**Vascular plant inventory of expanded Craters of the Moon National Monument and Preserve: Contribution to the project by Michael Mancuso, 2006.**

Summary report prepared by Michael Mancuso, September 12, 2006

**Summary:** I made two plant collecting trips to Craters of the Moon National Monument and Preserve (CRMO) during summer, 2006. A total of 105 plant collections were made. I estimate 35 (33%) of the collections represent new additions to the vascular plant checklist for CRMO. Several other collections appear to represent species previously under-collected or unvouchered for CRMO.

**Methods:** Prior to my first visit to CRMO, I reviewed several plant lists supplied by Paige Wolken (Vegetation Ecologist, CRMO) to familiarize myself with the list of target species for 2006, as well as lists of plant species needing voucher or additional voucher material. I also reviewed the draft plant checklist to get an idea of what was already well documented for the CRMO area. Before arriving at CRMO I coordinated with Dr. Duane Atwood for suggestions and preferences concerning areas to focus my plant collecting efforts. This initial list of potential collecting areas was refined based on discussions with Paige Wolken upon my arrival at CRMO. During my initial visit I was assisted in the field by Amy Rowland, an intern at CRMO. I was unassisted during my visit later in the season.

Targets included plant species (1) not previously documented for CRMO, (2) needing verification of their occurrence within the CRMO, or (3) needing additional/supplemental voucher material. We walked in meandering transect fashion through each of the survey areas visited. Plants meeting any of the three criteria listed above were collected in large plastic zip-lock bags. Material sufficient for duplicate vouchers was collected unless only a few plants could be found. Collections were also made for plants with unknown or uncertain field identification that possibly met the target criteria. Plants were placed in a cooler upon return to our vehicle. Plants were pressed in a standard plant press and given a collection number at the end of the day.

GPS coordinates were recorded for most collection sites to help document their location. Documentation for each collection site also included general location, elevation, topographic, plant community and associated species, soil, flower color, and relative abundance information whenever possible. I assigned a tentative, unverified species or genus name to many, but not all of the collections. All of this information was recorded in my plant collection book. Pressed plants from the first collecting trip were submitted to Paige Wolken, CRMO. Plants from the second trip were mailed directly to Dr. Duane Atwood at Brigham Young University, who will determine the identification of each collection. Copies of my collection book pages have been submitted to CRMO and to Dr. Atwood.

**Results:** I made two plant collecting trips to CRMO, 31July – 2 August, and 1 September – 2 September, 2006. During these trips, a total of 105 plant collections were made, 84 during the first, and 21 during the second visit. I estimate 35 (33%) of the collections represent new additions to the vascular plant checklist for CRMO. Several other collections appear to represent under-collected or unvouchered species. The remaining collections are those whose identification I was uncertain, mistakenly thought were on one of the target lists, or thought might be of general floristic interest. Collections were made at 16 separate sites. These are listed in Table 1, along with dates and the number of collections made at each site. Maps showing the location of the collections sites are appended to this summary report. The maps also include my general plant survey routes. Digital photos were taken at several collection

sites. These images have been copied onto a CD and submitted to CRMO with this report. I did not observe any federally listed or Idaho Bureau of Land Management special status plant species during my field searches.

Table 1. Summary of plant collection sites within CRMO, 2006.

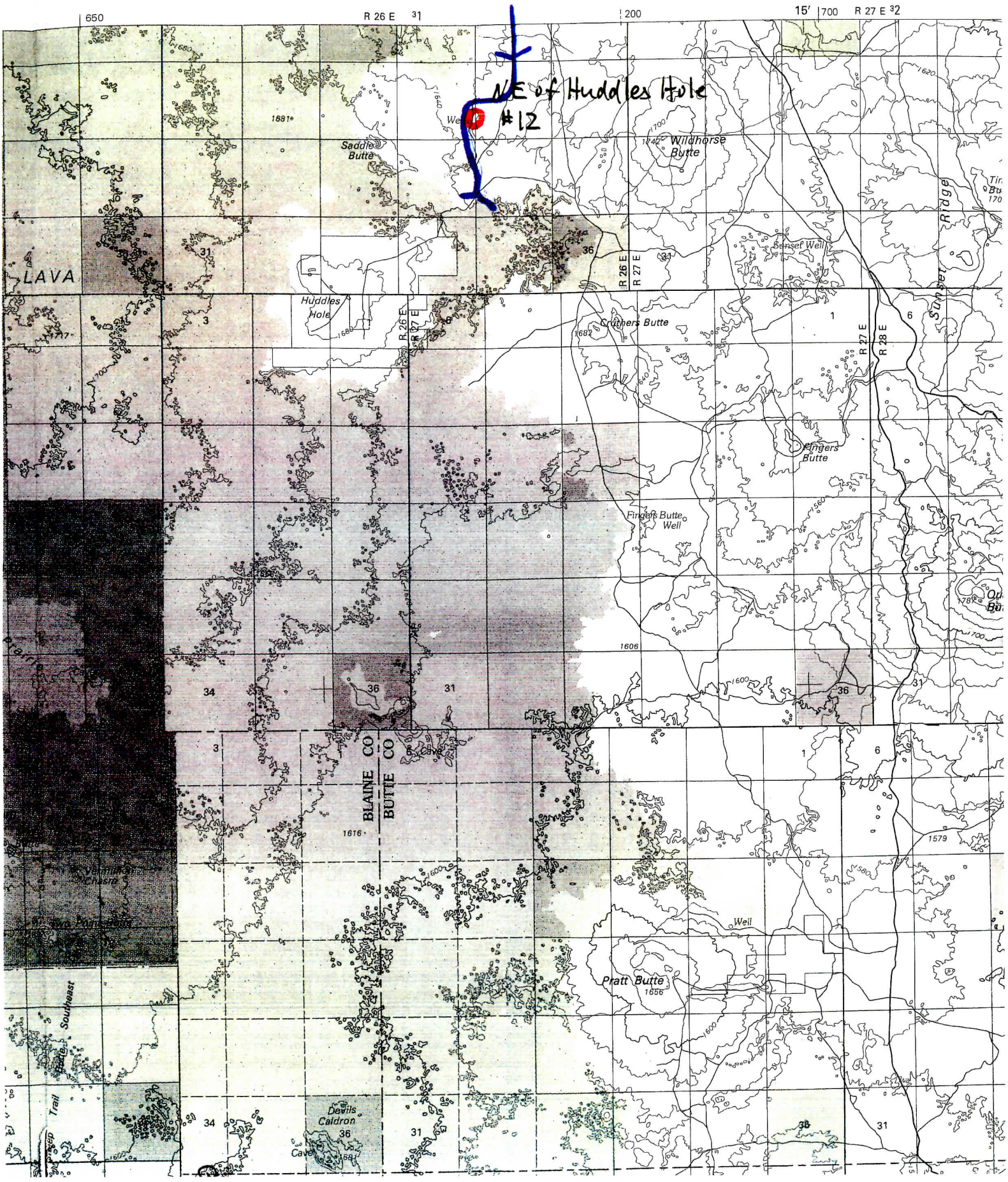
| Site # | Date | Location | UTM[1] | Legal description | Habitat | # of collections |
|---|---|---|---|---|---|---|
| 1 | 31 July | Lava Lake, east side | N4806851 E279752 | T1N R23E S28 | Wetland & upland | 12 |
| 2 | 31 July | Lava Lake, NE lobe | N4807272 E280121 | T1N R23E S27 | Wetland | 9 |
| 3 | 31 July | Hillside springs ca 2 miles E of Lava Lake | N4807868 E283086 | T1N R23E S26 | Wetland & seeding | 10 |
| 4 | 1 August | Western edge of Carey Lava Flow | N4798434 E263822 | T1S R21E S25 | Wetland & upland | 9 |
| 5 | 1 August | Huff Creek | N4805030 E271746 | T1S R22E S2 | Wetland | 15 |
| 6 | 2 August | Huff Creek hot springs area | N4805212 E274694 | T1S R22E S1 | Wetland | 14 |
| 7 | 2 August | Spring ca 1 mile NE of Lava Lake | N4808635 E281790 | T1N R23E S23 | Wetland | 3 |
| 8 | 2 August | Little Cottonwood Ck. | N4818241 E290235 | T2N R24E S22 | Wetland | 6 |
| 9 | 2 August | Leech Creek, near research camp | | T2N R24E S27 | Wetland | 4 |
| 10 | 2 August | Hillside ca 3.5 miles ENE of Lava Lake | N4808463 E285966 | T1N R24E S19 | Wetland | 1 |
| 11 | 2 August | Dirt road N of Sunset Cone | | T2N R24E S26 | Upland | 1 |
| 12 | 1 Sept. | Ca 2.5 miles NE of Huddles Hole | N4817335 E311912 | T2S R26E S22 | Upland | 3 |
| 13 | 1 Sept. | Little Springs, upper Little Cottonwood Ck. | N4818788 E289570 | T2N R24E S21 | Wetland | 2 |
| 14 | 2 Sept. | Huff Creek | N4804495 E271366 | T1S R22E S10 | Wetland | 8 |
| 2 | 2 Sept. | Lava Lake, NE lobe | N4807272 E280121 | T1N R23E S27 | Wetland | 3 |
| 15 | 2 Sept. | Huff Lake | N4800927 E269402 | T1S R22E S21 | Wetland | 4 |
| 16 | 2 Sept. | Hillside ca 1 mile E of Huff Ck. hot spring | N4805220 E276187 | T1N R23E S31 | Upland | 1 |

