

APPENDIX B

**PERCENT CANOPY COVER/CONSTANCY BY PLOT FOR ECOLOGICAL SITES,
WOODLAND AND TAME PASTURE –VEGETATION STUDY AREA
STARK COUNTY, NORTH DAKOTA, 2006-2007**

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APPENDIX B

PERCENT CANOPY COVER/CONSTANCY BY PLOT FOR ECOLOGICAL SITES, WOODLAND AND TAME PASTURE –VEGETATION STUDY AREA STARK COUNTY, NORTH DAKOTA, 2006-2007

Footnotes for the tables in Appendix B:

Trace cover values were assigned 0.3 percent for each 0.01-hectare (5.64 m radius) canopy cover ocular estimation plot; plots were 0.03-hectare (10 m radius) in Woodland.

Constancy values apply to species recorded in the 0.01- and 0.03-hectare plots; constancy is not given where n=1.

Binomials follow Great Plains Flora Association (1986).

*Site Parameters:

Topography codes: Ben = Bench
Bnk = Bank
Bot = Bottom
Flo = Floodplain
Low, Lower = Lower slope
Mid = Midslope
Sh, Should = Shoulder
Ter = Terrace
Toe = Toeslope
Upper = Upper slope

Configuration codes: S = Straight
X = Convex
U = Undulating
V = Concave

Soil Codes:

AD-AB = Arnegard clay loam	LE-A = Lallie silty clay
AR-CD = Amor loam	LR-A = Lawther silty clay
CB-AB = Cabba silt loam	LR-B = Lawther silty clay
CB-C = Cabba silt loam	MG-AB = Manning sandy loam
CB-DE = Cabba loam	MN-BC = Morton loam
CHAN = River Channels	MU-B = Moreau silty clay loam
DH-A = Dogtooth silty clay loam	PL-DEF = Parshall sandy loam
DH-B = Dogtooth silty clay loam	RS-A = Rhoades silty clay
DM-AB = Daglum silty clay loam	RS-B = Rhoades silty clay
EH-A = Entic Haplustolls-silt loams and silty clay loams	RT-CD = Regent silty clay loam
EH-A s/s = Entic Haplustolls (s/s)	SE-A = Savage silty clay loam
FR-DE = Flasher sandy loam	SE-B = Savage silty clay loam
FV-A = Fluvents-silt loams and silty clay loams	SN-AB = Sen silt loam
FV-A s/s = Fluvents (s/s)	SO-A s/s = Shambo loam (s/s)
GL-A = Grail silty clay loam	SO-ABC = Shambo loam
HL-A = Havrelon silt loam	TY-ABC = Tally sandy loam
HL-A s/s = Havrelon (s/s)	Wet Saline = Saline silty clay loam
HL-A ch = Havrelon (ch)	WN-A = Wayden silty clay
JG-AB = Janesburg silty clay	WN-B = Wayden silty clay
	WN-CDE = Wayden silty clay

Modifiers: A,B,C,D,E,F = slope classes
ch = channeled
s/s = saline sodic substratum

n = number of samples

NPG (c) = Native Perennial Graminoids (cool season)

NPG (w) = Native Perennial Graminoids (warm season)

TABLE B1

PERCENT CANOPY COVER BY CLASS AND SPECIES FOR 9 PLOTS IN THE SALINE LOWLAND - WET LAND - SUBIRRIGATED COMPLEX ECOLOGICAL SITES –
 VEGETATION STUDY AREA
 STARK COUNTY, NORTH DAKOTA, 2006-2007

	SALINE LOWLAND - WET LAND - SUBIRRIGATED										Mean Cover	Const- ancy
	PLOT NUMBER											
	SL-1	SL-2	SL-3	SL-4	SL-5	SL-6	SL-7	SL-8	SL-9			
	n=9											
SITE PARAMETERS*												
Slope (percent)	4	1	1	3-4	3-6/ 60-90	1-2/8	5	0	5			
Aspect (degrees)	055	306	180	346	012	352	054	026	355			
Topography	Toe	Swale	Lower	Bot	Bot	Bot/Toe	Lower	Swale	Bot			
Configuration	S	S	S	V	V	V	S	S	Und			
Soil	Wet Saline	Wet Saline	Wet Saline	Wet Saline	Wet Saline	Wet Saline	WN-B	WN-B	WN-B			
Ecological Site	SL-WL- Sb	SL-WL- Sb	SL-WL- Sb	SL-WL- Sb	SL-WL- Sb	SL-WL- Sb	SL-WL- Sb	SL-WL- Sb	SL-WL- Sb			
Investigator	DC/JB	DC/JB	LL/PC	KS/DB	KS/DB	KS/DB	LL/PC	LL/PC	LL/PC			
Date	9-7-06	9-7-06	8-23-06	9-8-06	9-8-06	9-9-06	9-8-06	9-8-06	9-8-06			
GROUND COVER												
Bare Ground	15	77	42	10	6	4	67	74	40	37.22	100	
Rock							1	0.3	0.3	0.18	33	
Litter	80	20	54	83	85	89	28	23	54	57.33	100	
Lichens	0.3								0.3	0.07	22	
Moss					1	0.3				0.14	22	
Water												
Basal Vegetation	5	3	4	7	8	7	4	3	6	5.22	100	
VEGETATION STRUCTURE (nonstratified cover)												
Total Vegetation	58	43	49	87	92	88	37	31	70	61.67	100	
Perennial Graminoids	51	10	40	80	72	84	28	23	70	50.89	100	
Annual Graminoids												
Perennial Forbs	7	0.3	1	21	25	10	9	3	1	8.59	100	
Annual/Biennial Forbs	4	35	16	12	11	4	0.3	0.3	0.3	9.21	100	
Shrubs					32			5		4.11	22	
Trees												

TABLE B1

PERCENT CANOPY COVER BY CLASS AND SPECIES FOR 9 PLOTS IN THE SALINE LOWLAND - WET LAND - SUBIRRIGATED COMPLEX ECOLOGICAL SITES –
 VEGETATION STUDY AREA
 STARK COUNTY, NORTH DAKOTA, 2006-2007

	SALINE LOWLAND - WET LAND - SUBIRRIGATED										Mean Cover	Const- ancy
	PLOT NUMBER											
	SL-1	SL-2	SL-3	SL-4	SL-5	SL-6	SL-7	SL-8	SL-9			
	n=9											
CLASS/SPECIES												
NATIVE PERENNIAL GRAMINOIDS												
(Cool Season)												
XAgrohordeum macounii		0.3									0.03	11
Agropyron trachycaulum					1						0.11	11
Carex lanuginosa					2						0.22	11
Carex praegracilis				22	9						3.44	22
Eleocharis xyridiformis				9	8	0.3					1.92	33
Elymus canadensis					0.3						0.03	11
Hordeum jubatum	1	0.3		5	0.3	1					0.84	56
Juncus balticus				7					1		0.89	22
Poa glaucifolia	1			1	0.3	0.3			13		1.73	56
Poa juncifolia		0.3	1								0.14	22
Puccinellia cusickii			39								4.33	11
Puccinellia nuttalliana	6	2		14		1	10	17	20		7.78	78
Scirpus americanus									0.3		0.03	11
Scirpus validus				6							0.67	11
TOTAL NPG(C)	8.0	2.9	40.0	64.0	20.9	2.6	10.0	17.0	34.3		22.19	100
NATIVE PERENNIAL GRAMINOIDS												
(Warm Season)												
Buchloe dactyloides	0.3										0.03	11
Distichlis spicata	35	8		4		3	13	4	40		11.89	78
Schedonnardus paniculatus							1				0.11	11
Spartina pectinata		0.3		30	16	74					13.37	44
TOTAL NPG(W)	35.3	8.3	0.0	34.0	16.0	77.0	14.0	4.0	40.0		25.40	89
INTRODUCED PERENNIAL GRAMINOIDS												
Agropyron cristatum	5				26	1	4	3	0.3		4.37	67
Bromus inermis	2				18	16	1		0.3		4.14	56
Poa pratensis	3				8	1					1.33	33
TOTAL IPG	10.0	0.0	0.0	0.0	52.0	18.0	5.0	3.0	0.6		9.84	67

TABLE B1

PERCENT CANOPY COVER BY CLASS AND SPECIES FOR 9 PLOTS IN THE SALINE LOWLAND - WET LAND - SUBIRRIGATED COMPLEX ECOLOGICAL SITES –
 VEGETATION STUDY AREA
 STARK COUNTY, NORTH DAKOTA, 2006-2007

	SALINE LOWLAND - WET LAND - SUBIRRIGATED										Mean Cover	Const- ancy
	PLOT NUMBER											
	SL-1	SL-2	SL-3	SL-4	SL-5	SL-6	SL-7	SL-8	SL-9			
	n=9											
NATIVE PERENNIAL FORBS												
Achillea millefolium	0.3				0.3						0.07	22
Artemisia frigida	0.3										0.03	11
Artemisia ludoviciana					0.3						0.03	11
Asclepias speciosa					2	1					0.33	22
Aster pansus	5	0.3		9	4	3	0.3				2.40	67
Aster simplex					6						0.67	11
Astragalus bisulcatus	0.3						0.3				0.07	22
Glycyrrhiza lepidota				6	0.3	0.3					0.73	33
Gutierrezia sarothrae	1						5	0.3			0.70	33
Helianthus maximiliani				1	14	0.3					1.70	33
Iva axillaris				0.3			4	3	1		0.92	44
Opuntia polyacantha							0.3				0.03	11
Ratibida columnifera	0.3										0.03	11
Solidago canadensis					0.3						0.03	11
Solidago rigida					0.3						0.03	11
Sphaeralcea coccinea	0.3										0.03	11
TOTAL NPF	7.5	0.3	0.0	16.3	27.5	4.6	9.9	3.3	1.0		7.82	89
INTRODUCED PERENNIAL FORBS												
Cirsium arvense				0.3							0.03	11
Euphorbia esula						5					0.56	11
Medicago sativa			1								0.11	11
Rumex crispus					0.3	0.3					0.07	22
Sonchus arvensis				8							0.89	11
Taraxacum officinale	1								0.3		0.14	22
TOTAL IPF	1.0	0.0	1.0	8.3	0.3	5.3	0.0	0.0	0.3		1.80	67

TABLE B1

PERCENT CANOPY COVER BY CLASS AND SPECIES FOR 9 PLOTS IN THE SALINE LOWLAND - WET LAND - SUBIRRIGATED COMPLEX ECOLOGICAL SITES –
 VEGETATION STUDY AREA
 STARK COUNTY, NORTH DAKOTA, 2006-2007

	SALINE LOWLAND - WET LAND - SUBIRRIGATED										Mean Cover	Const- ancy
	PLOT NUMBER											
	SL-1	SL-2	SL-3	SL-4	SL-5	SL-6	SL-7	SL-8	SL-9			
	n=9											
NATIVE ANNUAL/BIENNIAL FORBS												
Ambrosia artemisiifolia						2					0.22	11
Ambrosia trifida				0.3	0.3						0.07	22
Atriplex subspicata		0.3		1							0.14	22
Chenopodium glaucum				0.3	1						0.14	22
Grindelia squarrosa	4	1	3				0.3	0.3	0.3		0.99	67
Oenothera villosa					0.3						0.03	11
Polygonum ramosissimum				1	1						0.22	22
Suaeda depressa		32		7		0.3			0.3		4.40	44
TOTAL NAF	4.0	33.3	3.0	9.6	2.6	2.3	0.3	0.3	0.6		6.22	100
INTRODUCED ANNUAL/BIENNIAL FORBS												
Atriplex heterosperma		0.3	1	2	8	1					1.37	56
Kochia scoparia		2			0.3						0.26	22
Lactuca serriola				0.3		0.3					0.07	22
Melilotus officinalis			12								1.33	11
Salsola iberica			0.3								0.03	11
Thlaspi arvense					0.3	0.3					0.07	22
TOTAL IAF	0.0	2.3	13.3	2.3	8.6	1.6	0.0	0.0	0.0		3.12	56
NATIVE SHRUBS												
Atriplex nuttallii								5			0.56	11
Rosa woodsii					4						0.44	11
Symphoricarpos occidentalis					30						3.33	11
TOTAL NATIVE SHRUBS	0.0	0.0	0.0	0.0	34.0	0.0	0.0	5.0	0.0		4.33	22
TOTAL VEGETATION (Stratified)	65.8	47.1	57.3	134.5	161.9	111.4	39.2	32.6	76.8		80.73	100

Footnotes given on index page B-ii.

