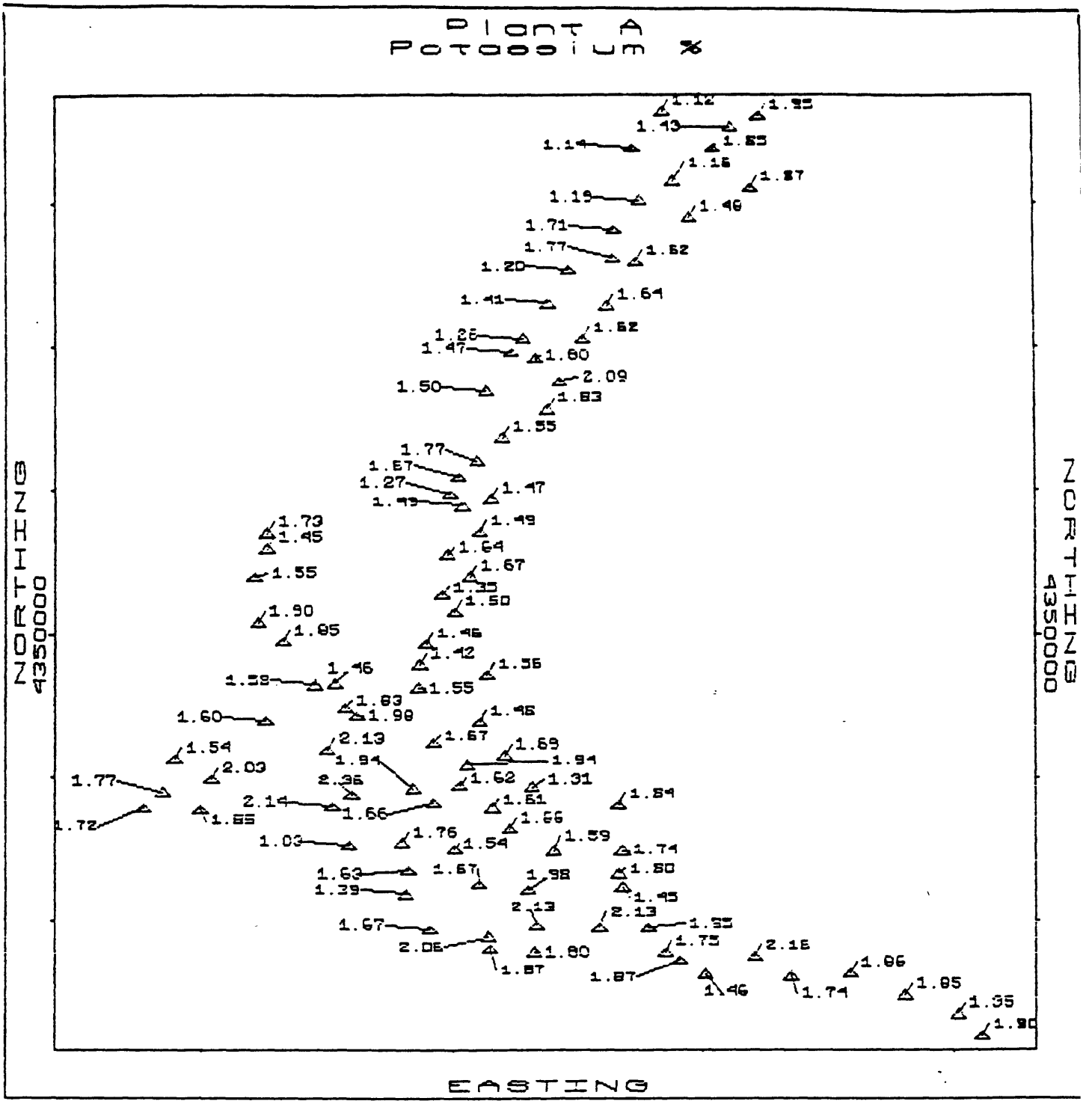

Figure 16.--Individual element plots, dry weight basis, for Sedge A (*Carex utriculata*) on the Leadville, Colorado wetland.

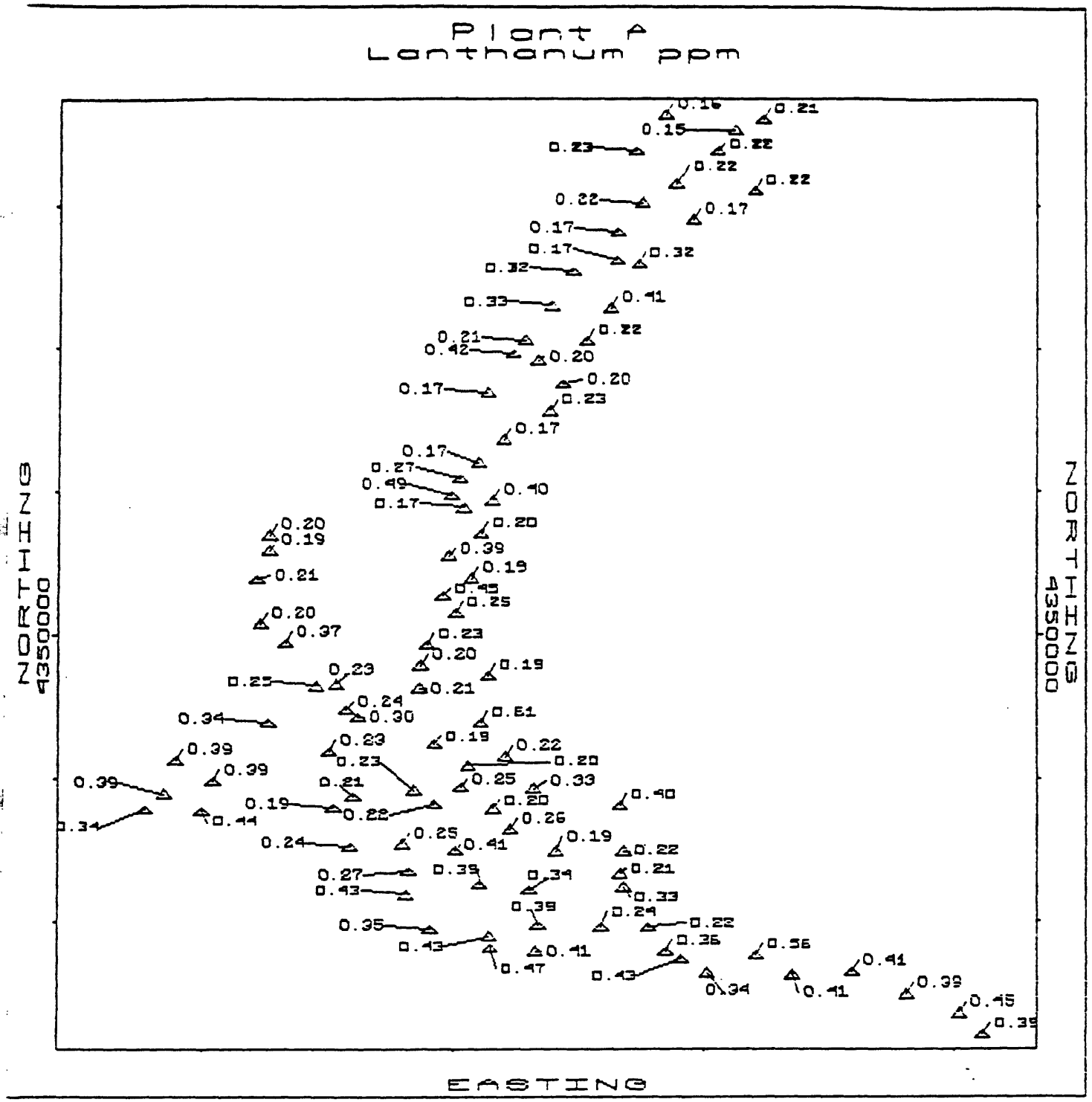

Figure 17.--Individual element plots, dry weight basis, for Sedge A (*Carex utriculata*) on the Leadville, Colorado wetland.

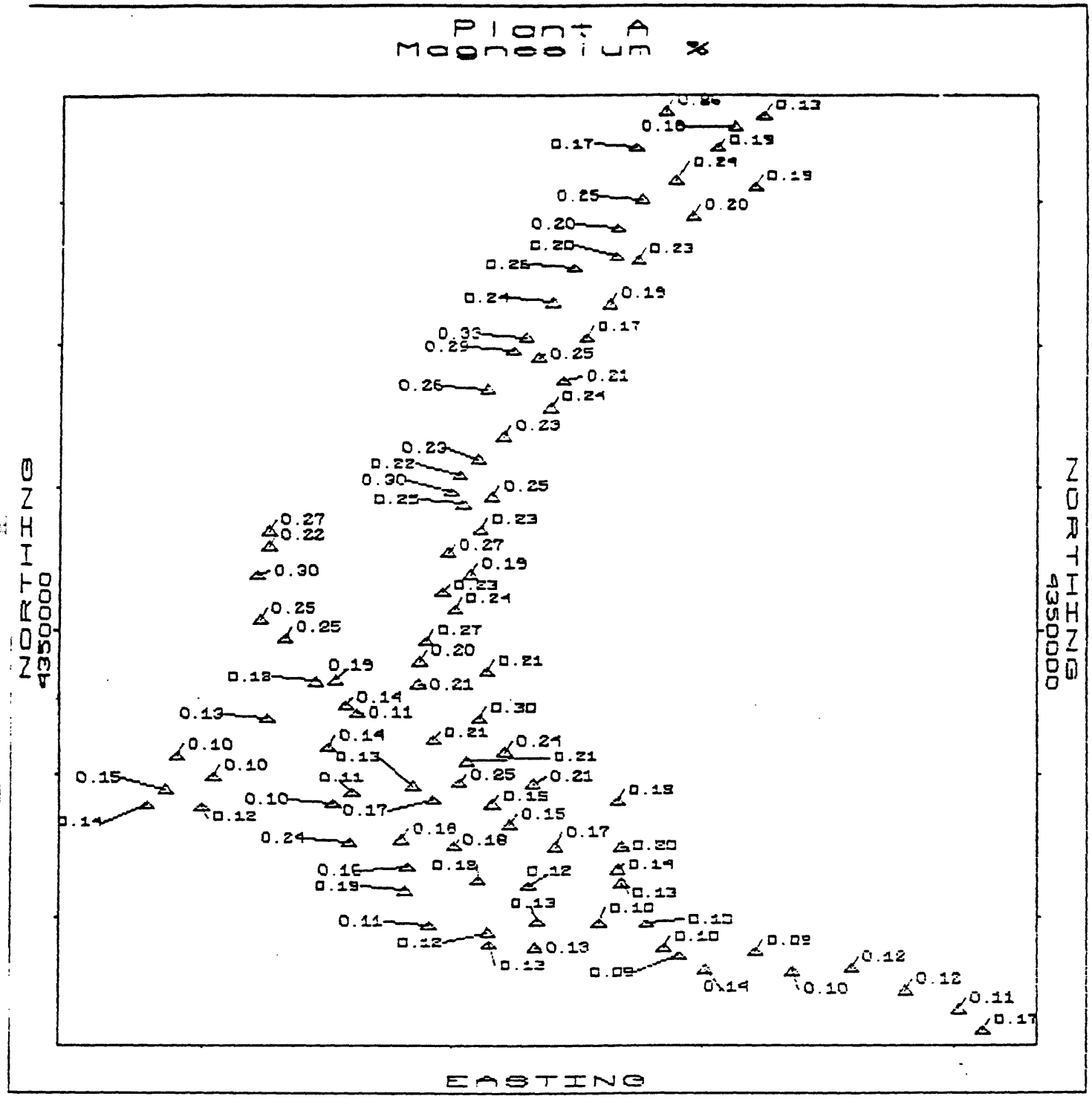

Figure 18.--Individual element plots, dry weight basis, for Sedge A (*Carex utriculata*) on the Leadville, Colorado wetland.

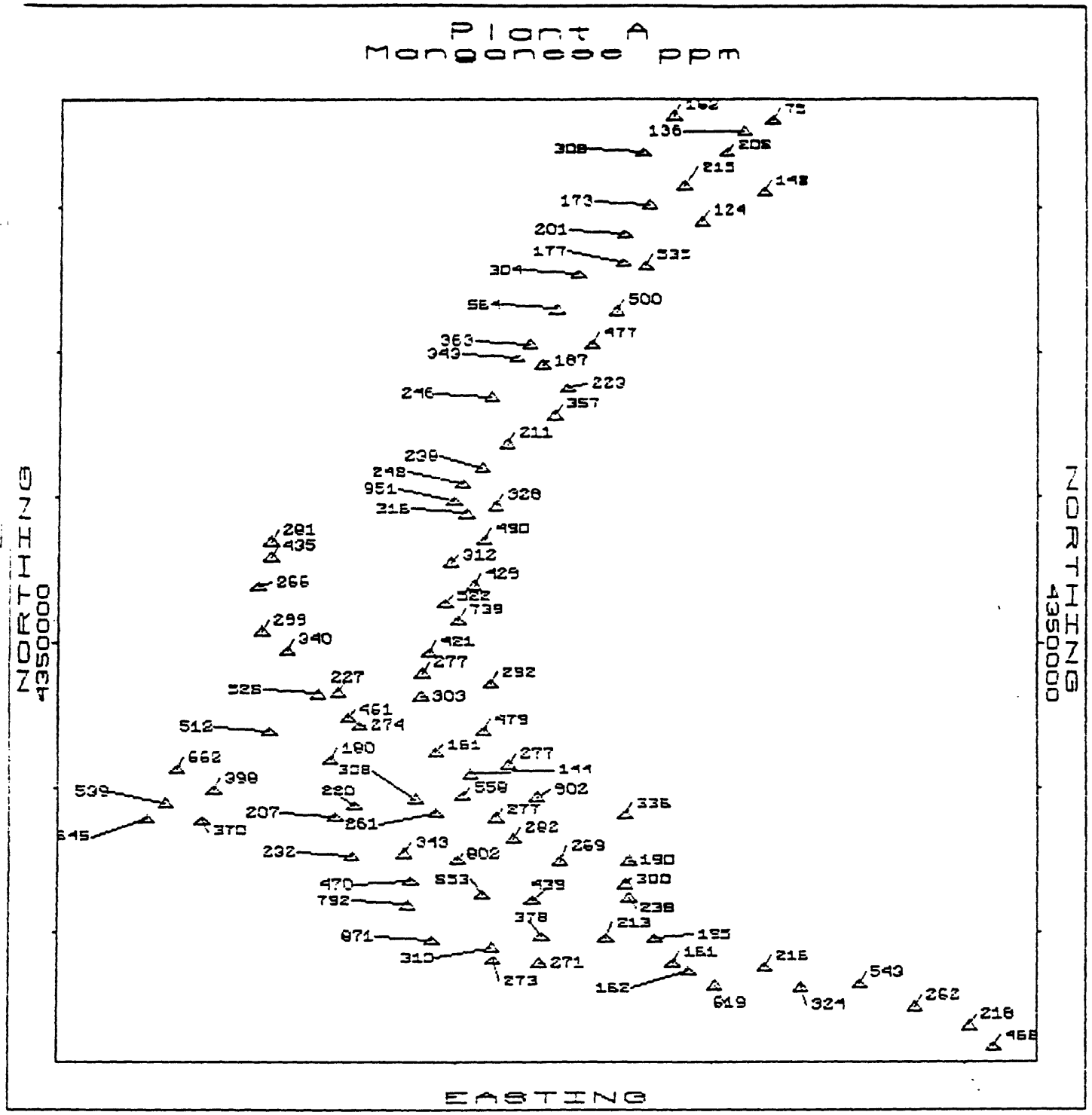

Figure 19.--Individual element plots, dry weight basis, for Sedge A (*Carex utriculata*) on the Leadville, Colorado wetland.

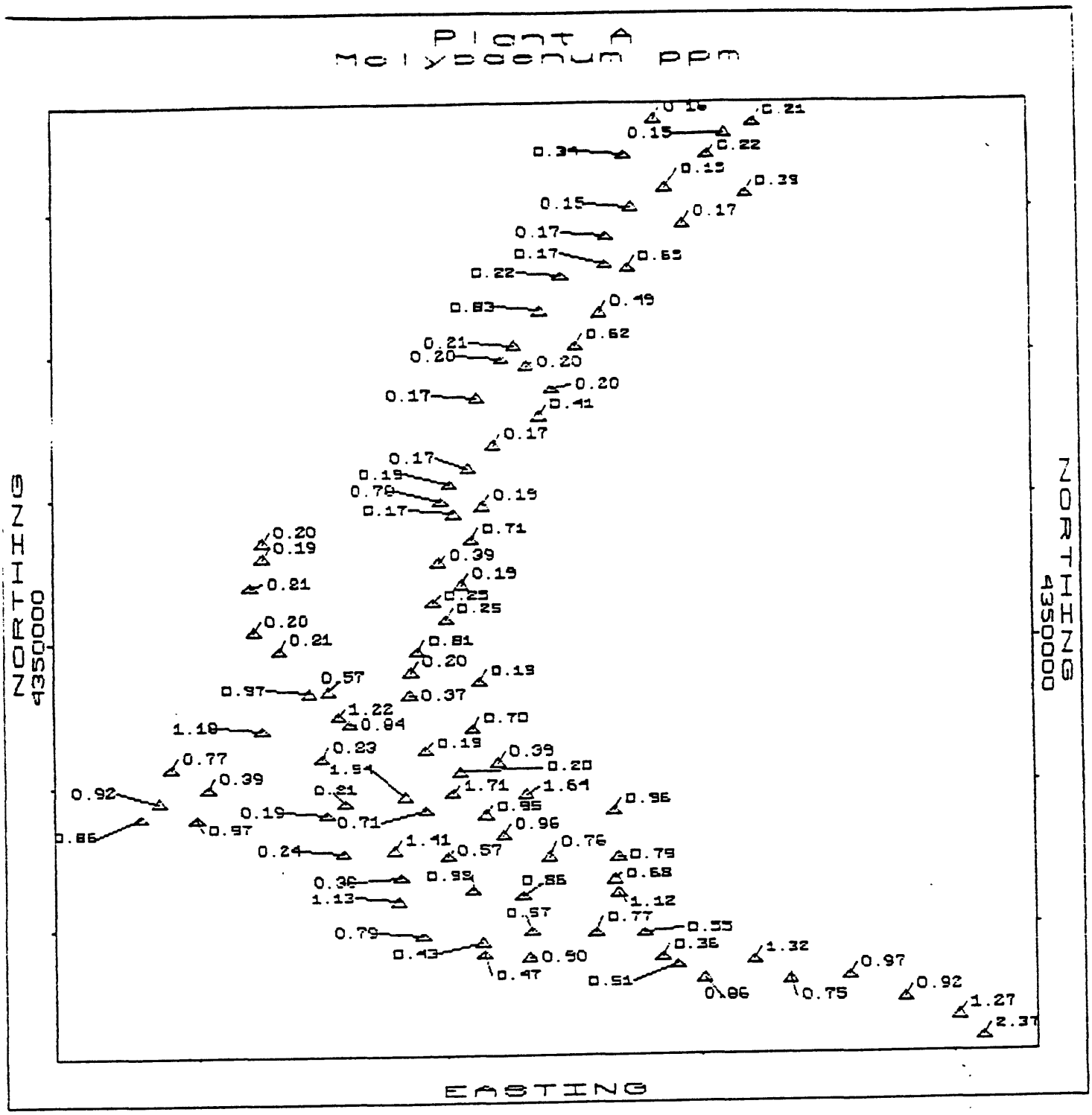

Figure 20.--Individual element plots, dry weight basis, for Sedge A (*Carex utriculata*) on the Leadville, Colorado wetland.

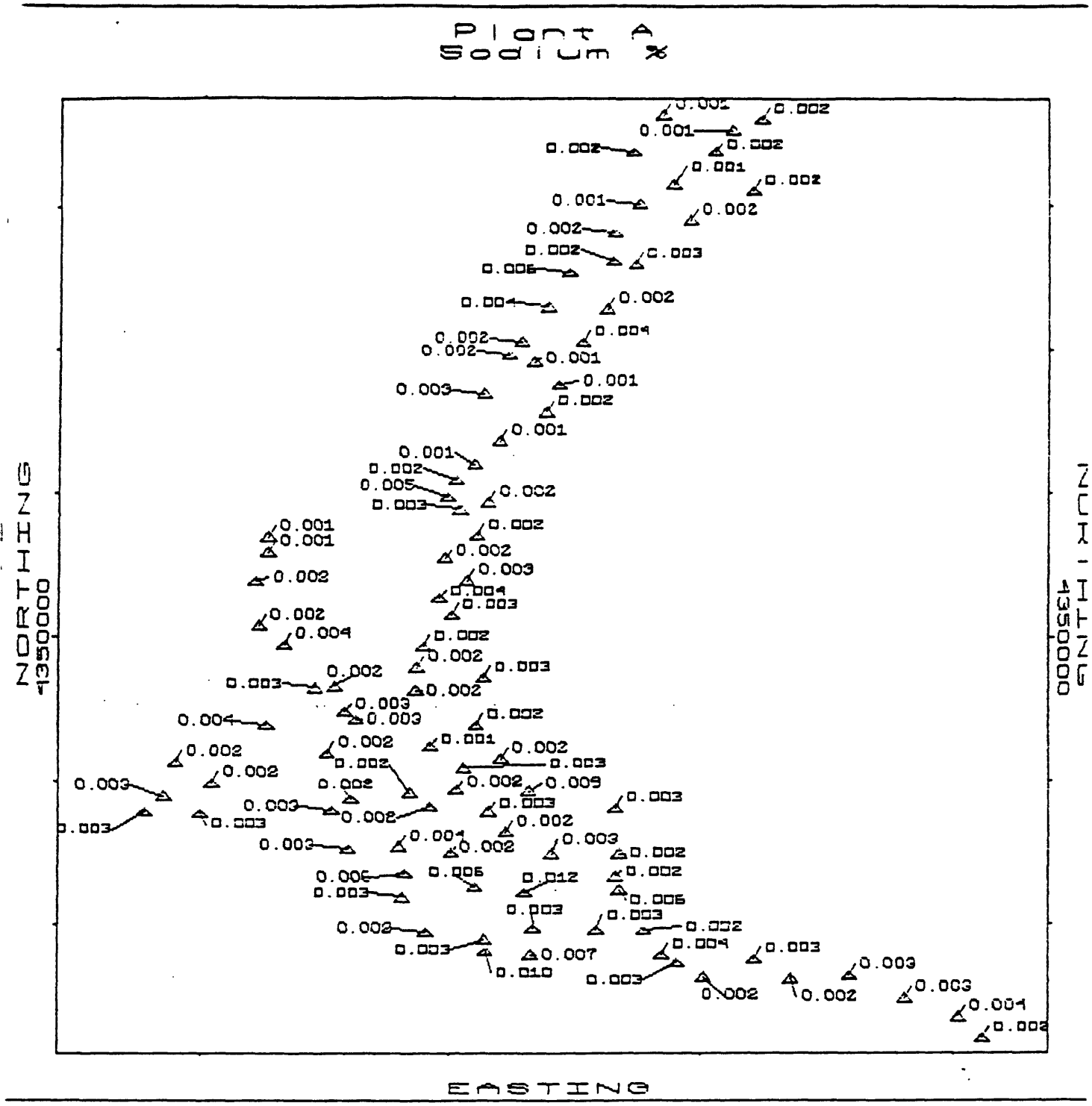

Figure 21.--Individual element plots, dry weight basis, for Sedge A (*Carex utriculata*) on the Leadville, Colorado wetland.

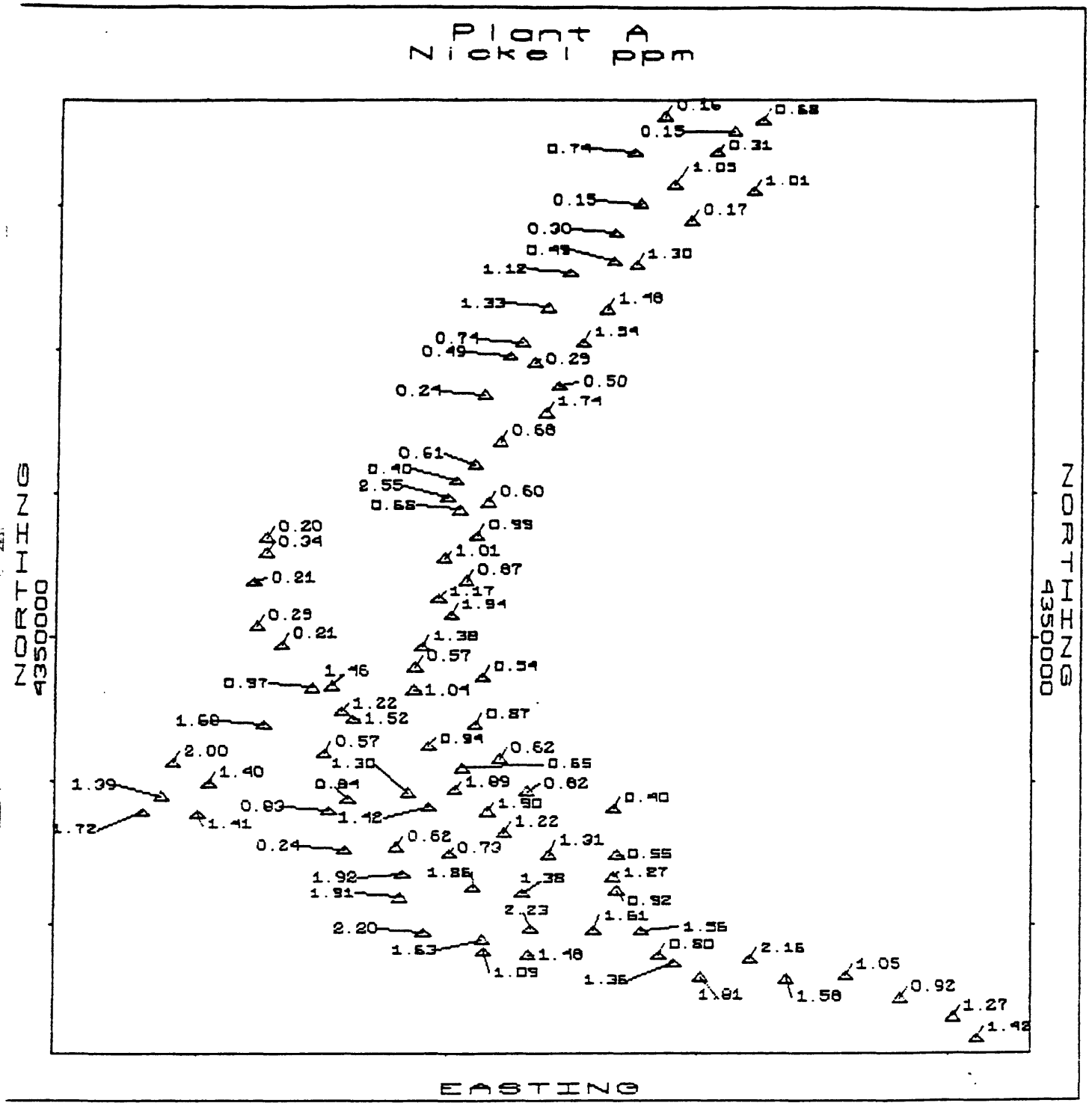

Figure 22.--Individual element plots, dry weight basis, for Sedge A (*Carex utriculata*) on the Leadville, Colorado wetland.

