

APPENDIX B.

DESCRIPTIONS OF VEGETATION TYPES,
DUGOUT GULCH PROPOSED SPECIAL BOTANICAL AREA

Pinus ponderosa/*Juniperus scopulorum* community. This community occurs on steep southeast- through southwest-facing slopes with small outcrops of sandstone and limestone. Pine canopy cover was estimated at 5-25%. Juniper is occasional and often associated with rock outcrops. The understory is dominated by mixed grass prairie species: *Stipa comata*, *Andropogon scoparius*, *Agropyron spicatum* and many grassland forbs (e.g. *Echinacea pallida*, *Liatris punctata*, *Psoralea esculenta* and *Yucca glauca*). Understory cover was estimated at 25-50%. No macroplots were read for this community, as stands within the study area are small and too variable.

Ostrya virginiana/*Carex sprengei* community. This community occurs in the main drainage bottom where it is sufficiently wide to provide nearly level topography. It disappears approximately 1.5 mile upstream from the Forest boundary, as conditions become too dry, or elevation too high. Two macroplots were read for this community (see map and data sheets that follow). Canopy cover averaged 77%, and was dominated by hophornbeam (51%). The other important canopy species was *Quercus macrocarpa* (27%). *Ulmus americana*, *Acer negundo* and *Crataegus* sp. were occasionally found. Hophornbeam is a small tree, and could be considered a subcanopy component. However, in the Dugout Gulch study area, there is not an obvious distinction between canopy and subcanopy, and the two strata were combined. Understory cover was estimated at 100%, and species composition was fairly uniform. Sprengel's sedge dominates, with an estimated average cover of 66%. *Galium aparine* is an important associate. *Poa pratensis* (Kentucky bludgrass) was common in one of the two macroplots read. In the same macroplot, *Cynoglossum officinale* (houndstongue) occurred in 50% of the microplots read.

Betula papyrifera/*Corylus cornuta* community. This community occurs on the lower slopes of the gulch, and in the drainage bottom where it is too narrow for the hophornbeam community. It extends higher up slopes with northerly aspects, and in narrow side drainages. Upstream from the fork in Dugout Gulch (the study area boundary), birch stands are much less extensive. Two macroplots were read for this community (see map and data sheets that follow). Canopy cover averaged 100%, and was dominated by hophornbeam (82%) and birch (54%). Although the birch stands in the study area have a very significant hophornbeam component, a distinct birch/hophornbeam community was not described. Birch/hazelnut stands without hophornbeam are fairly common in the northwest Black Hills (Marriott 1985), whereas birch/hophornbeam/hazelnut stands are unusual, and perhaps restricted to lower elevations. They may be more common at lower elevations on the east slope of the Black Hills. At this time, it is not clear that this vegetation type should be considered a separate plant community.

In the stands studied, birch generally overtopped the hophornbeam, and the two could be considered separate strata (canopy and subcanopy). However the distinction was not always clear, and so the two strata were combined. Tall shrub cover was significant in

this community, averaging 53%, with hazelnut the dominant species (39%). Herbaceous associates were diverse and variable. Oryzopsis asperifolia and Mahonia repens were the most frequent species in the microplots read. The herbaceous stratum shows very strong boreal affinities, with species such as Aralia nudicaulis, Halenia deflexa, Maianthemum canadense and Viola pubescens fairly common.

Symphoricarpos albus meadow. This vegetation type occurs in small openings in the heavily forested drainage bottom. Cover was estimated at 100%. The dominant species is Symphoricarpos albus. Exotic species are common, especially Cynoglossum officinale. No macroplots were read for this vegetation type, as stands in the study area are quite small.

Pinus ponderosa forest. Much of the study area above the drainage bottom is vegetated with a mixture of ponderosa pine forest types that are difficult to segregate. Structure and associates are quite variable. Included is a spectrum ranging from dense doghair with little understory on north-facing slopes to open park-like stands on the ridgecrests. Bur oak is a common component on intermediate sites. The park-like stands on gentle topography may be artifacts of logging. Cut stumps and old overgrown roads show that the area has been logged. No macroplots were read as it was impossible to select representative stands in the study area for this extremely variable vegetation type.