TABLE B2

PERCENT CANOPY COVER BY CLASS AND SPECIES FOR 15 PLOTS IN
 THE LOAMY OVERFLOW - SUBIRRIGATED - WET LAND COMPLEX
 AND WET LAND - WET MEADOW COMPLEX ECOLOGICAL SITES – VEGETATION STUDY AREA

	LOAMY OVERFLOW - SUBIRRIGATED - WET LAND							WET LAND - WET MEADOW										WET LAND COMPOSITE			
	PLOT NUMBER						Mean Cover	Const-ancy	PLOT NUMBER								Mean Cover	Const-ancy	Mean Cover	Const-ancy	
	WL-1	WL-2	WL-3	WL-4	WL-5	WL-6			WL-7	WL-8	WL-9	WL-10	WL-11	WL-12	WL-13	WL-14					WL-15
SITE PARAMETERS*																					
Slope (percent)	2	2	2	3	2	2			2	2	2	2	1	2-3	3	1	1				
Aspect (degrees)	125	055	097	010	112	112			014/136	125	067	153	006	004	310	250	279				
Topography	BotBnk	Bot	Bot/Bnk	Bot/Bnk	Bot	Bot			Bot	Bot	Bot	Bot	Swale	Bot	FloTer	Swale	Bot				
Configuration	Und	Und	Und	Und	V	V			Und	V	V	V	V	V	V(S)	V	V				
Soil	CHAN	CHAN	CHAN	CHAN	CHAN	CHAN			AD-AB	AD-AB	CB-DE	CB-DE	HL-A s/s	LE-A	LE-A	LE-A	RS-A				
Ecological Site	LyOv-Sb-WL	LyOv-Sb-WL	LyOv-Sb-WL	LyOv-Sb-WL	LyOv-Sb-WL	LyOv-Sb-WL			WL-WM	WL-WM	WL-WM	WL-WM	WL-WM	WL-WM	WL-WM	WL-WM	WL-WM				
Investigator	LL/PC	LL/PC	LL/PC	LL/PC	LL/PC	LL/PC			JB/CB	JB/CB	DC/JB	LL/PC	LL/PC	KS/DB	KS/DB	DC/JB	DC/JB				
Date	9-10-06	9-11-06	9-11-06	9-11-06	9-11-06	9-11-06			8-23-06	9-5-06	9-7-06	9-11-06	9-10-06	9-8-06	9-11-06	9-8-06	8-22-06				
GROUND COVER																					
Bare Ground	10	40	24	23	27	35	26.50	100	8	35	2	24	10	14		40	4	15.22	89	19.73	93
Rock						0.3	0.05	17			0.3							0.03	11	0.04	13
Litter	75	54	70	71	60	51	63.50	100	83	61	89	70	85	80	94	52	88	78.00	100	72.20	100
Lichens										0.3	0.3					0.3		0.10	33	0.06	20
Moss					5	9	2.33	33	0.3	0.3	0.3			1		0.3	0.3	0.28	67	1.10	53
Water	10						1.67	17												0.67	7
Basal Vegetation	5	6	6	6	8	5	6.00	100	9	4	9	6	5	5	6	8	8	6.67	100	6.40	100
VEGETATION STRUCTURE (nonstratified cover)																					
Total Vegetation	70	80	85	82	75	84	79.33	100	90	63	93	61	80	90	87	74	80	79.78	100	79.60	100
Perennial Graminoids	61	75	62	75	65	58	66.00	100	60	58	90	59	50	52	86	73	78	67.33	100	66.80	100
Annual Graminoids		0.3	1			2	0.55	50	0.3									0.03	11	0.24	27
Perennial Forbs	4	5	8	5	9	12	7.17	100	44	10	10	4	1	62	1	3	7	15.78	100	12.33	100
Annual/Biennial Forbs	0.3	0.3	0.3	0.3	0.3	4	0.92	100	5	1	0.3	0.3	1	1	2	1	2	1.51	100	1.27	100
Shrubs	5	0.3			0.3	5	1.77	67					21				1	2.44	22	2.17	40
Trees	2	2	30	5	2	12	8.83	100				2	14					1.78	22	4.60	53

TABLE B2

PERCENT CANOPY COVER BY CLASS AND SPECIES FOR 15 PLOTS IN
 THE LOAMY OVERFLOW - SUBIRRIGATED - WET LAND COMPLEX
 AND WET LAND - WET MEADOW COMPLEX ECOLOGICAL SITES – VEGETATION STUDY AREA

CLASS\SPECIES	LOAMY OVERFLOW - SUBIRRIGATED - WET LAND								WET LAND - WET MEADOW									WET LAND COMPOSITE			
	PLOT NUMBER						Mean Cover	Const-ancy	PLOT NUMBER									Mean Cover	Const-ancy		
	WL-1	WL-2	WL-3	WL-4	WL-5	WL-6			WL-7	WL-8	WL-9	WL-10	WL-11	WL-12	WL-13	WL-14	WL-15				
n=6								n=9									n=15				
NATIVE PERENNIAL GRAMINOIDS (Cool Season)																					
XAgrohordeum macounii																	10	1.11	11	0.67	7
Agropyron smithii									0.3			1	1				6	0.92	44	0.55	27
Agropyron trachycaulum									1		0.3		0.3	0.3			2	0.43	56	0.26	33
Carex aquatilis	54	65	62	65	62	55	60.50	100											24.20	40	
Carex brevior															2			0.22	11	0.13	7
Carex gravida														4				0.44	11	0.27	7
Carex laeviconica				10			1.67	17	18	58		1	43		82	73	30	33.89	78	21.00	53
Carex lanuginosa														7				0.78	11	0.47	7
Carex praegracilis											30							3.33	11	2.00	7
Eleocharis xyridiformis	0.3	0.3			0.3	0.3	0.20	67	35					9		1		5.00	33	3.08	47
Elymus canadensis	1		0.3		1	1	0.55	67												0.22	27
Hordeum jubatum	1	1				0.3	0.38	50	0.3		10	48	9			3	40	12.26	67	7.51	60
Juncus balticus											1							0.11	11	0.07	7
Poa glaucifolia											1							0.11	11	0.07	7
Puccinellia nuttalliana									0.3									0.03	11	0.02	7
Scirpus maritimus			0.3			0.3	0.10	33												0.04	13
Scirpus validus		0.3					0.05	17												0.02	7
TOTAL NPG(C)	56.3	66.6	62.6	75.0	63.3	56.9	63.45	100	54.9	58.0	43.3	50.0	52.3	16.3	88.0	77.0	88.0	58.64	100	60.57	100
NATIVE PERENNIAL GRAMINOIDS (Warm Season)																					
Distichlis spicata											2							0.22	11	0.13	7
Panicum virgatum											0.3							0.03	11	0.02	7
Spartina pectinata	4	10					2.33	33	9		60			40		3		12.44	44	8.40	40
TOTAL NPG(W)	4.0	10.0	0.0	0.0	0.0	0.0	2.33	33	9.0	0.0	62.3	0.0	0.0	40.0	0.0	0.0	3.0	12.70	44	8.55	40
INTRODUCED PERENNIAL GRAMINOIDS																					
Agropyron cristatum												0.3						0.03	11	0.02	7
Bromus inermis												1				4		0.56	22	0.33	13
Poa palustris		0.3				0.3	0.10	33												0.04	13
Poa pratensis	2			3	4	3	2.00	67	1		2	12						1.67	33	1.80	47
TOTAL IPG	2.0	0.3	0.0	3.0	4.0	3.3	2.10	83	1.0	0.0	2.0	13.3	0.0	0.0	0.0	0.0	4.0	2.26	44	2.19	60

TABLE B2

PERCENT CANOPY COVER BY CLASS AND SPECIES FOR 15 PLOTS IN
 THE LOAMY OVERFLOW - SUBIRRIGATED - WET LAND COMPLEX
 AND WET LAND - WET MEADOW COMPLEX ECOLOGICAL SITES – VEGETATION STUDY AREA

	LOAMY OVERFLOW - SUBIRRIGATED - WET LAND								WET LAND - WET MEADOW									WET LAND COMPOSITE			
	PLOT NUMBER						Mean Cover	Const-ancy	PLOT NUMBER									Mean Cover	Const-ancy		
	WL-1	WL-2	WL-3	WL-4	WL-5	WL-6			WL-7	WL-8	WL-9	WL-10	WL-11	WL-12	WL-13	WL-14	WL-15				
n=6								n=9									n=15				
NATIVE ANNUAL GRAMINOIDS																					
Beckmannia syzigachne						0.3	0.05	17	0.3									0.03	11	0.04	13
TOTAL NAG	0.0	0.0	0.0	0.0	0.0	0.3	0.05	17	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.03	11	0.04	13
INTRODUCED ANNUAL GRAMINOIDS																					
Avena fatua			0.3				0.05	17												0.02	7
Echinochloa muricata		0.3	1			2	0.55	50												0.22	20
TOTAL IAG	0.0	0.3	1.3	0.0	0.0	2.0	0.60	50	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0	0.24	20
NATIVE PERENNIAL FORBS																					
Alisma triviale									0.3									0.03	11	0.02	7
Artemisia ludoviciana		0.3					0.05	17												0.02	7
Asclepias speciosa				0.3			0.05	17	0.3									0.03	11	0.04	13
Aster commutatus	0.3						0.05	17												0.02	7
Aster pansus	0.3				0.3		0.10	33			8					0.3	0.92	22	0.59	27	
Aster simplex	0.3	1	6	1	3	0.3	1.93	100					0.3				0.03	11	0.79	47	
Cirsium flodmanii											0.3					0.3	0.07	22	0.04	13	
Geum aleppicum			0.3		0.3		0.10	33											0.04	13	
Glycyrrhiza lepidota															0.3		0.03	11	0.02	7	
Helianthus maximiliani									1	0.3	0.3						0.18	33	0.11	20	
Lysimachia ciliata			1			0.3	0.22	33											0.09	13	
Mentha arvensis	0.3			0.3	0.3	0.3	0.20	67	0.3								0.03	11	0.10	33	
Osmorhiza longistylis			0.3				0.05	17											0.02	7	
Polygonum amphibium									40	9				62	0.3		12.70	56	7.62	33	
Ranunculus cymbalaria						0.3	0.05	17											0.02	7	
Ranunculus macounii	0.3						0.05	17											0.02	7	
Ratibida columnifera											0.3						0.03	11	0.02	7	
Rorippa sinuata												0.3			0.3	0.3	0.10	33	0.06	20	
Rumex mexicanus		0.3	0.3	1	1	5	1.27	83	2	0.3		3	0.3		0.3	3	2	1.21	78	1.23	80
Sagittaria cuneata		0.3	0.3	1		2	0.60	67	0.3								0.03	11	0.26	33	
Solidago gigantea			0.3	0.3			0.10	33											0.04	13	
Solidago mollis											0.3						0.03	11	0.02	7	
Thalictrum dasycarpum			0.3				0.05	17											0.02	7	
Typha angustifolia			0.3			0.3	0.10	33											0.04	13	
TOTAL NPF	1.5	1.9	9.1	3.6	5.2	8.5	4.97	100	44.2	9.6	9.2	3.0	0.6	62.3	0.6	3.3	6.2	15.44	100	11.25	100

TABLE B2

PERCENT CANOPY COVER BY CLASS AND SPECIES FOR 15 PLOTS IN
 THE LOAMY OVERFLOW - SUBIRRIGATED - WET LAND COMPLEX
 AND WET LAND - WET MEADOW COMPLEX ECOLOGICAL SITES – VEGETATION STUDY AREA

	LOAMY OVERFLOW - SUBIRRIGATED - WET LAND								WET LAND - WET MEADOW									WET LAND COMPOSITE			
	PLOT NUMBER						Mean Cover	Const-ancy	PLOT NUMBER						Mean Cover	Const-ancy	Mean Cover	Const-ancy			
	WL-1	WL-2	WL-3	WL-4	WL-5	WL-6			WL-7	WL-8	WL-9	WL-10	WL-11	WL-12					WL-13	WL-14	WL-15
n=6								n=9									n=15				
INTRODUCED PERENNIAL FORBS																					
Cirsium arvense	2					0.3	0.38	33				0.3						0.03	11	0.17	20
Convolvulus arvensis	0.3						0.05	17		0.3			0.3		1		0.3	0.21	44	0.15	33
Euphorbia esula	0.3		0.3			0.3	0.15	50				0.3						0.03	11	0.08	27
Medicago sativa											0.3						0.3	0.07	22	0.04	13
Plantago major			0.3	0.3	0.3	1	0.32	67												0.13	27
Rumex crispus	0.3	3	0.3	2	4	3	2.10	100	1		0.3	0.3	0.3				0.3	0.24	56	0.99	73
Sonchus arvensis				0.3			0.05	17												0.02	7
Taraxacum officinale			0.3				0.05	17	0.3		1							0.14	22	0.11	20
TOTAL IPF	2.9	3.0	1.2	2.6	4.3	4.6	3.10	100	1.3	0.3	1.6	0.9	0.6	0.0	1.0	0.0	0.9	0.73	78	1.68	87
NATIVE ANNUAL/BIENNIAL FORBS																					
Amaranthus retroflexus										0.3			0.3					0.07	22	0.04	13
Ambrosia artemisiifolia														0.3	0.3			0.07	22	0.04	13
Ambrosia trifida											0.3							0.03	11	0.02	7
Artemisia biennis			0.3	0.3		1	0.27	50				0.3						0.03	11	0.13	27
Atriplex subspicata	0.3		0.3				0.10	33				0.3		0.3				0.07	22	0.08	27
Chenopodium glaucum						0.3	0.05	17												0.02	7
Chenopodium leptophyllum										0.3								0.03	11	0.02	7
Grindelia squarrosa											0.3	0.3				0.3	1	0.21	44	0.13	27
Helianthus annuus											0.3							0.03	11	0.02	7
Helianthus petiolaris														0.3				0.03	11	0.02	7
Polygonum arenastrum		0.3				1	0.22	33				0.3				1	1	0.26	33	0.24	33
Polygonum aviculare	0.3						0.05	17												0.02	7
Polygonum lapathifolium		0.3				0.3	0.10	33	5									0.56	11	0.37	20
Polygonum ramosissimum												1		0.3		0.3		0.18	33	0.11	20
Solanum rostratum										1								0.11	11	0.07	7
Xanthium strumarium	0.3	0.3					0.10	33	0.3							0.3		0.07	22	0.08	27
TOTAL NAF	0.9	0.9	0.6	0.3	0.0	2.6	0.88	83	5.3	1.6	0.3	1.5	1.6	0.0	1.2	1.9	2.3	1.74	89	1.40	87