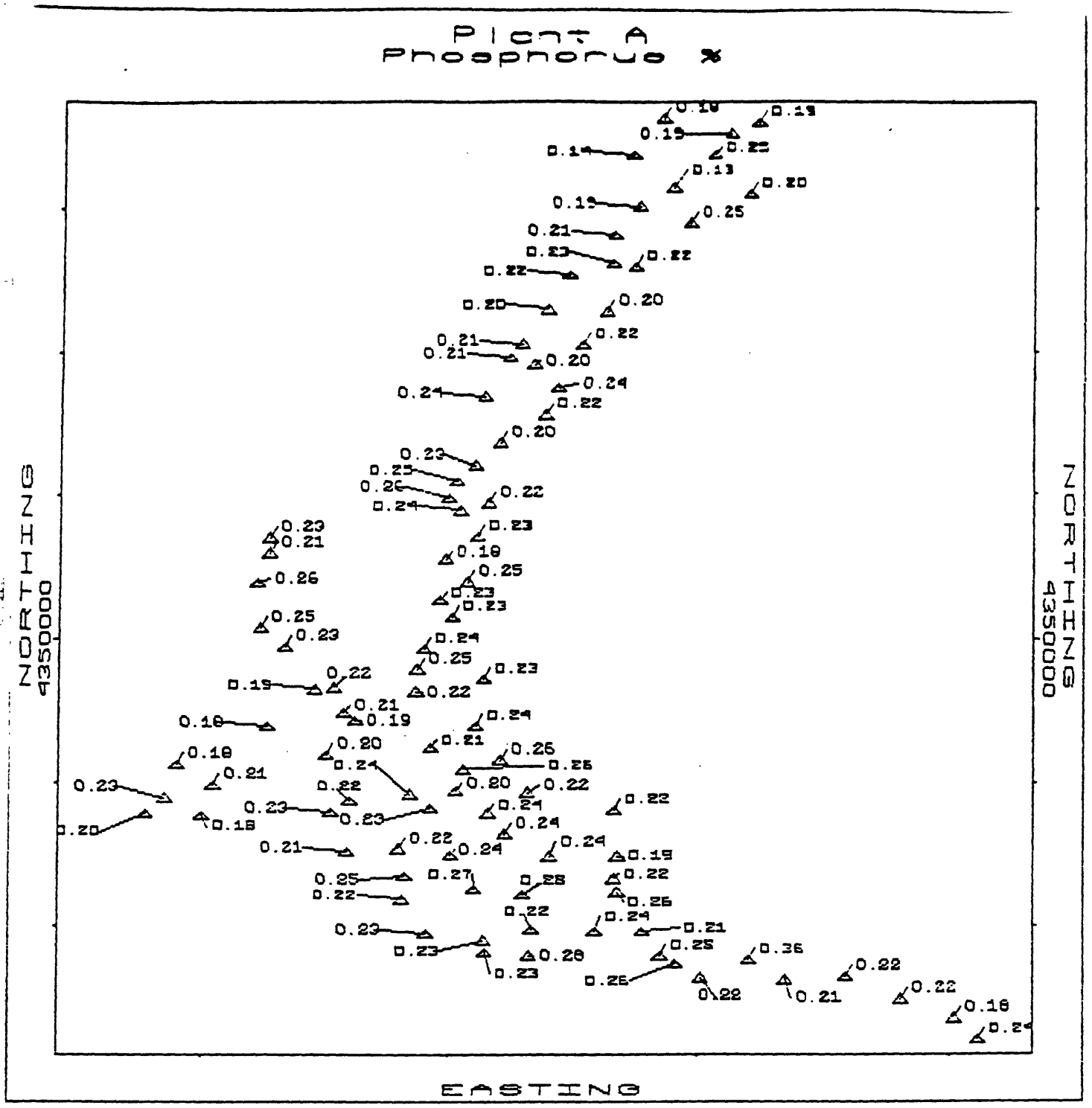

Figure 23.--Individual element plots, dry weight basis, for Sedge A (*Carex utriculata*) on the Leadville, Colorado wetland.

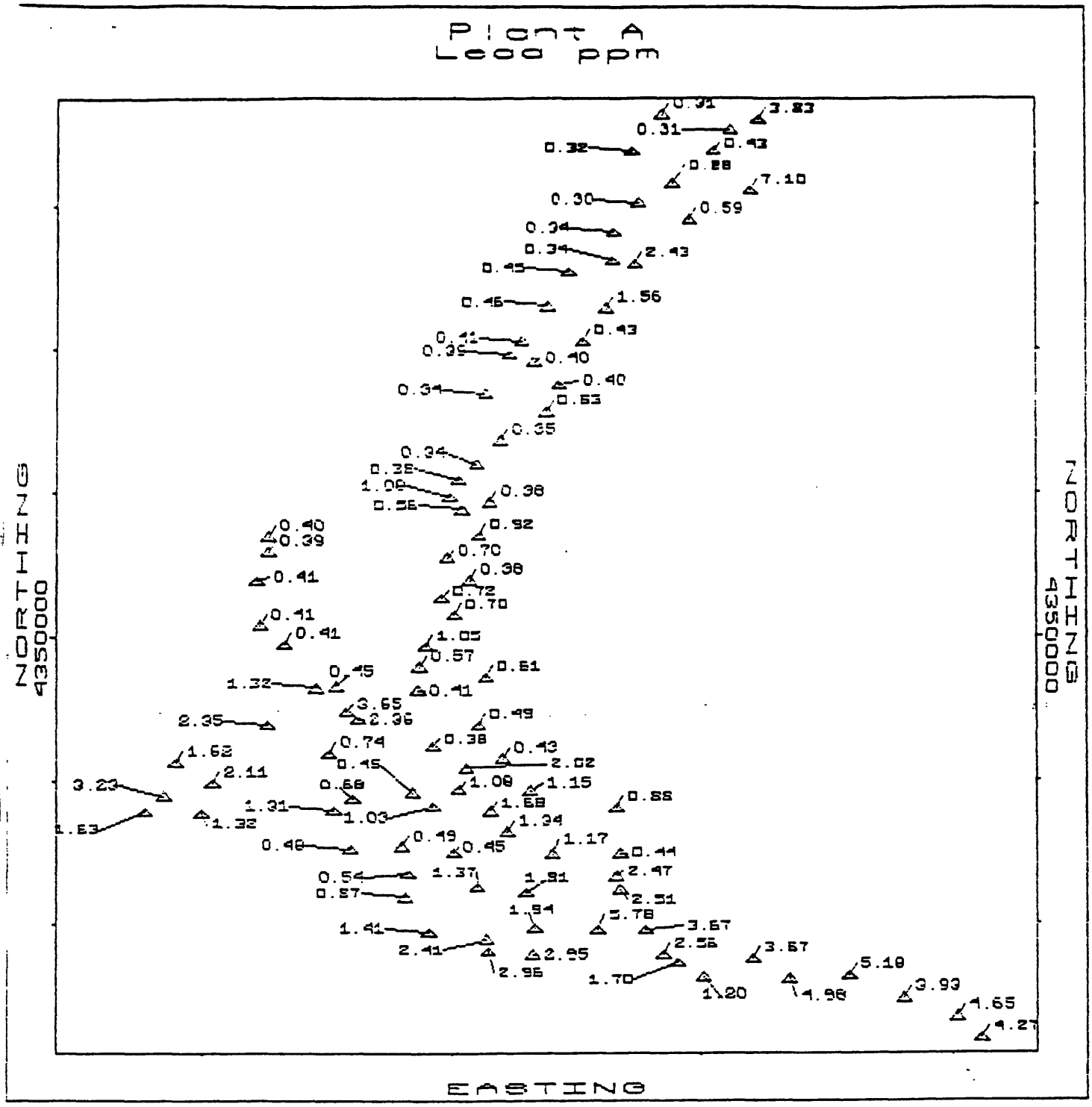

Figure 24.--Individual element plots, dry weight basis, for Sedge A (*Carex utriculata*) on the Leadville, Colorado wetland.

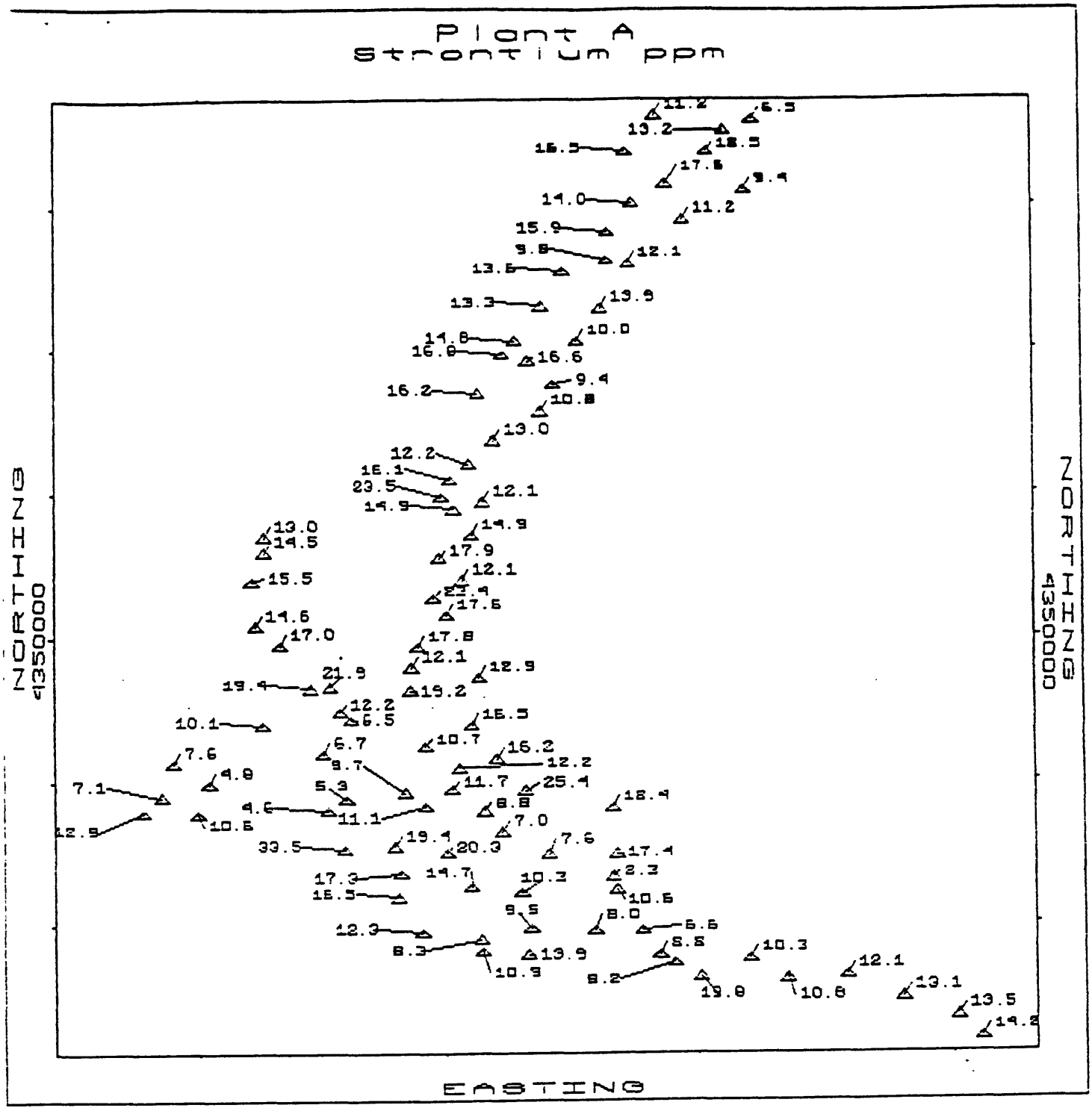

Figure 25.--Individual element plots, dry weight basis, for Sedge A (*Carex utriculata*) on the Leadville, Colorado wetland.

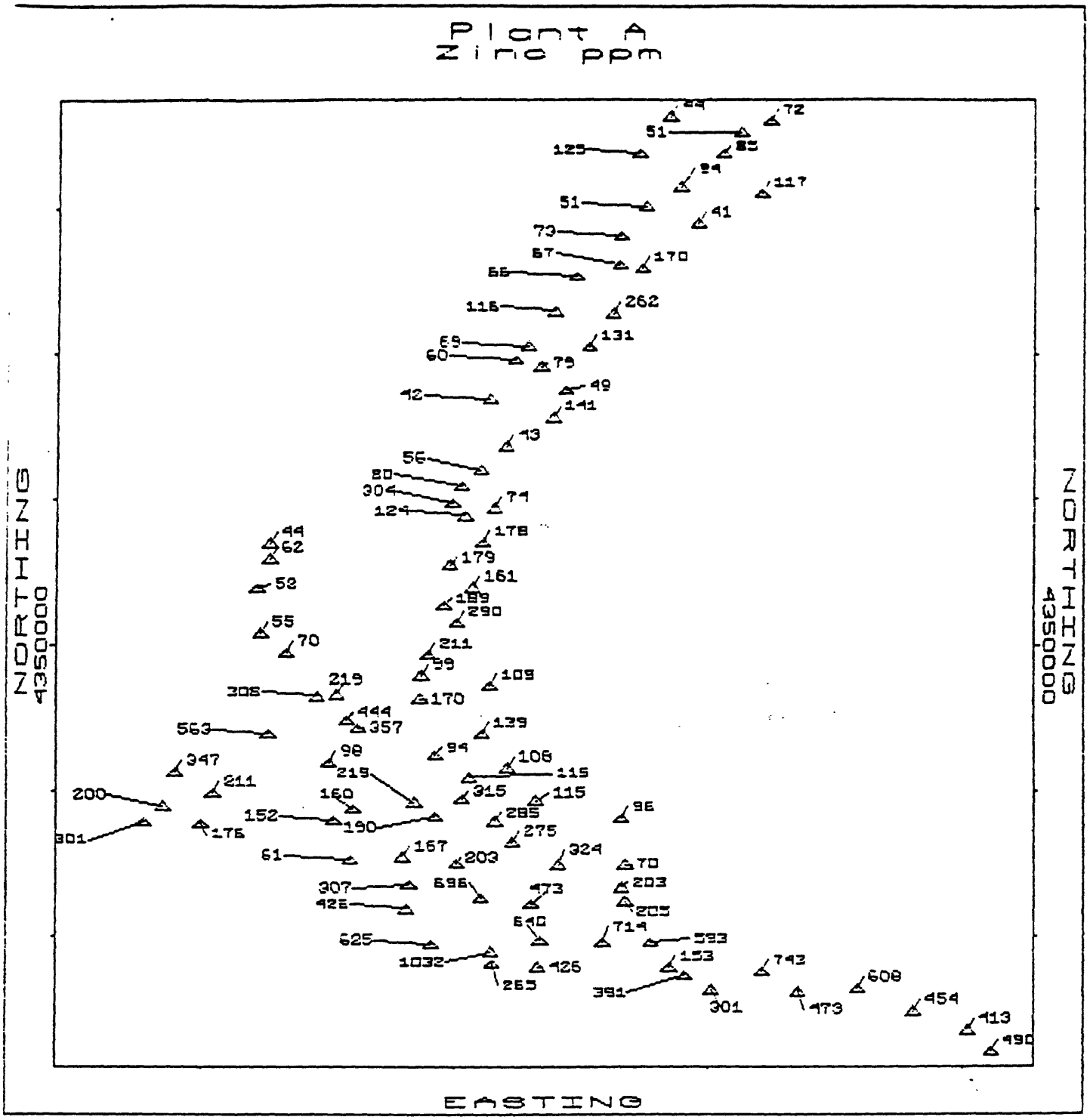

Figure 26.--Individual element plots, dry weight basis, for Sedge A (*Carex utriculata*) on the Leadville, Colorado wetland.

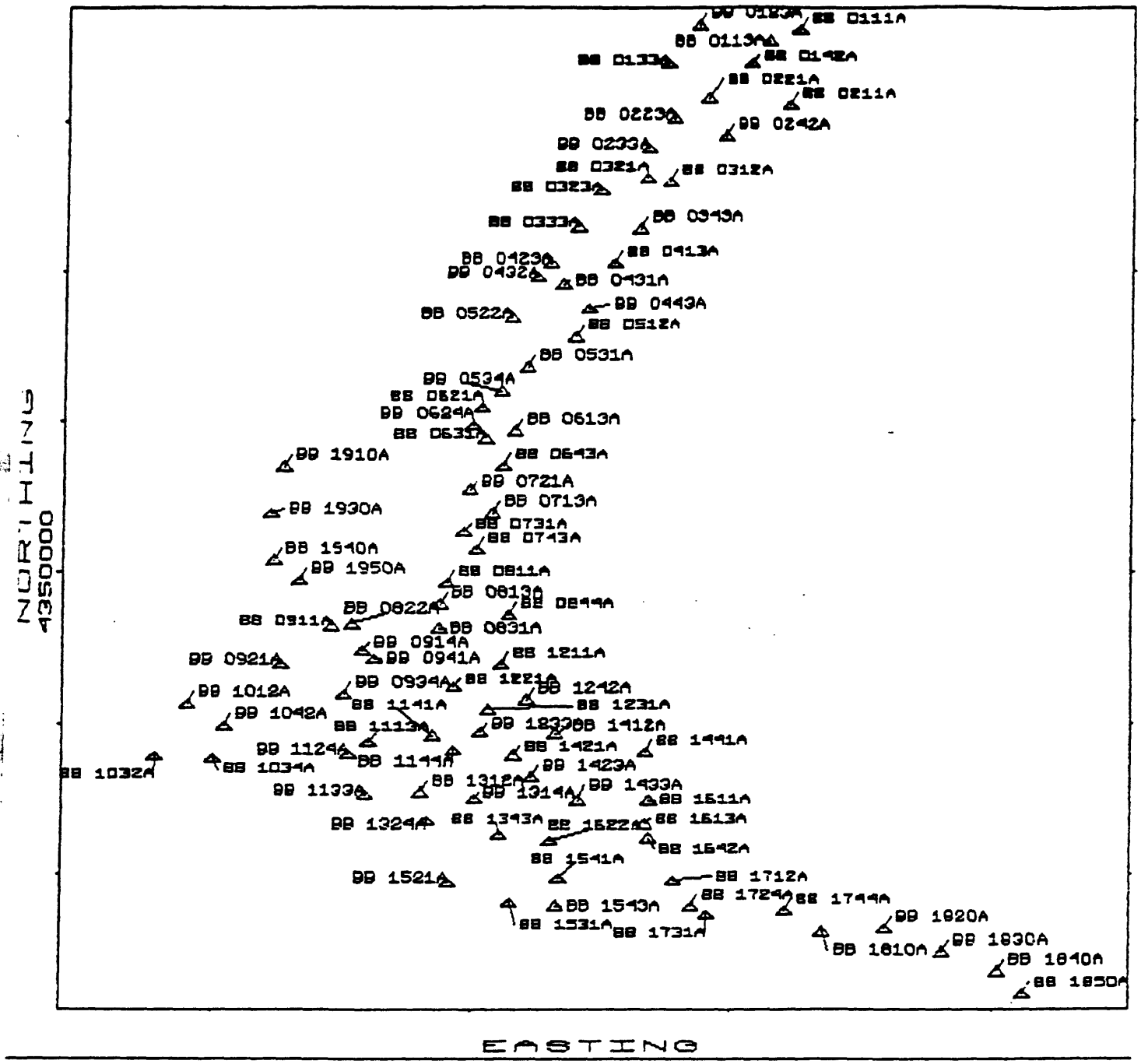

Figure 27.--Individual element plots, dry weight basis, for Sedge B (*Carex canescens*) on the Leadville, Colorado wetland.

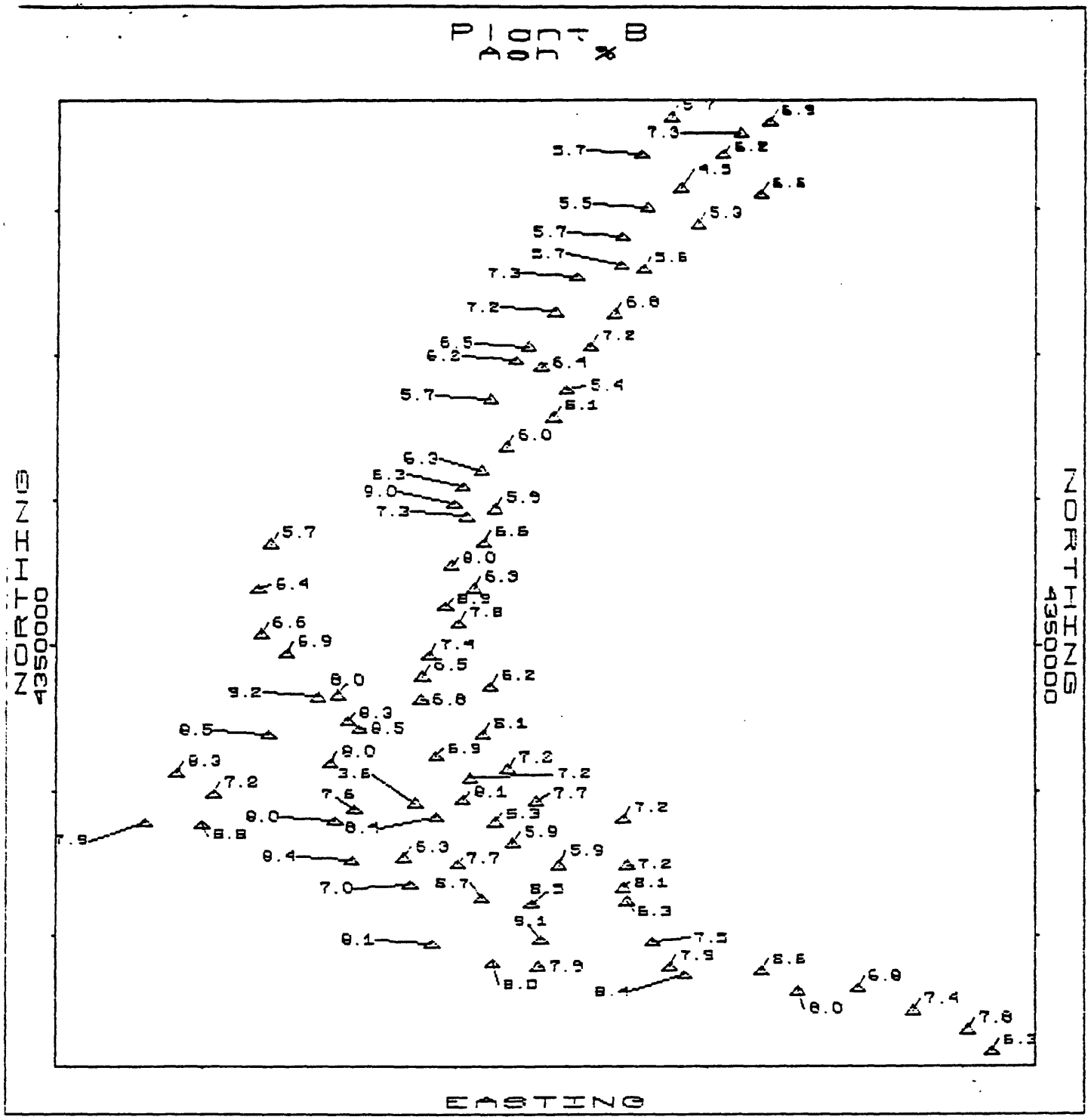

Figure 28.--Individual element plots, dry weight basis, for Sedge B (*Carex canescens*) on the Leadville, Colorado wetland.

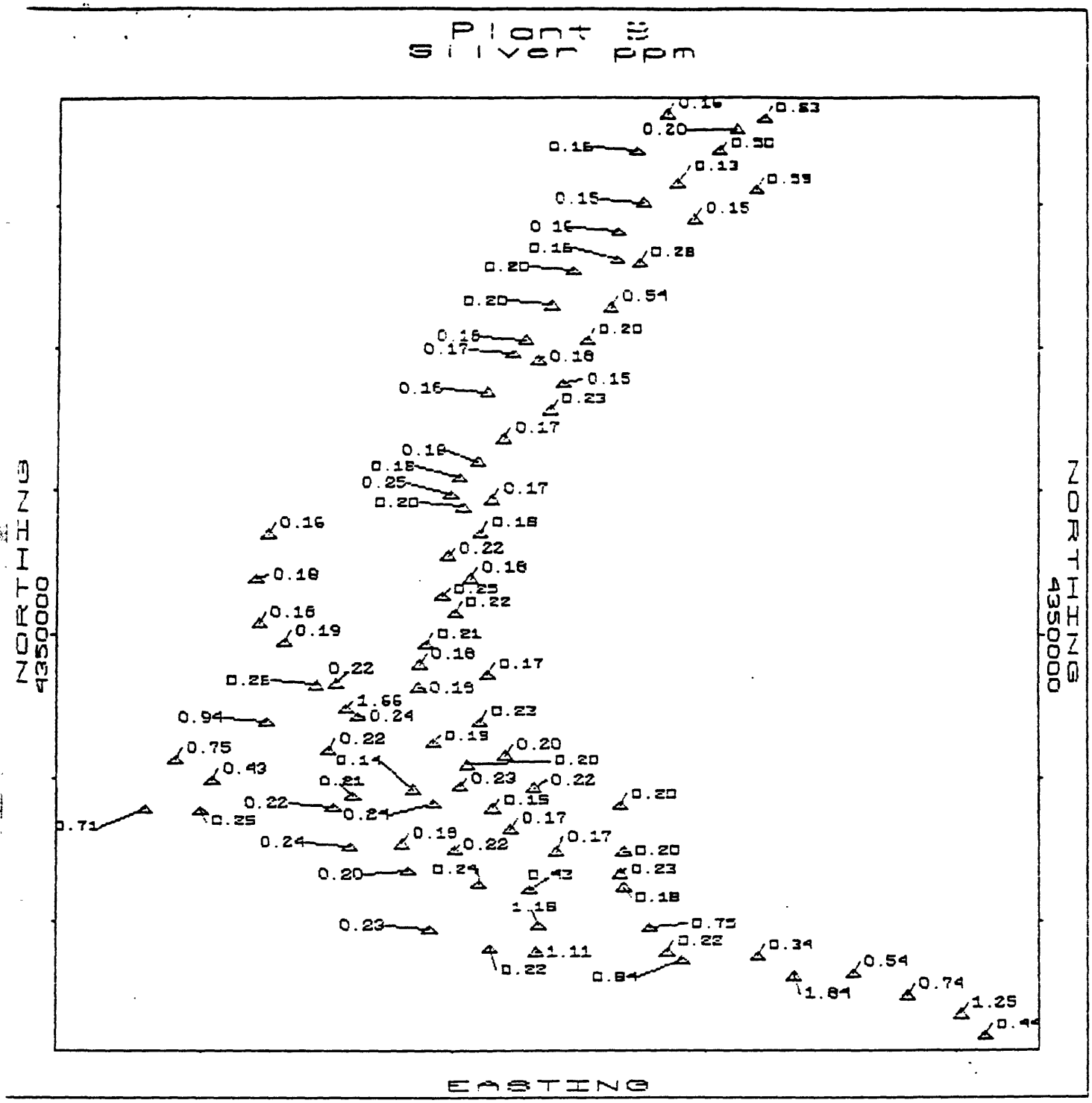

Figure 29.--Individual element plots, dry weight basis, for Sedge B (*Carex canescens*) on the Leadville, Colorado wetland.