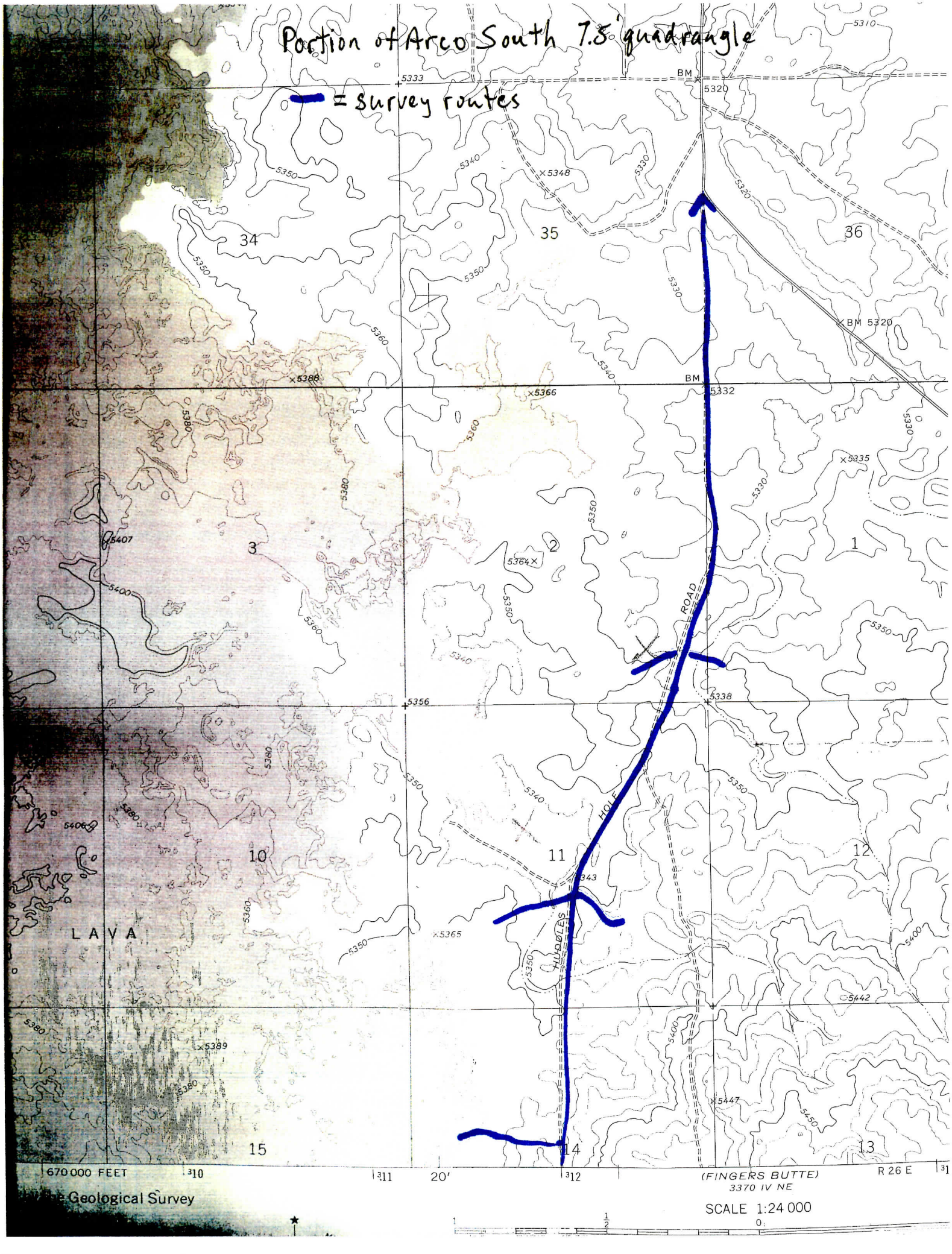
[1] = Zone 12T, NAD 83

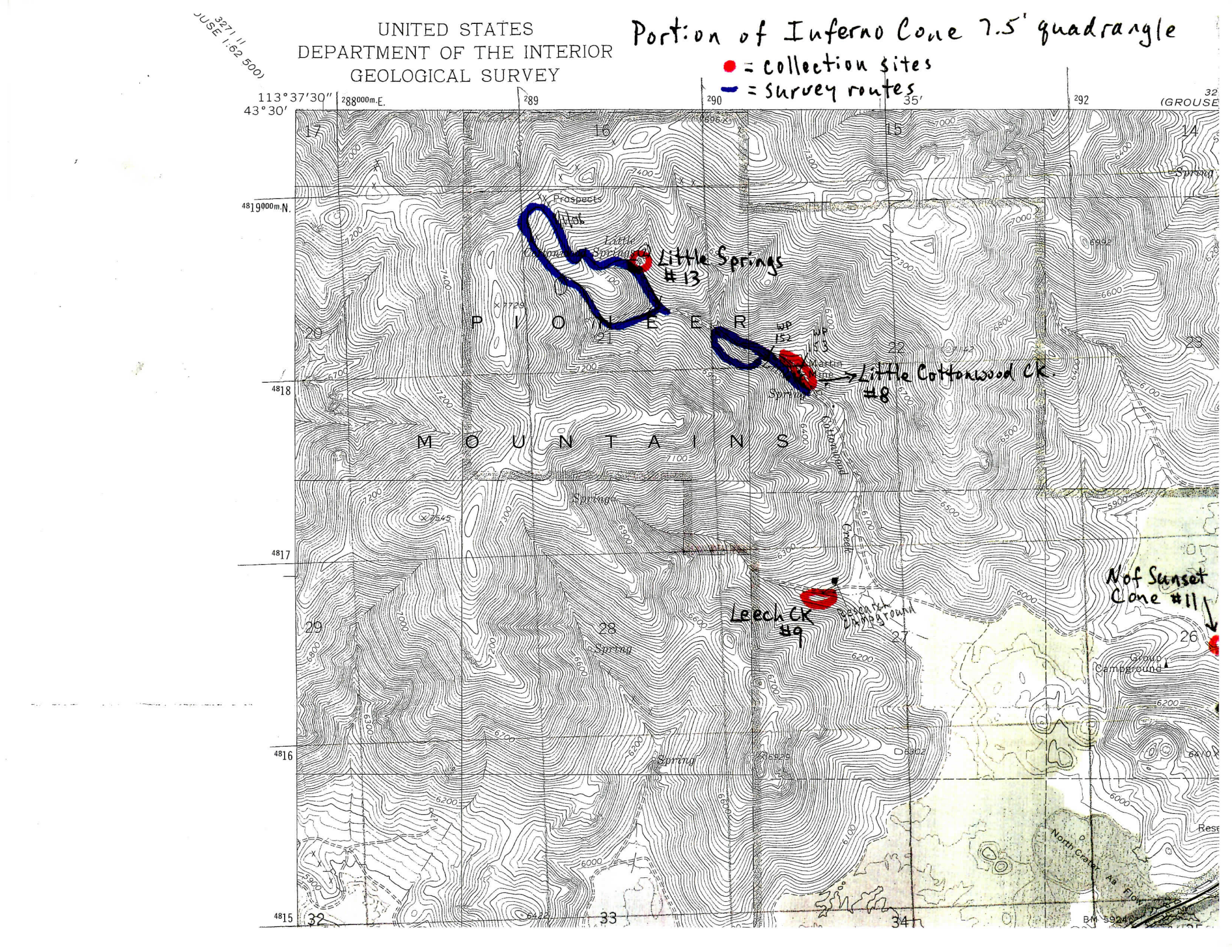
Portion of Craters of the Moon 1:100 000 map

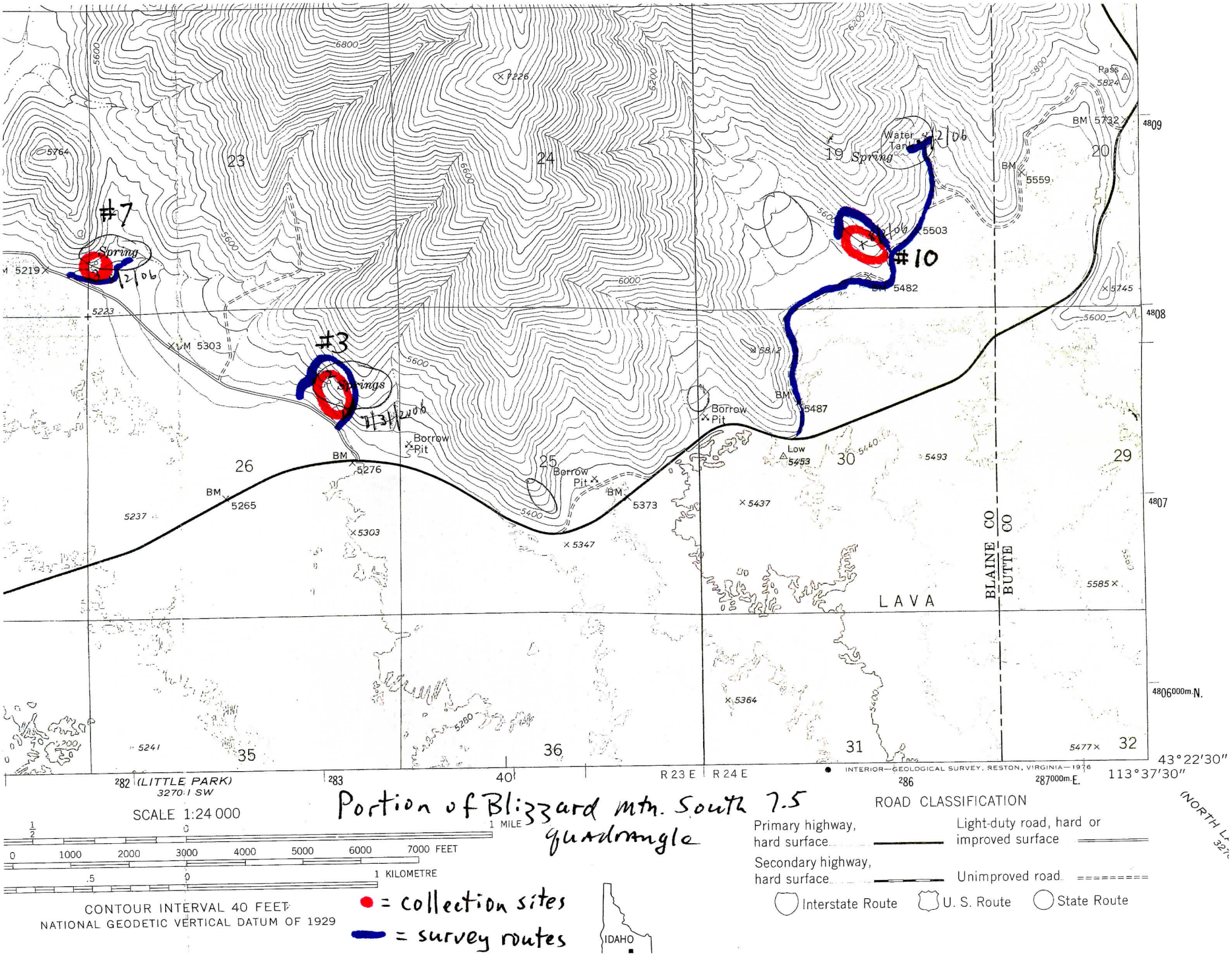
● = collection sites

▬ = survey routes




Portion of Arco South 7.5' quadrangle
= survey routes
ROAD
HOLE
HUGGLES
LAVA
(FINGERS BUTTE)
3370 IV NE
SCALE 1:24 000
670 000 FEET
R 26 E
Geological Survey


UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
Portion of Inferno Cone 7.5' quadrangle
● = collection sites
— = survey routes
Little Springs #13
Little Cottonwood Ck. #8
Leech Ck #9
N of Sunset Cone #11
PIONEER
MOUNTAINS
WP 152
WP 153
Research Campground
Group Campground
North Crater Aa Flow
Little Cottonwood Creek
Leech Creek
Spring
Prospects
Mine
BM 5924
113°37'30"
43°30'




Portion of Blizzard Mtn. South 7.5 quadrangle

SCALE 1:24 000

1 MILE

0 1000 2000 3000 4000 5000 6000 7000 FEET

.5 0 1 KILOMETRE

CONTOUR INTERVAL 40 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

● = collection sites

▬ = survey routes

IDAHO

ROAD CLASSIFICATION

Primary highway, hard surface

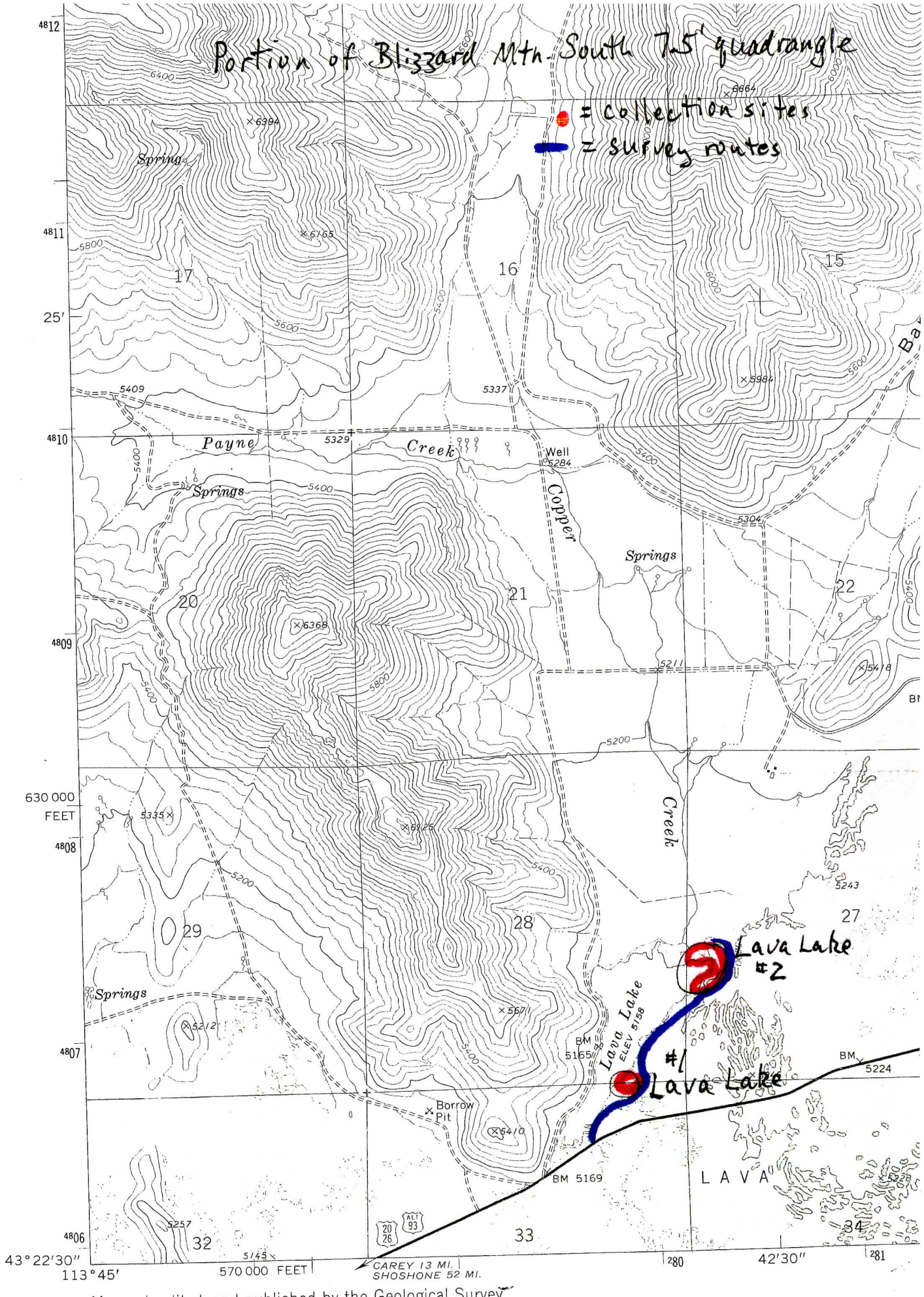
Secondary highway, hard surface

Light-duty road, hard or improved surface

Unimproved road

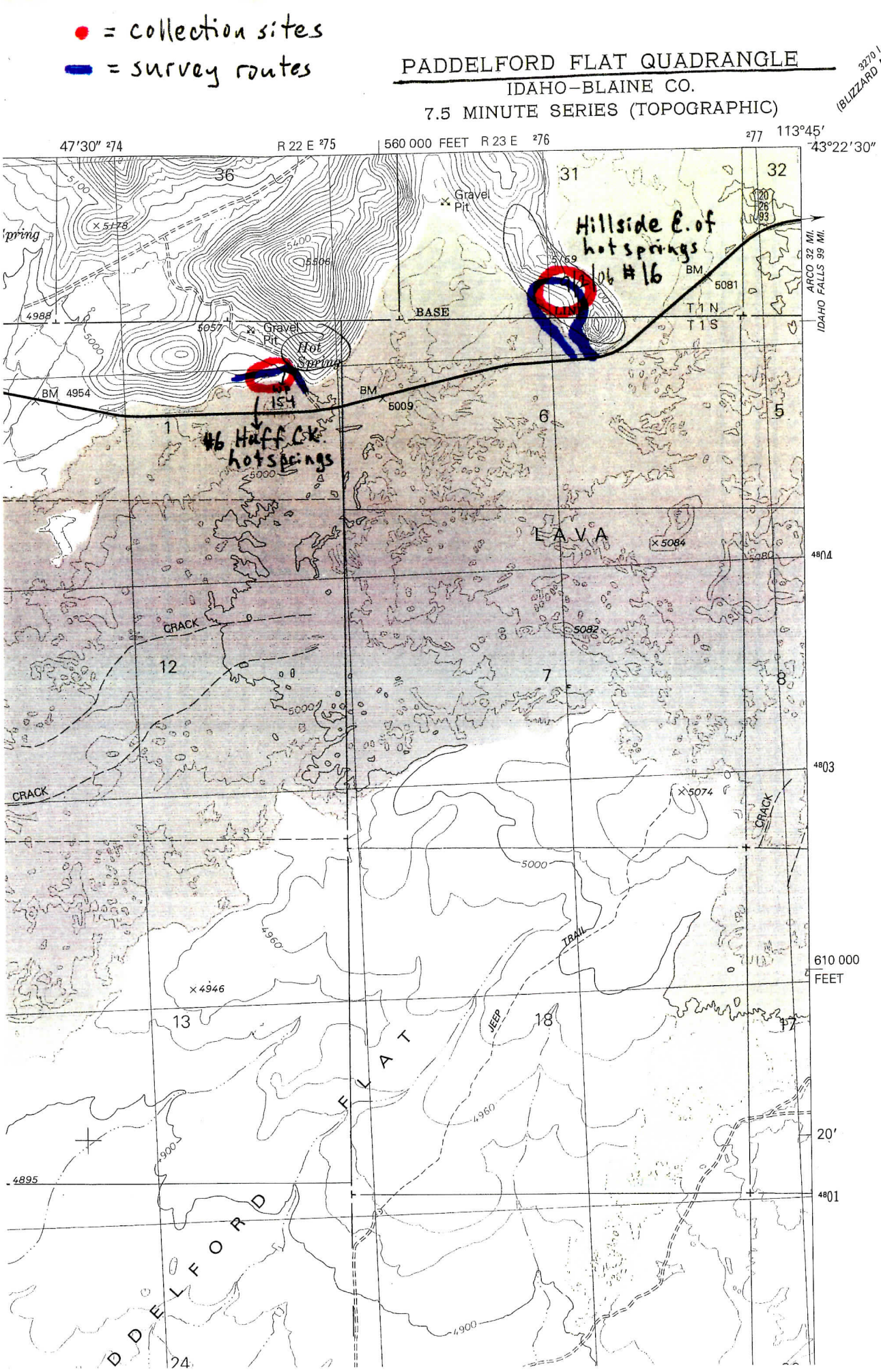
Interstate Route U. S. Route State Route