TABLE B2

**PERCENT CANOPY COVER BY CLASS AND SPECIES FOR 15 PLOTS IN
THE LOAMY OVERFLOW - SUBIRRIGATED - WET LAND COMPLEX
AND WET LAND - WET MEADOW COMPLEX ECOLOGICAL SITES – VEGETATION STUDY AREA**

	LOAMY OVERFLOW - SUBIRRIGATED - WET LAND								WET LAND - WET MEADOW									WET LAND COMPOSITE			
	PLOT NUMBER						Mean Cover	Const-ancy	PLOT NUMBER						Mean Cover	Const-ancy	Mean Cover	Const-ancy			
	WL-1	WL-2	WL-3	WL-4	WL-5	WL-6			WL-7	WL-8	WL-9	WL-10	WL-11	WL-12					WL-13	WL-14	WL-15
n=6								n=9									n=15				
INTRODUCED ANNUAL/BIENNIAL FORBS																					
Atriplex heterosperma			0.3				0.05	17							1			0.11	11	0.09	13
Chenopodium album				0.3			0.05	17				0.3	0.3	0.3	1			0.21	44	0.15	33
Kochia scoparia												0.3						0.03	11	0.02	7
Lactuca serriola	0.3	0.3				0.3	0.15	50						0.3			0.3	0.07	22	0.10	33
Malva rotundifolia			0.3				0.05	17		0.3								0.03	11	0.04	13
Medicago lupulina			0.3				0.05	17			0.3							0.03	11	0.04	13
Melilotus officinalis						0.3	0.05	17				0.3					0.3	0.07	22	0.06	20
Polygonum persicaria				0.3	0.3	2	0.43	50												0.17	20
Thlaspi arvense												0.3			0.3			0.07	22	0.04	13
TOTAL IAF	0.3	0.3	0.9	0.6	0.3	2.6	0.83	100	0.0	0.3	0.3	0.9	0.6	1.6	1.3	0.0	0.6	0.62	78	0.71	87
NATIVE SHRUBS																					
Amelanchier humilis	0.3						0.05	17												0.02	7
Ribes odoratum	0.3						0.05	17												0.02	7
Rosa woodsii	1	0.3			0.3		0.27	50				2					0.3	0.26	22	0.26	33
Salix lutea						3	0.50	17												0.20	7
Symphoricarpos occidentalis	4	0.3				2	1.05	50				20					1	2.33	22	1.82	33
TOTAL NATIVE SHRUBS	5.6	0.6	0.0	0.0	0.3	5.0	1.92	67	0.0	0.0	0.0	0.0	22.0	0.0	0.0	0.0	1.3	2.59	22	2.32	40
NATIVE TREES																					
Fraxinus pennsylvanica	2		30	5	2	12	8.50	83				2	14					1.78	22	4.47	47
Salix amygdaloides		1					0.17	17												0.07	7
Ulmus americana	0.3	1					0.22	33												0.09	13
TOTAL NATIVE TREES	2.3	2.0	30.0	5.0	2.0	12.0	8.88	100	0.0	0.0	0.0	2.0	14.0	0.0	0.0	0.0	0.0	1.78	22	4.62	53
TOTAL VEGETATION (Stratified)	75.8	85.9	105.7	90.1	79.4	97.8	89.12	100	116.0	69.8	119.0	71.6	91.7	120.2	92.1	82.2	106.3	96.54	100	93.57	100

Footnotes given on index page B-ii.

TABLE B3

PERCENT CANOPY COVER BY CLASS AND SPECIES FOR 32 PLOTS IN THE RIPARIAN WOODLAND AND
 3 PLOTS IN THE DECIDUOUS TREE WOODLAND
 VEGETATION TYPES – VEGETATION STUDY AREA
 STARK COUNTY, NORTH DAKOTA, 2006-2007

	RIPARIAN WOODLAND															
	PLOT NUMBER															
	RW-1	RW-2	RW-3	RW-4	RW-5	RW-6	RW-7	RW-8	RW-9	RW-10	RW-11	RW-12	RW-13	RW-14	RW-15	RW-16
SITE PARAMETERS*																
Slope (percent)	3-5/ 40-80	2-8/ 40-50	0-2/ 20-80	0-15/ 80-100	0-15/ 80-90	0-2/ 10-100	2-6/ 40-80	2-3	0-2	1-2/ 60-80	2-3	2-3	2-3/ 15-55	3-10	4-10	2-3
Aspect (degrees)	322/ 044	277/ 190	330/ 055	043/ 314	104/ 014	042	135/ 045	005	306	060	330	064	050/ 340	035	132	030
Topography	Bot/ Bnk	Ter/ Bnk	Bot/ Bnk	Bot/ Bnk	Bot/ Bnk	Bot/ Bnk	Ter/ Bnk	Bot/Ter	Bot	Bot/ Bnk	FloTer	FloTer	Ter/ Bnk	lowTer	lowTer	FloTer
Configuration	V(Und)	V	V	V	V	Und	Und/V	S/V	S(V)	V/S	S	S(V)	V(S)	Und	V	S
Soil	CHAN	CHAN	CHAN	CHAN	CHAN	CHAN	CHAN	LE-A	HL-A ch	HL-A ch	HL-A	HL-A	HL-A	HL-A	HL-A	HL-A s/s
Ecological Site	LyOv- Sb-WL	LyOv- Sb-WL	LyOv- Sb-WL	LyOv- Sb-WL	LyOv- Sb-WL	LyOv- Sb-WL	LyOv- Sb-WL	WL- WM	LyOv	LyOv	LyT	LyT	LyT	LyT	LyT	LyT
Investigator	KS/DB	KS/DB	KS/DB	KS/DB	KS/DB	KS/DB	KS/DB	KS/DB	KS/DB	KS/DB	KS/DB	KS/DB	KS/DB	KS/DB	KS/DB	KS/DB
Date	9-6-06	9-6-06	8-21-06	9-10-06	9-10-06	9-11-06	9-9-06	9-11-06	8-20-06	8-20-06	9-6-06	9-6-06	9-11-06	9-10-06	9-10-06	8-22-06
GROUND COVER																
Bare Ground	7	0.3	8	6	8	12	1	3	3	8			2		1	2
Rock																
Litter	83	92	85	78	80	81	92	90	88	84	93	94	94	92	93	90
Lichens									0.3							0.3
Moss	3	0.3	0.3	0.3			0.3	0.3	0.3	0.3	0.3	0.3		0.3	0.3	0.3
Water				8	5											
Basal Vegetation	7	7	7	8	7	7	7	7	8	8	7	6	4	8	6	7
VEGETATION STRUCTURE																
(nonstratified cover)																
Total Vegetation	95	94	90	88	85	85	88	97	94	88	92	94	95	94	96	94
Perennial Graminoids	88	84	33	80	78	78	82	55	60	74	70	82	43	89	82	68
Annual Graminoids	0.3			0.3									4			
Perennial Forbs	3	1	15	16	5	2	4	13	14	18		1	1	0.3	11	8
Annual/Biennial Forbs	0.3	0.3	0.3		0.3	1	0.3	23	1	4	45		11	0.3	10	13
Shrubs	0.3	0.3	52	7	13	1	4	18	63	30			52	35	16	37
Trees	58	60	38	62	56	32	31	72	14	13	15	42	78	38	63	48

TABLE B3

PERCENT CANOPY COVER BY CLASS AND SPECIES FOR 32 PLOTS IN THE RIPARIAN WOODLAND AND
 3 PLOTS IN THE DECIDUOUS TREE WOODLAND
 VEGETATION TYPES – VEGETATION STUDY AREA
 STARK COUNTY, NORTH DAKOTA, 2006-2007

CLASS/SPECIES	RIPARIAN WOODLAND															
	PLOT NUMBER															
	RW-1	RW-2	RW-3	RW-4	RW-5	RW-6	RW-7	RW-8	RW-9	RW-10	RW-11	RW-12	RW-13	RW-14	RW-15	RW-16
NATIVE PERENNIAL GRAMINOIDS																
(Cool Season)																
XAgrohordeum macounii																
Agropyron smithii			8			5			24	28						9
Agropyron trachycaulum			4		0.3					10						
Calamagrostis montanensis																
Carex aquatilis	8		6		3		1									
Carex brevior		0.3	3													0.3
Carex eleocharis																3
Carex gravida			0.3													
Carex laeviconica																
Carex saximontana																
Carex sprengeii																0.3
Eleocharis xyridiformis										1						
Elymus canadensis										3						
Elymus virginicus	1		2						2						1	16
Hordeum jubatum									20	2						
Koeleria pyramidata																
Poa sandbergii																
Scirpus microcarpus					1											
Scirpus validus			0.3													
Stipa comata																
Stipa viridula			1			4				7						4
TOTAL NPG(C)	9.0	0.3	24.6	0.0	4.3	9.0	1.0	0.0	46.0	51.0	0.0	0.0	0.0	0.0	1.0	32.6
NATIVE PERENNIAL GRAMINOIDS																
(Warm Season)																
Bouteloua gracilis						1										
Buchloe dactyloides																8
Muhlenbergia racemosa			0.3													
Spartina pectinata			2	8	0.3					0.3						
TOTAL NPG(W)	0.0	0.0	2.3	8.0	0.3	1.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	8.0

TABLE B3

PERCENT CANOPY COVER BY CLASS AND SPECIES FOR 32 PLOTS IN THE RIPARIAN WOODLAND AND
 3 PLOTS IN THE DECIDUOUS TREE WOODLAND
 VEGETATION TYPES – VEGETATION STUDY AREA
 STARK COUNTY, NORTH DAKOTA, 2006-2007

	RIPARIAN WOODLAND															
	PLOT NUMBER															
	RW-1	RW-2	RW-3	RW-4	RW-5	RW-6	RW-7	RW-8	RW-9	RW-10	RW-11	RW-12	RW-13	RW-14	RW-15	RW-16
INTRODUCED PERENNIAL GRAMINOIDS																
Agropyron cristatum		0.3	0.3			16		1						2		
Agropyron repens								8								
Bromus inermis	54	58	1	76	74	41	54	54		26	70	82	43	88	80	3
Poa palustris	1			2	1		0.3		1						0.3	
Poa pratensis	58	54	9			28	48		12	18					4	38
TOTAL IPG	113.0	112.3	10.3	78.0	75.0	85.0	102.3	55.0	21.0	44.0	70.0	82.0	43.0	90.0	84.3	41.0
INTRODUCED ANNUAL GRAMINOIDS																
Avena sativa													4			
Echinochloa muricata	0.3			0.3									0.3			
TOTAL IAG	0.3	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.3	0.0	0.0	0.0
NATIVE PERENNIAL FORBS																
Achillea millefolium			0.3							0.3						0.3
Agrimonia striata																
Allium textile																
Apocynum cannabinum					0.3		0.3								0.3	
Artemisia frigida																
Artemisia ludoviciana			4							4						5
Asclepias speciosa			0.3													
Aster commutatus			0.3							2						
Aster laevis																
Aster simplex	0.3		2	1	1		0.3		0.3	2					0.3	
Cicuta maculata			0.3													
Cirsium flodmanii			0.3													1
Comandra umbellata																
Cynoglossum boreale															1	
Galium boreale																
Geum aleppicum			0.3												1	0.3
Glycyrrhiza lepidota										4						
Helianthus maximilianii										4	6					
Helianthus tuberosus				0.3												
Lactuca oblongifolia					0.3							0.3			0.3	

TABLE B3

PERCENT CANOPY COVER BY CLASS AND SPECIES FOR 32 PLOTS IN THE RIPARIAN WOODLAND AND
 3 PLOTS IN THE DECIDUOUS TREE WOODLAND
 VEGETATION TYPES – VEGETATION STUDY AREA
 STARK COUNTY, NORTH DAKOTA, 2006-2007