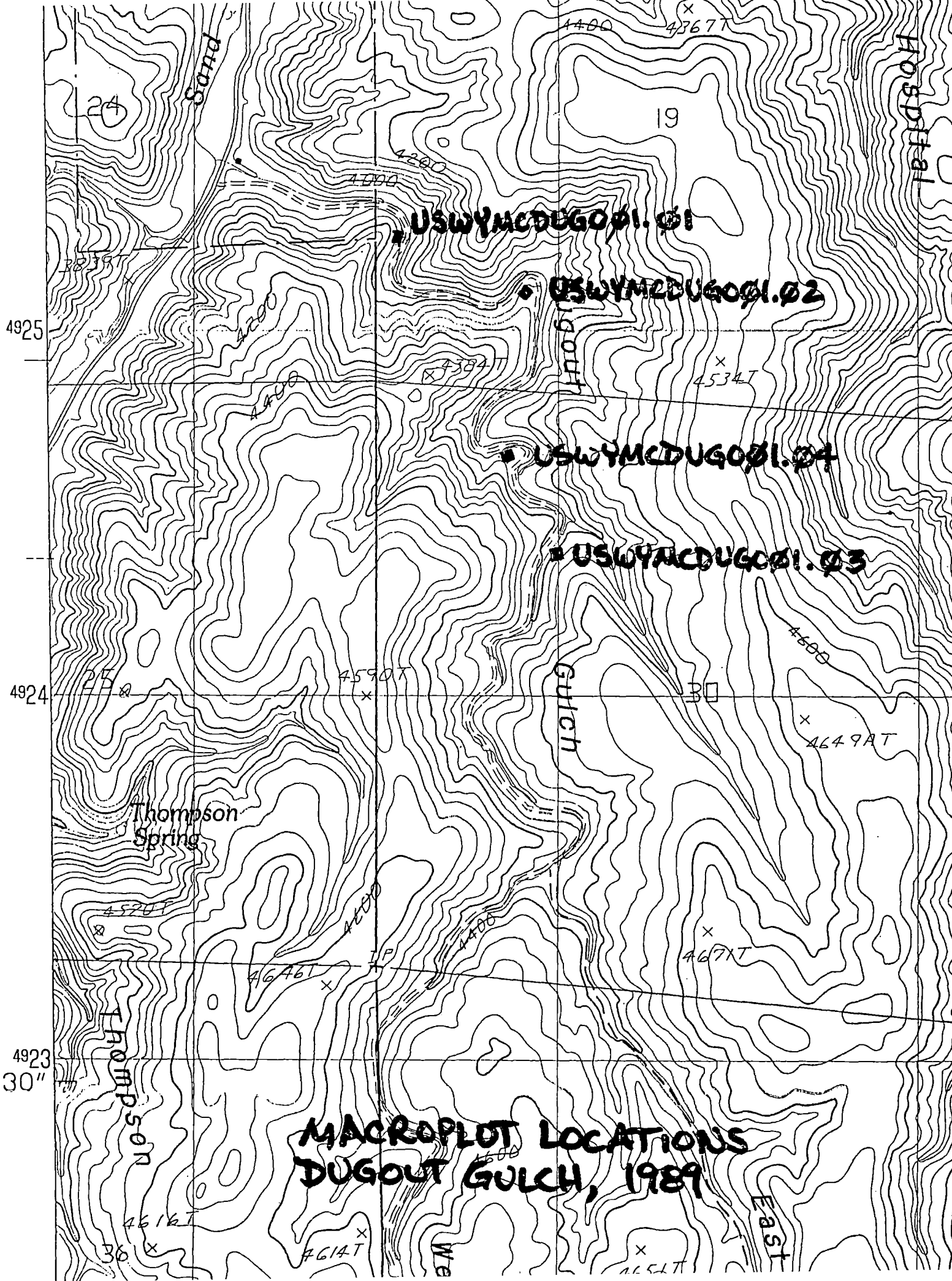
MACROPLOT DATA

20 x 20

Plant communities were sampled using a macroplot method developed by The Nature Conservancy. Sample field forms are included in Appendix A. Stands were sampled using 20 m X ~~50~~ 20 m macroplots, located at sites considered representative of the plant community. Macroplot locations are shown on the map on the following page.