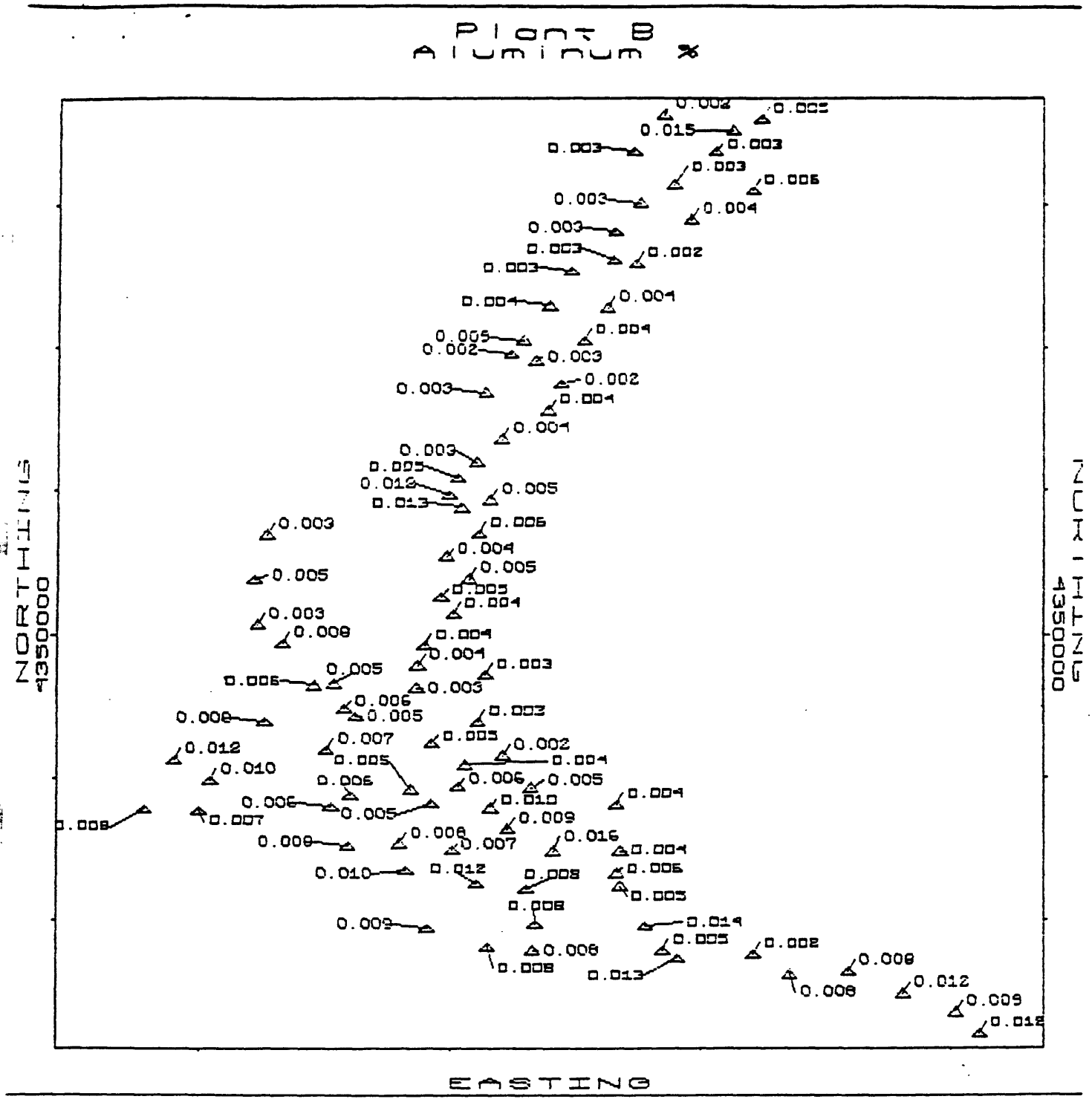

Figure 30.--Individual element plots, dry weight basis, for Sedge B (*Carex canescens*) on the Leadville, Colorado wetland.

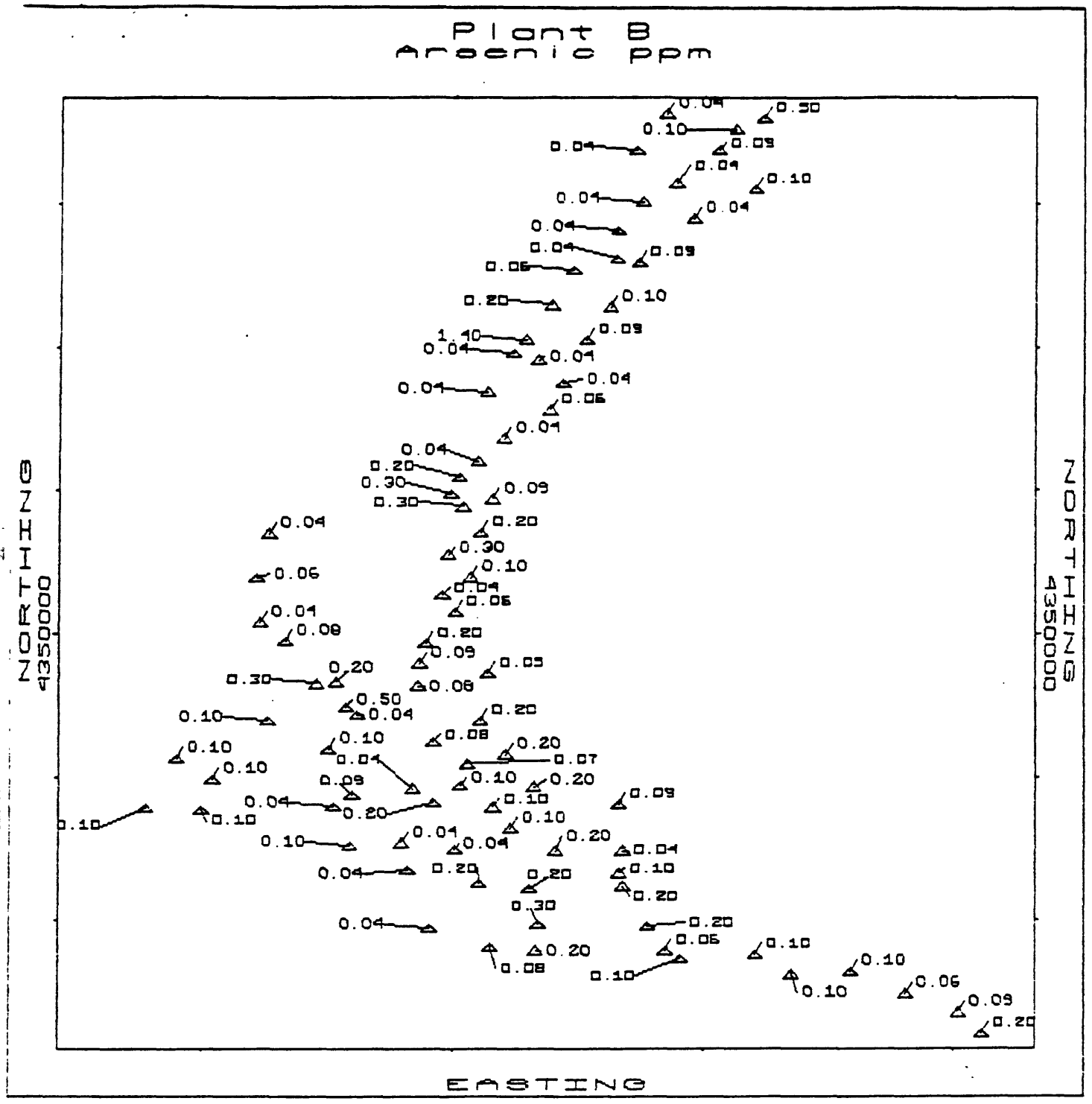

Figure 31.--Individual element plots, dry weight basis, for Sedge B (*Carex canescens*) on the Leadville, Colorado wetland.

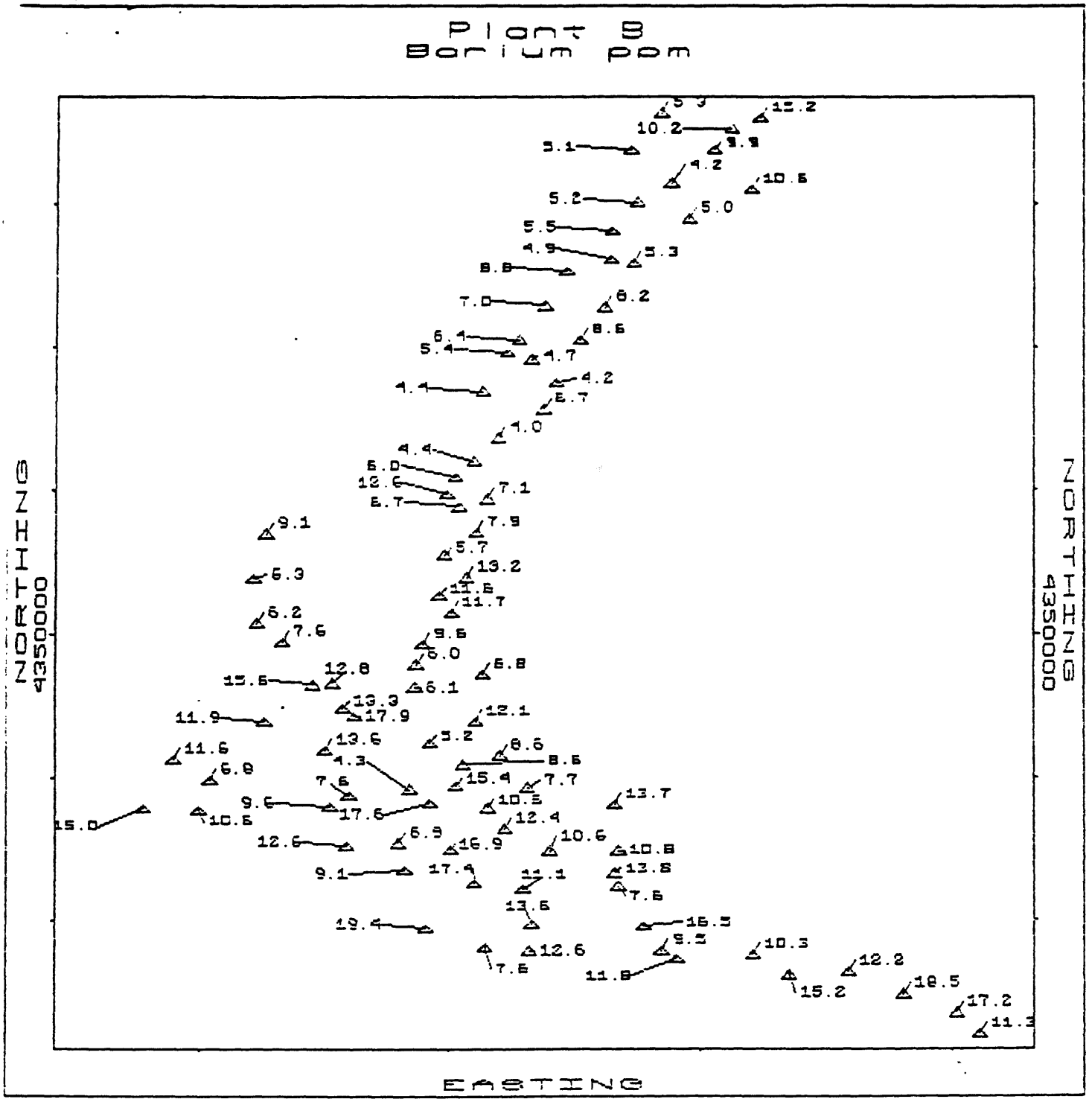

Figure 32.--Individual element plots, dry weight basis, for Sedge B (*Carex canescens*) on the Leadville, Colorado wetland.

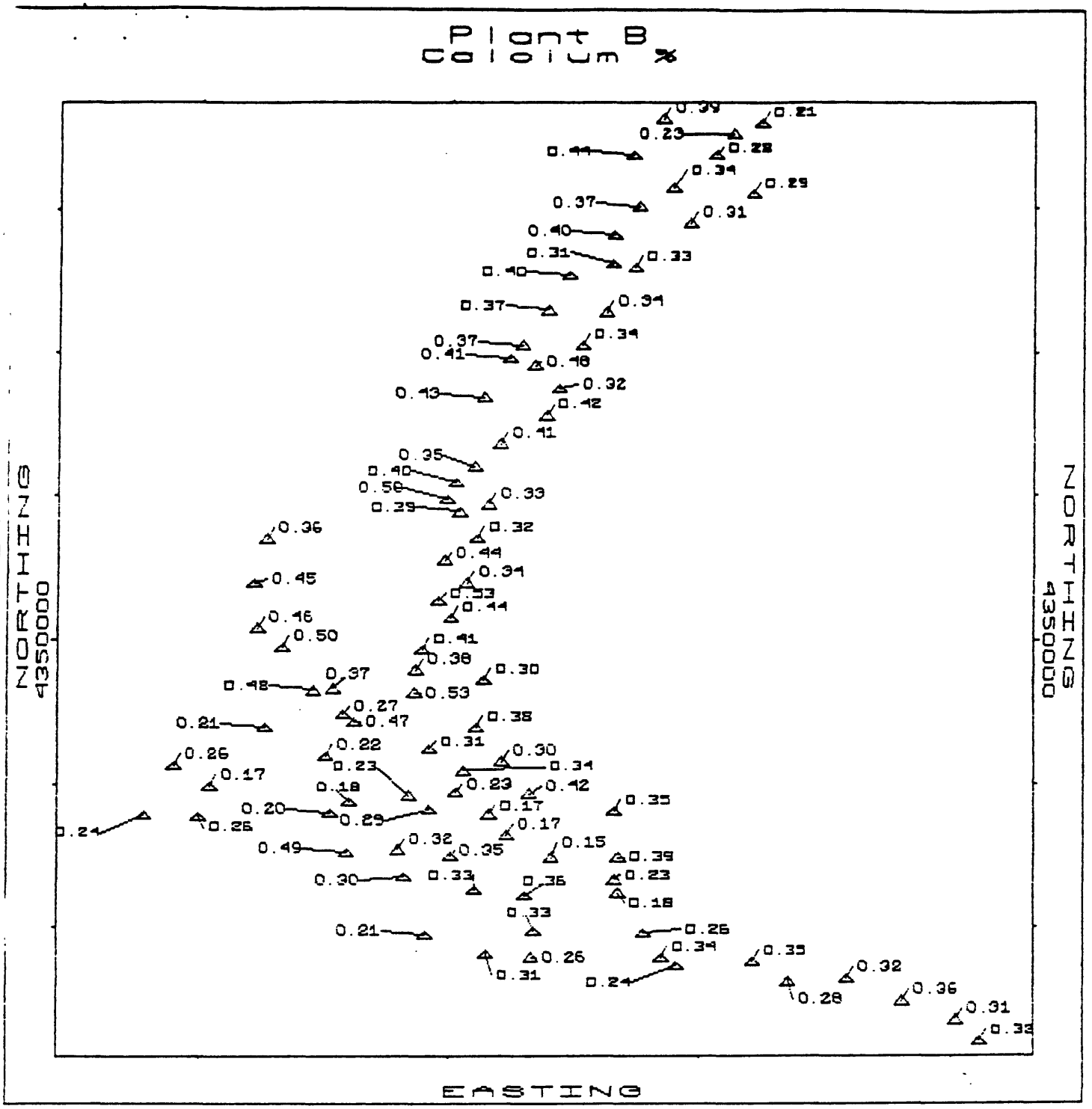

Figure 33.--Individual element plots, dry weight basis, for Sedge B (*Carex canescens*) on the Leadville, Colorado wetland.

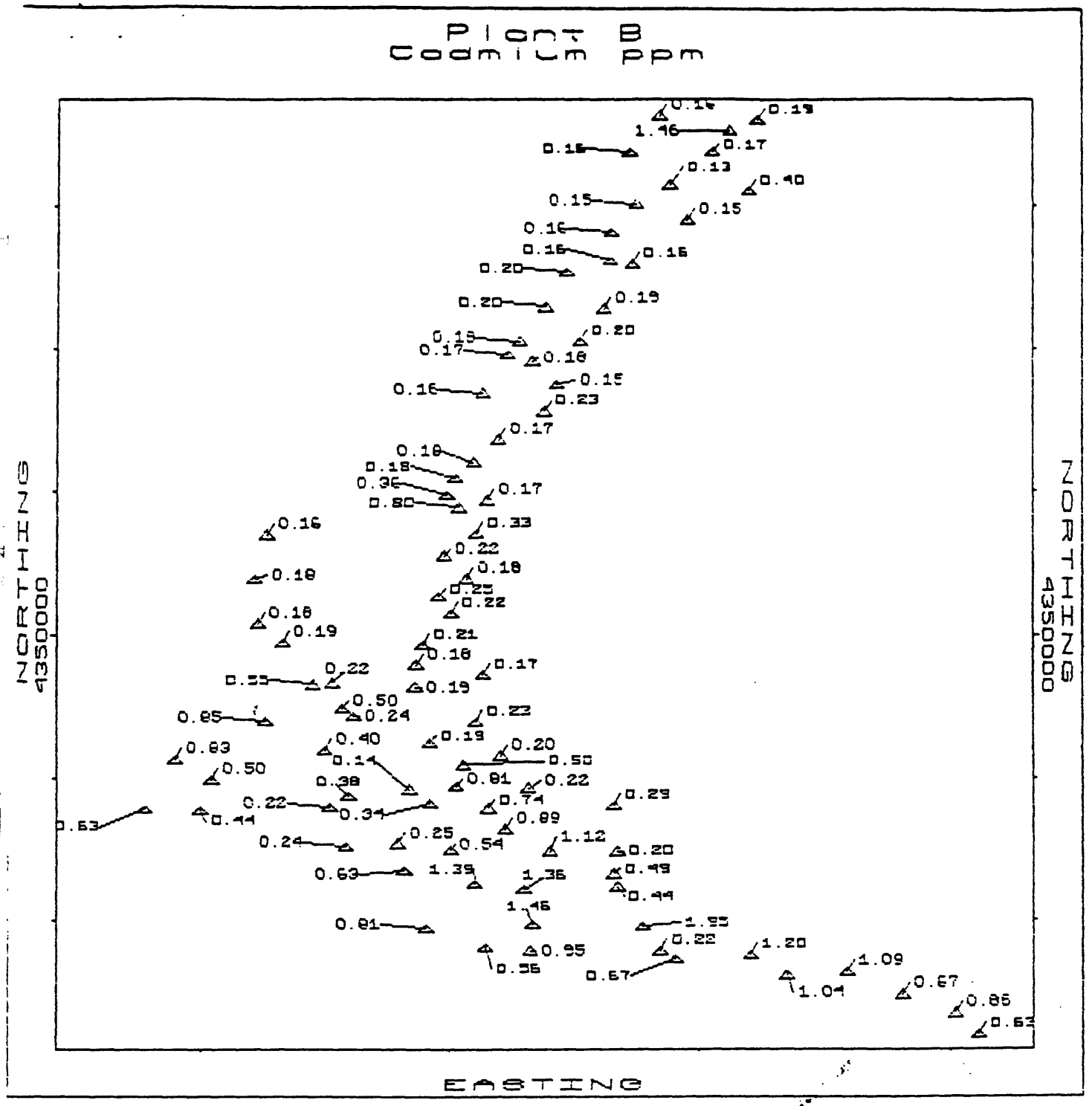

Figure 34.--Individual element plots, dry weight basis, for Sedge B (*Carex canescens*) on the Leadville, Colorado wetland.

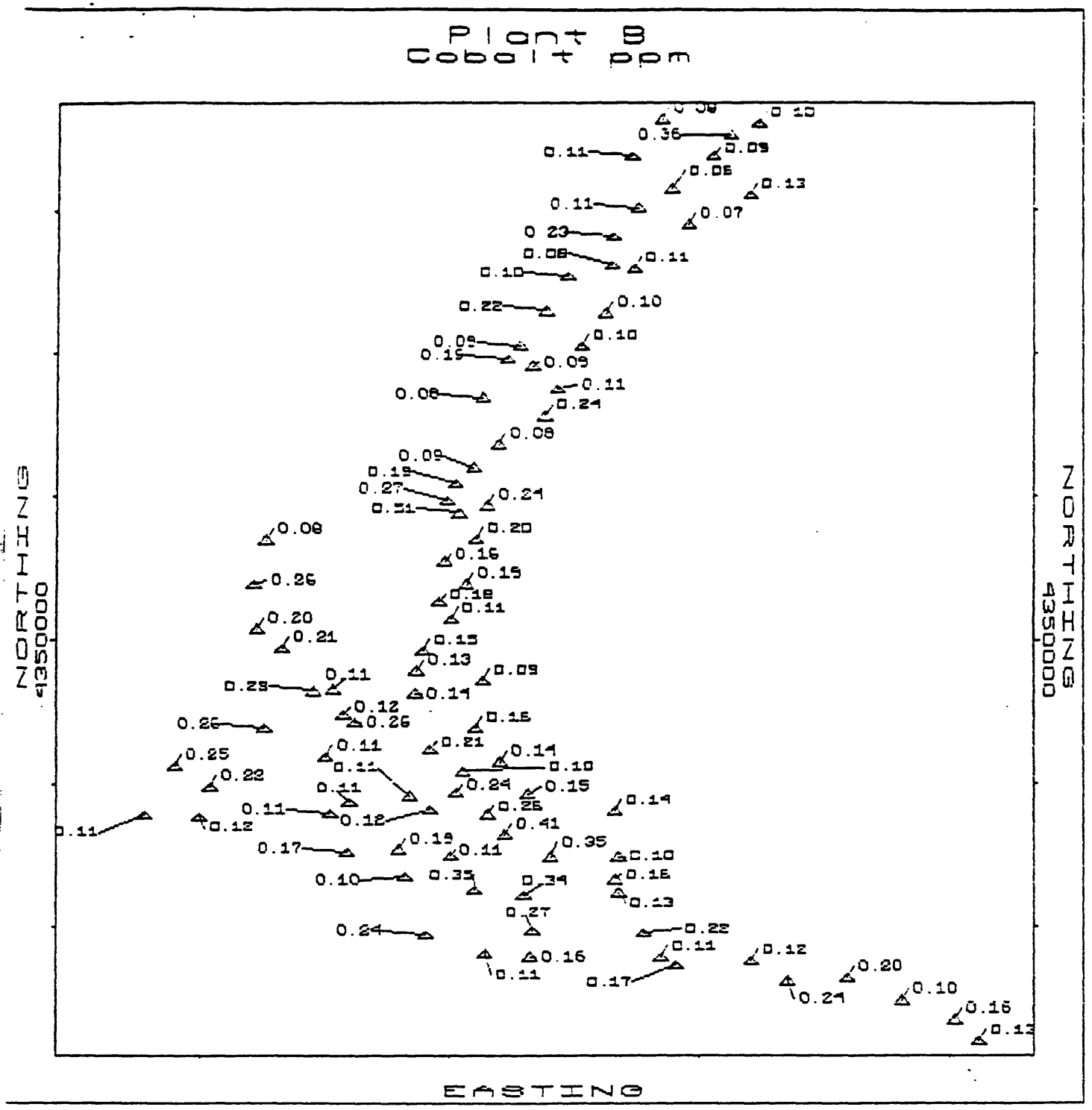

Figure 35.--Individual element plots, dry weight basis, for Sedge B (*Carex canescens*) on the Leadville, Colorado wetland.

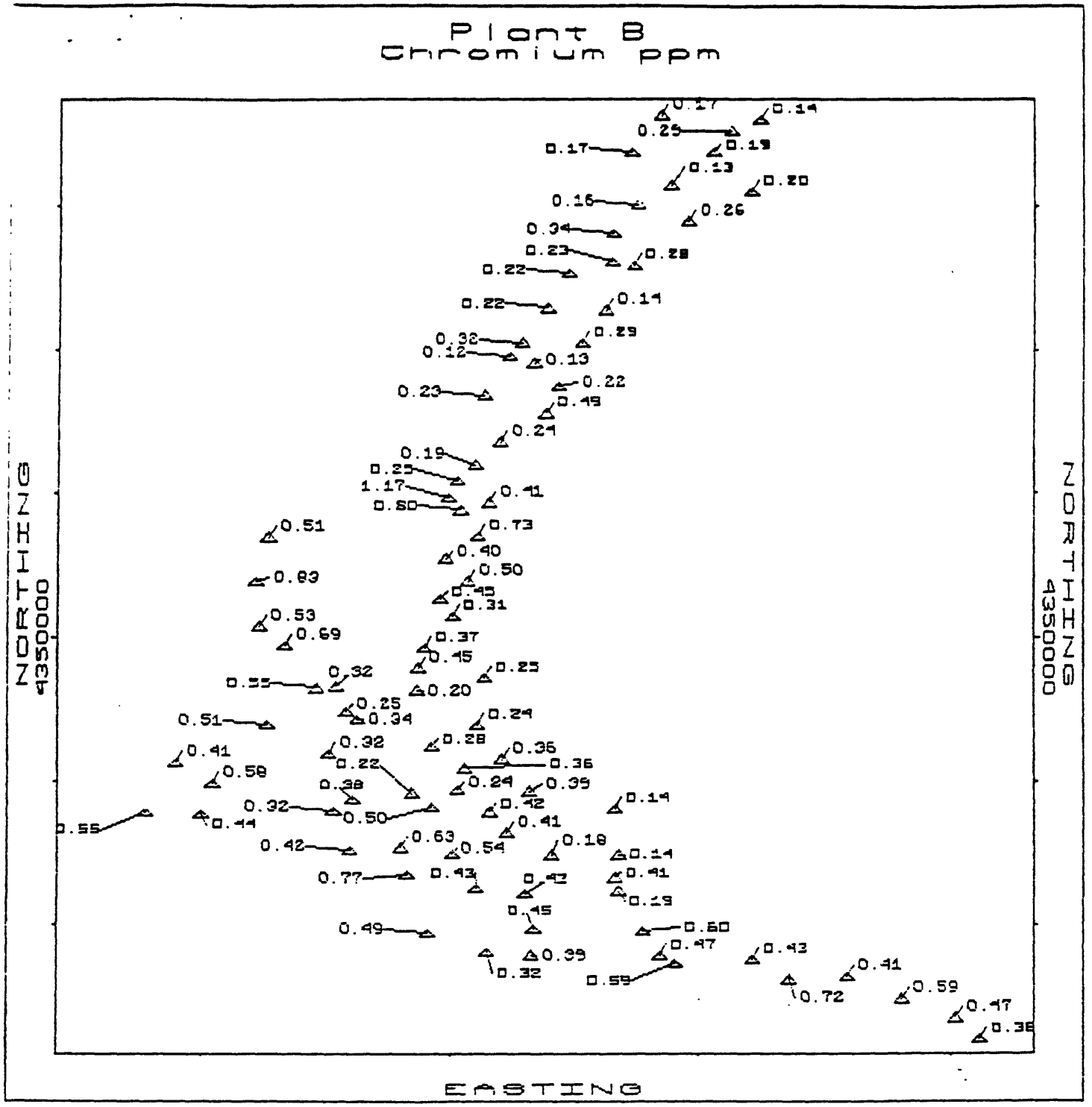

Figure 36.--Individual element plots, dry weight basis, for Sedge B (*Carex canescens*) on the Leadville, Colorado wetland.