	RIPARIAN WOODLAND															
	PLOT NUMBER															
	RW-1	RW-2	RW-3	RW-4	RW-5	RW-6	RW-7	RW-8	RW-9	RW-10	RW-11	RW-12	RW-13	RW-14	RW-15	RW-16
Linum perenne																
Lysimachia ciliata	1		0.3				0.3									
Mentha arvensis			0.3				0.3								0.3	
Mirabilis nyctaginea																
Monarda fistulosa			0.3													
Opuntia polyacantha																
Picradeniopsis oppositifolia																
Osmorhiza longistylis							0.3									
Plantago eriopoda																
Polygonum amphibium												1				
Potamogeton pectinatus																
Psoralea argophylla																0.3
Ranunculus cymbalaria	0.3															
Ratibida columnifera			0.3							1						0.3
Rumex mexicanus					0.3				1	3						
Sagittaria cuneata			1													
Sisyrinchium montanum																
Smilacina stellata								0.3					0.3			0.3
Solidago gigantea			4	1					3							0.3
Solidago mollis																
Solidago rigida																
Sphaeralcea coccinea																
Thalictrum dasycarpum	0.3	0.3	1	0.3				0.3							4	0.3
Thalictrum venulosum																
Thermopsis rhombifolia																
Toxicodendron rydbergii																
Urtica dioica								2				0.3	0.3		1	
Viola pratensis	0.3						0.3								0.3	
TOTAL NPF	2.2	0.3	15.0	2.6	1.9	0.0	1.5	2.9	12.3	18.3	0.0	0.6	1.6	0.0	9.1	7.5
INTRODUCED PERENNIAL FORBS																
Artemisia absinthium																
Cirsium arvense		0.3		14	2			10	0.3	0.3		1			2	
Euphorbia esula	0.3	0.3			0.3	0.3	3	0.3	0.3	1				0.3		

TABLE B3

PERCENT CANOPY COVER BY CLASS AND SPECIES FOR 32 PLOTS IN THE RIPARIAN WOODLAND AND
 3 PLOTS IN THE DECIDUOUS TREE WOODLAND
 VEGETATION TYPES – VEGETATION STUDY AREA
 STARK COUNTY, NORTH DAKOTA, 2006-2007

	RIPARIAN WOODLAND															
	PLOT NUMBER															
	RW-1	RW-2	RW-3	RW-4	RW-5	RW-6	RW-7	RW-8	RW-9	RW-10	RW-11	RW-12	RW-13	RW-14	RW-15	RW-16
Hesperis matronalis							0.3									
Medicago sativa						0.3								0.3		
Nepeta cataria																
Plantago major	0.3															
Rumex crispus			0.3						2	0.3					0.3	0.3
Rumex domesticus																
Rumex patientia																
Taraxacum officinale	0.3	0.3	0.3			2	0.3								0.3	1
TOTAL IPF	0.9	0.9	0.6	14.0	2.3	2.6	3.6	10.3	2.6	1.6	0.0	1.0	0.0	0.3	2.9	1.3
FERNS AND ALLIES																
Cystopteris fragilis																
TOTAL F&A	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NATIVE ANNUAL/BIENNIAL FORBS																
Amaranthus retroflexus											0.3					
Ambrosia artemisiifolia																0.3
Ambrosia trifida												0.3				
Artemisia biennis	0.3									0.3						
Atriplex subspicata											22		3	0.3	0.3	11
Chenopodium fremontii																
Chenopodium gigantospermum											0.3					
Chenopodium glaucum	0.3															
Collomia linearis																
Descurainia richardsonii																
Conyza canadensis																
Echinocystis lobata									0.3							
Ellisia nyctelea																
Galium aparine												0.3			2	
Grindelia squarrosa						1				3						1
Hackelia deflexa																
Helianthus petiolaris												0.3				
Parietaria pensylvanica								0.3								
Polygonum arenastrum									0.3							

TABLE B3

PERCENT CANOPY COVER BY CLASS AND SPECIES FOR 32 PLOTS IN THE RIPARIAN WOODLAND AND
 3 PLOTS IN THE DECIDUOUS TREE WOODLAND
 VEGETATION TYPES – VEGETATION STUDY AREA
 STARK COUNTY, NORTH DAKOTA, 2006-2007

	RIPARIAN WOODLAND															
	PLOT NUMBER															
	RW-1	RW-2	RW-3	RW-4	RW-5	RW-6	RW-7	RW-8	RW-9	RW-10	RW-11	RW-12	RW-13	RW-14	RW-15	RW-16
Polygonum lapathifolium																
Polygonum ramosissimum												0.3				
Rorippa palustris					0.3											
Xanthium strumarium								1	1							
TOTAL NAF	0.6	0.0	0.0	0.0	0.0	1.3	0.0	0.3	1.6	4.3	22.6	0.0	4.2	0.3	2.3	12.3
INTRODUCED ANNUAL/BIENNIAL FORBS																
Arctium minus			0.3					23				0.3			8	
Atriplex heterosperma										0.3						
Camelina microcarpa																
Chenopodium album										24		5				
Descurainia sophia										0.3						
Kochia scoparia	0.3										2	1				
Lactuca serriola												0.3		0.3		
Malva rotundifolia	0.3															
Medicago lupulina												0.3				1
Melilotus officinalis	0.3									0.3						
Polygonum convolvulus																
Polygonum persicaria	0.3				0.3		0.3									
Silene noctiflora																
Sisymbrium loeselii		0.3				0.3										
Thlaspi arvense												0.3				
Tragopogon dubius		0.3				0.3										
TOTAL IAF	1.2	0.6	0.3	0.0	0.3	0.6	0.3	23.0	0.0	0.3	26.6	0.0	7.2	0.0	8.3	1.0
NATIVE SHRUBS AND VINES																
Amelanchier humilis																
Cornus stolonifera				1	0.3											
Crataegus rotundifolia			2													
Humulus lupulus				0.3				0.3				0.3			1	
Parthenocissus vitacea																
Prunus americana																
Prunus virginiana			0.3			0.3	0.3	18				52	0.3			

TABLE B3

PERCENT CANOPY COVER BY CLASS AND SPECIES FOR 32 PLOTS IN THE RIPARIAN WOODLAND AND
 3 PLOTS IN THE DECIDUOUS TREE WOODLAND
 VEGETATION TYPES – VEGETATION STUDY AREA
 STARK COUNTY, NORTH DAKOTA, 2006-2007

	RIPARIAN WOODLAND															
	PLOT NUMBER															
	RW-1	RW-2	RW-3	RW-4	RW-5	RW-6	RW-7	RW-8	RW-9	RW-10	RW-11	RW-12	RW-13	RW-14	RW-15	RW-16
Ribes americanum				0.3					0.3							
Ribes odoratum			0.3										4			
Ribes setosum	0.3	0.3	0.3		0.3		0.3					0.3	0.3	0.3	0.3	
Rosa arkansana																
Rosa woodsii			15		0.3				9	9						1
Salix exigua									0.3							
Salix lutea									4							
Shepherdia argentea				0.3					42	5						
Smilax herbacea																
Symphoricarpos occidentalis	0.3	0.3	40	5	12	1	4		23	18		0.3	32	15	36	
TOTAL NATIVE SHRUBS	0.6	0.6	57.9	6.9	12.9	1.3	4.6	18.3	78.6	32.0	0.0	0.0	52.9	36.6	16.3	37.3
INTRODUCED SHRUBS																
Lonicera tatarica			0.3												1	
TOTAL INTRODUCED SHRUBS	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0
NATIVE TREES																
Acer negundo	8	4	1	42	48	18	3	22			1	26	4	1	38	8
Fraxinus pennsylvanica	54	58	14	30	16	16	28	36	14	13	14	20	70	37	30	36
Populus deltoides																
Salix amygdaloides			1												2	
Ulmus americana			24		0.3			27				8				16
TOTAL NATIVE TREES	62.0	62.0	40.0	72.0	64.3	34.0	31.0	85.0	14.0	13.0	15.0	46.0	82.0	38.0	70.0	60.0
INTRODUCED TREES																
Elaeagnus angustifolia																
TOTAL INTRODUCED TREES	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL VEGETATION (Stratified)	189.8	177.0	151.3	181.8	161.3	134.8	144.3	194.8	176.1	164.8	134.2	129.6	195.2	165.2	195.2	201.0

Footnotes given on index page B-ii.

TABLE B3

PERCENT CANOPY COVER BY CLASS AND SPECIES FOR 32 PLOTS IN THE RIPARIAN WOODLAND AND
 3 PLOTS IN THE DECIDUOUS TREE WOODLAND
 VEGETATION TYPES – VEGETATION STUDY AREA
 STARK COUNTY, NORTH DAKOTA, 2006-2007

	RIPARIAN WOODLAND															
	PLOT NUMBER															
	RW-17	RW-18	RW-19	RW-20	RW-21	RW-22	RW-23	RW-24	RW-25	RW-26	RW-27	RW-28	RW-29	RW-30	RW-31	RW-32
SITE PARAMETERS*																
Slope (percent)	2	2-3	2-3/ 25-30	4/ 25	2	2-3	2	2-3	2-3	1-2	2-3	1-2	1-2	1-3	2	2-3
Aspect (degrees)	304	033	320/ 040	052	330	077	306	106	075	140	047	058	038	037	172	050
Topography	FloTer	Bot	Ter/ Bot	Bot/ Bnk	Bot	FloTer	Ter/Toe	FloTer	FloTer	Ter	lowTer	FloTer	FloTer	FloTer	Bot	FloTer
Configuration	S	S(V)	V	V	S(V)	S	S	S(V)	S	S	S(V)	S	S	S	S(V)	S
Soil	HL-A s/s	HL-A s/s	HL-A s/s	HL-A s/s	HL-A s/s	EH-A	EH-A	EH-A	EH-A s/s	EH-A s/s	EH-A s/s	EH-A s/s	EH-A s/s	FV-A	FV-A	FV-A
Ecological Site	LyT	LyT	LyT	LyT	LyT	LyT (CyT)	LyT (CyT)	LyT (CyT)	LyT (CyT)	LyT (CyT)	LyT (CyT)	LyT (CyT)	LyT (CyT)	LyT (CyT)	LyT (CyT)	LyT (CyT)
Investigator	KS/DB	KS/DB	KS/DB	KS/DB	KS/DB	KS/DB	KS/DB	KS/DB	KS/DB	KS/DB	KS/DB	KS/DB	KS/DB	KS/DB	KS/DB	KS/DB
Date	8-22-06	8-21-06	8-22-06	8-21-06	8-20-06	9-6-06	9-7-06	9-9-06	8-23-06	8-23-06	8-23-06	8-23-06	8-23-06	9-7-06	9-9-06	9-9-06
GROUND COVER																
Bare Ground	1	1	8	1	4	0.3			0.3	4	10	0.3	3	5	0.3	5
Rock																
Litter	91	91	80	92	88	93	94	94	91	89	83	93	86	88	91	88
Lichens											0.3					
Moss	0.3	0.3	0.3	0.3	0.3	1		0.3	1	0.3	0.3		3		0.3	
Water			4													
Basal Vegetation	8	8	8	7	8	6	6	6	8	7	6	7	8	7	8	7
VEGETATION STRUCTURE																
(nonstratified cover)																
Total Vegetation	94	95	93	96	95	95	88	88	94	94	95	92	95	82	91	91
Perennial Graminoids	54	58	74	42	80	60	86	85	88	89	84	82	88	78	82	88
Annual Graminoids																
Perennial Forbs	7	7	9	3	3	2		0.3	11	4	3	0.3	5	0.3	1	4
Annual/Biennial Forbs	2	15	0.3	20	1	40	4			0.3	0.3		0.3	7	5	0.3
Shrubs	56	40	31	47	45			10	0.3	0.3	0.3	12	0.3	0.3	2	2
Trees	66	66	42	68	36	66	6	20	18	26	63	19	30	16	58	14

TABLE B3

PERCENT CANOPY COVER BY CLASS AND SPECIES FOR 32 PLOTS IN THE RIPARIAN WOODLAND AND
 3 PLOTS IN THE DECIDUOUS TREE WOODLAND
 VEGETATION TYPES – VEGETATION STUDY AREA
 STARK COUNTY, NORTH DAKOTA, 2006-2007

CLASS/SPECIES	RIPARIAN WOODLAND															
	PLOT NUMBER															
	RW-17	RW-18	RW-19	RW-20	RW-21	RW-22	RW-23	RW-24	RW-25	RW-26	RW-27	RW-28	RW-29	RW-30	RW-31	RW-32
NATIVE PERENNIAL GRAMINOIDS (Cool Season)																
XAgrohordeum macounii										0.3						
Agropyron smithii			3									1				
Agropyron trachycaulum			2		6					1						
Calamagrostis montanensis			0.3									0.3				
Carex aquatilis			9													
Carex brevior	1	2	0.3						0.3							
Carex eleocharis													2			
Carex gravida	4	3	5		2											
Carex laeviconica	19	20	10													
Carex saximontana																
Carex sprengeii																
Eleocharis xyridiformis																
Elymus canadensis			0.3													
Elymus virginicus	9	11	2	7		0.3										
Hordeum jubatum																
Koeleria pyramidata																
Poa sandbergii			0.3													
Scirpus microcarpus																
Scirpus validus																
Stipa comata			1										1			
Stipa viridula			5		0.3					1	0.3					
TOTAL NPG(C)	33.0	36.0	38.2	7.0	8.3	0.3	0.0	0.0	0.3	1.0	1.6	0.0	4.3	0.0	0.0	0.0
NATIVE PERENNIAL GRAMINOIDS (Warm Season)																
Bouteloua gracilis			5													
Buchloe dactyloides			4										14			
Muhlenbergia racemosa		0.3														
Spartina pectinata			1													
TOTAL NPG(W)	0.0	0.3	10.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	14.0	0.0	0.0	0.0