Cover was estimated for the different strata, and for canopy and shrub species. Cover was estimated also for dominant species in herbaceous strata, where dominance was obvious. For each macroplot, four cover class estimates (one per quarter) were obtained. Cover values in the following tables represent averaged midpoints of cover class estimates. Frequencies of herbaceous species were estimated using 20 cm X 20 cm microplots (12 per macroplot).

Macroplot sampling is designed to provide structured, thorough descriptions of plant communities...to force the observer to look at stands in a defined and consistent manner. Data collected from macroplots can be used for comparison with similar studies, but the following limitations of the data must be realized: 1) plot locations are chosen by the researcher; 2) using fewer larger plots makes coverage estimates less accurate and more variable.



USWYACDUGOBI.01

USWYACDUGOBI.02

USWYACDUGOBI.04

USWYACDUGOBI.03

MACROPLOT LOCATIONS
DUGOUT GULCH, 1989

4925

4924

4923
30"

24

19

25

30

Thompson

Thompson Spring

36

Hospital

Dugout

Gulch

East

WB

4400

4367T

4000

4200

4200

4400

4384

4534T

4590T

4600

4649AT

4590T

4600

4400

4671T

4646T

4616T

4614T

4651T

EPCODE: CTMRFDHVCS.001

NAME: OSTRYA VIRGINIANA/CAREX SPRENGELII COMMUNITY

COMNAME:

HOPHORNBEAM/SPRENGEL'S SEDGE COMMUNITY

MARGNUM: 0 TENTEN: IDENT: Y EORANK: B

EOANKCOMM: NOT VERY LARGE, GRAZED LATE IN SUMMER, RELATIVELY FEW WEEDS

SURVEYDATE: 1989-07-05 LASTOBS: 1989-07 FIRSTOBS: GRANK:

SRANK: S1 STATE: WY COUNTYNAME: WYCROO

QUADCODE:

QUADNAME: TINTON PRECISION: S

LAT: 442845 LONG: 1040630 S: 0 N: 0 E: 0 W: 0

TOWNRANGE: 052N060W SECTION: 30 MERIDIAN: 6P

TRSCOMM: NW4 +S19 SW4 PHYSPROV: WATERSHED:

DIRECTIONS: NORTHERN BLACK HILLS, DUGOUT GULCH CA. ONE MILE UPSTREAM FROM CONFLUENCE WITH SAND CREEK

GENDESC: DRAINAGE BOTTOM WHERE SUFFICIENTLY WIDE. ON NEARLY LEVEL TOPOGRAPHY. CLOSED TO NEARLY-CLOSED CANOPY. ALSO ULMUS, ACER NEGUNDO, CRATAEGUS. HEAVY C. SPRENGELII COVER. SOME BLUEGRASS.

ELEV: 4000 SIZE: 0

EODATA:

COMMENTS: MACROPLOTS USWYMCDUG001.01, USWYMCDUG001.02

MACODE1: CONTAINED1: MACODE2: CONTAINED2:

MACODE3: FFSNFBAC1WYUS CONTAINED3: N ADDLMAS: MORELAND: MOREPROT:

MOREMGMT: SITECODE:

SITENAME:

OWNER: PRIVATE DOWNSTREAM

OWNERCOMM:

PROTCOMM:

MGMTCOMM:

MONITOR: MONITORNUM:

BESTSOURCE: MARRIOTT, H.J. (SEE 1989 FINAL REPORT TO BBNF ON PROPOSED DUGOUT GULCH SBA)

SOURCECODE: PNDMAR01WYUS

DATASENS: N BOUNDARIES: Y PHOTOS: Y OWNERINFO:

TRANSCRIBR: 89-12-13 HJM CDREV: MAPPER: QC:

UPDATE: 89-12-13 HJM

Community: OSTRYA VIRGINIANA/CAREX SPRENGELII (hophornbeam/Sprengel's sedge)
 Site: Dugout Gulch Date: 5, 6 JULY 89 Investigator: H. Marriott

Macroplot #: USWYCDUG001.01
 Elevation: 3950 ft. above sea level
 Slope: level

Location: Crook Co., T52N R60W S19 SW4 SW4
 Topographical position: narrow drainage bottom
 Aspect: flat

Macroplot #: USWYCDUG001.02
 Elevation: 4040 ft. above sea level
 Slope: level

Location: Crook Co., T52N R60W S19 SW4 SW4
 Topographical position: narrow drainage bottom
 Aspect: flat

% COVER

Stratum/Species	Plot .01	Plot .02	Average
<u>CANOPY</u>	85 T2 90	68 T2 30 T3 60	77
ACER NEGUNDO	12	2	7
OSTRYA VIRGINIANA T3	46 T3 50	56	51
QUERCUS MACROCARPA	29	25	27
ULMUS AMERICANA		4	2
<u>TALL SHRUB</u>			
<u>LOW SHRUB</u>	38	15	27
SYMPHORICARPOS ALBUS	23	19	21
<u>HERB</u>	100	100	100
CAREX SPRENGELII	85	46	66
POA PRATENSIS	21	1	11

% FREQUENCY

Species	Plot .01	Plot .02	Average
CAREX SPRENGELII	100	83	92
CYNOGLOSSUM OFFICINALE		50	25
ELLISIA NYCTELAEA	1		1
GALIUM APARINE	46	67	57
GALIUM BOREALE		1	1
GEUM CANADENSE	18		9
LACTUCA SP.	1		1
LAPPULA REDOWSKII	1		1
MAHONIA REPENS 52	18		9
MEDICAGO LUPULINA		1	1
MONARDA FISTULOSA	1		1
OSMORHIZA SP.		42	21
OXALIS STRICTA	1		1
PARIETARIA PENNSYLVANICA		1	1
POA PRATENSIS	46	17	32
SMILACINA STELLATA		25	13
TARAXACUM SP.		1	1
THALICTRUM SP.	1		1
URTICA DIOICA		1	1
VIOLA PUBESCENS		17	9

EOCODE: CTMUFDBPCC.002
NAME: BETULA POPYRIFERA/CORYLUS CORNUTA COMMUNITY
COMNAME:
PAPER BIRCH/HAZELNUT COMMUNITY
MARGNUM: 0 TENTEN: IDENT: EORANK: A
EORANKCOMM: LARGE STANDS, VERY LITTLE DISTURBANCE
SURVEYDATE: 1989-07-06 LASTOBS: 1989-07-06 FIRSTOBS: GRANK:
SRANK: STATE: WY COUNTYNAME: WYCROO
QUADCODE:
QUADNAME: TINTON PRECISION: S
LAT: 442820 LONG: 1040630 S: 0 N: 0 E: 0 W: 0
TOWNRANGE: 052N060W SECTION: 30 MERIDIAN: 6P
TRSCOMM: W2, +S19 SW4 PHYSPROV: WATERSHED:
DIRECTIONS: NORTHERN BLACK HILLS, DUGOUT GULCH CA. ONE MILE UPSTREAM FRO
M CONFLUENCE WITH SAND CREEK. IN BOTTOM AND ON LOWER SLOPES
OF GULCH, BELOW EAST & WEST FORKS.
GENDESC: LOWER SLOPES WITH MESIC ASPECTS (E, N, W). HIGHER ON N-FACIN
G SLOPES & IN NARROW SIDE DRAINAGES. NEARLY-CLOSED CANOPY. M
ANY BOREAL SPP IN UNDERSTORY. OSTRYA IS MAJOR COMPONENT.
ELEV: 4200 SIZE: 0
EODATA: OSTRYA COMPONENT IS SOMEWHAT UNUSUAL. HOWEVER OSTRYA VIRGIN
IANA DOMINATES RIPRIAN HABITAT IN LOWER PART OF GULCH.