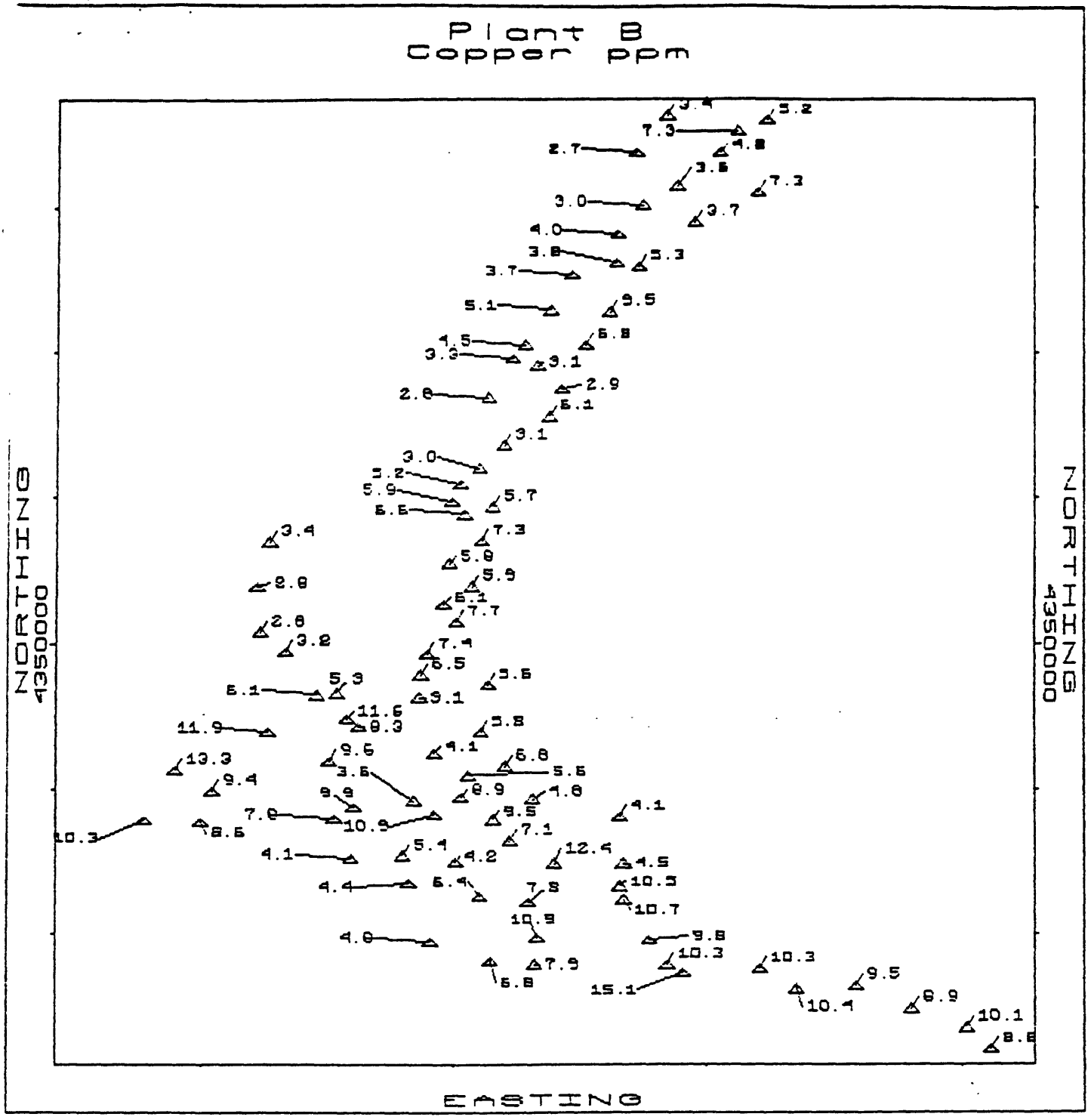

Figure 37.--Individual element plots, dry weight basis, for Sedge B (*Carex canescens*) on the Leadville, Colorado wetland.

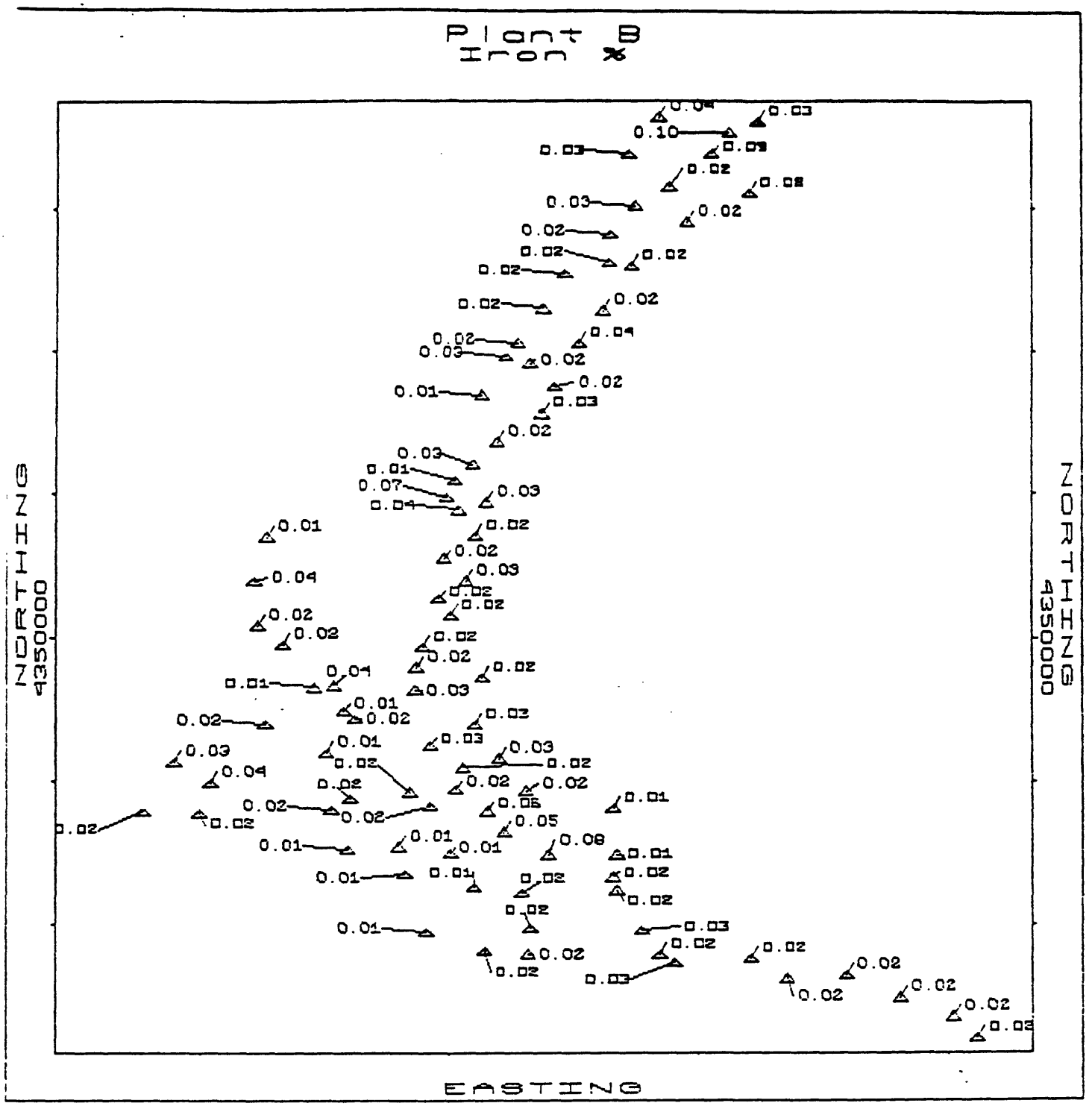

Figure 38.--Individual element plots, dry weight basis, for Sedge B (*Carex canescens*) on the Leadville, Colorado wetland.

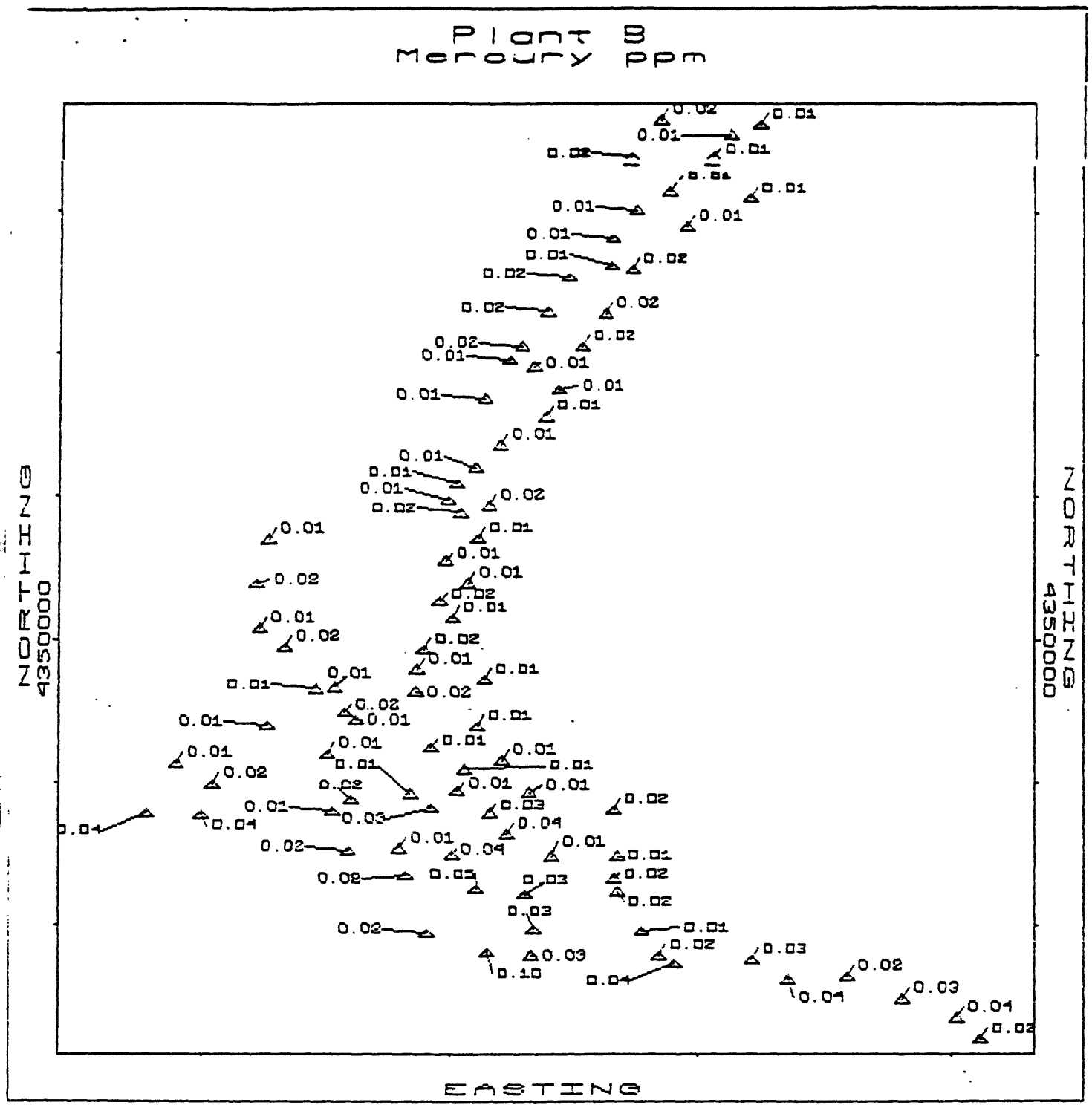

Figure 39.--Individual element plots, dry weight basis, for Sedge B (*Carex canescens*) on the Leadville, Colorado wetland.

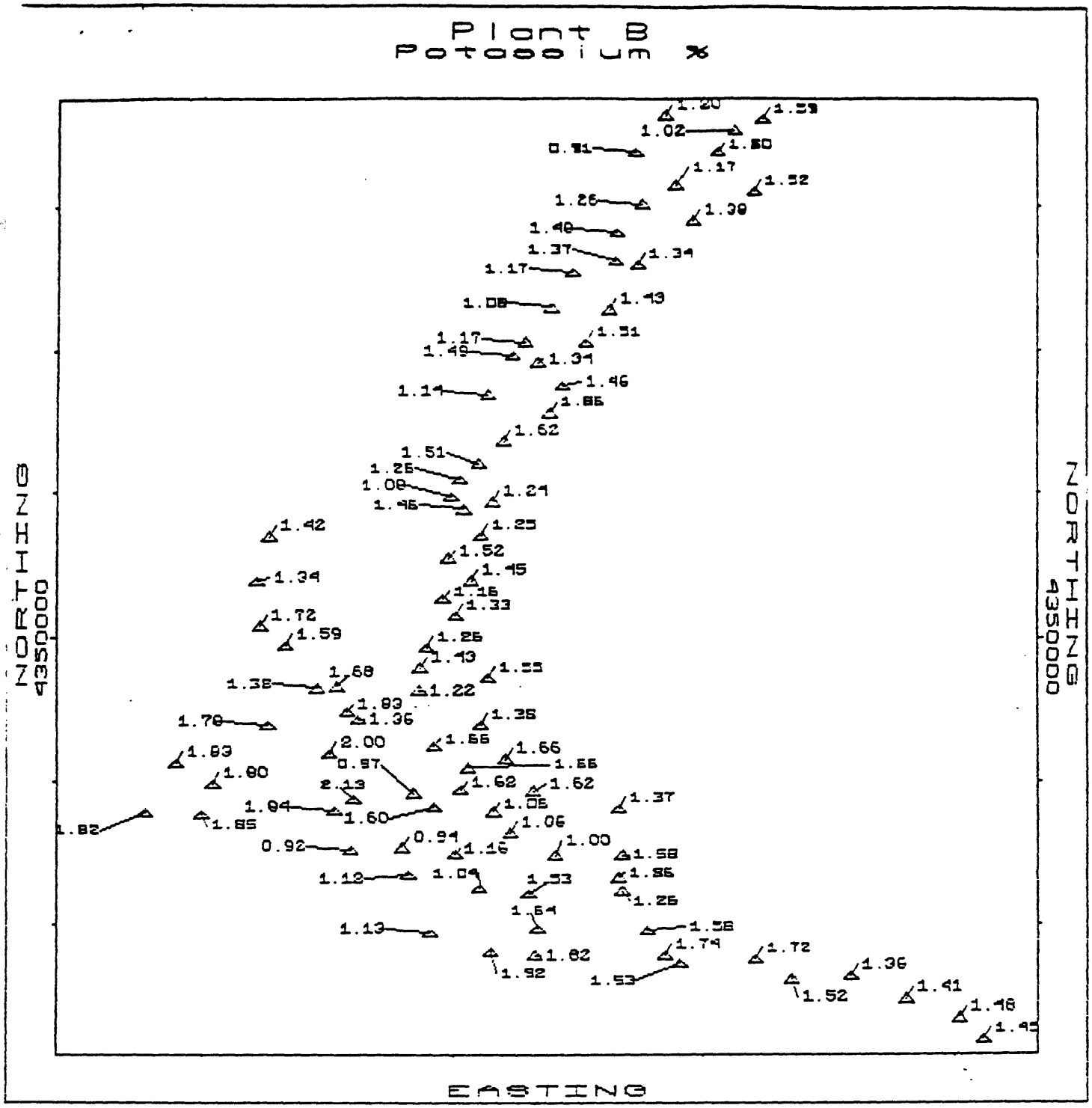

Figure 40.--Individual element plots, dry weight basis, for Sedge B (*Carex canescens*) on the Leadville, Colorado wetland.

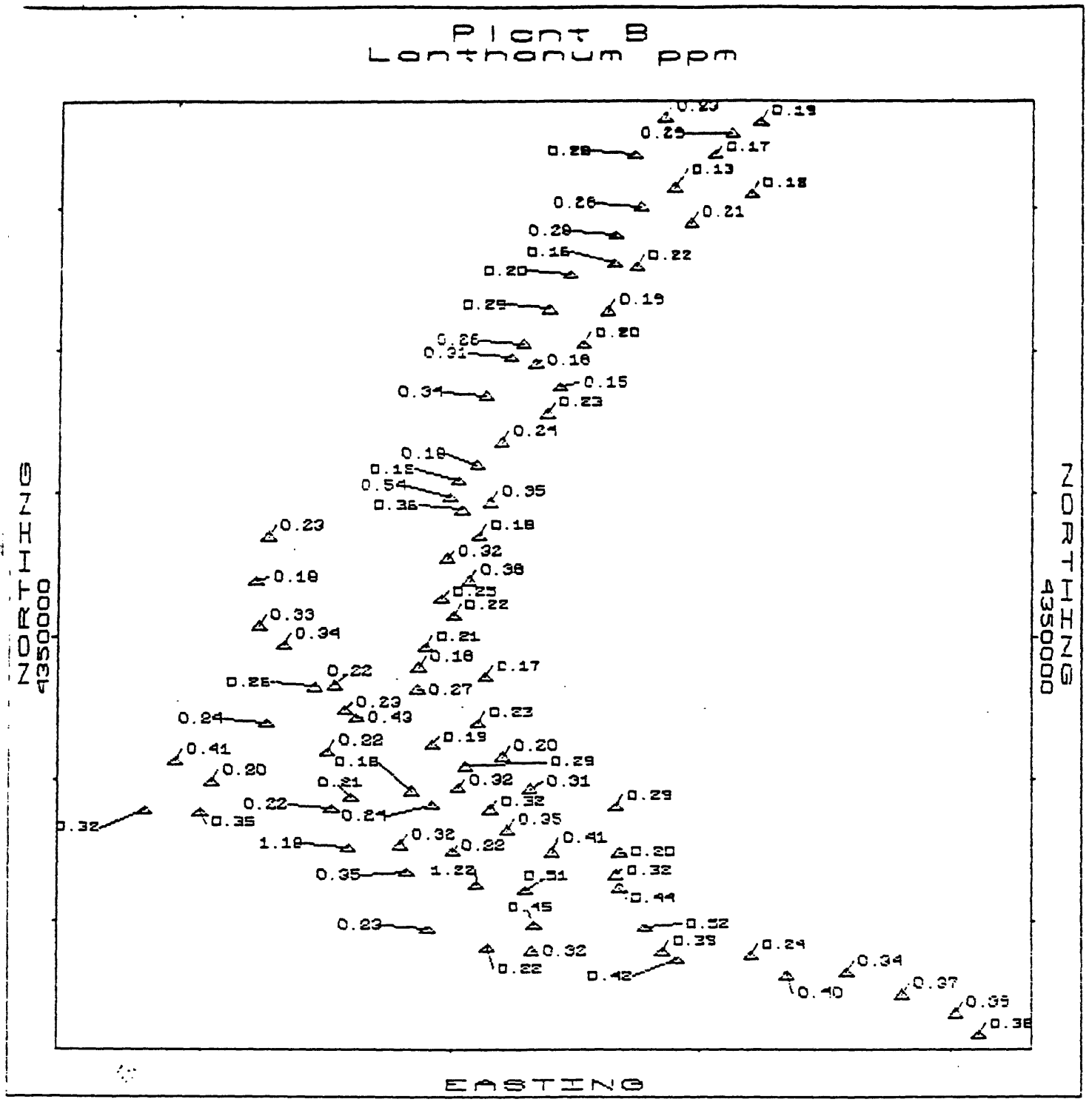

Figure 41.--Individual element plots, dry weight basis, for Sedge B (*Carex canescens*) on the Leadville, Colorado wetland.

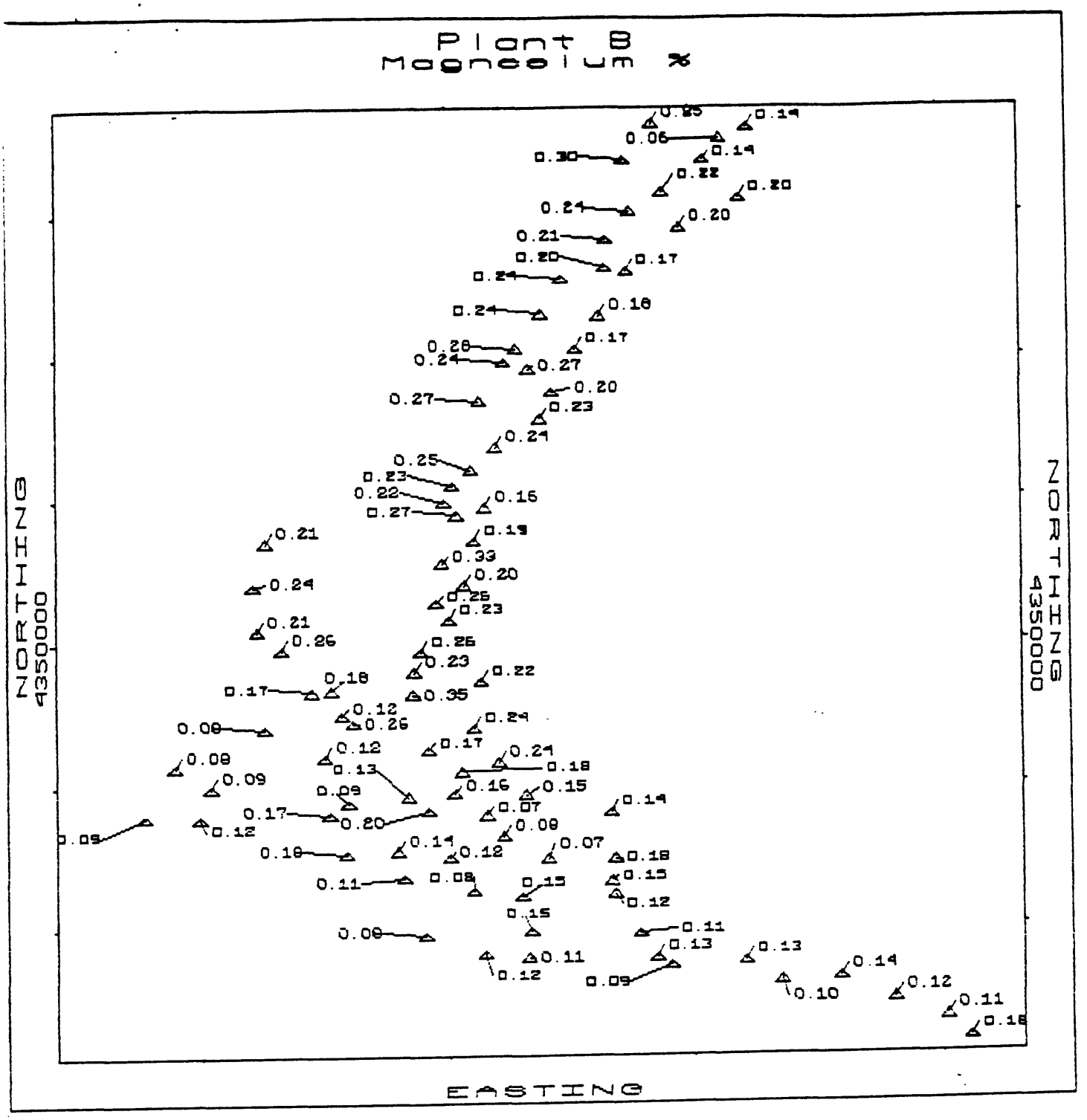

Figure 42.--Individual element plots, dry weight basis, for Sedge B (*Carex canescens*) on the Leadville, Colorado wetland.

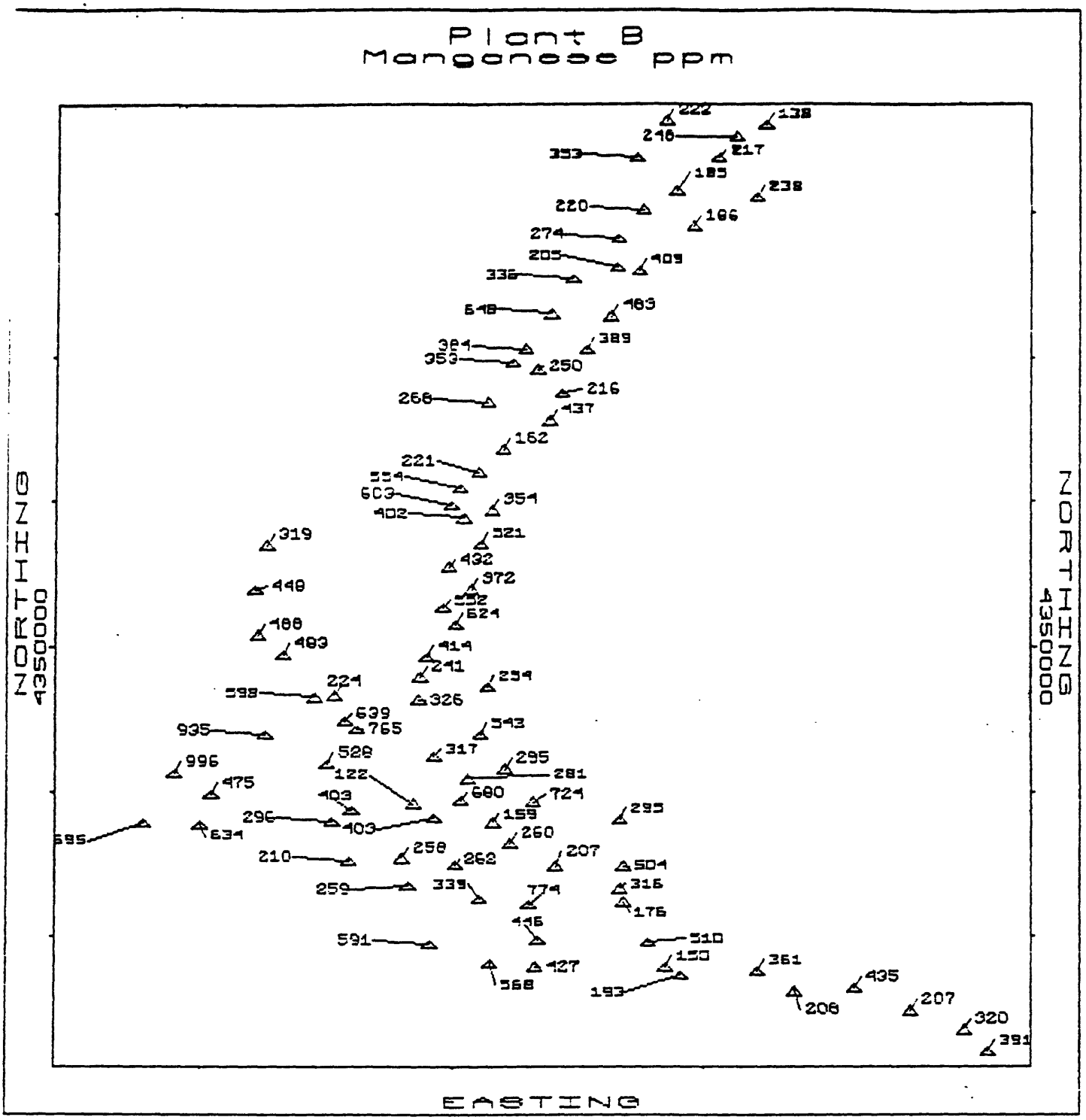

Figure 43.--Individual element plots, dry weight basis, for Sedge B (*Carex canescens*) on the Leadville, Colorado wetland.