TABLE B3

PERCENT CANOPY COVER BY CLASS AND SPECIES FOR 32 PLOTS IN THE RIPARIAN WOODLAND AND
 3 PLOTS IN THE DECIDUOUS TREE WOODLAND
 VEGETATION TYPES – VEGETATION STUDY AREA
 STARK COUNTY, NORTH DAKOTA, 2006-2007

	RIPARIAN WOODLAND															
	PLOT NUMBER															
	RW-17	RW-18	RW-19	RW-20	RW-21	RW-22	RW-23	RW-24	RW-25	RW-26	RW-27	RW-28	RW-29	RW-30	RW-31	RW-32
INTRODUCED PERENNIAL GRAMINOIDS																
Agropyron cristatum			0.3		0.3	1				9		1	3	0.3	28	1
Agropyron repens				2												
Bromus inermis	4	1	10	30	35	56	86	76	54	52	48	46	34	56	58	52
Poa palustris		2	0.3													
Poa pratensis	28	32	38	8	54	5		16	56	54	56	54	56	40	14	58
TOTAL IPG	32.0	35.0	48.6	40.0	89.3	62.0	86.0	92.0	110.0	115.0	104.0	101.0	93.0	96.3	100.0	111.0
INTRODUCED ANNUAL GRAMINOIDS																
Avena sativa																
Echinochloa muricata																
TOTAL IAG	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NATIVE PERENNIAL FORBS																
Achillea millefolium					0.3					0.3						
Agrimonia striata		0.3														
Allium textile																
Apocynum cannabinum																
Artemisia frigida			0.3													
Artemisia ludoviciana			4		2											
Asclepias speciosa											1					
Aster commutatus																
Aster laevis			0.3													
Aster simplex			0.3													
Cicuta maculata																
Cirsium flodmanii			0.3		0.3											
Comandra umbellata																
Cynoglossum boreale		0.3		0.3												
Galium boreale																
Geum aleppicum	1	1														
Glycyrrhiza lepidota					0.3											
Helianthus maximiliani																
Helianthus tuberosus																
Lactuca oblongifolia	0.3			0.3												

TABLE B3

PERCENT CANOPY COVER BY CLASS AND SPECIES FOR 32 PLOTS IN THE RIPARIAN WOODLAND AND
 3 PLOTS IN THE DECIDUOUS TREE WOODLAND
 VEGETATION TYPES – VEGETATION STUDY AREA
 STARK COUNTY, NORTH DAKOTA, 2006-2007

	RIPARIAN WOODLAND															
	PLOT NUMBER															
	RW-17	RW-18	RW-19	RW-20	RW-21	RW-22	RW-23	RW-24	RW-25	RW-26	RW-27	RW-28	RW-29	RW-30	RW-31	RW-32
Linum perenne																
Lysimachia ciliata																
Mentha arvensis			0.3													
Mirabilis nyctaginea														0.3		
Monarda fistulosa		0.3	1		1											
Opuntia polyacantha																
Picradeniopsis oppositifolia																
Osmorhiza longistylis																
Plantago eriopoda		0.3														
Polygonum amphibium			0.3													
Potamogeton pectinatus			1													
Psoralea argophylla																
Ranunculus cymbalaria																
Ratibida columnifera			1								0.3					
Rumex mexicanus																
Sagittaria cuneata			0.3													
Sisyrinchium montanum																
Smilacina stellata				0.3												
Solidago gigantea																
Solidago mollis																
Solidago rigida					0.3											
Sphaeralcea coccinea																
Thalictrum dasycarpum	0.3	1	0.3	0.3	0.3						0.3					
Thalictrum venulosum	0.3															
Thermopsis rhombifolia																
Toxicodendron rydbergii																
Urtica dioica				2		2										
Viola pratincola																
TOTAL NPF	1.9	3.2	9.4	3.2	4.5	2.0	0.0	0.0	0.0	0.3	1.6	0.0	0.0	0.3	0.0	0.0
INTRODUCED PERENNIAL FORBS																
Artemisia absinthium			0.3													
Cirsium arvense	0.3		0.3						2	0.3						
Euphorbia esula			0.3					0.3	1	0.3	0.3		0.3	0.3	1	1

TABLE B3

PERCENT CANOPY COVER BY CLASS AND SPECIES FOR 32 PLOTS IN THE RIPARIAN WOODLAND AND
 3 PLOTS IN THE DECIDUOUS TREE WOODLAND
 VEGETATION TYPES – VEGETATION STUDY AREA
 STARK COUNTY, NORTH DAKOTA, 2006-2007

	RIPARIAN WOODLAND															
	PLOT NUMBER															
	RW-17	RW-18	RW-19	RW-20	RW-21	RW-22	RW-23	RW-24	RW-25	RW-26	RW-27	RW-28	RW-29	RW-30	RW-31	RW-32
Hesperis matronalis															0.3	
Medicago sativa								0.3							0.3	
Nepeta cataria		0.3														
Plantago major																
Rumex crispus	0.3	0.3	0.3	0.3							0.3	0.3				
Rumex domesticus														0.3		
Rumex patientia						0.3										
Taraxacum officinale	5	4		0.3				8	4	1		5	0.3	0.3	3	
TOTAL IPF	5.6	4.6	1.2	0.6	0.0	0.3	0.0	0.3	11.3	4.6	1.6	0.3	5.3	0.9	1.9	4.0
FERNS AND ALLIES																
Cystopteris fragilis																
TOTAL F&A	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NATIVE ANNUAL/BIENNIAL FORBS																
Amaranthus retroflexus															0.3	
Ambrosia artemisiifolia																
Ambrosia trifida																
Artemisia biennis																
Atriplex subspicata	1	13		18	1	30	4							3	2	
Chenopodium fremontii						0.3										
Chenopodium gigantospermum						0.3										0.3
Chenopodium glaucum																
Collomia linearis																
Descurainia richardsonii																
Conyza canadensis			0.3													
Echinocystis lobata																
Ellisia nyctelea																
Galium aparine	0.3	0.3		0.3												
Grindelia squarrosa										0.3	0.3			0.3		
Hackelia deflexa	0.3															
Helianthus petiolaris																
Parietaria pensylvanica																
Polygonum arenastrum																

TABLE B3

PERCENT CANOPY COVER BY CLASS AND SPECIES FOR 32 PLOTS IN THE RIPARIAN WOODLAND AND
 3 PLOTS IN THE DECIDUOUS TREE WOODLAND
 VEGETATION TYPES – VEGETATION STUDY AREA
 STARK COUNTY, NORTH DAKOTA, 2006-2007

	RIPARIAN WOODLAND															
	PLOT NUMBER															
	RW-17	RW-18	RW-19	RW-20	RW-21	RW-22	RW-23	RW-24	RW-25	RW-26	RW-27	RW-28	RW-29	RW-30	RW-31	RW-32
Polygonum lapathifolium			0.3													
Polygonum ramosissimum																
Rorippa palustris																
Xanthium strumarium																
TOTAL NAF	1.6	13.3	0.6	18.3	1.0	30.6	4.0	0.0	0.0	0.3	0.3	0.0	0.0	3.3	2.3	0.3
INTRODUCED ANNUAL/BIENNIAL FORBS																
Arctium minus	0.3	2		2		7								1		
Atriplex heterosperma																
Camelina microcarpa									0.3							
Chenopodium album							0.3							0.3	0.3	0.3
Descurainia sophia			0.3									0.3		2		
Kochia scoparia																
Lactuca serriola																
Malva rotundifolia																
Medicago lupulina	0.3															
Melilotus officinalis	0.3															
Polygonum convolvulus				0.3		0.3										
Polygonum persicaria			0.3													
Silene noctiflora						0.3										
Sisymbrium loeselii						3			0.3					3		0.3
Thlaspi arvense		0.3				0.3								0.3		
Tragopogon dubius																
TOTAL IAF	0.9	2.3	0.6	2.3	0.0	10.9	0.3	0.0	0.0	0.6	0.0	0.0	0.3	4.6	2.3	0.6
NATIVE SHRUBS AND VINES																
Amelanchier humilis																
Cornus stolonifera																
Crataegus rotundifolia					4			1								
Humulus lupulus	0.3		0.3	0.3												
Parthenocissus vitacea				0.3												
Prunus americana		4	0.3													
Prunus virginiana		0.3	1	1				0.3		1	0.3		0.3			

TABLE B3

PERCENT CANOPY COVER BY CLASS AND SPECIES FOR 32 PLOTS IN THE RIPARIAN WOODLAND AND
 3 PLOTS IN THE DECIDUOUS TREE WOODLAND
 VEGETATION TYPES – VEGETATION STUDY AREA
 STARK COUNTY, NORTH DAKOTA, 2006-2007

	RIPARIAN WOODLAND															
	PLOT NUMBER															
	RW-17	RW-18	RW-19	RW-20	RW-21	RW-22	RW-23	RW-24	RW-25	RW-26	RW-27	RW-28	RW-29	RW-30	RW-31	RW-32
Ribes americanum																
Ribes odoratum																
Ribes setosum	0.3	0.3	0.3	0.3	0.3			0.3	0.3	0.3	0.3			1	0.3	
Rosa arkansana																
Rosa woodsii	0.3		2	3	3											
Salix exigua																
Salix lutea			4													
Shepherdia argentea																
Smilax herbacea		0.3	0.3					0.3								
Symphoricarpos occidentalis	56	38	26	44	42			9	0.3	0.3		12	0.3	0.3	1	2
TOTAL NATIVE SHRUBS	56.9	42.9	34.2	48.9	49.3	0.0	0.0	10.3	0.9	0.6	0.6	12.3	0.6	0.3	2.0	2.3
INTRODUCED SHRUBS																
Lonicera tatarica			0.3	3	0.3											
TOTAL INTRODUCED SHRUBS	0.0	0.0	0.3	3.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NATIVE TREES																
Acer negundo	23		28	20		26	1	2	17	14			13	3	34	8
Fraxinus pennsylvanica	52	65	26	58	10	50	5	13	3	18	62	15	17	13	29	6
Populus deltoides												6				
Salix amygdaloides											5					
Ulmus americana	0.3	2	0.3		28			5				2				
TOTAL NATIVE TREES	75.3	67.0	54.3	78.0	38.0	76.0	6.0	20.0	20.0	32.0	67.0	23.0	30.0	16.0	63.0	14.0
INTRODUCED TREES																
Elaeagnus angustifolia												0.3				
TOTAL INTRODUCED TREES	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0
TOTAL VEGETATION (Stratified)	207.2	204.6	197.4	201.3	190.7	182.1	96.3	122.6	142.5	154.4	177.0	136.6	147.5	121.7	171.5	132.2

Footnotes given on index page B-ii.

TABLE B3

**PERCENT CANOPY COVER BY CLASS AND SPECIES FOR 32 PLOTS IN THE RIPARIAN WOODLAND AND
3 PLOTS IN THE DECIDUOUS TREE WOODLAND
VEGETATION TYPES – VEGETATION STUDY AREA
STARK COUNTY, NORTH DAKOTA, 2006-2007**

	RIPARIAN WOODLAND		DECIDUOUS TREE WOODLAND			WOODLAND COMPOSITE			
	Mean	Const-	PLOT NUMBER			Mean	Const-	Mean	Const-
	Cover	ancy	DTW-1	DTW-2	DTW-3	Cover	ancy	Cover	ancy
	n=32					n=3		n=35	
SITE PARAMETERS*									
Slope (percent)			6-9/ 30-70	95-100	3-5/ 45-60				
Aspect (degrees)			060	008	022				
Topography			Bot/ Banks	Bluff	Bot/ Banks				
Configuration			V	V	V				
Soil			RT-CD	RT-CD	RT-CD				
Ecological Site			DTW	DTW	DTW				
Investigator			KS/ED	KS/ED	KS/ED				
Date			6-14-07	6-14-07	6-14-07				
GROUND COVER									
Bare Ground	3.27	84	4	28	12	14.67	100	4.24	86
Rock					0.3	0.10	33	0.01	3
Litter	88.78	100	88	46	80	71.33	100	87.29	100
Lichens	0.03	9						0.03	9
Moss	0.45	78	0.3	20	0.3	6.87	100	1.00	80
Water	0.53	9	1			0.33	33	0.51	11
Basal Vegetation	7.06	100	7	6	7	6.67	100	7.03	100
VEGETATION STRUCTURE									
(nonstratified cover)									
Total Vegetation	92.09	100	93	92	91	92.00	100	92.09	100
Perennial Graminoids	73.88	100	68	34	78	60.00	100	72.69	100
Annual Graminoids	0.14	9						0.13	9
Perennial Forbs	5.38	94	23	2	17	14.00	100	6.12	94
Annual/Biennial Forbs	6.42	84	3		8	3.67	67	6.18	83
Shrubs	17.97	88	60	72	13	48.33	100	20.57	89
Trees	41.69	100	56	36	58	50.00	100	42.40	100

TABLE B3

PERCENT CANOPY COVER BY CLASS AND SPECIES FOR 32 PLOTS IN THE RIPARIAN WOODLAND AND
 3 PLOTS IN THE DECIDUOUS TREE WOODLAND
 VEGETATION TYPES – VEGETATION STUDY AREA
 STARK COUNTY, NORTH DAKOTA, 2006-2007