COMMENTS: MACROPLOTS USWYMCDUGO01.03,USWYMCDUGO01.04.

MACODE1: CONTAINED1: MACODE2: CONTAINED2:
MACODE3: FFSNFBAC1WYUS CONTAINED3: N ADDLMAS: MORELAND: MOREPROT:
MOREMGMT: SITECODE:
SITENAME:
OWNER: PRIVATE LAND DOWNSTREAM
OWNERCOMM:
PROTCOMM:
MGMTCOMM:
MONITOR: MONITORNUM:
BESTSOURCE: MARRIOTT, H.J. (SEE 1989 FINAL REPORT TO BHNF ON PROPOSED DU
GOUT GULCH SBA)
SOURCECODE: PNDMAR01WYUS

DATASENS: N BOUNDARIES: Y PHOTOS: Y OWNERINFO:
TRANSCRIBR: 89-12-13 HJM CDREV: MAPPER: QC:
UPDATE: 89-12-13 HJM

Community: BETULA POPYRIFERA/CORYLUS CORNUTA (paper birch/hazelnut)

Site: Dugout Gulch

Date: 6 JULY 89

Investigator: H. Marriott

Macroplot #: USWYMCBLPA01.03

Elevation: 4200 ft. above sea level

Slope: 0-45 degrees

Location: Crook Co., T52N R60W S30 CENTER NW4

Topographical position: slope toe, lower slope

Aspect: northwest

Macroplot #: USWYMCBLPA01.04

Elevation: 4120 ft. above sea level

Slope: 0-30 degrees

Location: Crook Co., T52N R60W S30 NW4 NW4

Topographical position: slope toe, lower slope

Aspect: north

% COVER

Stratum/Species	Plot .03	Plot .04	Average
<u>CANOPY</u>	100	100	100
BETULA POPYRIFERA	61	47	54
OSTRYA VIRGINIANA	85	79	82
QUERCUS MACROCARPA	1	8	5
ULMUS AMERICANA	8	5	7
<u>TALL SHRUB</u>	68	38	53
AMELANCHIER ALNIFOLIA	1	2	2
CORYLUS CORNUTA	44	33	39
PRUNUS VIRGINIANA		1	1
<u>LOW SHRUB</u>	15 30	15 30	30
QUERCUS MACROCARPA		2	1
JUNIPERUS COMMUNIS		1	1
PRUNUS VIRGINIANA	2	12	7
RIBES SP.	9	3	6
ROSA SP.	1	2	2
RUBUS PARVIFLORUS	2		1
SYMPHORICARPOS SP.	12	11	12
<u>HERB</u>	68	68	68
<u>BRYOID</u>	15	3	9