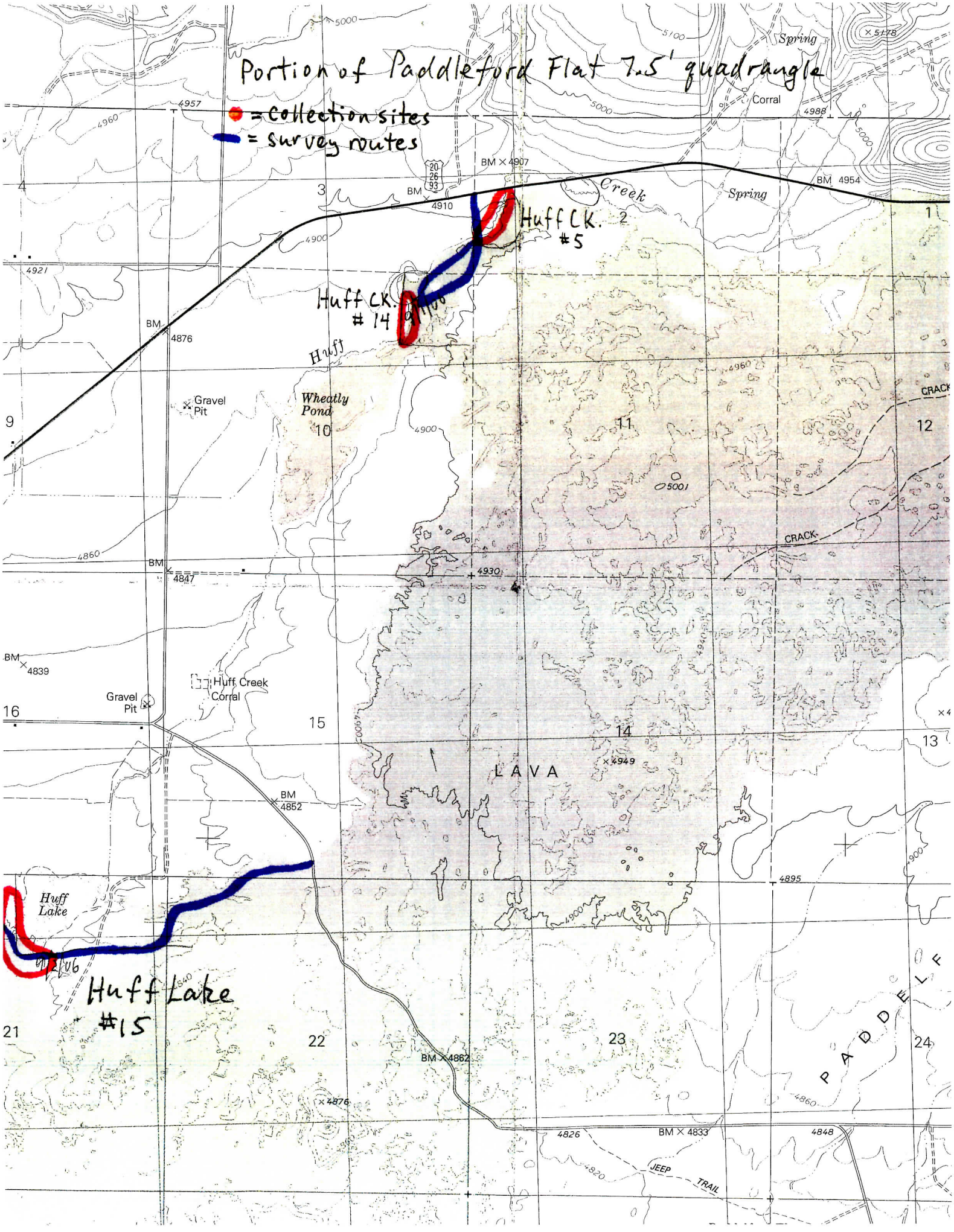
(NORTH L 32

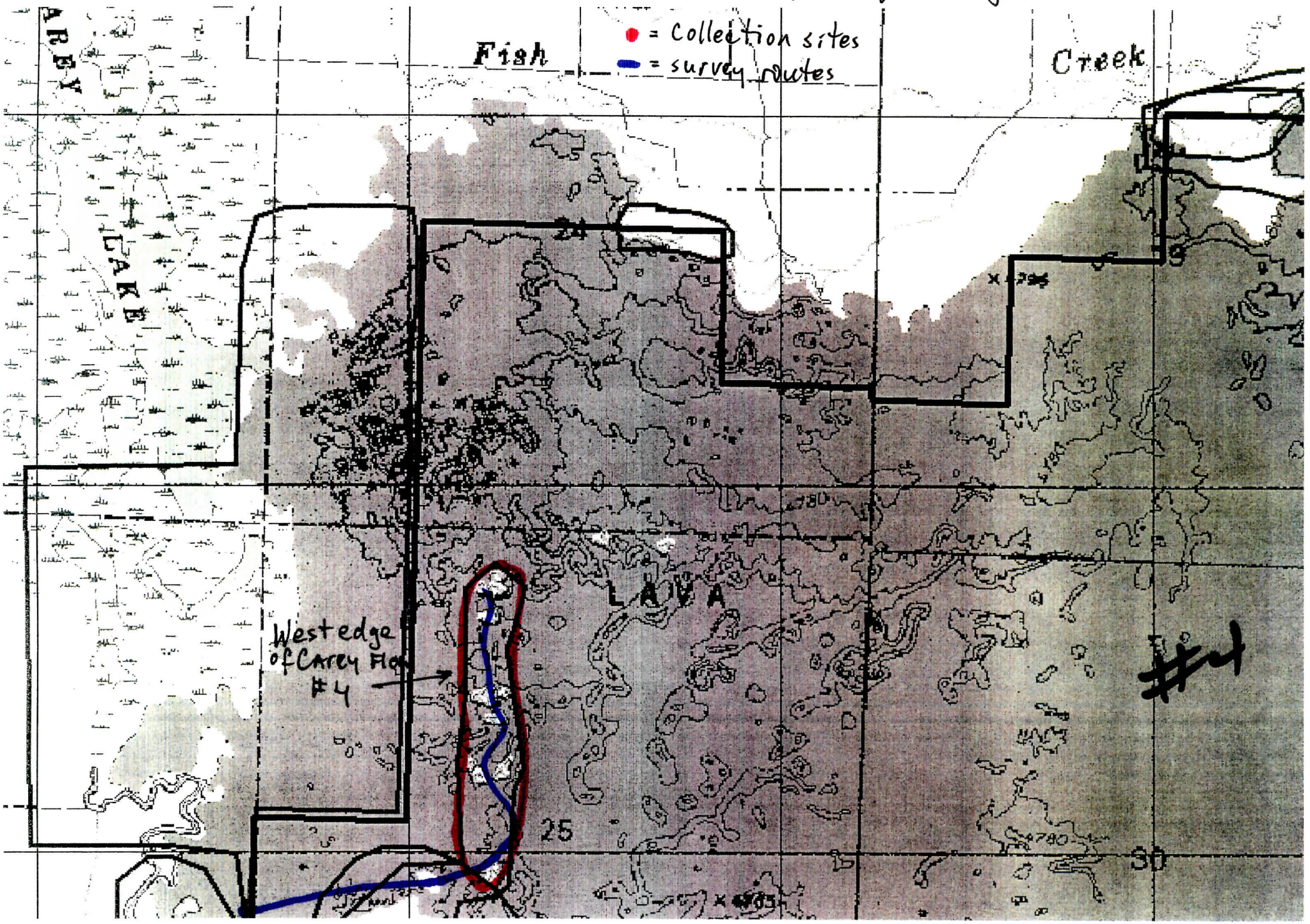

Portion of Blizzard Mtn South 7.5' quadrangle
= collection sites
= survey routes
Lava Lake #2
Lava Lake #1
Lava Lake Elev 5158
Payne Creek
Copper Creek
Springs
Well
Borrow Pit
BM 5165
BM 5169
BM 5224
L A V A
CAREY 13 MI.
SHOSHONE 52 MI.
630 000 FEET
570 000 FEET
43°22'30"
113°45'
42'30"
Mapped, edited, and published by the Geological Survey
Control by USGS and NOS/NOAA
MN
1000

● = collection sites

▬ = survey routes




Portion of Paddleford Flat 7.5' quadrangle
= collection sites
= survey routes
Huff Ck. #5
Huff Ck. #14
Huff Lake #15
Huff Creek
Spring
Corral
Wheatly Pond
Gravel Pit
Huff Creek Corral
LAVA
JEEP TRAIL
CRACK
PADDLEFORD
BM × 4907
BM 4954
BM 4910
BM 4876
BM 4847
BM 4839
BM 4852
BM × 4862
BM × 4833
4957
4960
4988
5000
5100
5178
4921
4900
4930
4940
4949
4895
4826
4848
4820
4860
5001
20
26
93
1
2
3
4
9
10
11
12
13
14
15
16
21
22
23
24


Portion of Carey 7.5' quadrangle
● = Collection sites
— = survey routes
Fish
Creek
CAREY
LAKE
LAVA
West edge of Carey Flow #4
#4
25
30

094

2955 Bromus inermis

with #2945; plants rhizomatous; becoming common

July 31

2956 Blaine Co. Δ

July 31

2956 Sonchus asper

Blaine Co. east side of Lava Lake, ca 13 miles NE of Carey, T1N R23E sec 28 SEH; UTM (NAD83 12T) N4806851 E279752 elev. 5160 ft.; muddy substrate up from receding lakeshore; with Polygonum ~~coccineum amphibium~~, Salix exigua; heads yellow; plants apparently annual; uncommon

2957 Erigeron ?