CLASS\SPECIES	RIPARIAN WOODLAND		DECIDUOUS TREE WOODLAND			WOODLAND COMPOSITE			
	Mean	Const-	PLOT NUMBER			Mean	Const-	Mean	Const-
	Cover	ancy	DTW-1	DTW-2	DTW-3	Cover	ancy	Cover	ancy
	n=32					n=3		n=35	
NATIVE PERENNIAL GRAMINOIDS									
(Cool Season)									
XAgrohordeum macounii	0.01	3						0.01	3
Agropyron smithii	2.44	22	5			1.67	33	2.37	23
Agropyron trachycaulum	0.73	19						0.67	17
Calamagrostis montanensis	0.02	6						0.02	6
Carex aquatilis	0.84	16	0.3			0.10	33	0.78	17
Carex brevior	0.23	22			0.3	0.10	33	0.21	23
Carex eleocharis	0.16	6						0.14	6
Carex gravida	0.45	16						0.41	14
Carex laeviconica	1.53	9						1.40	9
Carex saximontana					0.3	0.10	33	0.01	3
Carex sprengei	0.01	3						0.01	3
Eleocharis xyridiformis	0.03	3						0.03	3
Elymus canadensis	0.10	6						0.09	6
Elymus virginicus	1.60	31						1.47	29
Hordeum jubatum	0.69	6	1			0.33	33	0.66	9
Koeleria pyramidata			0.3			0.10	33	0.01	3
Poa sandbergii	0.01	3						0.01	3
Scirpus microcarpus	0.03	3						0.03	3
Scirpus validus	0.01	3						0.01	3
Stipa comata	0.06	6						0.06	6
Stipa viridula	0.71	25	1			0.33	33	0.67	26
TOTAL NPG(C)	9.65	63	7.6	0.0	0.6	2.73	67	9.06	63
NATIVE PERENNIAL GRAMINOIDS									
(Warm Season)									
Bouteloua gracilis	0.19	6						0.17	6
Buchloe dactyloides	0.81	9						0.74	9
Muhlenbergia racemosa	0.02	6						0.02	6
Spartina pectinata	0.36	16	4			1.33	33	0.45	17
TOTAL NPG(W)	1.38	28	4.0	0.0	0.0	1.33	33	1.38	29

TABLE B3

PERCENT CANOPY COVER BY CLASS AND SPECIES FOR 32 PLOTS IN THE RIPARIAN WOODLAND AND
 3 PLOTS IN THE DECIDUOUS TREE WOODLAND
 VEGETATION TYPES – VEGETATION STUDY AREA
 STARK COUNTY, NORTH DAKOTA, 2006-2007

	RIPARIAN WOODLAND		DECIDUOUS TREE WOODLAND				WOODLAND COMPOSITE		
	Mean	Const-	PLOT NUMBER			Mean	Const-	Mean	Const-
	Cover	ancy	DTW-1	DTW-2	DTW-3	Cover	ancy	Cover	ancy
	n=32					n=3		n=35	
INTRODUCED PERENNIAL GRAMINOIDS									
Agropyron cristatum	1.98	44						1.81	40
Agropyron repens	0.31	6	14		5	6.33	67	0.83	11
Bromus inermis	46.94	97	28	34	58	40.00	100	46.34	97
Poa palustris	0.25	25						0.23	23
Poa pratensis	26.19	75	32	0.3	38	23.43	100	25.95	77
TOTAL IPG	75.67	100	74.0	34.3	101.0	69.77	100	75.16	100
INTRODUCED ANNUAL GRAMINOIDS									
Avena sativa	0.13	3						0.11	3
Echinochloa muricata	0.03	9						0.03	9
TOTAL IAG	0.15	9	0.0	0.0	0.0	0.00	0	0.14	9
NATIVE PERENNIAL FORBS									
Achillea millefolium	0.05	16	0.3		1	0.43	67	0.08	20
Agrimonia striata	0.01	3						0.01	3
Allium textile					0.3	0.10	33	0.01	3
Apocynum cannabinum	0.03	9						0.03	9
Artemisia frigida	0.01	3						0.01	3
Artemisia ludoviciana	0.59	16	0.3			0.10	33	0.55	17
Asclepias speciosa	0.04	6	0.3			0.10	33	0.05	9
Aster commutatus	0.07	6	0.3			0.10	33	0.07	9
Aster laevis	0.01	3	0.3			0.10	33	0.02	6
Aster simplex	0.23	28						0.21	26
Cicuta maculata	0.01	3						0.01	3
Cirsium flodmanii	0.06	13						0.05	11
Comandra umbellata			0.3			0.10	33	0.01	3
Cynoglossum boreale	0.05	9						0.05	9
Galium boreale			0.3	1	3	1.43	100	0.12	9
Geum aleppicum	0.11	16						0.10	14
Glycyrrhiza lepidota	0.13	6	0.3			0.10	33	0.13	9
Helianthus maximilianii	0.31	6	0.3			0.10	33	0.29	9
Helianthus tuberosus	0.01	3						0.01	3
Lactuca oblongifolia	0.05	16	0.3			0.10	33	0.05	17

TABLE B3

PERCENT CANOPY COVER BY CLASS AND SPECIES FOR 32 PLOTS IN THE RIPARIAN WOODLAND AND
 3 PLOTS IN THE DECIDUOUS TREE WOODLAND
 VEGETATION TYPES – VEGETATION STUDY AREA
 STARK COUNTY, NORTH DAKOTA, 2006-2007

	RIPARIAN WOODLAND		DECIDUOUS TREE WOODLAND			WOODLAND COMPOSITE			
	Mean	Const-	PLOT NUMBER			Mean	Const-	Mean	Const-
	Cover	ancy	DTW-1	DTW-2	DTW-3	Cover	ancy	Cover	ancy
	n=32					n=3		n=35	
Linum perenne			1			0.33	33	0.03	3
Lysimachia ciliata	0.05	9	2		0.3	0.77	67	0.11	14
Mentha arvensis	0.04	13						0.03	11
Mirabilis nyctaginea	0.01	3						0.01	3
Monarda fistulosa	0.08	13						0.07	11
Opuntia polyacantha			0.3			0.10	33	0.01	3
Picradeniopsis oppositifolia			0.3			0.10	33	0.01	3
Osmorhiza longistylis	0.01	3						0.01	3
Plantago eriopoda	0.01	3						0.01	3
Polygonum amphibium	0.04	6						0.04	6
Potamogeton pectinatus	0.03	3						0.03	3
Psoralea argophylla	0.01	3	2			0.67	33	0.07	6
Ranunculus cymbalaria	0.01	3						0.01	3
Ratibida columnifera	0.09	16						0.08	14
Rumex mexicanus	0.13	9	1			0.33	33	0.15	11
Sagittaria cuneata	0.04	6						0.04	6
Sisyrinchium montanum			0.3			0.10	33	0.01	3
Smilacina stellata	0.04	13			0.3	0.10	33	0.04	14
Solidago gigantea	0.26	13	1			0.33	33	0.27	14
Solidago mollis			0.3			0.10	33	0.01	3
Solidago rigida	0.01	3						0.01	3
Sphaeralcea coccinea			0.3			0.10	33	0.01	3
Thalictrum dasycarpum	0.28	41						0.26	37
Thalictrum venulosum	0.01	3			0.3	0.10	33	0.02	6
Thermopsis rhombifolia			0.3			0.10	33	0.01	3
Toxicodendron rydbergii			16		0.3	5.43	67	0.47	6
Urtica dioica	0.24	19						0.22	17
Viola pratincola	0.03	9						0.03	9
TOTAL NPF	3.19	69	27.8	1.0	5.5	11.43	100	3.90	71
INTRODUCED PERENNIAL FORBS									
Artemisia absinthium	0.01	3						0.01	3
Cirsium arvense	1.03	38						0.94	34
Euphorbia esula	0.34	56	0.3	1	0.3	0.53	100	0.36	60

TABLE B3

PERCENT CANOPY COVER BY CLASS AND SPECIES FOR 32 PLOTS IN THE RIPARIAN WOODLAND AND
 3 PLOTS IN THE DECIDUOUS TREE WOODLAND
 VEGETATION TYPES – VEGETATION STUDY AREA
 STARK COUNTY, NORTH DAKOTA, 2006-2007

	RIPARIAN WOODLAND		DECIDUOUS TREE WOODLAND				WOODLAND COMPOSITE		
	Mean	Const-	PLOT NUMBER			Mean	Const-	Mean	Const-
	Cover	ancy	DTW-1	DTW-2	DTW-3	Cover	ancy	Cover	ancy
	n=32					n=3		n=35	
Hesperis matronalis	0.02	6						0.02	6
Medicago sativa	0.04	13			0.3	0.10	33	0.04	14
Nepeta cataria	0.01	3						0.01	3
Plantago major	0.01	3						0.01	3
Rumex crispus	0.16	34						0.14	31
Rumex domesticus	0.01	3	0.3		0.3	0.20	67	0.03	9
Rumex patienta	0.01	3						0.01	3
Taraxacum officinale	1.11	53	0.3	0.3	12	4.20	100	1.37	57
TOTAL IPF	2.73	88	0.9	1.3	12.9	5.03	100	2.93	89
FERNS AND ALLIES									
Cystopteris fragilis					0.3	0.10	33	0.01	3
TOTAL F&A	0.00	0	0.0	0.0	0.3	0.10	33	0.01	3
NATIVE ANNUAL/BIENNIAL FORBS									
Amaranthus retroflexus	0.02	6						0.02	6
Ambrosia artemisiifolia	0.01	3						0.01	3
Ambrosia trifida	0.01	3						0.01	3
Artemisia biennis	0.02	6						0.02	6
Atriplex subspicata	3.39	41						3.10	37
Chenopodium fremontii	0.01	3						0.01	3
Chenopodium gigantospermum	0.03	9						0.03	9
Chenopodium glaucum	0.01	3						0.01	3
Collomia linearis					0.3	0.10	33	0.01	3
Descurainia richardsonii			0.3		0.3	0.20	67	0.02	6
Conyza canadensis	0.01	3						0.01	3
Echinocystis lobata	0.01	3						0.01	3
Ellisia nyctelea					1	0.33	33	0.03	3
Galium aparine	0.10	16			2	0.67	33	0.15	17
Grindelia squarrosa	0.18	19						0.17	17
Hackelia deflexa	0.01	3						0.01	3
Helianthus petiolaris	0.01	3						0.01	3
Parietaria pensylvanica	0.01	3	3		4	2.33	67	0.21	9
Polygonum arenastrum	0.01	3						0.01	3

TABLE B3

PERCENT CANOPY COVER BY CLASS AND SPECIES FOR 32 PLOTS IN THE RIPARIAN WOODLAND AND
 3 PLOTS IN THE DECIDUOUS TREE WOODLAND
 VEGETATION TYPES – VEGETATION STUDY AREA
 STARK COUNTY, NORTH DAKOTA, 2006-2007

	RIPARIAN WOODLAND		DECIDUOUS TREE WOODLAND				WOODLAND COMPOSITE		
	Mean	Const-	PLOT NUMBER			Mean	Const-	Mean	Const-
	Cover	ancy	DTW-1	DTW-2	DTW-3	Cover	ancy	Cover	ancy
	n=32					n=3		n=35	
Polygonum lapathifolium	0.01	3						0.01	3
Polygonum ramosissimum	0.01	3						0.01	3
Rorippa palustris	0.01	3						0.01	3
Xanthium strumarium	0.06	6						0.06	6
TOTAL NAF	3.93	69	3.3	0.0	7.6	3.63	67	3.90	69
INTRODUCED ANNUAL/BIENNIAL FORBS									
Arctium minus	1.37	28						1.25	26
Atriplex heterosperma	0.01	3						0.01	3
Camelina microcarpa	0.01	3			0.3	0.10	33	0.02	6
Chenopodium album	0.94	19						0.86	17
Descurainia sophia	0.09	13	0.3			0.10	33	0.09	14
Kochia scoparia	0.10	9						0.09	9
Lactuca serriola	0.02	6			0.3	0.10	33	0.03	9
Malva rotundifolia	0.01	3						0.01	3
Medicago lupulina	0.05	9						0.05	9
Melilotus officinalis	0.03	9						0.03	9
Polygonum convolvulus	0.02	6			0.3	0.10	33	0.03	9
Polygonum persicaria	0.04	13						0.03	11
Silene noctiflora	0.01	3						0.01	3
Sisymbrium loeselii	0.23	19			0.3	0.10	33	0.21	20
Thlaspi arvense	0.04	13			0.3	0.10	33	0.04	14
Tragopogon dubius	0.02	6	0.3			0.10	33	0.03	9
TOTAL IAF	2.98	72	0.6	0.0	1.5	0.70	67	2.79	71
NATIVE SHRUBS AND VINES									
Amelanchier humilis			14	5		6.33	67	0.54	6
Cornus stolonifera	0.04	6	7	2		3.00	67	0.29	11
Crataegus rotundifolia	0.22	9						0.20	9
Humulus lupulus	0.09	22			0.3	0.10	33	0.09	23
Parthenocissus vitacea	0.01	3						0.01	3
Prunus americana	0.13	6						0.12	6
Prunus virginiana	2.33	38	26	14	1	13.67	100	3.30	43