40
Stake out
coco
soddy

DUGOUT GULCH MACROPLOTS USWYCDUG001.03, USWYCDUG001.04 continued

Species	% FREQUENCY		
	Plot .03	Plot .04	Average
ACTAEA RUBRA	1		1
ARNICA CORDIFOLIA	17	50	34
ARALIA NUDICAULIS	25	1	13
ASTER SP.	1		1
CAREX SP.	25	25	25
CIRCAEA LUTETIANA		1	1
CORYLUS CORNUTA seedling SZ		67	34
CYSTOPTERIS FRAGILIS	25		13
DISPORUM TRACHYCARPUM	25	33	29
DODECATHEON PULCHELLUM	17		9
GALIUM APARINE		1	1
GALIUM TRIFLORUM	25	1	13
HEUCHERA RICHARDSONII		17	9
MAHONIA REPENS SZ	25	67	46
MAIANTHEMUM CANADENSE	17	58	38
ORYZOPSIS ASPERIFOLIA	42	42	42
OSMORHIZA SP.	17		9
PYROLA SP.	17	33	25
QUERCUS MACROCARPA seedling SZ		1	1
SANICULA MARILANDICA	17	1	9
SMILACINA STELLATA	33	1	17
SPIRAEA BETULIFOLIA SZ	1		1
TARAXACUM SP.		17	9
THALICTRUM SP.		17	9
VIOLA PUBESCENS		1	1
VIOLA SP.	1		1

Tree size class distribution in numbers of trees (for multi-stemmed individuals, only the largest stem was measured):

Species	Minimum diameter at breast height (inches)									
	<1	1	2	3	5	7	9	11	13	15+
BETULA PAPYRIFERA										
Plot .03				8	8	4				
Plot .04				6	2	1				
OSTRYA VIRGINIANA										
Plot .03	6	9	8	21	5					
Plot .04	16	8	14	29	4					
PINUS PONDEROSA										
Plot .03										
Plot .04				1						
PRUNUS VIRGINIANA										
Plot .03										
Plot .04	1									
QUERCUS MACROCARPA										
Plot .03				1	1					
Plot .04				1	2	1				
ULMUS AMERICANA										
Plot .03	2				2	1	1			
Plot .04	1			1	2					

EPCODE: CTXUFEPPJS.001

NAME: PINUS PONDEROSA/JUNIPERUS SCOPULORUM COMMUNITY

COMNAME:

PONDEROSA PINE/ROCKY MOUNTAIN JUNIPER COMMUNITY

MARGNUM: 0 TENTEN: IDENT: Y EORANK: BC

EORANKCOMM: EXEMPLARINESS UNKNOWN. VERY OLD OVERGROWN DIRT ROADS.

SURVEYDATE: 1989-07-09 LASTOBS: 1989-07 FIRSTOBS: GRANK:

SRANK: STATE: WY COUNTYNAME: WYCROO

QUADCODE:

QUADNAME: TINTON

PRECISION: S

LAT: 442830 LONG: 1040630 S: 0 N: 0 E: 0 W: 0

TOWNRANGE: 052N060W SECTION: 30 MERIDIAN: 6P

TRSCOMM: +S19 PHYSPROV: WATERSHED:

DIRECTIONS: NORTHERN BLACK HILLS, DUGOUT GULCH CA. 1 MILE ABOVE CONFLUENCE WITH SAND CREEK.

GENDESC: SE-, SW-FACING SLOPES ABOVE DRAINAGE BOTTOM, OFTEN QUITE STEEP. VERY OPEN "CANOPY" OF PINUS PONDEROSA WITH MIXED-GRASS PRAIRIE SPP. UNDERSTORY. JUNIPERUS SCOPULORUM IS OCCASIONAL.

ELEV: 4100 SIZE: 0

EODATA:

COMMENTS: NO MACROPLOTS READ.

MACODE1: CONTAINED1: MACODE2: CONTAINED2:

MACODE3: FFSNFBLAC1WYUS CONTAINED3: N ADDLMAS: MORELAND: MOREPROT:

MOREMGMT: SITECODE:

SITENAME:

OWNER: PRIVATE DOWNSTREAM

OWNERCOMM:

PROTCOMM:

MGMTCOMM:

MONITOR: MONITORNUM:

BESTSOURCE: MARRIOTT, H.J. (SEE 1989 FINAL REPORT TO BBNF ON PROPOSED DUGOUT GULCH SBA)

SOURCECODE: PNDMAR01WYUS

DATASENS: N BOUNDARIES: Y PHOTOS: Y OWNERINFO:

TRANSCRIBR: 89-12-13 HJM CDREV: MAPPER: QC:

UPDATE: 89-12-13 HJM