with #2956, except on exposed lava outcrop; growing in crevices of outcrop above wetland vegetation; rare

2958 Euphorbia

with #2956, except extending onto dried mud and low bench immediately above high water line w pulverized crater

2959 Chenopodium

with #2958; uncommon

2960

with #2958; common; additional assoc. spp. for 2958-60 include Xanthium strumarium, Rorippa sp.

2961 Amaranthus

with #2958

miles

2962 Plantago major

with #2956, except along northeast segment of Laost Lake in sec 27 SW4; muddy substrate; with Polygonum ~~amphibium~~ coccineum, Salix exigua; uncommon
UTM (NAD83 12T) N4807272 E280121

2963 Alisma plantago-aquatica

with #2962, except in saturated muck and very shallow standing water in ~~area that~~ low-lying area; with Polygonum ~~amphibium~~ coccineum, Eleocharis palustris; ~~Persicaria~~ ~~hydropiper~~; scattered/uncommon

2964 Sagittaria latifolia 2

with #2963; fairly common

2965 Rorripa 2

with #2962; flowers yellow; uncommon

2966 Rorripa 2

with #2962; flowers yellow; common

2967 Echinochloa crusgalli 2

with #2962; uncommon

2968 Sporobolus airoides 2

with #2962; uncommon

2969 Eleocharis 29

with #2962; forming small, dense patches, but uncommon overall

2970 Rumex

with #2962; common locally

2971 Chenopodium

with #2958; locally common

2972 Potomogeton richardsonii

with #2956, except in shallow water along margin of lake; with #2973+2974

2973 Potomogeton

with #2972

2974 Potomogeton pectinatus

with #2972

2975

with #2958

2976 Cuscuta

with #2958; plants twining and parasitic on several annual forb species; flowers white; uncommon