TABLE B3

PERCENT CANOPY COVER BY CLASS AND SPECIES FOR 32 PLOTS IN THE RIPARIAN WOODLAND AND
 3 PLOTS IN THE DECIDUOUS TREE WOODLAND
 VEGETATION TYPES – VEGETATION STUDY AREA
 STARK COUNTY, NORTH DAKOTA, 2006-2007

	RIPARIAN WOODLAND		DECIDUOUS TREE WOODLAND				WOODLAND COMPOSITE		
	Mean	Const-	PLOT NUMBER			Mean	Const-	Mean	Const-
	Cover	ancy	DTW-1	DTW-2	DTW-3	Cover	ancy	Cover	ancy
	n=32					n=3		n=35	
Ribes americanum	0.02	6	2			0.67	33	0.07	9
Ribes odoratum	0.13	6	1			0.33	33	0.15	9
Ribes setosum	0.21	63	1	2	2	1.67	100	0.33	66
Rosa arkansana			1			0.33	33	0.03	3
Rosa woodsii	1.33	28	2	16	0.3	6.10	100	1.74	34
Salix exigua	0.01	3						0.01	3
Salix lutea	0.25	6						0.23	6
Shepherdia argentea	1.48	9	9	10	1	6.67	100	1.92	17
Smilax herbacea	0.03	9			0.3	0.10	33	0.03	11
Symphoricarpos occidentalis	13.07	81	20	40	8	22.67	100	13.89	83
TOTAL NATIVE SHRUBS	19.34	88	83.0	89.0	12.9	61.63	100	22.97	89
INTRODUCED SHRUBS									
Lonicera tatarica	0.15	16						0.14	14
TOTAL INTRODUCED SHRUBS	0.15	16	0.0	0.0	0.0	0.00	0	0.14	14
NATIVE TREES									
Acer negundo	12.91	81						11.80	74
Fraxinus pennsylvanica	29.00	100	56	32	44	44.00	100	30.29	100
Populus deltoides	0.19	3						0.17	3
Salix amygdaloides	0.25	9						0.23	9
Ulmus americana	3.53	34		4	16	6.67	67	3.80	37
TOTAL NATIVE TREES	45.87	100	56.0	36.0	60.0	50.67	100	46.28	100
INTRODUCED TREES									
Elaeagnus angustifolia	0.01	3						0.01	3
TOTAL INTRODUCED TREES	0.0	0							
TOTAL VEGETATION (Stratified)	165.06	100	257.2	161.6	202.3	207.03	100	168.66	100

Footnotes given on index page B-ii.

TABLE B4

PERCENT CANOPY COVER BY CLASS/SPECIES FOR 2 PLOTS IN THE SHALLOW CLAYEY, 16 PLOTS IN THE SHALLOW LOAMY AND 2 PLOTS IN THE SHALLOW SANDY ECOLOGICAL SITES – VEGETATION STUDY AREA
STARK COUNTY, NORTH DAKOTA, 2006-2007

	SHALLOW CLAYEY				SHALLOW LOAMY										
	PLOT		Mean	Const-	PLOT NUMBER										
	SwCy-1	SwCy-2	Cover	ancy	SwLy-1	SwLy-2	SwLy-3	SwLy-4	SwLy-5	SwLy-6	SwLy-7	SwLy-8	SwLy-9	SwLy-10	SwLy-11
n=2															
SITE PARAMETERS															
Slope (percent)	6	17			4	12	12	7	10	3	15	19	14	25	12
Aspect (degrees)	354	220			205	136	043	215	037	218	225	330	008	040	085
Topography	Mid	Ridge			Upper	Lower	Mid	Ridge	Mid	Swale	Mid	Upper	Upper	Should	Ridge
Configuration	V	X			S	X	Und	S (X)	V (S)	V	S	X	V	Und	X
Soil	WN-B	WN-CDE			CB-AB	CB-AB	CB-C	CB-C	CB-C	CB-DE	CB-DE	CB-DE	CB-DE	CB-DE	CB-DE
Ecological Site	SwCy	SwCy			SwLy	SwLy	SwLy	SwLy	SwLy	SwLy	SwLy	SwLy	SwLy	SwLy	SwLy
Investigator	LL/PC	DC/JB			LL/PC	LL/PC	LL/PC	DC/JB	DC/LL	LL/PC	DC/JB	DC/JB	LL/PC	DC/JB	DC/JB
Date	9-8-06	9-6-06			8-21-06	8-18-06	8-21-06	8-21-06	8-21-06	8-20-06	9-6-06	9-7-06	9-7-06	9-6-06	9-6-06
GROUND COVER															
Bare Ground	18	50	34.00	100	14	23	37	25	6	8	5	45	8	3	10
Rock	0.3	0.3	0.30	100	0.3		1						0.3	0.3	
Litter	73	36	54.50	100	78	70	55	65	85	87	88	47	79	77	81
Lichens	3	8	5.50	100	3	3	2	3	2		0.3	4	6	5	4
Moss						0.3		1	0.3			0.3		0.3	
Water															
Basal Vegetation	6	6	6.00	100	5	4	5	6	7	5	7	4	7	15	5
VEGETATION STRUCTURE (nonstratified cover)															
Total Vegetation	87	49	68.00	100	75	80	72	56	69	78	63	49	87	63	63
Perennial Graminoids	80	48	64.00	100	70	59	60	55	60	70	57	43	73	58	53
Annual Graminoids		4	2.00	50		0.3									
Perennial Forbs	7	0.3	3.65	100	6	30	14	3	12	4	6	10	18	16	13
Annual/Biennial Forbs					4	7	2	0.3	1	8	0.3		1	1	
Shrubs	5		2.50	50		2	2			2		1	0.3	2	3
Trees															

TABLE B4

PERCENT CANOPY COVER BY CLASS/SPECIES FOR 2 PLOTS IN THE SHALLOW CLAYEY, 16 PLOTS IN THE SHALLOW LOAMY AND 2 PLOTS IN THE SHALLOW SANDY ECOLOGICAL SITES – VEGETATION STUDY AREA
STARK COUNTY, NORTH DAKOTA, 2006-2007

CLASS\SPECIES	SHALLOW CLAYEY				SHALLOW LOAMY										
	PLOT		Mean	Const-	PLOT NUMBER										
	SwCy-1	SwCy-2	Cover	ancy	SwLy-1	SwLy-2	SwLy-3	SwLy-4	SwLy-5	SwLy-6	SwLy-7	SwLy-8	SwLy-9	SwLy-10	SwLy-11
			n=2												
NATIVE PERENNIAL GRAMINOIDS (Cool Season)															
Agropyron dasystachyum		1	0.50	50		1		0.3				1	5	3	2
Agropyron smithii					14	8	5	4	3	12	7				
Agrostis scabra						0.3									
Calamagrostis montanensis							0.3	1				0.3	0.3		
Carex eleocharis		0.3	0.15	50		3	0.3	1	2		2	1			2
Carex filifolia	35	28	31.50	100	15		3	21	2		13	23	27	33	22
Carex heliophila						1			3		3	1		8	5
Koeleria pyramidata	5	3	4.00	100	11	6	10	6	9	1	2	4	4	3	2
Poa juncifolia										2					
Poa sandbergii	3		1.50	50	1	1	0.3	1	2				2		
Stipa comata	2	15	8.50	100	6	4	3	10	1		20	6	15	10	6
Stipa viridula							8		2	3	0.3	1			
TOTAL NPG(C)	45.0	47.3	46.15	100	47.0	24.3	29.9	44.3	24.0	18.0	47.3	37.0	53.3	57.3	39.0
NATIVE PERENNIAL GRAMINOIDS (Warm Season)															
Andropogon scoparius												5		0.3	
Bouteloua gracilis	13	4	8.50	100	32	15	8	26	10		1	1	23	2	4
Buchloe dactyloides					1	30	27	0.3	30	42					
Calamovilfa longifolia	25		12.50	50					0.3		6	1		4	15
Muhlenbergia cuspidata	0.3	1	0.65	100			1					3	0.3	0.3	
TOTAL NPG(W)	38.3	5.0	21.65	100	33.0	45.0	36.0	26.3	40.3	42.0	7.0	10.0	23.3	6.6	19.0
INTRODUCED PERENNIAL GRAMINOIDS															
Agropyron cristatum											5				0.3
Poa pratensis	9		4.50	50						18	4	0.3	3		
TOTAL IPG	9.0	0.0	4.50	50	0.0	0.0	0.0	0.0	0.0	18.0	9.0	0.3	3.0	0.0	0.3
NATIVE ANNUAL GRAMINOIDS															
Festuca octoflora						0.3									
TOTAL NAG	0.0	0.0	0.00	0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

TABLE B4

PERCENT CANOPY COVER BY CLASS/SPECIES FOR 2 PLOTS IN THE SHALLOW CLAYEY, 16 PLOTS IN THE SHALLOW LOAMY AND 2 PLOTS IN THE SHALLOW SANDY ECOLOGICAL SITES – VEGETATION STUDY AREA
STARK COUNTY, NORTH DAKOTA, 2006-2007

	SHALLOW CLAYEY				SHALLOW LOAMY											
	PLOT		Mean	Const-	PLOT NUMBER											
	SwCy-1	SwCy-2	Cover	ancy	SwLy-1	SwLy-2	SwLy-3	SwLy-4	SwLy-5	SwLy-6	SwLy-7	SwLy-8	SwLy-9	SwLy-10	SwLy-11	
			n=2													
NATIVE PERENNIAL FORBS																
Achillea millefolium	0.3		0.15	50		0.3	0.3		0.3	1		0.3				
Anemone patens												0.3		1	0.3	
Antennaria microphylla									2			5	9			
Antennaria neglecta									1							
Antennaria parvifolia	0.3		0.15	50			4		0.3						0.3	
Artemisia dracunculus														0.3	3	
Artemisia frigida	0.3	1	0.65	100	0.3	3	0.3	0.3	1	0.3	0.3	0.3	3	0.3	4	
Artemisia ludoviciana					0.3	2	3			0.3	2	0.3		3	2	
Aster commutatus		1	0.50	50		3	1		0.3	1		0.3	0.3			
Aster laevis												0.3				
Aster oblongifolius																
Aster pansus	0.3		0.15	50						1			1			
Astragalus crassicaulus																
Astragalus gilviflorus		0.3	0.15	50					0.3				1			
Astragalus lotiflorus	0.3		0.15	50				0.3	0.3							
Astragalus missouriensis	0.3		0.15	50					0.3							
Astragalus tenellus												0.3				
Calochortus nuttallii												0.3				
Castilleja sessiliflora													0.3			
Chrysopsis villosa														0.3	1	
Cirsium flodmanii					1					0.3		0.3				
Cirsium undulatum		0.3	0.15	50	0.3		0.3	0.3	0.3		0.3	0.3	0.3			
Comandra umbellata		0.3	0.15	50					0.3			0.3		0.3		
Dalea purpurea												0.3	0.3	0.3		
Echinacea angustifolia	1	0.3	0.65	100	0.3		1		0.3			0.3		0.3	0.3	
Erigeron ochroleucus	0.3		0.15	50												
Erigeron pumilus							0.3						0.3			
Eriogonum flavum		0.3	0.15	50												
Erysimum inconspicuum							0.3							0.3		
Gaillardia aristata												0.3				
Gaura coccinea							0.3						0.3			
Geum triflorum							0.3									
Glycyrrhiza lepidota												0.3				
Gutierrezia sarothrae	0.3		0.15	50	0.3		0.3					0.3				
Haplopappus spinulosus		0.3	0.15	50	0.3	3							0.3	0.3		

TABLE B4

PERCENT CANOPY COVER BY CLASS/SPECIES FOR 2 PLOTS IN THE SHALLOW CLAYEY, 16 PLOTS IN THE SHALLOW LOAMY AND 2 PLOTS IN THE SHALLOW SANDY ECOLOGICAL SITES – VEGETATION STUDY AREA
STARK COUNTY, NORTH DAKOTA, 2006-2007