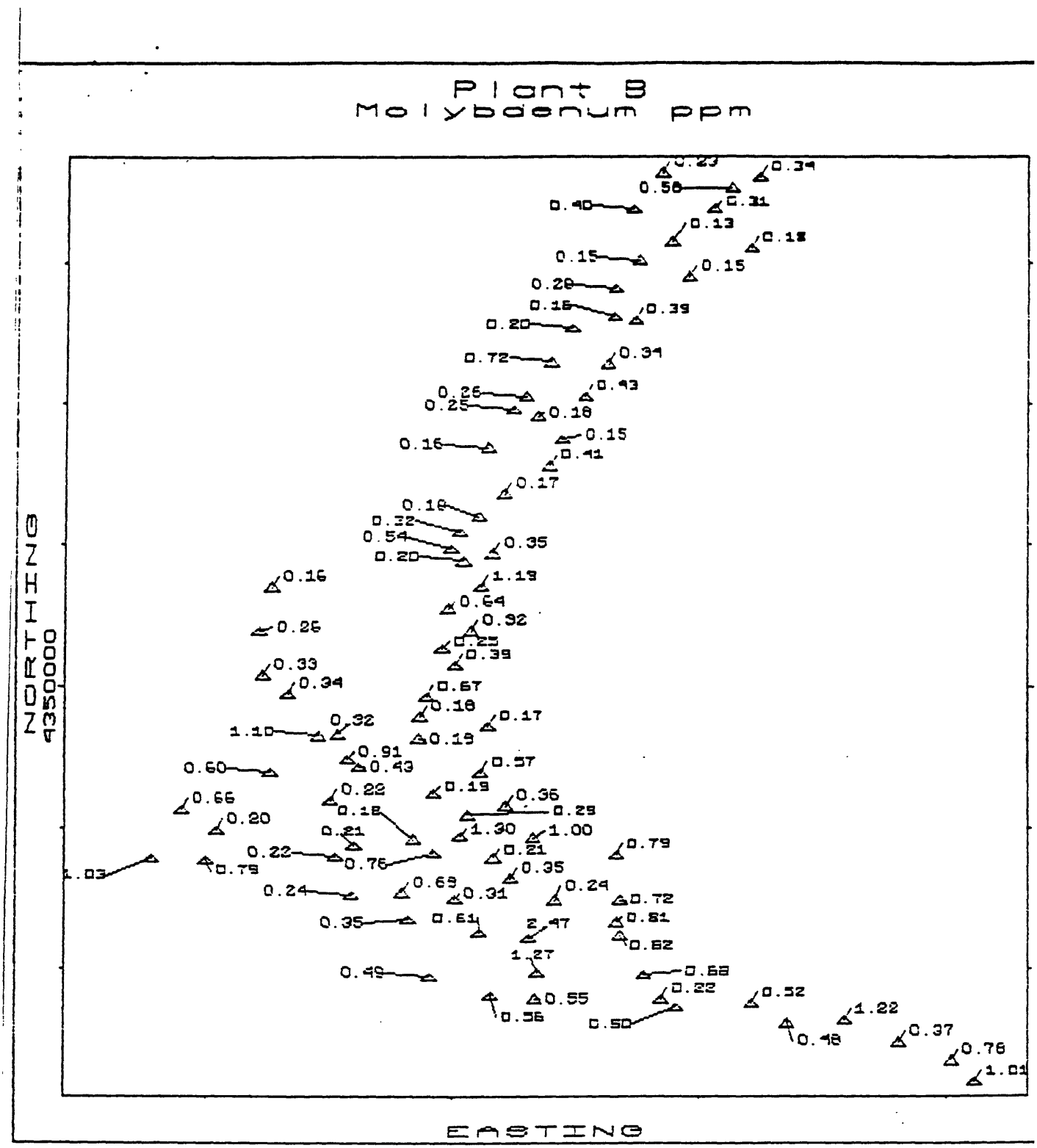

Figure 44.--Individual element plots, dry weight basis, for Sedge B (*Carex canescens*) on the Leadville, Colorado wetland.

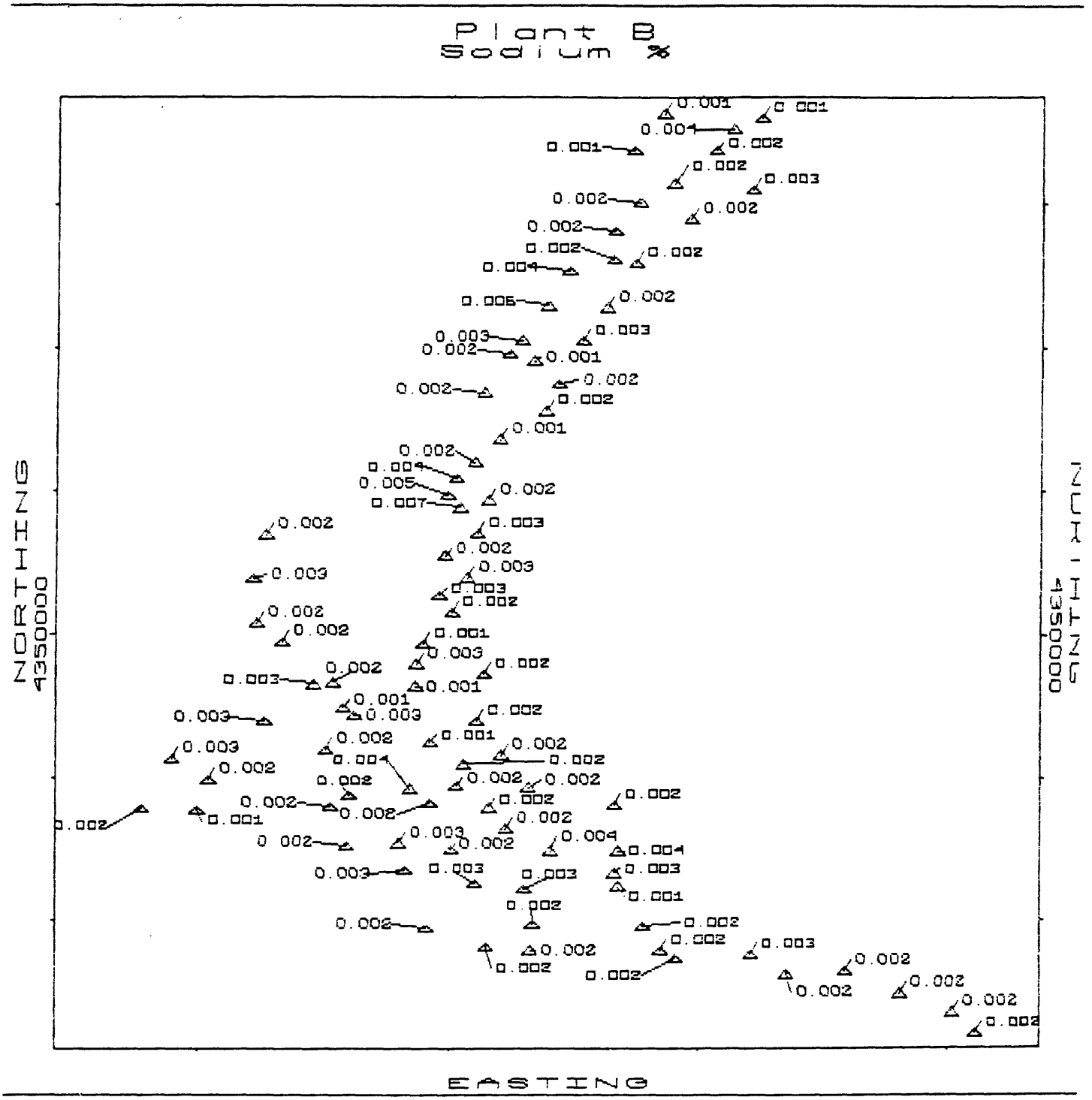

Figure 45.--Individual element plots, dry weight basis, for Sedge B (*Carex canescens*) on the Leadville, Colorado wetland.

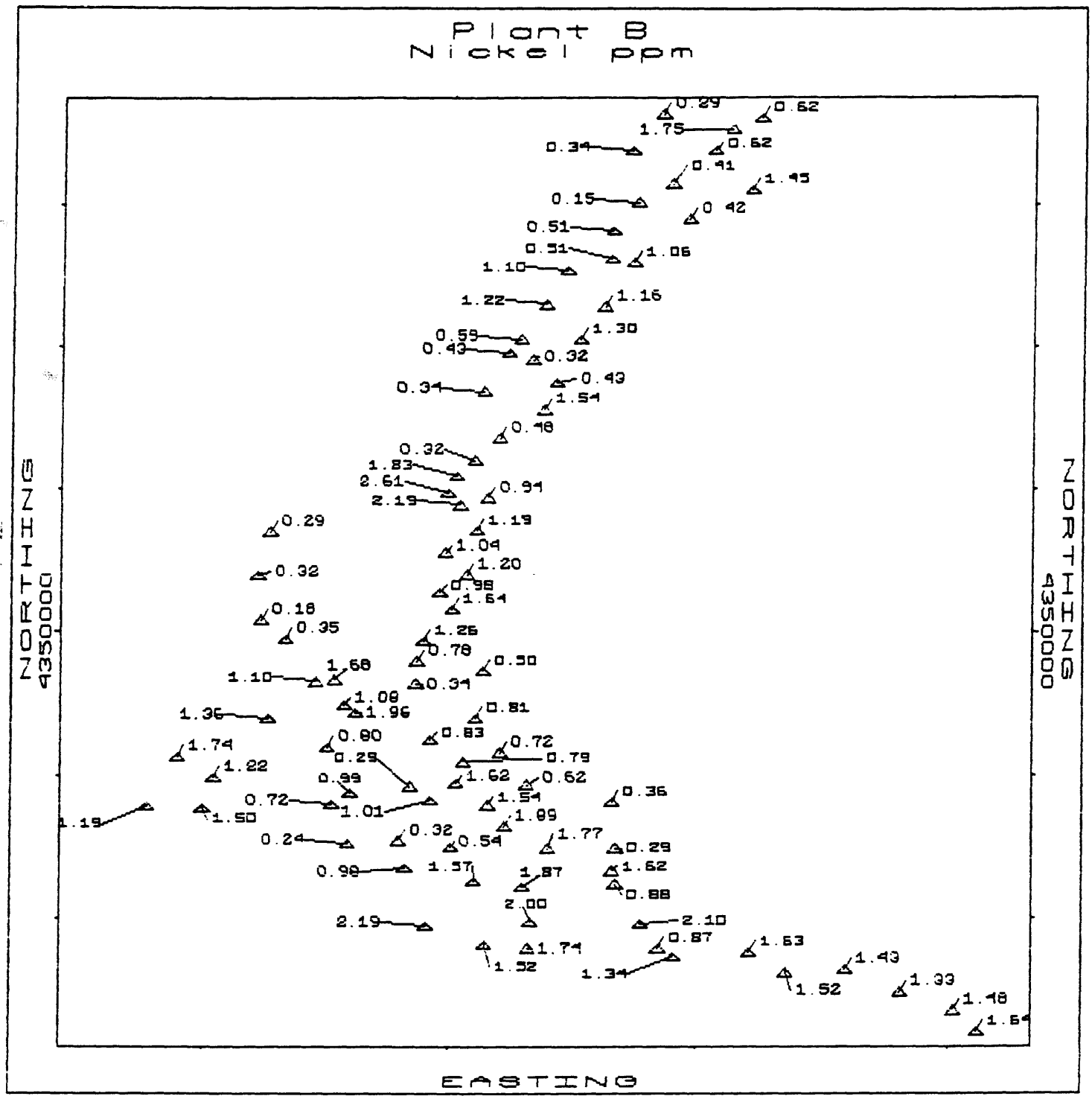

Figure 46.--Individual element plots, dry weight basis, for Sedge B (*Carex canescens*) on the Leadville, Colorado wetland.

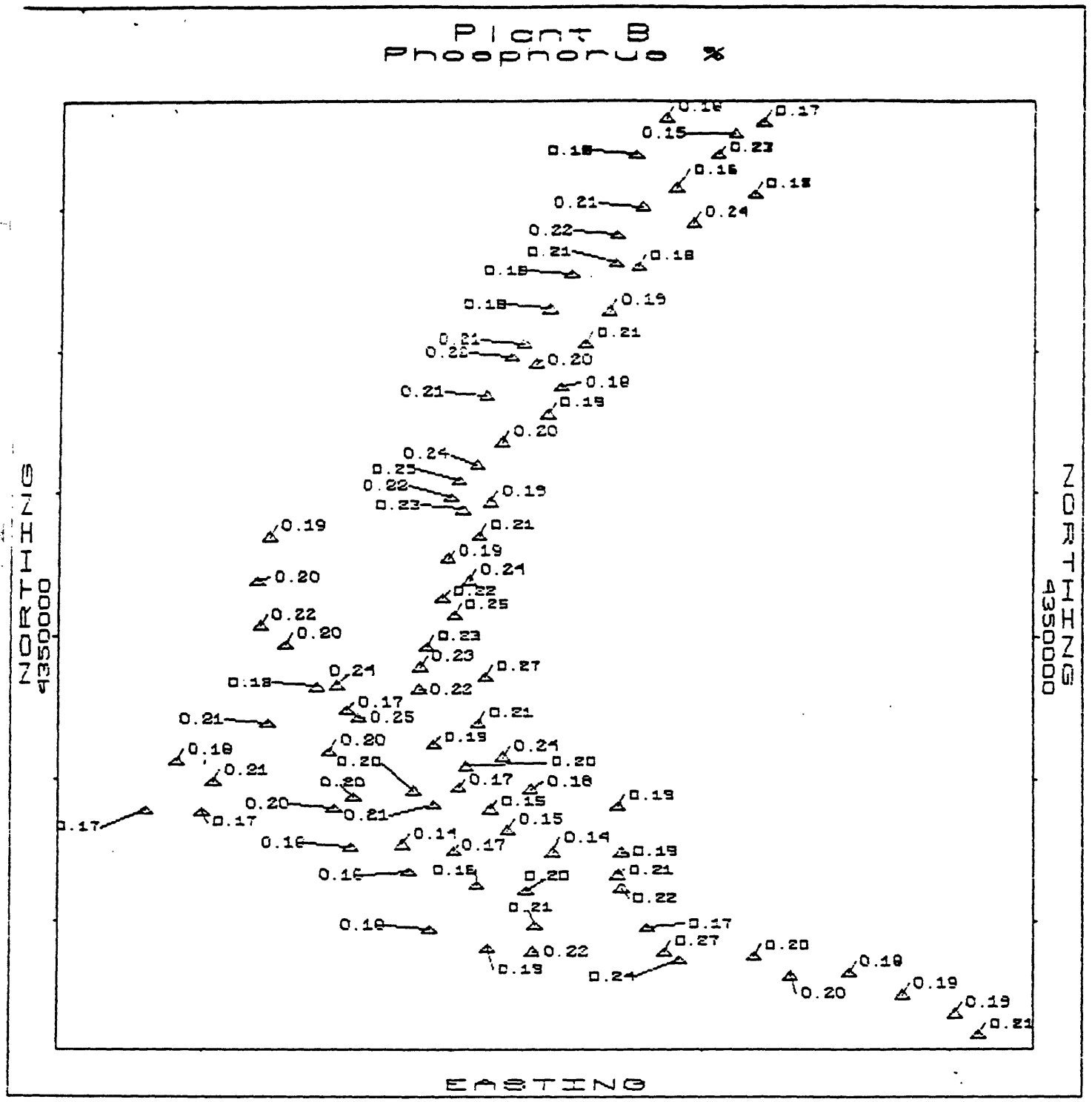

Figure 47.--Individual element plots, dry weight basis, for Sedge B (*Carex canescens*) on the Leadville, Colorado wetland.

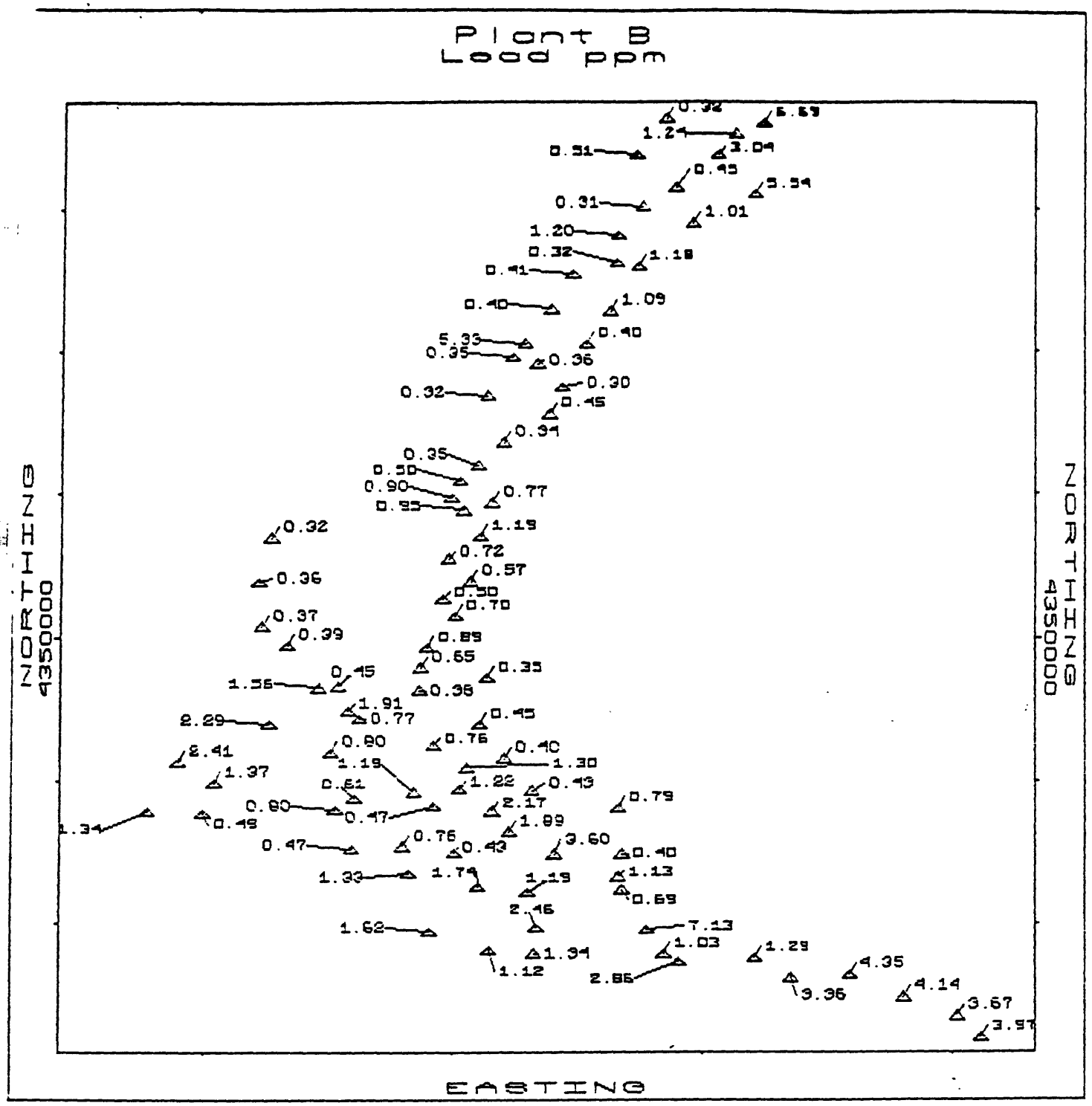

Figure 48.--Individual element plots, dry weight basis, for Sedge B (*Carex canescens*) on the Leadville, Colorado wetland.

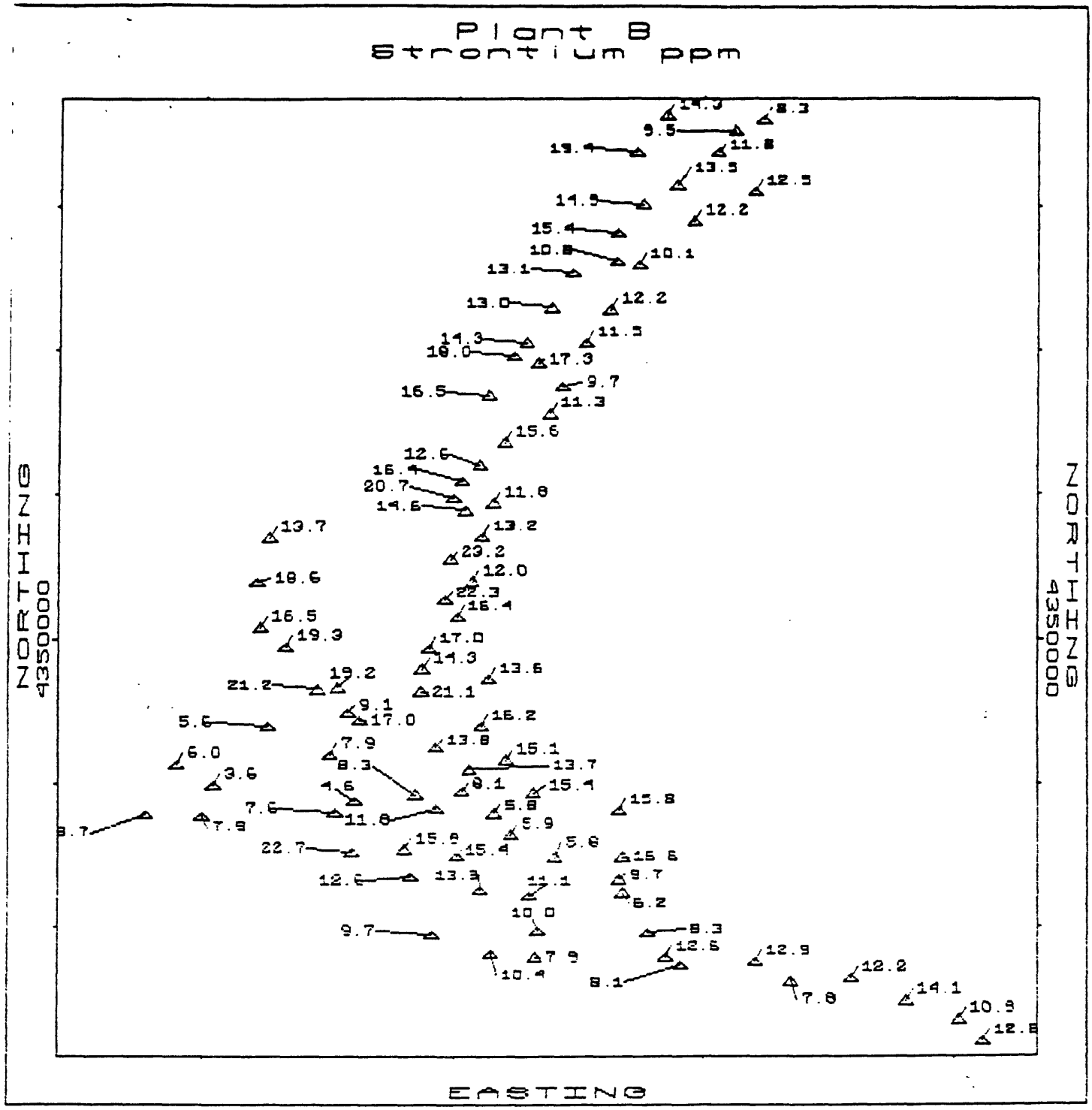

Figure 49.--Individual element plots, dry weight basis, for Sedge B (*Carex canescens*) on the Leadville, Colorado wetland.

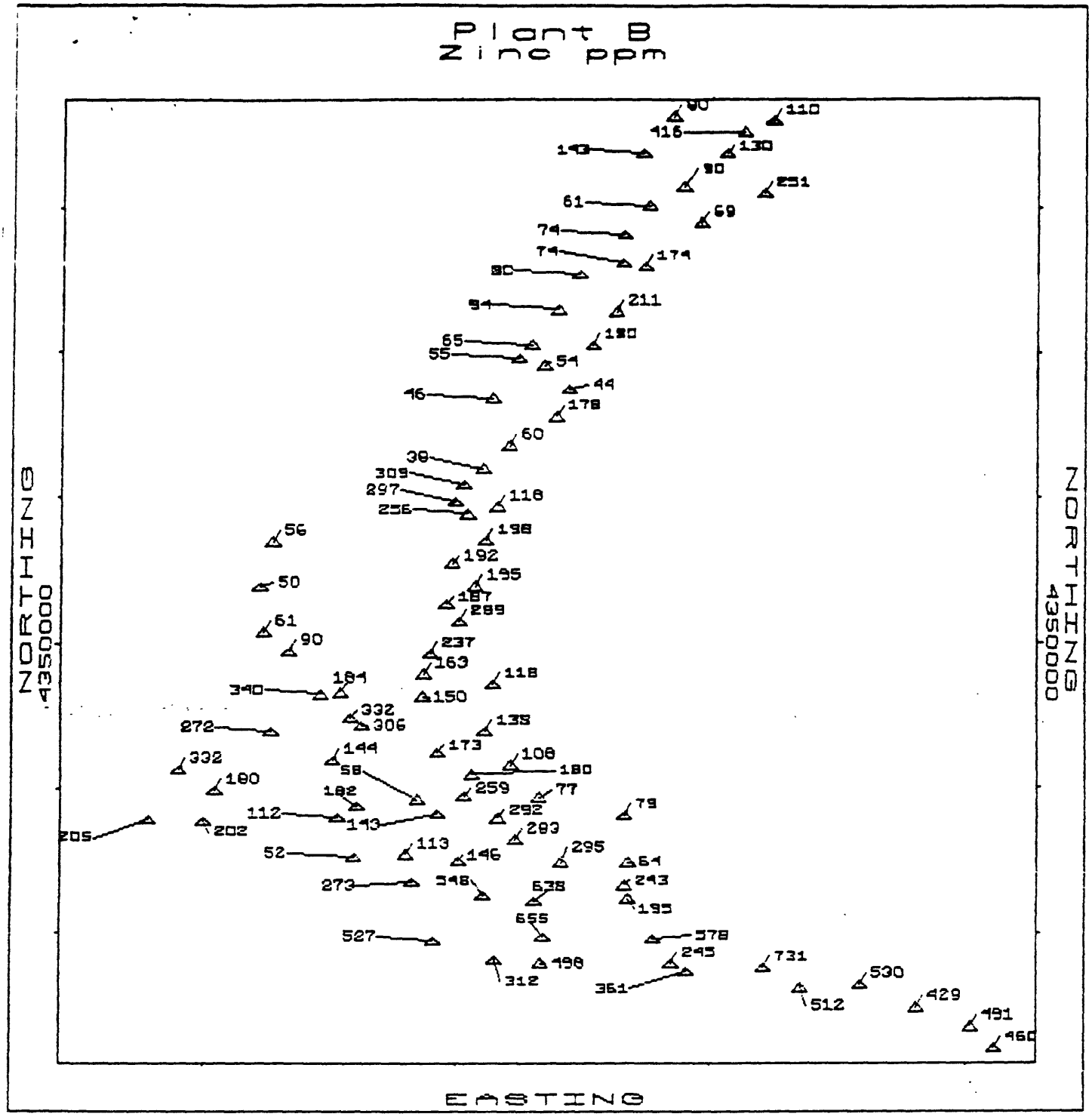

Figure 50.--Individual element plots, dry weight basis, for Sedge B (*Carex canescens*) on the Leadville, Colorado wetland.