098

2977 Iva axillaris

Blaine Co., north of Highway 20 ca 2 miles east of Lava Lake, ca 1.5 miles NE of Carey, T1N R23E sec 26 NE¼; elev 5400 ft.; small hillside spring on south-facing lower slope; with Carex nebrascensis, Juncus spp., Carsium arvense, Rumex crispus, Epilobium ciliatum var. glandulosum, Rosa sp.; #2977 growing along margin of spring on drier ground; locally common utm (NAD 83 12T) N4807868 E283086

2978 Salix

with #2977, except in spring zone (not marshy) 1 large shrub up to ca 2.5 m tall

2979 Alopecurus pratense

with # 2978; rare

2980 Muhlenbergia

with # 2978; rare

2981 pubescent wheatgrass

with #2977, except in seeded area downslope from spring; gently-sloping; southerly aspect; adjacent to sagebrush-steppe vegetation; with #2982, Agropyron cristatum

2982 intermediate wheatgrass cultivar ?

with #2981; plants rhizomatous

2983 Agrostis stolonifera

with #2978 except at spring located ca 0.1 mile NW of #2977, but habitat basically the same, but with Salix boothii

2984 Juncus

with #2978; caesp. fose

2985 Aster

with #2978; rare; rays lavender

2986 Epilobium densiflorum

with #2978; flowers light purple

100

August 1, 2006
w Paige Wolken + Amy Rowland

2987 Alisma gramineum

Blaine Co. western edge of the Carey lava flow, ca 2 miles east of Carey, Craters of the Moon National Reserve, T1S R21E sec 25 SW4; elev. 4780 ft.; rocky, wet mud in portion of ephemeral water hole complex within lava field; associated with Eleocharis palustris, Polygonum coccineum; uncommon
UTM (NAD 83 12T) N4798435 E263822

2988 Panicum capillare

with # 2987, except in moist areas along margins of ephemeral water pools amongst lava; uncommon; assoc. with Asclepias sp., Helianthus annuus

2989 Cyperus aristatus

with # 2988; rare

2990 Madia

with # 2987; except in crevices of east-facing lava outcrop rimming an ephemeral water hole; assoc. with Scutellaria antirhinoides, Chrysopsis villosa.; rays yellow; rare.

2991 unknown annual forb

with # 2987; rare

2992 Verbena bracteata

with # 2987; except in rocky bottom of areas having standing water into early summer and in crevices of lava outcrops rimming these ephemeral water holes; flowers lavender; abundant

2993 Carex athrostachya

with # 2987; except in 'Crater Lake' area - a large complex of seasonally ephemeral + longer-lasting water pools;

moist soil with # 2994; plants ceaspitose; spotty, uncommon overall

2994 Potentilla

with # 2993; flowers yellow; common, but all other plants observed vegetative only

2995 Chrysopsis villosa

with # 2993; heads yellow, plants multi-branched from the base; common

2996 Centaurea macrosa

Blaine Co. Huff Creek, ca 7 miles NE of Carey, just south of Highway 20, Craters of the Moon National Preserve, T1S R22E sec 2; elev. 4900 ft.; flat; extending from mesic, graminoid-dominated vegetation adjacent to creek, to nearby sagebrush-steppe; rays light purple; locally common
UTM (NAD83 12T) N 4805030 277146

2997 Helianthus nuttallii

with # 2996, except in moist bottomland adjacent to creek, with Juncus balticus; rays yellows; plants in a few small clumps

2998 Aster

with # 2997; rays lavender; uncommon

2999 Conyza canadensis

with # 2997 ~~except in moist bottomland~~; heads white; uncommon

3000 Matricaria chamomilla

with # 2997; rays white; rare

3001 Muhlenbergia

with # 2997; uncommon

3002 Polypogon monospeliensis

with # 2997; uncommon

3003 Hordeum

with # 2997; in heavy clay soil site that is wet in spring, but dries hard as rock in summer; plants annual; localized

3004 Carex praegracilis

with # 2997; uncommon; rhizomatous

3005 Carex hebrascensis

with # 2997; common; rhizomatous

3006 grass sp.

with # 3003; uncommon

3007 Polygonum or Rumex

with # 2997; percanth pink; uncommon

3008 Veronica anagallis-aquatica

with #2997; common; flowers blueish

3009 Sonchus

with #2997; rare

3010 Chrysothamnus viscidiflorus

with #2996; shrubs to ca 3.5 cm tall; common heads yellow.

August 2 with Amy Rowland

3011 Scirpus americanus

Blaine Co. Huff Creek Hot Springs area, meadow complex immediately downstream of hot spring on Craters of the Moon National Reserve land, ca 10 miles NE of Carey, ca 0.1 mile north of Highway 20, T1S R22E sec 1 NE¼; elev 5000 ft.; thermally-influenced wetland complex; saturated, often marl-like or mucky substrate; very gently sloping to the west; plants perennial and clonal, up to ca 1.5 m tall; community dominant and forming near monoculture in places. UTM (NAD 83 12T) N 4805212 E 274694

3012 Carex

with # 3011; except on slightly raised areas with moist soil; graminoid-forb mix community; plant rhizomatous; patchy distribution, uncommon overall

3013 Juncus

with # 3011; uncommon

3014 Muhlenbergia asperifolia

with # 3012; uncommon

3015 grass

with # 3012; uncommon

3016 Aster eatonii

with # 3011; rays whitish; uncommon

3017 Solidago canadensis

with # 3012; heads yellow; common

3018 Hordeum SAMe as #3003 ?

with # 3011; plants annual; uncommon

3019 umbel family

with # 3011; rare; plants in fruit

3020 Hypericum formosum

with # 3011; flowers yellow; uncommon

3021 Geum macrophyllum - odd variety?

with # 3012; petals yellow; rare

3022 Potentilla anserinus

with # 3011; plants with above ground stolons; although common no plants with flowers or fruits observed

3023 Centaurium exaltatus

with # 3011; uncommon; perianth pinkish

3024 Ranunculus cymbalaria

with #3011; petals yellow; rare

3025 Ranunculus cymbalaria

Blaine Co. ca 1 mile NE of Lava Lake, <0.1 mile north of Lava Lake Ranch Road, ca 14 miles NE of Carey, T1N R23E sec 23 SW4; elev 5220 ft.; small livestock pond surrounded by sagebrush-steppe vegetation; wet, mucky soil; associated with Typha latifolia; petals yellow; very localized
UTM (NAD83 12T) N4808635 E281790

3026 Bidens cernua

with #3025; rays yellow; very localized

3027 Alopecurus aequalis

with #3025; very localized.