Table 1.--Summary statistics for element concentrations in Sedge A (*Carex utriculata*, collected off of the hummocks), Leadville, Colorado wetland

[Concentrations are in ppm (parts per million), dry-weight basis, except ash yield and potassium which are in parts per hundred]

Element	Detection ratio	Geometric mean	Geometric deviation	Baseline or expected range
Ash	94:94	7.60	1.47	3.5 - 16.4
Ag	25:94	0.28	1.78	0.09 - 0.89
Al	94:94	50	1.74	17 - 151
As	77:94	0.12	2.23	0.02 - 0.60
Ba	94:94	9	1.61	3.5 - 23
Ca	94:94	3200	1.36	1730 - 5920
Cd	38:94	0.34	1.98	0.09 - 1.3
Co	44:94	0.15	1.57	0.06 - 0.37
Cr	92:94	0.34	1.60	0.13 - 0.87
Cu	94:94	6.20	1.70	2.1 - 17.9
Fe	94:94	270	1.86	78 - 934
Hg	44:94	0.02	1.64	0.007 - 0.05
K	94:94	1.70	1.18	1.2 - 2.4
Mg	94:94	1800	1.40	918 - 3528
Mn	94:94	317	1.65	116 - 863
Mo	58:94	0.45	2.14	0.10 - 2.1
Na	94:94	30	1.63	11 - 80
Ni	86:94	0.86	2.04	0.21 - 3.6
P	94:94	2200	1.14	1690 - 2860
Pb	58:94	.96	2.40	.17 - 5.5
Sr	94:94	13	1.45	6 - 27
Zn	94:94	166	2.28	32 - 863

Table 2.--Summary satatistics for element concentrations in Sedge B (*Carex canescens*, collected on the hummocks), Leadville, Colorado wetland

[Concentrations are in ppm (parts per million), dry matter basis except ash yield and potassium which are in parts per hundred]

Element	Detection ratio	Geometric mean	Geometric deviation	Baseline or expected range
Ash	92:92	7	1.18	5 - 9.7
Ag	24:92	0.27	1.86	0.08 - 0.93
Al	92:92	55	1.74	18 - 167
As	66:92	0.09	2.32	0.02 - 0.48
Ba	92:92	9	1.54	3.8 - 21
Ca	92:92	3247	1.34	1810 - 5830
Cd	44:92	0.33	2.07	0.08 - 1.4
Co	58:92	0.16	1.67	0.06 - 0.45
Cr	92:92	0.34	1.64	0.13 - 0.91
Cu	92:92	6	1.57	2.4 - 14.8
Fe	92:92	229	1.82	69 - 759
Hg	52:92	0.02	1.78	0.006 - 0.06
K	92:92	1.40	1.22	0.94 - 2.1
Mg	92:92	1628	1.49	733 - 3610
Mn	92:92	354	1.61	137 - 918
Mo	67:92	0.39	1.92	0.11 - 1.4
Na	92:92	22	1.60	8.6 - 56
Ni	89:92	0.89	1.98	0.23 - 3.5
P	92:92	1976	1.15	1494 - 2610
Pb	62:92	0.92	2.31	0.17 - 4.9
Sr	92:92	12	1.48	5.5 - 26
Zn	92:92	170	2.11	38 - 757

Table 3.--Geographical and procedural variance for element concentrations measured in Sedge A (*Carex utriculata*) collected on the Leadville, Colorado wetland

[* indicates variance component tested significant at the 0.05 probability level, Ag and Cd not included as more than one-third of their data were qualified]

Element or ash yield	Variance among			
	400 m cells	200 m cells	100 m cells	Field duplicates
Ash	*37	2	*46	9
Al	*53	18	*23	*4
As	*20	3	*64	5
Ba	*40	0	*39	0
Ca	*14	20	*42	*22
Co	*24	0	*49	3
Cr	*53	0	18	18
Cu	*45	12	*40	*2
Fe	7	*67	6	*19
Hg	*33	0	*39	13
K	*13	26	*40	3
Mg	*67	6	9	*15
Mn	*23	0	*62	*13
Mo	*25	0	*57	*18
Na	*17	*55	*2	24
Ni	*23	0	*71	*5
P	*29	*36	0	19
Pb	*22	*43	*34	0
Sr	2	35	36	*25
Zn	*43	*40	*17	*1

Table A1.--Listing of analytical methods and lower limits of detection for elements reported.

Analytical method	Determination limit	Elements
Induction coupled plasma[1]	0.01%	Al, Ca, Fe, Mg, Na, P
	0.1%	K
	2 ppm	Ba, Co, Cr, Cu
	4 ppm	Ag, Cd, La, Mo, Ni, Sr, Zn
	8 ppm	Mn, Pb
Continuous flow hydride generation[2]	0.05 ppm	As
Continuous flow cold vapor[2]	0.01 ppm	Hg

[1]Determined on plant ash.
[2]Determined on plant raw material.

EXPLANATION OF APPENDIX TABLES

A2 AND A3

These two tables give the sample identification, laboratory number, location, and chemical composition (ash weight basis), of the sedge samples collected on the Leadville, Colorado wetland. The sample identifications are keyed as follows:

First position (B, D, or Z) for Bog, field Duplicate level, or analytical split level (Z);
Second position (A or B) for Sedge A or Sedge B;
Third and Fourth position (01-19) for cell or 400 m level;
Fifth position (1-4) for 200 m level; and
Sixth position (1-4) for 100 m level.

Table A2.--Listing of analytical results for samples of Sedge A (Carex utriculata), ash-weight basis, collected on the wetland receiving acid mine drainage from St. Kevin Gulch, Leadville, Colorado.

FieldNo	Latitude	Longitude	ASH, %	AG, PPM	AL, %	AS, PPM	BA, PPM	CA, %	CD, PPM	CO, PPM	CR, PPM	CU, PPM
Cell 1												
BA 0111A	391700	1062100	7.5	5	0.07	0.40	150	2.3	< 4	< 2	2	66
BA 0113A	391700	1062100	5.5	< 4	0.04	0.07	81	6.2	< 4	< 2	3	63
BA 0123A	391700	1062100	5.6	< 4	0.05	< 0.05	97	5.9	23	< 2	3	42
ZA 0123A	391700	1062100	5.9	< 4	0.08	< 0.05	84	5.5	< 4	3	3	36
BA 0133A	391700	1062100	5.7	< 4	0.07	< 0.05	79	6.6	< 4	2	6	60
DA 0133A	391700	1062100	5.8	< 4	0.05	< 0.05	100	7.6	< 4	< 2	2	44
BA 0142A	391700	1062100	7.7	5	0.04	0.10	120	6.1	< 4	< 2	3	86
Cell 2												
BA 0211A	391700	1062100	7.8	16	0.05	0.20	73	3.1	< 4	< 2	3	81
DA 0211A	391700	1062100	7.7	20	0.04	0.30	89	3.2	< 4	< 2	2	82
ZA 0211A	391700	1062100	7.9	16	0.05	0.20	57	3.1	< 4	< 2	3	80
BA 0221A	391700	1062100	5.5	< 4	0.07	< 0.05	88	8.0	< 4	< 2	4	65
BA 0223A	391700	1062100	5.4	< 4	0.05	< 0.05	76	7.7	< 4	< 2	5	42
BA 0233A	391700	1062100	6.1	< 4	0.07	< 0.05	72	6.5	< 4	< 2	4	59
BA 0242A	391700	1062100	5.9	< 4	0.07	< 0.05	76	5.2	< 4	< 2	5	49
Cell 3												
BA 0312A	391700	1062100	8.1	7	0.05	< 0.05	85	5.1	< 4	< 2	3	71
BA 0321A	391700	1062100	6.1	< 4	0.03	0.06	72	5.1	< 4	< 2	4	65
BA 0323A	391700	1062100	8.0	< 4	0.04	0.09	94	5.0	< 4	2	3	34
BA 0333A	391700	1062100	8.3	< 4	0.04	0.20	96	5.1	< 4	3	3	63
BA 0343A	391700	1062100	8.2	7	0.05	0.20	93	5.0	< 4	< 2	3	100
DA 0343A	391700	1062100	8.1	8	0.04	0.20	95	5.0	< 4	2	2	120
Cell 4												
BA 0413A	391700	1062100	7.7	< 4	0.06	0.07	110	4.1	< 4	< 2	2	82
BA 0423A	391700	1062100	7.4	< 4	0.05	0.08	79	5.6	< 4	< 2	5	43
BA 0431A	391700	1062100	7.2	< 4	0.04	< 0.05	80	6.6	< 4	< 2	3	54
DA 0431A	391700	1062100	6.5	< 4	0.04	< 0.05	75	6.1	< 4	< 2	4	48
ZA 0431A	391700	1062100	6.9	< 4	0.04	< 0.05	71	6.5	< 4	< 2	3	51
BA 0432A	391700	1062100	7.0	< 4	0.03	< 0.05	76	6.2	< 4	3	3	54
BA 0443A	391700	1062100	7.2	< 4	0.05	< 0.05	69	4.5	< 4	< 2	< 2	39
Cell 5												
BA 0512A	391700	1062100	8.3	< 4	0.04	0.08	68	4.6	< 4	< 2	7	60
BA 0522A	391700	1062100	6.0	< 4	0.04	< 0.05	65	6.4	< 4	< 2	7	42
ZA 0522A	391700	1062100	5.5	< 4	0.05	0.06	79	6.4	< 4	2	8	43
BA 0531A	391700	1062100	6.2	< 4	0.04	< 0.05	66	5.7	< 4	< 2	7	47
BA 0534A	391700	1062100	6.1	< 4	0.04	0.06	74	5.7	< 4	< 2	7	55
DA 0534A	391700	1062100	6.1	< 4	0.05	0.09	98	5.4	< 4	< 2	5	58
ZA 0534A	391700	1062100	6.1	< 4	0.05	0.07	90	5.5	< 4	2	5	59
ZA 0543A	391700	1062100	6.3	< 4	0.03	0.06	93	5.0	< 4	< 2	5	49

Table A2.--Listing of analytical results for samples of Sedge A (Carex utriculata), ash-weight basis, collected on the wetland receiving acid mine drainage from St. Kevin Gulch, Leadville, Colorado.--continued

FieldNo	Latitude	Longitude	ASH, %	AG, PPM	AL, %	AS, PPM	BA, PPM	CA, %	CD, PPM	CO, PPM	CR, PPM	CU, PPM
Cell 6												
BA 0613A	391700	1062100	6.7	< 4	0.05	0.20	86	4.8	< 4	3	5	68
BA 0621A	391700	1062100	6.7	< 4	0.06	0.08	81	5.8	< 4	< 2	5	49
BA 0624A	391700	1062100	9.8	< 4	0.08	0.30	130	6.3	< 4	5	8	75
BA 0631A	391700	1062100	6.2	< 4	0.08	0.30	86	5.5	< 4	4	15	74
DA 0631A	391700	1062100	5.7	< 4	0.06	0.20	89	5.7	< 4	4	12	61
BA 0643A	391700	1062100	7.1	< 4	0.07	0.20	74	4.4	< 4	3	11	80
Cell 7												
BA 0713A	391700	1062100	6.7	< 4	0.07	0.30	120	4.0	< 4	5	10	83
BA 0721A	391700	1062100	7.8	< 4	0.04	0.20	89	4.9	< 4	< 2	6	64
BA 0731A	391700	1062100	9.0	< 4	0.07	0.10	150	5.7	< 4	2	7	78
BA 0743A	391700	1062100	8.8	< 4	0.05	0.20	160	5.0	< 4	4	6	89
DA 0743A	391700	1062100	8.5	< 4	0.07	0.10	170	5.3	< 4	3	6	80
BA 0744A	391700	1062100	7.4	< 4	0.05	0.20	120	4.6	< 4	2	6	92
Cell 8												
BA 0811A	391700	1062100	8.1	< 4	0.05	0.20	80	4.7	< 4	2	4	69
BA 0813A	391700	1062100	7.1	< 4	0.06	0.20	78	4.2	< 4	2	6	97
DA 0813A	391700	1062100	6.6	< 4	0.06	0.20	84	4.3	< 4	2	6	92
BA 0822A	391700	1062100	8.1	< 4	0.06	0.08	110	5.7	< 4	< 2	4	69
BA 0831A	391700	1062100	7.4	< 4	0.05	0.10	80	5.8	< 4	2	5	62
BA 0844A	391700	1062100	6.8	< 4	0.03	0.10	110	3.6	< 4	< 2	5	74
Cell 9												
BA 0911A	391700	1062100	8.8	< 4	0.05	0.20	130	5.1	5	< 2	3	57
BA 0914A	391700	1062100	8.7	16	0.05	0.56	190	3.2	7	< 2	3	150
BA 0921A	391700	1062100	8.4	< 4	0.10	0.10	180	3.5	10	4	4	95
BA 0934A	391700	1062100	8.2	< 4	0.05	0.07	85	2.2	< 4	< 2	4	89
BA 0941A	391700	1062100	7.6	11	0.09	0.40	79	2.7	7	< 2	4	160
DA 0941A	391700	1062100	8.0	12	0.08	0.40	82	2.9	7	3	6	170
Cell 10												
BA 1012A	391700	1062100	7.7	6	0.11	0.20	240	2.9	6	< 2	3	120
DA 1012A	391700	1062100	8.1	7	0.11	0.20	200	3.2	7	3	5	130
BA 1024A	391700	1062100	7.7	12	0.23	0.30	140	3.2	5	< 2	6	170
BA 1032A	391700	1062100	8.6	6	0.09	0.10	230	3.4	8	3	7	110
BA 1034A	391700	1062100	8.8	< 4	0.06	< 0.05	100	3.2	< 4	2	5	75
BA 1042A	391700	1062100	7.8	6	0.16	0.20	120	2.5	5	< 2	6	150

Table A2.--Listing of analytical results for samples of Sedge A (Carex utriculata), ash-weight basis, collected on the wetland receiving acid mine drainage from St. Kevin Gulch, Leadville, Colorado.--continued

FieldNo	Latitude	Longitude	ASH, %	AG, PPM	AL, %	AS, PPM	BA, PPM	CA, %	CD, PPM	CO, PPM	CR, PPM	CU, PPM
Cell 11												
BA 1113A	391700	1062100	7.6	< 4	0.05	0.10	96	2.3	< 4	< 2	6	130
BA 1124A	391700	1062100	6.9	< 4	0.07	0.30	120	2.1	< 4	< 2	4	130
DA 1124A	391700	1062100	7.2	< 4	0.07	0.20	110	2.3	< 4	< 2	4	130
BA 1133A	391700	1062100	8.6	< 4	0.04	0.09	99	7.5	< 4	< 2	5	56
BA 1141A	391700	1062100	8.1	< 4	0.06	0.30	240	3.3	5	< 2	5	150
BA 1144A	391700	1062100	7.9	< 4	0.05	0.20	170	2.9	5	2	3	130
Cell 12												
BA 1211A	391700	1062100	8.7	< 4	0.07	0.20	93	4.6	< 4	< 2	2	54
BA 1221A	391700	1062100	6.7	< 4	0.04	0.07	90	3.7	< 4	2	7	63
ZA 1221A	391700	1062100	5.8	< 4	0.04	< 0.05	72	3.8	< 4	< 2	6	62
BA 1231A	391700	1062100	7.2	< 4	0.05	0.20	73	3.5	< 4	< 2	3	68
BA 1233A	391700	1062100	9.0	< 4	0.05	< 0.05	160	3.4	6	2	4	89
BA 1242A	391700	1062100	7.7	< 4	0.04	0.20	91	4.0	< 4	3	4	83
Cell 13												
BA 1312A	391700	1062100	8.8	< 4	0.03	0.20	200	4.8	< 4	< 2	3	74
BA 1314A	391700	1062100	8.1	< 4	0.06	< 0.05	240	5.5	8	3	3	76
BA 1324A	391700	1062100	9.6	< 4	0.08	0.10	180	4.0	7	3	3	110
BA 1332A	391700	1062100	8.7	< 4	0.06	0.09	250	4.5	6	5	6	80
BA 1343A	391700	1062100	9.8	< 4	0.08	0.20	140	3.8	15	4	2	90
Cell 14												
BA 1412A	391700	1062100	8.2	< 4	0.11	0.07	170	6.3	< 4	3	3	67
DA 1412A	391700	1062100	6.4	< 4	0.08	0.10	130	4.4	< 4	2	2	69
BA 1421A	391700	1062100	7.3	< 4	0.10	0.20	180	3.1	11	3	4	160
BA 1423A	391700	1062100	6.4	5	0.08	0.20	200	3.4	12	3	4	140
BA 1433A	391700	1062100	6.9	< 4	0.08	0.20	150	3.4	9	2	4	130
ZA 1433A	391700	1062100	7.2	4	0.08	0.30	140	3.3	9	3	5	120
BA 1441A	391700	1062100	8.0	< 4	0.04	< 0.05	220	5.4	< 4	2	4	68
Cell 15												
BA 1513A	391700	1062100	8.6	5	0.10	0.30	96	2.7	20	3	4	120
BA 1521A	391700	1062100	8.8	4	0.07	0.10	160	3.3	8	2	3	100
BA 1531A	391700	1062100	7.8	< 4	0.28	0.30	140	3.5	10	3	6	98
ZA 1531A	391700	1062100	8.0	< 4	0.08	0.40	260	3.6	11	3	5	97
BA 1541A	391700	1062100	9.7	11	0.08	0.40	150	2.8	16	< 2	2	120
BA 1543A	391700	1062100	8.2	< 4	0.20	0.20	130	3.9	8	< 2	4	87

Table A2.--Listing of analytical results of samples of Sedge A (Carex utriculata), ash-weight basis, collected on the wetland receiving acid mine drainage from St. Kevin Gulch, Leadville, Colorado.--continued

FieldNo	Latitude	Longitude	ASH, %	AG, PPM	AL, %	AS, PPM	BA, PPM	CA, %	CD, PPM	CO, PPM	CR, PPM	CU, PPM
Cell 16												
BA 1611A	391700	1062100	7.9	< 4	0.05	0.09	96	4.5	< 4	< 2	4	50
BA 1613A	391700	1062100	7.5	< 4	0.10	0.30	150	2.4	5	< 2	< 2	170
BA 1622A	391700	1062100	8.6	4	0.08	0.20	130	2.8	13	4	4	120
DA 1622A	391700	1062100	9.5	< 4	0.07	0.30	130	2.8	17	4	3	92
BA 1633A	391700	1062100	8.5	8	0.08	0.50	160	2.5	10	< 2	2	180
BA 1642A	391700	1062100	6.6	< 4	0.07	0.30	180	2.7	9	4	3	120
Cell 17												
BA 1712A	391700	1062100	7.8	8	0.12	0.30	120	2.7	14	< 2	6	130
BA 1724A	391700	1062100	7.3	< 4	0.21	0.07	160	3.1	4	2	7	130
BA 1731A	391700	1062100	8.5	7	0.11	0.20	130	2.6	7	< 2	6	170
ZA 1731A	391700	1062100	8.4	8	0.11	0.20	130	2.6	7	3	7	180
BA 1734A	391700	1062100	8.6	< 4	0.06	0.10	190	4.9	12	3	4	72
BA 1744A	391700	1062100	9.4	31	0.12	0.50	160	2.7	14	< 2	5	300
DA 1744A	391700	1062100	9.3	29	0.14	0.56	170	2.8	14	2	5	300
Cell 18												
BA 1801A	391700	1062100	8.3	13	0.10	0.09	240	3.6	13	3	5	130
ZA 1801A	391700	1062100	8.3	14	0.10	0.20	240	3.7	13	2	5	130
BA 1802A	391700	1062100	8.1	9	0.19	0.30	150	3.4	12	4	7	140
BA 1803A	391700	1062100	7.7	7	0.23	0.20	190	3.4	9	< 2	7	150
BA 1804A	391700	1062100	7.5	9	0.22	< 0.05	250	4.6	15	3	7	120
BA 1805A	391700	1062100	7.9	6	0.19	0.20	300	4.1	7	3	8	140
Cell 19												
BA 1901A	391700	1062100	7.2	< 4	0.05	0.06	140	5.0	< 4	2	9	53
DA 1901A	391700	1062100	7.5	< 4	0.11	0.06	130	4.5	< 4	< 2	11	37
BA 1902A	391700	1062100	6.9	< 4	0.06	0.06	140	5.5	< 4	< 2	8	45
BA 1903A	391700	1062100	7.4	< 4	0.04	0.05	91	5.2	< 4	< 2	8	24
BA 1904A	391700	1062100	7.3	< 4	0.07	0.07	78	5.5	< 4	< 2	19	28
ZA 1904A	391700	1062100	8.0	< 4	0.06	0.08	120	5.3	< 4	< 2	18	23
BA 1905A	391700	1062100	7.4	< 4	0.19	0.08	77	5.9	< 4	3	10	36
ZA 1905A	391700	1062100	7.3	< 4	0.17	0.07	80	6.0	< 4	3	11	34

Table A2.--Listing of analytical results for samples of Sedge A (Carex utriculata), ash-weight basis, collec on the wetland receiving acid mine drainage from St. Kevin Gulch, Leadville, Colorado.-- continued

FieldNo	Latitude	Longitude	Fe, %	Hg, PPM	K, %	La, PPM	Mg, %	Mn, PPM	Mo, PPM	Na, %	Ni, PPM	P, %
Cell 1												
BA 0111A	391700	1062100	1.10	N 0.02	26	< 4	1.8	1000	< 4	0.02	9	2.5
BA 0113A	391700	1062100	0.59	0.02	26	< 4	3.3	2500	< 4	0.02	< 4	3.4
BA 0123A	391700	1062100	0.58	N 0.02	20	< 4	4.6	2900	< 4	0.02	< 4	3.2
ZA 0123A	391700	1062100	0.63	0.02	19	7	4.7	2900	< 4	0.02	< 4	3.2
BA 0133A	391700	1062100	0.14	0.02	20	4	2.9	5400	6	0.03	13	2.5
DA 0133A	391700	1062100	0.51	0.01	18	6	5.0	4300	< 4	0.02	5	3.2
BA 0142A	391700	1062100	1.00	N 0.02	24	< 4	2.5	2700	< 4	0.02	4	3.2
Cell 2												
BA 0211A	391700	1062100	1.50	N 0.02	24	< 4	2.5	1900	5	0.02	13	2.6
DA 0211A	391700	1062100	0.99	N 0.02	26	< 4	2.5	2200	5	0.02	11	2.7
ZA 0211A	391700	1062100	1.60	N 0.02	25	< 4	2.5	2000	5	0.03	14	2.6
BA 0221A	391700	1062100	0.48	N 0.02	21	4	4.4	3900	< 4	0.02	19	3.4
BA 0223A	391700	1062100	0.29	N 0.02	22	4	4.7	3200	< 4	0.02	< 4	3.5
BA 0233A	391700	1062100	0.39	N 0.02	28	< 4	3.2	3300	< 4	0.03	5	3.4
BA 0242A	391700	1062100	0.55	N 0.02	25	< 4	3.4	2100	< 4	0.04	< 4	4.2
Cell 3												
BA 0312A	391700	1062100	0.46	N 0.02	20	4	2.8	6600	8	0.04	16	2.7
BA 0321A	391700	1062100	0.45	N 0.02	29	< 4	3.3	2900	< 4	0.03	8	3.7
BA 0323A	391700	1062100	0.32	N 0.02	15	4	3.2	3800	< 4	0.07	14	2.7
BA 0333A	391700	1062100	0.26	0.02	17	4	2.9	6800	10	0.05	16	2.4
BA 0343A	391700	1062100	0.31	0.02	20	5	2.3	6100	6	0.02	18	2.4
DA 0343A	391700	1062100	0.30	N 0.02	19	< 4	2.3	5900	6	0.02	17	2.8
Cell 4												
BA 0413A	391700	1062100	0.65	N 0.02	21	< 4	2.2	6200	8	0.05	20	2.8
BA 0423A	391700	1062100	0.28	0.02	17	< 4	4.4	4900	< 4	0.03	10	2.8
BA 0431A	391700	1062100	0.30	N 0.02	25	< 4	3.5	2600	< 4	0.02	4	2.8
DA 0431A	391700	1062100	0.30	0.02	27	< 4	3.5	2500	< 4	0.02	6	2.8
ZA 0431A	391700	1062100	0.30	N 0.02	25	4	3.5	2700	< 4	0.02	5	2.8
BA 0432A	391700	1062100	0.21	N 0.02	21	6	4.2	4900	< 4	0.03	7	3.0
BA 0443A	391700	1062100	0.56	N 0.02	29	< 4	2.9	3100	< 4	0.02	7	3.3
Cell 5												
BA 0512A	391700	1062100	0.33	N 0.02	22	< 4	2.9	4300	5	0.03	21	2.6
BA 0522A	391700	1062100	0.24	N 0.02	25	< 4	4.3	4100	< 4	0.05	4	4.0
ZA 0522A	391700	1062100	0.25	N 0.02	24	< 4	4.2	4100	< 4	0.05	5	3.6
BA 0531A	391700	1062100	0.52	0.02	25	< 4	3.7	3400	< 4	0.02	11	3.2
BA 0534A	391700	1062100	0.34	N 0.02	29	< 4	3.8	3900	< 4	0.02	10	3.7
DA 0534A	391700	1062100	0.40	0.02	28	5	3.8	3800	4	0.02	14	3.4
ZA 0534A	391700	1062100	0.41	N 0.02	24	< 4	3.7	3800	< 4	0.02	12	3.5
ZA 0543A	391700	1062100	0.37	N 0.02	25	< 4	3.3	3200	< 4	0.02	6	3.4

Table A2.--Listing of analytical results for samples of Sedge A (Carex utriculata), ash-weight basis, collected on the wetland receiving acid mine drainage from St. Kevin Gulch, Leadville, Colorado.-- continued

FieldNo	Latitude	Longitude	Fe, %	Hg, PPM	K, %	La, PPM	Mg, %	Mn, PPM	Mo, PPM	Na, %	Ni, PPM	P, %
Cell 6												
BA 0613A	391700	1062100	0.55	N 0.02	22	6	3.8	4900	< 4	0.03	9	3.3
BA 0621A	391700	1062100	0.28	N 0.02	25	4	3.3	3700	< 4	0.03	6	3.7
BA 0624A	391700	1062100	0.25	N 0.02	13	5	3.1	9700	8	0.05	26	2.7
BA 0631A	391700	1062100	0.51	N 0.02	24	< 4	4.1	5100	< 4	0.05	11	3.9
DA 0631A	391700	1062100	0.43	N 0.02	25	< 4	4.7	4500	5	0.03	21	4.6
BA 0643A	391700	1062100	0.41	N 0.02	21	< 4	3.2	6900	10	0.03	14	3.2
Cell 7												
BA 0713A	391700	1062100	0.59	0.02	25	< 4	2.9	6400	< 4	0.04	13	3.7
BA 0721A	391700	1062100	0.30	0.01	21	5	3.5	4000	5	0.02	13	2.3
BA 0731A	391700	1062100	0.36	N 0.02	15	5	2.6	5800	< 4	0.04	13	2.6
BA 0743A	391700	1062100	0.30	0.02	17	< 4	2.7	8400	< 4	0.03	22	2.6
DA 0743A	391700	1062100	0.37	N 0.02	16	< 4	2.9	9000	< 4	0.04	25	2.9
BA 0744A	391700	1062100	0.47	N 0.02	23	< 4	3.0	5500	8	0.02	12	2.9
Cell 8												
BA 0811A	391700	1062100	0.48	N 0.02	18	< 4	3.3	5200	10	0.03	17	3.0
BA 0813A	391700	1062100	0.44	N 0.02	20	< 4	2.8	3900	< 4	0.03	8	3.5
DA 0813A	391700	1062100	0.49	0.02	25	< 4	3.0	4100	< 4	0.04	11	3.5
BA 0822A	391700	1062100	0.24	N 0.02	18	< 4	2.4	2800	7	0.02	18	2.7
BA 0831A	391700	1062100	0.14	0.02	21	< 4	2.8	4100	5	0.03	14	3.0
BA 0844A	391700	1062100	0.42	0.02	23	< 4	3.1	4300	< 4	0.05	8	3.4
Cell 9												
BA 0911A	391700	1062100	0.09	N 0.02	18	< 4	2.0	6000	11	0.03	11	2.2
BA 0914A	391700	1062100	0.14	N 0.02	21	< 4	1.6	5300	14	0.03	14	2.4
BA 0921A	391700	1062100	0.15	N 0.02	19	4	1.5	6100	14	0.05	20	2.1
BA 0934A	391700	1062100	0.17	N 0.02	26	< 4	1.7	2200	< 4	0.03	7	2.4
BA 0941A	391700	1062100	0.25	0.01	26	4	1.4	3600	11	0.04	20	2.5
DA 0941A	391700	1062100	0.23	N 0.02	25	4	1.5	3500	12	0.05	20	2.6
Cell 10												
BA 1012A	391700	1062100	0.32	N 0.01	20	5	1.3	8600	10	0.02	26	2.4
DA 1012A	391700	1062100	0.33	N 0.02	22	< 4	1.4	8600	8	0.03	23	2.4
BA 1024A	391700	1062100	1.00	N 0.02	23	5	1.9	7000	12	0.04	18	3.0
BA 1032A	391700	1062100	0.30	0.03	20	4	1.6	7500	10	0.04	20	2.3
BA 1034A	391700	1062100	0.25	0.02	21	5	1.4	4200	11	0.03	16	2.1
BA 1042A	391700	1062100	0.75	N 0.02	26	5	1.3	5100	5	0.03	18	2.7

Table A2.--Listing of analytical results for samples of Sedge A (Carex utriculata), ash-weight basis, collected on the wetland receiving acid mine drainage from St. Kevin Gulch, Leadville, Colorado.-- continued

FieldNo	Latitude	Longitude	Fe, %	Hg, PPM	K, %	La, PPM	Mg, %	Mn, PPM	Mo, PPM	Na, %	Ni, PPM	P, %
Cell 11												
BA 1113A	391700	1062100	0.51	0.02	31	< 4	1.4	2900	< 4	0.03	11	2.9
BA 1124A	391700	1062100	1.90	0.02	31	< 4	1.5	3000	< 4	0.05	12	3.4
DA 1124A	391700	1062100	1.50	0.01	24	< 4	1.5	3200	< 4	0.06	13	3.4
BA 1133A	391700	1062100	0.09	0.02	12	< 4	2.8	2700	< 4	0.04	< 4	2.4
BA 1141A	391700	1062100	0.59	N 0.02	24	< 4	1.6	3800	24	0.02	16	3.0
BA 1144A	391700	1062100	0.62	N 0.01	21	< 4	2.1	3300	9	0.03	18	2.9
Cell 12												
BA 1211A	391700	1062100	0.34	N 0.02	17	7	3.4	5500	8	0.02	10	2.8
BA 1221A	391700	1062100	0.26	N 0.02	25	< 4	3.2	2400	< 4	0.02	14	3.1
ZA 1221A	391700	1062100	0.26	N 0.02	27	< 4	3.2	2500	< 4	0.02	16	3.1
BA 1231A	391700	1062100	0.46	N 0.02	27	< 4	2.9	2000	< 4	0.04	9	3.6
BA 1233A	391700	1062100	0.23	N 0.02	18	< 4	2.8	6200	19	0.02	21	2.2
BA 1242A	391700	1062100	0.31	N 0.02	22	< 4	3.1	3600	5	0.02	8	3.4
Cell 13												
BA 1312A	391700	1062100	0.11	0.04	20	< 4	2.1	3900	16	0.05	7	2.5
BA 1314A	391700	1062100	0.09	N 0.02	19	5	2.2	9900	7	0.03	9	3.0
BA 1324A	391700	1062100	0.20	0.02	17	< 4	1.7	4900	4	0.06	20	2.6
BA 1332A	391700	1062100	0.11	0.03	16	5	2.2	9100	13	0.03	22	2.5
BA 1343A	391700	1062100	0.12	0.02	17	4	1.8	8700	10	0.06	19	2.8
Cell 14												
BA 1412A	391700	1062100	0.19	N 0.02	16	4	2.6	11000	20	0.11	10	2.7
DA 1412A	391700	1062100	0.41	N 0.02	21	< 4	2.6	7000	10	0.07	10	3.3
BA 1421A	391700	1062100	0.73	0.02	22	< 4	2.0	3800	13	0.04	26	3.3
BA 1423A	391700	1062100	0.55	N 0.02	26	4	2.4	4400	15	0.03	19	3.7
BA 1433A	391700	1062100	0.57	N 0.02	23	< 4	2.4	3900	11	0.04	19	3.5
ZA 1433A	391700	1062100	0.55	0.02	24	< 4	2.4	3700	12	0.04	19	3.3
BA 1441A	391700	1062100	0.16	N 0.02	23	5	2.2	4200	12	0.04	5	2.8
Cell 15												
BA 1513A	391700	1062100	0.39	0.03	24	5	1.4	3600	5	0.04	19	2.7
BA 1521A	391700	1062100	0.15	0.02	19	4	1.3	9900	9	0.02	25	2.6
BA 1531A	391700	1062100	1.70	0.03	24	6	1.7	3500	6	0.13	14	3.0
ZA 1531A	391700	1062100	1.70	0.03	21	6	1.7	3600	6	0.13	13	3.0
BA 1541A	391700	1062100	0.23	0.05	22	4	1.3	3900	10	0.03	23	2.3
BA 1543A	391700	1062100	0.43	0.02	22	5	1.6	3300	11	0.08	18	3.4

Table A2.--Listing of analytical results for samples of Sedge A (Carex utriculata), ash-weight basis, collected on the wetland receiving acid mine drainage from St. Kevin Gulch, Leadville, Colorado.-- continued

FieldNo	Latitude	Longitude	Fe, %	Hg, PPM	K, %	La, PPM	Mg, %	Mn, PPM	Mo, PPM	Na, %	Ni, PPM	P, %
Cell 16												
BA 1611A	391700	1062100	0.21	0.02	22	< 4	2.5	2400	10	0.02	7	2.4
BA 1613A	391700	1062100	0.45	0.03	24	< 4	1.9	4000	9	0.03	17	2.9
BA 1622A	391700	1062100	0.49	0.02	23	4	1.4	5100	10	0.14	16	3.2
DA 1622A	391700	1062100	0.48	0.02	24	< 4	1.3	5300	7	0.16	14	3.5
BA 1633A	391700	1062100	0.37	0.06	25	< 4	1.2	2500	9	0.03	19	2.8
BA 1642A	391700	1062100	0.50	0.02	22	5	1.9	3600	17	0.09	14	3.9
Cell 17												
BA 1712A	391700	1062100	0.29	0.04	25	< 4	1.3	2500	7	0.03	20	2.7
BA 1724A	391700	1062100	0.95	0.02	24	5	1.4	2200	5	0.06	11	3.8
BA 1731A	391700	1062100	0.66	N 0.02	22	5	1.1	1900	6	0.04	16	3.1
ZA 1731A	391700	1062100	0.69	0.02	24	5	1.1	1800	6	0.04	18	3.0
BA 1734A	391700	1062100	0.10	0.03	17	4	1.6	7200	10	0.02	21	2.6
BA 1744A	391700	1062100	0.60	0.03	23	6	1.0	2300	14	0.03	23	3.8
DA 1744A	391700	1062100	0.87	0.04	24	5	1.0	2400	13	0.05	22	3.3
Cell 18												
BA 1801A	391700	1062100	0.26	0.02	21	5	1.2	3900	9	0.02	19	2.5
ZA 1801A	391700	1062100	0.26	0.03	23	5	1.3	3900	9	0.02	18	2.5
BA 1802A	391700	1062100	1.20	0.03	23	5	1.5	6700	12	0.04	13	2.7
BA 1803A	391700	1062100	0.61	0.02	24	5	1.6	3400	12	0.04	12	2.8
BA 1804A	391700	1062100	0.33	0.02	18	6	1.4	2900	17	0.05	17	2.4
BA 1805A	391700	1062100	0.41	0.02	24	5	2.1	5900	30	0.03	18	3.0
Cell 19												
BA 1901A	391700	1062100	0.39	0.02	24	< 4	3.8	3900	< 4	0.02	< 4	3.2
DA 1901A	391700	1062100	0.39	0.01	23	< 4	4.1	3000	< 4	0.03	4	3.0
BA 1902A	391700	1062100	0.27	0.02	21	< 4	3.2	6300	< 4	0.02	5	3.1
BA 1903A	391700	1062100	0.30	N 0.02	21	< 4	4.0	3600	< 4	0.03	< 4	3.5
BA 1904A	391700	1062100	0.36	N 0.02	26	< 4	3.4	4100	< 4	0.03	4	3.4
ZA 1904A	391700	1062100	0.35	0.01	24	4	3.2	3800	< 4	0.03	< 4	2.9
BA 1905A	391700	1062100	0.32	0.03	25	5	3.4	4600	< 4	0.05	< 4	3.1
ZA 1905A	391700	1062100	0.31	0.02	25	5	3.5	4600	< 4	0.04	< 4	3.1

Table A2.--Listing of analytical results for samples of Sedge A (Carex utriculata), ash-weight basis, collected on the wetland receiving acid mine drainage from St. Kevin Gulch, Leadville, Colorado.-- continued

FieldNo	Latitude	Longitude	Pb, %	Sr, PPM	Zn, PPM
Cell 1					
BA 0111A	391700	1062100	51	87	960
BA 0113A	391700	1062100	< 8	240	920
BA 0123A	391700	1062100	< 8	200	790
ZA 0123A	391700	1062100	< 8	200	740
BA 0133A	391700	1062100	< 8	290	2200
DA 0133A	391700	1062100	< 8	310	2000
BA 0142A	391700	1062100	< 8	240	1100
Cell 2					
BA 0211A	391700	1062100	91	120	1500
DA 0211A	391700	1062100	91	120	1300
ZA 0211A	391700	1062100	86	120	1600
BA 0221A	391700	1062100	16	320	1700
BA 0223A	391700	1062100	< 8	260	950
BA 0233A	391700	1062100	< 8	260	1200
BA 0242A	391700	1062100	10	190	700
Cell 3					
BA 0312A	391700	1062100	30	150	2100
BA 0321A	391700	1062100	< 8	160	1100
BA 0323A	391700	1062100	< 8	170	820
BA 0333A	391700	1062100	< 8	160	1400
BA 0343A	391700	1062100	19	170	3200
DA 0343A	391700	1062100	23	170	3100
Cell 4					
BA 0413A	391700	1062100	< 8	130	1700
BA 0423A	391700	1062100	< 8	200	930
BA 0431A	391700	1062100	< 8	230	1100
DA 0431A	391700	1062100	< 8	210	1100
ZA 0431A	391700	1062100	< 8	230	1200
BA 0432A	391700	1062100	< 8	240	850
BA 0443A	391700	1062100	< 8	130	680
Cell 5					
BA 0512A	391700	1062100	10	130	1700
BA 0522A	391700	1062100	< 8	270	700
ZA 0522A	391700	1062100	< 8	260	680
BA 0531A	391700	1062100	< 8	210	690
BA 0534A	391700	1062100	< 8	200	910
DA 0534A	391700	1062100	< 8	190	840
ZA 0534A	391700	1062100	< 8	190	790
ZA 0543A	391700	1062100	< 8	190	600

Table A2.--Listing of analytical results for samples of Sedge A (Carex utriculata), ash-weight basis, collected on the wetland receiving acid mine drainage from St. Kevin Gulch, Leadville, Colorado.-- continued

FieldNo	Latitude	Longitude	Pb, %	Sr, PPM	Zn, PPM
		Cell 6			
BA 0613A	391700	1062100	< 8	180	1100
BA 0621A	391700	1062100	< 8	240	1200
BA 0624A	391700	1062100	11	240	3100
BA 0631A	391700	1062100	9	240	2000
DA 0631A	391700	1062100	10	250	2100
BA 0643A	391700	1062100	13	210	2500
		Cell 7			
BA 0713A	391700	1062100	< 8	180	2400
BA 0721A	391700	1062100	9	230	2300
BA 0731A	391700	1062100	8	260	2100
BA 0743A	391700	1062100	8	200	3300
DA 0743A	391700	1062100	11	220	3500
BA 0744A	391700	1062100	17	200	2300
		Cell 8			
BA 0811A	391700	1062100	13	220	2600
BA 0813A	391700	1062100	8	170	1400
DA 0813A	391700	1062100	< 8	170	1600
BA 0822A	391700	1062100	< 8	270	2700
BA 0831A	391700	1062100	< 8	260	2300
BA 0844A	391700	1062100	9	190	1600
		Cell 9			
BA 0911A	391700	1062100	15	220	3500
BA 0914A	391700	1062100	42	140	5100
BA 0921A	391700	1062100	28	120	6700
BA 0934A	391700	1062100	9	82	1200
BA 0941A	391700	1062100	31	85	4700
DA 0941A	391700	1062100	33	91	4400
		Cell 10			
BA 1012A	391700	1062100	21	99	4500
DA 1012A	391700	1062100	19	100	4200
BA 1024A	391700	1062100	42	92	2600
BA 1032A	391700	1062100	19	150	3500
BA 1034A	391700	1062100	15	120	2000
BA 1042A	391700	1062100	27	62	2700

Table A2.--Listing of analytical results for samples of Sedge A (Carex utriculata), ash-weight basis, collected on the wetland receiving acid mine drainage from St. Kevin Gulch, Leadville, Colorado.-- continued

FieldNo	Latitude	Longitude	Pb, %	Sr, PPM	Zn, PPM
		Cell 11			
BA 1113A	391700	1062100	9	70	2100
BA 1124A	391700	1062100	19	67	2200
DA 1124A	391700	1062100	18	72	2200
BA 1133A	391700	1062100	< 8	390	710
BA 1141A	391700	1062100	< 8	120	2700
BA 1144A	391700	1062100	13	140	2400
		Cell 12			
BA 1211A	391700	1062100	< 8	190	1600
BA 1221A	391700	1062100	< 8	160	1400
ZA 1221A	391700	1062100	< 8	160	1600
BA 1231A	391700	1062100	28	170	1600
BA 1233A	391700	1062100	12	130	3500
BA 1242A	391700	1062100	< 8	210	1400
		Cell 13			
BA 1312A	391700	1062100	< 8	220	1900
BA 1314A	391700	1062100	< 8	250	2500
BA 1324A	391700	1062100	< 8	180	3200
BA 1332A	391700	1062100	10	190	4900
BA 1343A	391700	1062100	14	150	7100
		Cell 14			
BA 1412A	391700	1062100	14	310	1400
DA 1412A	391700	1062100	15	200	2100
BA 1421A	391700	1062100	23	120	3900
BA 1423A	391700	1062100	21	110	4300
BA 1433A	391700	1062100	17	110	4700
ZA 1433A	391700	1062100	18	100	4500
BA 1441A	391700	1062100	11	230	1200
		Cell 15			
BA 1513A	391700	1062100	28	96	12000
BA 1521A	391700	1062100	16	140	7100
BA 1531A	391700	1062100	38	140	3400
ZA 1531A	391700	1062100	38	140	3500
BA 1541A	391700	1062100	20	98	6600
BA 1543A	391700	1062100	36	170	5200

Table A2.--Listing of analytical results for samples of Sedge A (Carex utriculata), ash-weight basis, collected on the wetland receiving acid mine drainage from St. Kevin Gulch, Leadville, Colorado.-- continued

FieldNo	Latitude	Longitude	Pb, %	Sr, PPM	Zn, PPM
Cell 16					
BA 1611A	391700	1062100	< 8	220	880
BA 1613A	391700	1062100	33	110	2700
BA 1622A	391700	1062100	21	120	5500
DA 1622A	391700	1062100	22	150	5800
BA 1633A	391700	1062100	68	94	8400
BA 1642A	391700	1062100	38	160	3100
Cell 17					
BA 1712A	391700	1062100	47	85	7600
BA 1724A	391700	1062100	35	120	2100
BA 1731A	391700	1062100	20	97	4600
ZA 1731A	391700	1062100	25	97	4600
BA 1734A	391700	1062100	14	230	3500
BA 1744A	391700	1062100	39	110	7900
DA 1744A	391700	1062100	38	110	7700
Cell 18					
BA 1801A	391700	1062100	60	130	5700
ZA 1801A	391700	1062100	61	130	5700
BA 1802A	391700	1062100	64	150	7500
BA 1803A	391700	1062100	51	170	5900
BA 1804A	391700	1062100	62	180	5500
BA 1805A	391700	1062100	54	180	6200
Cell 19					
BA 1901A	391700	1062100	< 8	180	610
DA 1901A	391700	1062100	< 8	160	530
BA 1902A	391700	1062100	< 8	210	900
BA 1903A	391700	1062100	< 8	210	700
BA 1904A	391700	1062100	< 8	200	750
ZA 1904A	391700	1062100	< 8	190	730
BA 1905A	391700	1062100	< 8	230	940
ZA 1905A	391700	1062100	< 8	230	930

Table A3.--Listing of analytical results for samples of Sedge B (Carex canescens), ash-weight basis, collect on the wetland receiving acid mine drainage from St. Kevin Gulch, Leadville, Colorado.

FieldNo	Latitude	Longitude	ASH, %	AG, PPM	AL, %	AS, PPM	BA, PPM	CA, %	CD, PPM	CO, PPM	CR, PPM	CU, PPM
Cell 1												
BB 0111A	391700	1062100	6.9	12	0.07	0.50	220	3.1	< 4	< 2	2	75
BB 0113A	391700	1062100	7.3	< 4	0.21	0.10	140	3.2	20	5	4	100
BB 0123A	391700	1062100	5.7	< 4	0.04	< 0.05	93	6.9	< 4	< 2	3	60
BB 0133A	391700	1062100	5.7	< 4	0.05	< 0.05	90	7.8	< 4	2	3	47
DB 0133A	391700	1062100	5.4	< 4	0.06	< 0.05	87	7.9	< 4	2	4	59
BB 0142A	391700	1062100	6.2	8	0.05	0.09	160	4.5	< 4	< 2	3	78
Cell 2												
BB 0211A	391700	1062100	6.6	9	0.09	0.10	160	4.4	6	2	3	110
DB 0211A	391700	1062100	5.8	9	0.09	0.09	110	5.0	5	2	4	130
BB 0221A	391700	1062100	4.5	< 4	0.06	< 0.05	94	7.5	< 4	< 2	3	81
BB 0223A	391700	1062100	5.5	< 4	0.05	< 0.05	94	6.8	< 4	2	3	55
BB 0233A	391700	1062100	5.7	< 4	0.05	< 0.05	97	7.0	< 4	4	6	71
BB 0242A	391700	1062100	5.3	< 4	0.07	< 0.05	94	5.8	< 4	< 2	5	70
Cell 3												
BB 0312A	391700	1062100	5.6	5	0.04	0.09	94	5.9	< 4	2	5	94
BB 0321A	391700	1062100	5.7	< 4	0.06	< 0.05	86	5.5	< 4	< 2	4	66
BB 0323A	391700	1062100	7.3	< 4	0.04	0.06	120	5.5	< 4	< 2	3	50
BB 0333A	391700	1062100	7.2	< 4	0.05	0.20	97	5.2	< 4	3	3	71
BB 0343A	391700	1062100	6.8	8	0.06	0.10	120	5.0	< 4	< 2	2	140
DB 0343A	391700	1062100	6.9	6	0.08	0.10	120	4.6	< 4	< 2	3	120
Cell 4												
BB 0413A	391700	1062100	7.2	< 4	0.05	0.09	120	4.7	< 4	< 2	4	95
ZB 0413A	391700	1062100	7.1	< 4	0.07	0.10	160	4.6	< 4	2	4	96
BB 0423A	391700	1062100	6.5	< 4	0.14	1.40	98	5.7	< 4	< 2	5	69
BB 0431A	391700	1062100	6.4	< 4	0.04	< 0.05	74	7.5	< 4	< 2	2	48
DB 0431A	391700	1062100	6.5	< 4	0.03	< 0.05	70	6.8	< 4	< 2	3	42
BB 0432A	391700	1062100	6.2	< 4	0.04	< 0.05	87	6.6	< 4	3	2	53
BB 0443A	391700	1062100	5.4	< 4	0.04	< 0.05	77	6.0	< 4	2	4	53
Cell 5												
BB 0512A	391700	1062100	8.1	< 4	0.05	0.06	83	5.2	< 4	3	6	75
BB 0522A	391700	1062100	5.7	< 4	0.05	< 0.05	78	7.5	< 4	< 2	4	50
BS 0522A	391700	1062100	6.3	5	0.56	1.50	130	9.0	< 4	21	9	74
BB 0534A	391700	1062100	6.3	< 4	0.05	< 0.05	70	5.6	< 4	< 2	3	48
DB 0534A	391700	1062100	6.1	< 4	0.04	0.09	69	5.8	< 4	< 2	4	47
BB 0543A	391700	1062100	5.6	< 4	0.05	< 0.05	80	5.9	< 4	< 2	4	67

Table A3.--Listing of analytical results for samples of Sedge B (Carex canescens), ash-weight basis, collected on the wetland receiving acid mine drainage from St. Kevin Gulch, Leadville, Colorado.--continued

Cell 6

FieldNo	Latitude	Longitude	ASH, %	AG, PPM	AL, %	AS, PPM	BA, PPM	CA, %	CD, PPM	CO, PPM	CR, PPM	CU, PPM
BB 0613A	391700	1062100	5.9	< 4	0.09	0.09	120	5.6	< 4	4	7	97
BB 0621A	391700	1062100	6.3	< 4	0.08	0.20	95	6.4	< 4	3	4	83
BB 0624A	391700	1062100	9.0	< 4	0.13	0.30	140	6.4	4	3	13	66
BB 0631A	391700	1062100	7.3	< 4	0.18	0.30	92	5.4	11	7	11	90
DB 0631A	391700	1062100	9.2	< 4	0.20	0.51	110	7.9	14	12	11	82
BB 0643A	391700	1062100	6.6	< 4	0.09	0.20	120	4.8	5	3	11	110
Cell 7												
BB 0713A	391700	1062100	6.3	< 4	0.08	0.10	210	5.4	< 4	3	8	93
BB 0721A	391700	1062100	8.0	< 4	0.05	0.30	71	5.5	< 4	2	5	72
BB 0731A	391700	1062100	8.9	< 4	0.06	< 0.05	130	5.9	< 4	2	5	69
BB 0743A	391700	1062100	7.8	< 4	0.05	0.06	150	5.7	< 4	< 2	4	99
DB 0743A	391700	1062100	7.4	9	0.13	0.09	160	2.6	11	3	5	170
Cell 8												
BB 0811A	391700	1062100	7.4	< 4	0.05	0.20	130	5.6	< 4	2	5	100
BB 0813A	391700	1062100	6.5	< 4	0.06	0.09	93	5.9	< 4	2	7	100
DB 0813A	391700	1062100	6.6	< 4	0.05	0.09	100	5.6	< 4	2	7	97
ZB 0813A	391700	1062100	6.4	< 4	0.06	0.08	110	5.7	< 4	< 2	5	88
BB 0822A	391700	1062100	8.0	< 4	0.06	0.20	160	4.6	< 4	< 2	4	66
BB 0831A	391700	1062100	6.8	< 4	0.04	0.08	89	7.8	< 4	2	3	46
BB 0844A	391700	1062100	6.2	< 4	0.05	0.05	110	4.8	< 4	< 2	4	90
Cell 9												
BB 0911A	391700	1062100	9.2	< 4	0.06	0.30	170	5.2	6	3	6	66
BB 0914A	391700	1062100	8.3	20	0.07	0.50	160	3.2	6	< 2	3	140
BB 0921A	391700	1062100	8.5	11	0.10	0.10	140	2.5	10	3	6	140
BB 0934A	391700	1062100	8.0	< 4	0.09	0.10	170	2.8	5	< 2	4	120
BB 0941A	391700	1062100	8.5	< 4	0.06	< 0.05	210	5.5	< 4	3	4	98
DB 0941A	391700	1062100	7.6	10	0.10	0.06	100	2.6	10	< 2	4	140
Cell 10												
BB 1012A	391700	1062100	8.3	9	0.14	0.10	140	3.1	10	3	5	160
DB 1012A	391700	1062100	8.4	8	0.14	0.20	130	3.0	10	4	6	150
ZB 1012A	391700	1062100	8.1	10	0.14	0.06	160	3.3	12	4	6	160
BB 1032A	391700	1062100	7.9	9	0.10	0.10	190	3.0	8	< 2	7	130
BB 1034A	391700	1062100	8.8	< 4	0.08	0.10	120	3.0	5	< 2	5	98
BB 1042A	391700	1062100	7.2	6	0.14	0.10	95	2.4	7	3	8	130
BB 1042A	391700	1062100	7.5	10	0.18	0.20	120	2.7	7	2	7	170

Table A3.--Listing of analytical results for samples of Sedge B (Carex canescens), ash-weight basis, collect on the wetland receiving acid mine drainage from St. Kevin Gulch, Leadville, Colorado.