$ 1

3028 Aster

Butte Co: Little Cottonwood Creek, southern Pioneer Mountains, ca 2 miles NW of Sunset Cone, Craters of the Moon National Monument, T2N R24E sec 22; elev. 6520 ft.; aspect NNE; moderately steep mid-slope; Pseudotsuga menziesii stand, with Calamagrostis rubescens, Symphoricarpos sp., Stipa sp.; loamy soil; rays dark purple; common.
UTM (NAD 83, 12T) N4818241 E290235

3029 Aster

with # 3028; rays lavender; common

3030 Aster

with #3028 except - open area along creek with scattered Populus tremuloides and Alnus sinuata, also Poa pratensis, Dactylis glomerata, Solidago canadensis; elev. 6350 ft.; nearly flat; rays white; uncommon
UTM (NAD 83, 12T) N4818179 E290417

3031 Epilobium angustifolium

with #3030; flowers pink-purple, plants to nearly 2 m tall; uncommon

3032 Artemisia dracunculus

with #3030; common

3033 Hieracium albertinum

with #3030; heads yellow; spotty - uncommon

3034 tall grass

Butte Co. Leech Creek (unnamed on USGS topographic map), ca 0.1 mile upstream from its confluence with Little Cottonwood Creek, southern Pioneer Mountains, ca 1.3 miles NW of Sunset Cone, near Craters of the Moon National Monument research campsite, T2N R24E sec 27 NW4; elev. 6000 ft.; riparian habitat with Populus tremuloides, Alnus sinuata, Urtica dioica, Senecio serra, Agastache formosa, Heracleum lanatum; wet ground immediately along creek; common

3035 grass

with #3030; uncommon

3036 Aster foliaceus

with #3034; rays lavender; uncommon

3037 Chrysothamnus

with # 3034; except on SE-facing lower slope within Populus tremuloides stand; heads yellow; shrubs to ca 40 cm tall; common

3038 Salix exigua -different variety?

Blaine Co. ca 0.5 mile north of Highway 20 and ca 3.5 miles ENE of Lava Lake, Craters of the Moon National Reserve, T1N R24E sec 19 SE4; elev. 5600 ft.; SW aspect; upper slope, just below ridgeline; metamorphic parent material; inclusion of more mesic species surrounded by sagebrush-steppe vegetation; no obvious sign of surface moisture; associated with Agrostis stolonifera, Equisetum hymale, Carex sp, Artemisia ludoviciana, Medicago sativa, Purshia tridentata; whisy shrubs to ca 1 m tall
UTM (NAD83 12T) N4808463 E285966

3039 Chenopodium

Butte Co. along dirt road leading to the Craters of the Moon National Monument's Grasp Campground, ca 0.5 mile N of Sunset Cone summit, T2N R24E sec 26; elev. 5820 ft.; cindery substrate, associated with Eriogonum viminem; plants annual; rare

3040 Polygonum coccineum

with #2956; plants growing in mud flats below high water line and in shallow water along lake edge; plants colonial; abundant; perianth pinkish

August 9

3041 Ligusticum tenuifolium

Custer Co. White Cloud Peaks ca 1.5 miles NNE of Washington Peak, ca 0.4 mile downstream from Phyllis Lake, ca 16 miles SE of Stanley; elev. 8900 ft.; graminoid-dominated wet meadow complex; associated with Carex spp., Juncus spp., Deschampsia cespitosa, Erigeron peregrinus, Polygonum bistortoides; moist organic substrate with moss spp.; perianth white; common UTM (11T NAD 27) N 4877483 E 688050

3042 Gentiana calycosa

with #3041; corolla deep blue; common

3043 Erigeron

with #3041; rays white; common

September 1

3104 Nicotinia

Butte Co. Craters of the Moon National Monument, ca 2.5 miles NE of Huddles Hole, ca 10 miles S of Arco, T2N R26E sec 22; elev. 5500 ft.; disturbed area near livestock water tank; associated with Artemisia tripartita, Chrysothamnus viscidiflorus, Polygonum aviculare, Astragalus lentiginosus; volcanic substrate; gently sloping; flowers white; locally common
UTM (12T NAD 83) N4817335 E311912

3105 Chenopodium

with #3104; common

3106 Eriogonum

with #3104; common

3107 Aster

Butte Co. Little Springs at head of Little Cottonwood Creek, ca 3 miles N of Grassy Cone, Craters of the Moon National Monument, T2N R24E sec 21 NE4; elev. 6950 ft.; rocky, saturated ground associated with spring zone; with Solidago canadensis, Urtica dioica, Geum macrophyllum, Angelica pinnata, Juncus ensifolius, Glyceria sp., Salix exigua; rays lavender; common
UTM (12T NAD 83) N4818788 E289570

3108 Cirsium vulgare

with # 3107; heads purple; uncommon

—

September 2

3109 Euthamia occidentalis

Blaine Co. Huff Creek, ca 0.5 mile upstream of Wheatly Pond and ca 0.3 mile S of Highway 20, ca 7 miles NE of Carey, T1S R22E sec 10 NE4; elev. 4880 ft.; narrow, graminoid-dominated riparian strip along creek; associated with Juncus balticus, Carex hebrascensis, Agrostis stolonifera, Mentha arvensis, Salix exigua; Craters of the Moon National Reserve; heads yellow; rare
UTM (12T NAD83) N 4804495 E 271366

3110 Zannichella palustris

with # 3109, except plants aquatic, submerged in shallow, slow moving water; uncommon

3111 Potamogeton

with # 3109; uncommon; aquatic plants submerged in shallow, slow moving water

3112 Potamogeton pectinatus

with #3109; common; submerged aquatic in shallow, slow moving water

3113 Juncus balticus

with #3109

3114 Carex nebrascensis

with #3109; common

3115 Betula erecta

with #3109; common; only vegetative individuals observed

3116 Bidens cernua

with #3109; rays yellow; uncommon

3117 Crypsis alopecuroides

Blaine Co. northeast shoreline of Lava Lake, ca 13 miles NE of Carey, Craters of the Moon National Reserve, T1N R23E sec 27 SW4, elev 5160 ft; moist clayey substrate below high water line; associated with Polygonum coccineum, #3118 + #3119; common
UTM (12T NAD 83) N4807272 E280121
(note: same location as #2962, July 31, 2006)

3118 Polygonum

with #3117; perianth white to light pink; common

3119 Amaranthus graecizans

with #3117; common

3120 Artemisia cana

Blaine Co. Huff Lake in vicinity of western shoreline, ca 5.5 miles ENE of Carey, Craters of the Moon National Reserve, T1S R22E sec 21; elev. 4820 ft.; stony margin of lake between Eleocharis palustris-dominated lakebed and Artemisia tripartita upland communities; associated with #3121; shrubs to ca 0.8 m tall; common
UTM (12T NAD 83) N4800927 E269402

3121 Elymus smithii

with # 3120; common

3122 Madia gracilis

with # 3120; uncommon

3123 Psilocarphus oregonus

with # 3120; common

3124 Artemisia tridentata ssp. wyomingensis

Blaine Co. ca 9 miles NE of Carey, ca 1 mile E of Muff Creek hot spring, and 0.2 mile N of Highway 20, Craters of the Moon National Reserve, T1N R23E sec 31 SW4; elev. 5050 ft.; SW aspect, lower slope to upper slope; associated with Agropyron spicatum, Eriogonum spp.; rocky soil; shrubs to ca 1.5M tall; common
UTM (12T NAD 83) N 4805220 E 276187