FieldNo	Latitude	Longitude	ASH, %	AG, PPM	AL, %	AS, PPM	BA, PPM	CA, %	CD, PPM	CO, PPM	CR, PPM	CU, PPM
Cell 11												
BB 1113A	391700	1062100	7.6	< 4	0.08	0.09	100	2.4	5	< 2	5	130
ZB 1113A	391700	1062100	7.8	< 4	0.08	0.10	94	2.3	4	< 2	4	130
BB 1124A	391700	1062100	8.0	< 4	0.07	< 0.05	120	2.5	< 4	< 2	4	97
DB 1124A	391700	1062100	7.6	< 4	0.06	0.05	150	2.6	< 4	2	5	110
BB 1133A	391700	1062100	8.4	< 4	0.09	0.10	150	5.8	< 4	2	5	49
BB 1141A	391700	1062100	3.6	4	0.13	< 0.05	120	6.3	4	3	6	100
BB 1144A	391700	1062100	8.4	< 4	0.06	0.20	210	3.4	4	< 2	6	130
Cell 12												
BB 1211A	391700	1062100	8.1	< 4	0.04	0.20	150	4.7	< 4	2	3	71
DB 1211A	391700	1062100	8.2	< 4	0.04	0.10	79	4.5	< 4	2	4	53
BB 1221A	391700	1062100	6.9	< 4	0.07	0.08	75	4.5	< 4	3	4	59
BB 1231A	391700	1062100	7.2	< 4	0.06	0.07	120	4.7	7	< 2	5	78
BB 1233A	391700	1062100	8.1	< 4	0.08	0.10	190	2.9	10	3	3	110
BB 1242A	391700	1062100	7.2	< 4	0.03	0.20	120	4.2	< 4	2	5	95
Cell 13												
BB 1312A	391700	1062100	6.3	< 4	0.12	< 0.05	110	5.1	4	3	10	86
BB 1314A	391700	1062100	7.7	< 4	0.09	< 0.05	220	4.5	7	< 2	7	55
BB 1322A	391700	1062100	7.7	< 4	0.09	< 0.05	170	4.4	7	4	5	62
BB 1324A	391700	1062100	7.0	< 4	0.15	< 0.05	130	4.3	9	< 2	11	63
BB 1343A	391700	1062100	8.7	< 4	0.14	0.20	200	3.8	16	4	5	73
Cell 14												
BB 1412A	391700	1062100	7.7	< 4	0.06	0.20	100	5.5	< 4	2	5	62
DB 1412A	391700	1062100	7.3	< 4	0.07	0.20	140	5.3	< 4	2	5	73
BB 1421A	391700	1062100	5.3	< 4	0.19	0.10	200	3.2	14	5	8	180
BB 1423A	391700	1062100	5.9	< 4	0.15	0.10	210	2.9	15	7	7	120
BB 1433A	391700	1062100	5.9	< 4	0.27	0.20	180	2.6	19	6	3	210
BB 1441A	391700	1062100	7.2	< 4	0.06	0.09	190	4.9	4	2	2	57
Cell 15												
BB 1521A	391700	1062100	8.1	< 4	0.11	< 0.05	240	2.6	10	3	6	59
BB 1531A	391700	1062100	8.0	< 4	0.10	0.08	95	3.9	7	< 2	4	85
BB 1541A	391700	1062100	9.1	13	0.09	0.30	150	3.6	16	3	5	120
BB 1543A	391700	1062100	7.9	14	0.10	0.20	160	3.3	12	2	5	100

Table A3.--Listing of analytical results for samples of Sedge B (Carex canescens), ash-weight basis, collected on the wetland receiving acid mine drainage from St. Kevin Gulch, Leadville, Colorado.--continued

FieldNo	Latitude	Longitude	ASH, %	AG, PPM	AL, %	AS, PPM	BA, PPM	CA, %	CD, PPM	CO, PPM	CR, PPM	CU, PPM
Cell 16												
BB 1611A	391700	1062100	7.2	< 4	0.05	< 0.05	150	5.4	< 4	< 2	2	63
BB 1613A	391700	1062100	8.1	< 4	0.08	0.10	170	2.8	6	2	5	130
BB 1622A	391700	1062100	8.5	5	0.09	0.20	130	4.2	16	4	5	92
DB 1622A	391700	1062100	8.6	5	0.08	0.10	130	4.0	13	3	5	88
BB 1642A	391700	1062100	6.3	< 4	0.08	0.20	120	2.9	7	2	3	170
Cell 17												
BB 1712A	391700	1062100	7.5	10	0.19	0.20	220	3.4	26	3	8	130
BB 1713A	391700	1062100	8.5	< 4	0.06	0.08	210	5.3	7	3	6	57
BB 1724A	391700	1062100	7.9	< 4	0.06	0.06	120	4.3	< 4	< 2	6	130
BB 1731A	391700	1062100	8.4	10	0.16	0.10	140	2.8	8	2	7	180
BB 1744A	391700	1062100	8.6	4	0.09	0.10	120	4.1	14	< 2	5	120
DB 1744A	391700	1062100	8.7	5	0.09	0.20	170	4.2	16	2	6	140
Cell 18												
BB 1801A	391700	1062100	8.0	23	0.10	0.10	190	3.5	13	3	9	130
BB 1802A	391700	1062100	6.8	8	0.12	0.10	180	4.7	16	3	6	140
BB 1803A	391700	1062100	7.4	10	0.16	0.06	250	4.9	9	< 2	8	120
BB 1804A	391700	1062100	7.8	16	0.11	0.09	220	4.0	11	2	6	130
BB 1805A	391700	1062100	6.3	7	0.19	0.20	180	5.0	10	2	6	140
Cell 19												
BB 1901A	391700	1062100	5.7	< 4	0.06	< 0.05	160	6.3	< 4	< 2	9	60
DB 1901A	391700	1062100	5.6	< 4	0.09	< 0.05	150	6.5	< 4	< 2	9	63
BB 1903A	391700	1062100	6.4	< 4	0.08	0.06	98	7.1	< 4	4	13	43
BB 1904A	391700	1062100	6.6	< 4	0.04	< 0.05	94	7.0	< 4	3	8	43
BB 1905A	391700	1062100	6.9	< 4	0.12	0.08	110	7.2	< 4	3	10	47

Table A3.--Listing of analytical results for samples of Sedge B (Carex canescens), ash-weight basis, collected on the wetland receiving acid mine drainage from St. Kevin Gulch, Leadville, Colorado.--continued

FieldNo	Latitude	Longitude	FE. %	HG PPM	K, %	LA, PPM	MG, %	MN, PPM	MO, PPM	NA, %	NI, PPM	P, %
Cell 1												
BB 0111A	391700	1062100	0.49	0.01	23	< 4	2.1	2000	5	0.02	9	2.5
BB 0113A	391700	1062100	1.40	N 0.02	14	4	0.9	3400	8	0.06	24	2.1
BB 0123A	391700	1062100	0.68	0.02	21	4	4.3	3900	4	0.02	5	3.1
BB 0133A	391700	1062100	0.54	0.02	16	5	5.2	6200	7	0.02	6	3.2
DB 0133A	391700	1062100	0.43	N 0.02	15	5	4.7	5200	6	0.02	4	3.1
BB 0142A	391700	1062100	1.40	N 0.02	29	< 4	2.2	3500	5	0.03	10	3.7
Cell 2												
BB 0211A	391700	1062100	1.20	N 0.01	23	< 4	3.1	3600	< 4	0.04	22	2.8
DB 0211A	391700	1062100	0.97	0.02	24	< 4	3.3	3700	< 4	0.04	21	3.0
BB 0221A	391700	1062100	0.35	N 0.02	26	< 4	4.8	4100	< 4	0.04	9	3.6
BB 0223A	391700	1062100	0.55	N 0.02	23	5	4.3	4000	< 4	0.03	< 4	3.9
BB 0233A	391700	1062100	0.38	N 0.02	26	5	3.6	4800	5	0.04	9	3.9
BB 0242A	391700	1062100	0.35	N 0.02	26	4	3.7	3500	< 4	0.04	8	4.5
Cell 3												
BB 0312A	391700	1062100	0.34	0.02	24	4	3.1	7300	7	0.04	19	3.2
BB 0321A	391700	1062100	0.38	N 0.02	24	< 4	3.5	3600	< 4	0.03	9	3.6
BB 0323A	391700	1062100	0.21	0.02	16	< 4	3.3	4600	< 4	0.05	15	2.5
BB 0333A	391700	1062100	0.33	0.02	15	4	3.3	9000	10	0.09	17	2.5
BB 0343A	391700	1062100	0.32	0.02	21	< 4	2.6	7100	5	0.03	17	2.8
DB 0343A	391700	1062100	0.35	0.02	19	< 4	2.2	5600	< 4	0.03	16	2.8
Cell 4												
BB 0413A	391700	1062100	0.49	0.02	21	< 4	2.3	5400	6	0.04	18	2.9
ZB 0413A	391700	1062100	0.48	0.03	20	< 4	2.2	5300	6	0.04	18	2.9
BB 0423A	391700	1062100	0.34	0.02	18	4	4.3	5900	4	0.04	9	3.3
BB 0431A	391700	1062100	0.26	N 0.02	21	< 4	4.2	3900	< 4	0.02	5	3.2
DB 0431A	391700	1062100	0.23	0.02	22	4	4.1	3100	< 4	0.02	< 4	2.9
BB 0432A	391700	1062100	0.43	N 0.02	24	5	3.9	5700	4	0.03	7	3.6
BB 0443A	391700	1062100	0.35	N 0.02	27	< 4	3.7	4000	< 4	0.04	8	3.4
Cell 5												
BB 0512A	391700	1062100	0.31	N 0.02	23	< 4	2.9	5400	5	0.02	19	2.4
BB 0522A	391700	1062100	0.22	N 0.02	20	6	4.7	4700	< 4	0.03	6	3.6
BS 0522A	391700	1062100	6.50	0.07	18	8	3.0	11000	7	0.39	38	3.0
BB 0534A	391700	1062100	0.40	N 0.02	24	< 4	4.0	3500	< 4	0.03	5	3.8
DB 0534A	391700	1062100	0.31	N 0.02	28	< 4	3.8	3600	< 4	0.03	6	3.5
BB 0543A	391700	1062100	0.35	0.02	23	< 4	3.6	3000	< 4	0.02	9	3.5

Table A3.--Listing of analytical results for samples of Sedge B (Carex canescens), ash-weight basis, collected on the wetland receiving acid mine drainage from St. Kevin Gulch, Leadville, Colorado.--continued

FieldNo	Latitude	Longitude	FE, %	HG, PPM	K, %	LA, PPM	MG, %	MN, PPM	MO, PPM	NA, %	NI, PPM	P, %
Cell 6												
BB 0613A	391700	1062100	0.57	0.02	21	6	2.7	6000	6	0.03	16	3.2
BB 0621A	391700	1062100	0.21	N 0.02	20	< 4	3.6	8800	5	0.06	29	3.9
BB 0624A	391700	1062100	0.83	0.01	12	6	2.4	6700	6	0.05	29	2.4
BB 0631A	391700	1062100	0.52	0.02	20	5	3.7	5500	< 4	0.09	30	3.1
DB 0631A	391700	1062100	0.83	N 0.02	15	8	2.8	5200	< 4	0.20	35	2.7
BB 0643A	391700	1062100	0.37	N 0.02	19	< 4	2.9	7900	18	0.04	18	3.2
Cell 7												
BB 0713A	391700	1062100	0.43	N 0.02	23	6	3.1	5900	5	0.04	19	3.8
BB 0721A	391700	1062100	0.29	N 0.02	19	4	4.1	5400	8	0.02	13	2.4
BB 0731A	391700	1062100	0.17	0.02	13	< 4	2.9	6200	< 4	0.03	11	2.5
BB 0743A	391700	1062100	0.20	N 0.02	17	< 4	3.0	8000	5	0.03	21	3.2
DB 0743A	391700	1062100	0.16	N 0.02	27	7	1.3	7500	10	0.03	20	2.4
Cell 8												
BB 0811A	391700	1062100	0.27	0.02	17	< 4	3.5	5600	9	0.02	17	3.1
BB 0813A	391700	1062100	0.30	N 0.02	22	< 4	3.6	3700	< 4	0.05	12	3.6
DB 0813A	391700	1062100	0.30	N 0.02	20	< 4	3.4	4000	< 4	0.04	12	3.6
ZB 0813A	391700	1062100	0.27	0.01	23	4	3.6	3700	< 4	0.05	12	3.5
BB 0822A	391700	1062100	0.51	N 0.02	21	< 4	2.3	2800	4	0.03	21	3.0
BB 0831A	391700	1062100	0.39	0.02	18	4	5.2	4800	< 4	0.02	5	3.2
BB 0844A	391700	1062100	0.33	N 0.02	25	< 4	3.5	4100	< 4	0.04	8	4.4
Cell 9												
BB 0911A	391700	1062100	0.10	N 0.02	15	< 4	1.8	6500	12	0.03	12	2.0
BB 0914A	391700	1062100	0.15	0.02	22	< 4	1.5	7700	11	0.01	13	2.1
BB 0921A	391700	1062100	0.18	N 0.02	21	< 4	1.0	11000	7	0.03	16	2.5
BB 0934A	391700	1062100	0.17	N 0.02	25	< 4	1.5	6600	< 4	0.02	10	2.5
BB 0941A	391700	1062100	0.21	N 0.02	16	5	3.0	9000	5	0.03	23	2.9
DB 0941A	391700	1062100	0.14	N 0.02	23	< 4	1.3	7700	8	0.02	18	2.2
Cell 10												
BB 1012A	391700	1062100	0.32	N 0.02	22	5	1.0	12000	8	0.04	21	2.2
DB 1012A	391700	1062100	0.37	0.02	20	4	1.0	11000	6	0.03	20	2.3
ZB 1012A	391700	1062100	0.32	N 0.02	23	6	1.1	13000	8	0.04	20	2.4
BB 1032A	391700	1062100	0.27	0.04	23	4	1.2	8800	13	0.03	15	2.2
BB 1034A	391700	1062100	0.18	0.04	21	4	1.4	7200	9	0.01	17	1.9
BB 1042A	391700	1062100	0.57	0.02	25	< 4	1.2	6600	< 4	0.03	17	2.9
BB 1042A	391700	1062100	0.65	0.02	26	5	1.3	8300	6	0.04	18	2.5

Table A3.--Listing of analytical results for samples of Sedge B (Carex canescens), ash-weight basis, collected on the wetland receiving acid mine drainage from St. Kevin Gulch, Leadville, Colorado.--continued

FieldNo	Latitude	Longitude	FE, %	HG, PPM	K, %	LA, PPM	MG, %	MN, PPM	MO, PPM	NA, %	NI, PPM	P, %
Cell 11												
BB 1113A	391700	1062100	0.24	0.02	28	< 4	1.2	5300	< 4	0.03	13	2.6
ZB 1113A	391700	1062100	0.23	N 0.02	25	< 4	1.2	5100	< 4	0.02	10	2.5
BB 1124A	391700	1062100	0.31	N 0.02	23	< 4	2.1	3700	< 4	0.02	9	2.5
DB 1124A	391700	1062100	0.33	N 0.02	24	5	1.8	4000	< 4	0.02	11	2.8
BB 1133A	391700	1062100	0.11	0.02	11	14	2.1	2500	< 4	0.02	< 4	2.1
BB 1141A	391700	1062100	0.52	N 0.02	27	5	3.7	3400	5	0.11	8	5.6
BB 1144A	391700	1062100	0.29	0.03	19	< 4	2.4	4800	9	0.02	12	2.5
Cell 12												
BB 1211A	391700	1062100	0.38	0.01	17	< 4	3.0	6700	7	0.03	10	2.6
DB 1211A	391700	1062100	0.35	N 0.02	17	< 4	3.4	5400	8	0.04	13	3.0
BB 1221A	391700	1062100	0.48	N 0.02	24	< 4	2.5	4600	< 4	0.02	12	2.7
BB 1231A	391700	1062100	0.32	N 0.02	23	4	2.5	3900	4	0.03	11	2.8
BB 1233A	391700	1062100	0.29	N 0.02	20	4	2.0	8400	16	0.02	20	2.1
BB 1242A	391700	1062100	0.42	0.00	23	< 4	3.4	4100	5	0.03	10	3.4
Cell 13												
BB 1312A	391700	1062100	0.16	N 0.02	15	5	2.3	4100	11	0.04	5	2.2
BB 1314A	391700	1062100	0.12	0.04	15	< 4	1.5	3400	4	0.03	7	2.2
BB 1322A	391700	1062100	0.13	0.02	15	< 4	1.6	5700	6	0.05	20	2.4
BB 1324A	391700	1062100	0.21	0.02	16	5	1.6	3700	5	0.04	14	2.3
BB 1343A	391700	1062100	0.15	0.05	12	14	0.9	3900	7	0.03	18	1.8
Cell 14												
BB 1412A	391700	1062100	0.22	N 0.02	21	4	2.0	9400	13	0.03	8	2.4
DB 1412A	391700	1062100	0.59	N 0.02	22	< 4	2.1	10000	14	0.05	9	2.5
BB 1421A	391700	1062100	1.10	0.03	20	6	1.3	3000	4	0.04	29	2.8
BB 1423A	391700	1062100	0.82	0.04	18	6	1.3	4400	6	0.04	32	2.5
BB 1433A	391700	1062100	1.40	N 0.02	17	7	1.2	3500	4	0.06	30	2.3
BB 1441A	391700	1062100	0.15	0.02	19	4	1.9	4100	11	0.03	5	2.6
Cell 15												
BB 1521A	391700	1062100	0.14	0.02	14	< 4	1.0	7300	6	0.02	27	2.2
BB 1531A	391700	1062100	0.27	0.10	24	< 4	1.5	7100	7	0.02	19	2.4
BB 1541A	391700	1062100	0.22	0.03	18	5	1.6	4900	14	0.02	22	2.3
BB 1543A	391700	1062100	0.30	0.03	23	4	1.4	5400	7	0.03	22	2.8

Table A3.--Listing of analytical results for samples of Sedge B (Carex canescens), ash-weight basis, collected on the wetland receiving acid mine drainage from St. Kevin Gulch, Leadville, Colorado.--continued

FieldNo	Latitude	Longitude	FE, %	HG, PPM	K, %	LA, PPM	MG, %	MN, PPM	MO, PPM	NA, %	NI, PPM	P, %
Cell 16												
BB 1611A	391700	1062100	0.17	N 0.02	22	< 4	2.5	7000	10	0.05	4	2.6
BB 1613A	391700	1062100	0.22	0.02	23	4	1.9	3900	10	0.04	20	2.6
BB 1622A	391700	1062100	0.18	0.03	18	6	1.8	9100	29	0.03	22	2.4
DB 1622A	391700	1062100	0.17	N 0.02	19	5	1.9	8200	30	0.03	18	2.5
BB 1642A	391700	1062100	0.30	0.02	20	7	1.9	2800	13	0.01	14	3.5
Cell 17												
BB 1712A	391700	1062100	0.37	N 0.02	21	7	1.4	6800	9	0.03	28	2.3
BB 1713A	391700	1062100	0.09	0.02	16	4	1.7	6200	13	0.02	20	2.3
BB 1724A	391700	1062100	0.25	0.02	22	5	1.6	1900	< 4	0.02	11	3.4
BB 1731A	391700	1062100	0.41	0.04	23	5	1.1	2300	6	0.02	16	2.8
BB 1744A	391700	1062100	0.19	0.03	20	< 4	1.5	4200	6	0.03	19	2.3
DB 1744A	391700	1062100	0.20	0.02	17	4	1.5	4600	8	0.02	19	2.5
Cell 18												
BB 1801A	391700	1062100	0.23	0.04	19	5	1.2	2600	6	0.02	19	2.5
BB 1802A	391700	1062100	0.28	0.02	20	5	2.1	6400	18	0.03	21	2.7
BB 1803A	391700	1062100	0.21	0.03	19	5	1.6	2800	5	0.03	18	2.6
BB 1804A	391700	1062100	0.23	0.04	19	5	1.4	4100	10	0.02	19	2.4
BB 1805A	391700	1062100	0.38	0.02	23	6	2.5	6200	16	0.03	26	3.3
Cell 19												
BB 1901A	391700	1062100	0.22	N 0.01	25	4	3.6	5600	< 4	0.03	5	3.3
DB 1901A	391700	1062100	0.33	N 0.02	23	6	3.6	5100	4	0.05	5	3.8
BB 1903A	391700	1062100	0.61	0.02	21	< 4	3.8	7000	4	0.04	5	3.2
BB 1904A	391700	1062100	0.32	N 0.02	26	5	3.2	7400	5	0.03	< 4	3.3
BB 1905A	391700	1062100	0.36	0.02	23	5	3.8	7000	5	0.03	5	2.9

Table A3.--Listing of analytical results for samples of Sedge B (Carex canescens), ash-weight basis, collected on the wetland receiving acid mine drainage from St. Kevin Gulch, Leadville, Colorado.--continued

FieldNo	Latitude	Longitude	PB, PPM	SR, PPM	ZN, PPM
			Cell 1		
BB 0111A	391700	1062100	97	120	1600
BB 0113A	391700	1062100	17	130	5700
BB 0123A	391700	1062100	< 8	250	1400
BB 0133A	391700	1062100	9	340	2500
DB 0133A	391700	1062100	< 8	320	1800
BB 0142A	391700	1062100	49	190	2100
			Cell 2		
BB 0211A	391700	1062100	84	190	3800
DB 0211A	391700	1062100	52	210	4300
BB 0221A	391700	1062100	10	300	2000
BB 0223A	391700	1062100	< 8	270	1100
BB 0233A	391700	1062100	21	270	1300
BB 0242A	391700	1062100	19	230	1300
			Cell 3		
BB 0312A	391700	1062100	21	180	3100
BB 0321A	391700	1062100	< 8	190	1300
BB 0323A	391700	1062100	< 8	180	1100
BB 0333A	391700	1062100	< 8	180	1300
BB 0343A	391700	1062100	16	180	3100
DB 0343A	391700	1062100	10	160	2700
			Cell 4		
BB 0413A	391700	1062100	< 8	160	2500
ZB 0413A	391700	1062100	10	160	2200
BB 0423A	391700	1062100	82	220	1000
BB 0431A	391700	1062100	< 8	270	840
DB 0431A	391700	1062100	< 8	240	670
BB 0432A	391700	1062100	< 8	290	890
BB 0443A	391700	1062100	< 8	180	820
			Cell 5		
BB 0512A	391700	1062100	< 8	140	2200
BB 0522A	391700	1062100	< 8	290	800
BS 0522A	391700	1062100	26	370	3900
BB 0534A	391700	1062100	< 8	200	600
DB 0534A	391700	1062100	< 8	200	640
BB 0543A	391700	1062100	< 8	220	990

Table A3.--Listing of analytical results for samples of Sedge B (Carex canescens), ash-weight basis, collected on the wetland receiving acid mine drainage from St. Kevin Gulch, Leadville, Colorado.--continued

FieldNo	Latitude	Longitude	PB, PPM	SR, PPM	ZN, PPM
			Cell 6		
BB 0613A	391700	1062100	13	200	2000
BB 0621A	391700	1062100	8	260	4900
BB 0624A	391700	1062100	10	230	3300
BB 0631A	391700	1062100	13	200	3500
DB 0631A	391700	1062100	42	290	3500
BB 0643A	391700	1062100	18	200	3000
			Cell 7		
BB 0713A	391700	1062100	9	190	3100
BB 0721A	391700	1062100	9	290	2400
BB 0731A	391700	1062100	< 8	250	2100
BB 0743A	391700	1062100	9	210	3700
DB 0743A	391700	1062100	42	62	4000
			Cell 8		
BB 0811A	391700	1062100	12	230	3200
BB 0813A	391700	1062100	10	220	2500
DB 0813A	391700	1062100	< 8	200	2200
ZB 0813A	391700	1062100	< 8	210	2600
BB 0822A	391700	1062100	< 8	240	2300
BB 0831A	391700	1062100	< 8	310	2200
BB 0844A	391700	1062100	< 8	220	1900
			Cell 9		
BB 0911A	391700	1062100	17	230	3700
BB 0914A	391700	1062100	23	110	4000
BB 0921A	391700	1062100	27	66	3200
BB 0934A	391700	1062100	10	99	1800
BB 0941A	391700	1062100	9	200	3600
DB 0941A	391700	1062100	27	62	3800
			Cell 10		
BB 1012A	391700	1062100	29	72	4000
DB 1012A	391700	1062100	24	71	3500
ZB 1012A	391700	1062100	31	76	4000
BB 1032A	391700	1062100	17	110	2600
BB 1034A	391700	1062100	< 8	90	2300
BB 1042A	391700	1062100	19	50	2500
BB 1042A	391700	1062100	32	65	3500

Table A3.--Listing of analytical results for samples of Sedge B (Carex canescens), ash-weight basis, collected on the wetland receiving acid mine drainage from St. Kevin Gulch, Leadville, Colorado.--continued

FieldNo	Latitude	Longitude	PB, PPM	SR, PPM	ZN, PPM
			Cell 11		
BB 1113A	391700	1062100	8	61	2400
ZB 1113A	391700	1062100	< 8	60	2200
BB 1124A	391700	1062100	10	95	1400
DB 1124A	391700	1062100	13	77	1700
BB 1133A	391700	1062100	< 8	270	620
BB 1141A	391700	1062100	33	230	1600
BB 1144A	391700	1062100	< 8	140	1700
			Cell 12		
BB 1211A	391700	1062100	< 8	200	1700
DB 1211A	391700	1062100	< 8	200	1700
BB 1221A	391700	1062100	11	200	2500
BB 1231A	391700	1062100	18	190	2500
BB 1233A	391700	1062100	15	100	3200
BB 1242A	391700	1062100	< 8	210	1500
			Cell 13		
BB 1312A	391700	1062100	12	250	1800
BB 1314A	391700	1062100	< 8	200	1900
BB 1322A	391700	1062100	9	190	3900
BB 1324A	391700	1062100	19	180	3900
BB 1343A	391700	1062100	20	160	6300
			Cell 14		
BB 1412A	391700	1062100	< 8	200	1000
DB 1412A	391700	1062100	11	210	970
BB 1421A	391700	1062100	41	110	5500
BB 1423A	391700	1062100	32	100	4800
BB 1433A	391700	1062100	61	98	5000
BB 1441A	391700	1062100	11	220	1100
			Cell 15		
BB 1521A	391700	1062100	20	120	6500
BB 1531A	391700	1062100	14	130	3900
BB 1541A	391700	1062100	27	110	7200
BB 1543A	391700	1062100	17	100	6300

Table A32.--Listing of analytical results for samples of Sedge B (Carex canescens), ash weight basis, collected on the wetland receiving acid mine drainage from St. Kevin Gulch, Leadville, Colorado.--continued

FieldNo	Latitude	Longitude	PB, PPM	SR, PPM	ZN, PPM
Cell 16					
BB 1611A	391700	1062100	< 8	230	890
BB 1613A	391700	1062100	14	120	3000
BB 1622A	391700	1062100	14	130	7500
DB 1622A	391700	1062100	12	130	6500
BB 1642A	391700	1062100	11	99	3100
Cell 17					
BB 1712A	391700	1062100	95	110	7700
BB 1713A	391700	1062100	8	220	2300
BB 1724A	391700	1062100	13	160	3100
BB 1731A	391700	1062100	34	96	4300
BB 1744A	391700	1062100	15	150	8500
DB 1744A	391700	1062100	13	160	8600
Cell 18					
BB 1801A	391700	1062100	42	98	6400
BB 1802A	391700	1062100	64	180	7800
BB 1803A	391700	1062100	56	190	5800
BB 1804A	391700	1062100	47	140	6300
BB 1805A	391700	1062100	63	200	7300
Cell 19					
BB 1901A	391700	1062100	< 8	240	980
DB 1901A	391700	1062100	11	230	930
BB 1903A	391700	1062100	< 8	290	780
BB 1904A	391700	1062100	< 8	250	920
BB 1905A	391700	1062100	< 8	280	1300