	SHALLOW CLAYEY				SHALLOW LOAMY										
	PLOT		Mean	Const-	PLOT NUMBER										
	SwCy-1	SwCy-2	Cover	ancy	SwLy-1	SwLy-2	SwLy-3	SwLy-4	SwLy-5	SwLy-6	SwLy-7	SwLy-8	SwLy-9	SwLy-10	SwLy-11
			n=2												
Helianthus rigidus												0.3		0.3	
Hymenoxys acaulis												0.3	0.3		
Lactuca oblongifolia							0.3				1				
Lesquerella ludoviciana															
Liatris punctata	0.3	0.3	0.30	100	0.3							0.3	0.3	0.3	0.3
Linum perenne												0.3			
Lithospermum incisum												0.3		0.3	
Lygodesmia juncea		0.3	0.15	50	0.3			0.3	0.3		0.3		0.3	0.3	0.3
Mirabilis linearis															
Opuntia fragilis															
Opuntia polyacantha	0.3	0.3	0.30	100		1	0.3				1			0.3	1
Oxytropis lambertii		0.3	0.15	50							0.3				
Oxytropis sericea							0.3					0.3			
Penstemon albidus					0.3	0.3	0.3	0.3							
Penstemon angustifolius															
Penstemon eriantherus															
Penstemon gracilis															0.3
Phlox hoodii	0.3	0.3	0.30	100		1	0.3	0.3	0.3			0.3	1	0.3	
Polygala alba						0.3							0.3		
Potentilla pensylvanica					0.3				0.3						
Psoralea argophylla		0.3	0.15	50	1	0.3	0.3	0.3	0.3		1	0.3		1	0.3
Psoralea esculenta	0.3		0.15	50	0.3										
Ratibida columnifera					0.3	1	0.3	0.3	1				0.3		
Senecio canus	0.3		0.15	50								0.3			
Sisyrinchium montanum															
Solidago missouriensis	3		1.50	50		2		1					0.3		1
Solidago mollis							2					0.3	0.3		
Solidago nemoralis												0.3	0.3		
Solidago ptarmicoides												0.3			
Solidago rigida									0.3		1	2			
Sphaeralcea coccinea		0.3	0.15	50	0.3	1			0.3		0.3		0.3		
Thermopsis rhombifolia												1		3	0.3
Vicia americana													0.3		
TOTAL NPF	7.9	5.9	6.90	100	5.9	18.2	15.2	3.7	9.5	3.9	7.5	16.1	20.4	12.2	14.4

TABLE B4

PERCENT CANOPY COVER BY CLASS/SPECIES FOR 2 PLOTS IN THE SHALLOW CLAYEY, 16 PLOTS IN THE SHALLOW LOAMY AND 2 PLOTS IN THE SHALLOW SANDY ECOLOGICAL SITES – VEGETATION STUDY AREA
STARK COUNTY, NORTH DAKOTA, 2006-2007

	SHALLOW CLAYEY				SHALLOW LOAMY										
	PLOT		Mean	Const-	PLOT NUMBER										
	SwCy-1	SwCy-2	Cover	ancy	SwLy-1	SwLy-2	SwLy-3	SwLy-4	SwLy-5	SwLy-6	SwLy-7	SwLy-8	SwLy-9	SwLy-10	SwLy-11
n=2															
INTRODUCED PERENNIAL FORBS															
Convolvulus arvensis										0.3					
Medicago sativa	1		0.50	50						0.3			0.3		
Taraxacum officinale	0.3		0.15	50			0.3			0.3			2		
TOTAL IPF	1.3	0.0	0.65	50	0.0	0.0	0.3	0.0	0.0	0.9	0.0	0.0	2.3	0.0	0.0
FERNS AND ALLIES															
Selaginella densa						20			1				4	7	0.3
TOTAL F&A	0.0	0.0	0.00	0	0.0	20.0	0.0	0.0	1.0	0.0	0.0	0.0	4.0	7.0	0.3
NATIVE ANNUAL/BIENNIAL FORBS															
Androsace septentrionalis														0.3	
Arabis holboellii					0.3				0.3		0.3			0.3	
Collomia linearis															
Draba reptans															
Erysimum asperum														0.3	
Grindelia squarrosa		0.3	0.15	50	3	4	1		1	3			1		
Hedeoma hispidum							0.3								
Lepidium densiflorum															
Linum rigidum		0.3	0.15	50	0.3	0.3		0.3					0.3		
Lotus purshianus						0.3									
Orthocarpus luteus						0.3	0.3		0.3						
Plantago patagonica					0.3	3	0.3		0.3						
Polygonum douglasii															
TOTAL NAF	0.0	0.6	0.30	50	3.9	7.9	1.9	0.3	1.9	3.0	0.3	0.0	1.3	0.9	0.0
INTRODUCED ANNUAL/BIENNIAL FORBS															
Descurainia sophia										0.3					
Medicago lupulina										5					
Melilotus officinalis												0.3			
Tragopogon dubius		0.3	0.15	50	0.3	0.3					0.3			0.3	
TOTAL IAF	0.0	0.3	0.15	50	0.3	0.3	0.0	0.0	0.0	5.3	0.3	0.0	0.3	0.3	0.0

TABLE B4

**PERCENT CANOPY COVER BY CLASS/SPECIES FOR 2 PLOTS IN THE SHALLOW CLAYEY, 16 PLOTS IN THE SHALLOW LOAMY AND 2 PLOTS IN THE SHALLOW SANDY ECOLOGICAL SITES – VEGETATION STUDY AREA
STARK COUNTY, NORTH DAKOTA, 2006-2007**

	SHALLOW CLAYEY				SHALLOW LOAMY										
	PLOT		Mean	Const-	PLOT NUMBER										
	SwCy-1	SwCy-2	Cover	ancy	SwLy-1	SwLy-2	SwLy-3	SwLy-4	SwLy-5	SwLy-6	SwLy-7	SwLy-8	SwLy-9	SwLy-10	SwLy-11
n=2															
NATIVE SHRUBS															
Artemisia cana						2					2				
Calylophus serrulatus												0.3			
Prunus pumila														1	
Rosa arkansana												0.3		1	3
Rosa woodsii	5		2.50	50			2						0.3		
Symphoricarpos occidentalis												1			
TOTAL NATIVE SHRUBS	5.0	0.0	2.50	50	0.0	2.0	2.0	0.0	0.0	2.0	0.0	1.6	0.3	2.0	3.0
TOTAL VEGETATION (Stratified)															
	106.5	59.1	82.80	100	90.1	118.0	85.3	74.6	76.7	93.1	71.4	65.0	108.2	86.3	76.0

Footnotes given on index page B-ii.

TABLE B4

**PERCENT CANOPY COVER BY CLASS/SPECIES FOR 2 PLOTS IN THE SHALLOW CLAYEY, 16 PLOTS IN THE SHALLOW LOAMY AND 2 PLOTS IN THE SHALLOW SANDY ECOLOGICAL SITES – VEGETATION STUDY AREA
STARK COUNTY, NORTH DAKOTA, 2006-2007**

	SHALLOW LOAMY						SHALLOW SANDY				
	PLOT NUMBER					Mean	Const-	PLOT		Mean	Const-
	SwLy-12	SwLy-13	SwLy-14	SwLy-15	SwLy-16	Cover	ancy	SwSy-1	SwSy-2	Cover	ancy
						n=16				n=2	
SITE PARAMETERS											
Slope (percent)	16	10	23	22	11			18	10		
Aspect (degrees)	238	230	037	259	184			189	172		
Topography	Mid	Mid	Upper	Upper				Mid	Ridge		
Configuration	X	V	Und	X	Und			X	S		
Soil	CB-DE	CB-DE	CB-DE	CB-DE	CB-DE			FR-DE	FR-DE		
Ecological Site	SwLy	SwLy	SwLy	SwLy	SwLy			SwSy	SwSy		
Investigator	DC/JB	DC/JB	DC/JB	LL/PC	JB/CB			LL/PC	DC/JB		
Date	8-18-06	8-18-06	9-7-06	9-9-06	8-22-06			9-6-06	8-21-06		
GROUND COVER											
Bare Ground	20	2	15	29	15	16.56	100	12	35	23.50	100
Rock	0.3			6		0.51	38	0.3	0.3	0.30	100
Litter	70	89	75	51	78	73.44	100	81	57	69.00	100
Lichens	5	3	2	8	1	3.21	94	1	3	2.00	100
Moss	0.3	1	0.3		0.3	0.26	56		0.3	0.15	50
Water											
Basal Vegetation	5	5	8	6	6	6.25	100	6	4	5.00	100
VEGETATION STRUCTURE (nonstratified cover)											
Total Vegetation	50	69	59	71	62	66.63	100	68	49	58.50	100
Perennial Graminoids	48	55	47	63	59	58.13	100	64	48	56.00	100
Annual Graminoids	0.3	3				0.23	19				
Perennial Forbs	7	15	15	10	4	11.44	100	7	4	5.50	100
Annual/Biennial Forbs	1	4	0.3	0.3	1	1.95	88	0.3	0.3	0.30	100
Shrubs		2	1	0.3	0.3	0.99	69	1		0.50	50
Trees											

TABLE B4

PERCENT CANOPY COVER BY CLASS/SPECIES FOR 2 PLOTS IN THE SHALLOW CLAYEY, 16 PLOTS IN THE SHALLOW LOAMY AND 2 PLOTS IN THE SHALLOW SANDY ECOLOGICAL SITES – VEGETATION STUDY AREA
STARK COUNTY, NORTH DAKOTA, 2006-2007

CLASS\SPECIES	SHALLOW LOAMY							SHALLOW SANDY			
	PLOT NUMBER					Mean	Const-	PLOT		Mean	Const-
	SwLy-12	SwLy-13	SwLy-14	SwLy-15	SwLy-16	Cover	ancy	SwSy-1	SwSy-2	Cover	ancy
						n=16				n=2	
NATIVE PERENNIAL GRAMINOIDS (Cool Season)											
Agropyron dasystachyum			3	4	4	1.46	56	2		1.00	50
Agropyron smithii	12	18		0.3		5.21	63		3	1.50	50
Agrostis scabra						0.02	6				
Calamagrostis montanensis				0.3	0.3	0.16	38	0.3	0.3	0.30	100
Carex eleocharis		1				0.77	50	10	2	6.00	100
Carex filifolia	4	2	23	42	14	15.25	88	10	4	7.00	100
Carex heliophila						1.31	38		1	0.50	50
Koeleria pyramidata	5	2	5	3	9	5.13	100	7	2	4.50	100
Poa juncifolia						0.13	6				
Poa sandbergii						0.46	38	2		1.00	50
Stipa comata	2	3	7	11	2	6.63	94	2	23	12.50	100
Stipa viridula			2			1.02	38				
TOTAL NPG(C)	23.0	26.0	40.0	60.6	29.3	37.52	100	33.3	35.3	34.30	100
NATIVE PERENNIAL GRAMINOIDS (Warm Season)											
Andropogon scoparius			3		15	1.46	25	13		6.50	50
Bouteloua gracilis	25	30	0.3	4	13	12.14	94	14	12	13.00	100
Buchloe dactyloides			0.3			8.16	44				
Calamovilfa longifolia			0.3	3	10	2.48	50	16	6	11.00	100
Muhlenbergia cuspidata	4	0.3	6	0.3	2	1.08	56	1		0.50	50
TOTAL NPG(W)	29.0	30.3	9.9	7.3	40.0	25.31	100	44.0	18.0	31.00	100
INTRODUCED PERENNIAL GRAMINOIDS											
Agropyron cristatum			0.3	0.3		0.37	25		0.3	0.15	50
Poa pratensis		5	0.3			1.91	38				
TOTAL IPG	0.0	5.0	0.6	0.3	0.0	2.28	50	0.0	0.3	0.15	50
NATIVE ANNUAL GRAMINOIDS											
Festuca octiflora	0.3	3				0.23	19				
TOTAL NAG	0.3	3.0	0.0	0.0	0.0	0.23	19	0.0	0.0	0.00	0

TABLE B4

**PERCENT CANOPY COVER BY CLASS/SPECIES FOR 2 PLOTS IN THE SHALLOW CLAYEY, 16 PLOTS IN THE SHALLOW LOAMY AND 2 PLOTS IN THE SHALLOW SANDY ECOLOGICAL SITES – VEGETATION STUDY AREA
STARK COUNTY, NORTH DAKOTA, 2006-2007**

	SHALLOW LOAMY						SHALLOW SANDY				
	PLOT NUMBER					Mean	Const-	PLOT		Mean	Const-
	SwLy-12	SwLy-13	SwLy-14	SwLy-15	SwLy-16	Cover	ancy	SwSy-1	SwSy-2	Cover	ancy
						n=16				n=2	
NATIVE PERENNIAL FORBS											
Achillea millefolium	0.3	0.3				0.18	44				
Anemone patens			0.3			0.12	25				
Antennaria microphylla			11			1.69	25				
Antennaria neglecta			0.3			0.08	13				
Antennaria parvifolia		0.3				0.31	25	1		0.50	50
Artemisia dracunculus	1	3				0.46	25	0.3		0.15	50
Artemisia frigida	1	3	0.3	1		1.15	94	0.3	0.3	0.30	100
Artemisia ludoviciana		1		0.3		0.89	63	1		0.50	50
Aster commutatus	0.3		0.3	0.3	0.3	0.44	63	0.3		0.15	50
Aster laevis						0.02	6				
Aster oblongifolius				0.3		0.02	6				
Aster pansus				0.3		0.14	19	0.3		0.15	50
Astragalus crassicaulus		0.3				0.02	6				
Astragalus gilviflorus	0.3		0.3	2	0.3	0.26	38				
Astragalus lotiflorus						0.04	13		0.3	0.15	50
Astragalus missouriensis	0.3					0.04	13	0.3		0.15	50
Astragalus tenellus			0.3			0.04	13				
Calochortus nuttallii						0.02	6				
Castilleja sessiliflora				0.3		0.04	13				
Chrysopsis villosa						0.08	13	0.3		0.15	50
Cirsium flodmanii						0.10	19				
Cirsium undulatum			0.3	1		0.21	56	0.3		0.15	50
Comandra umbellata			0.3	0.3	0.3	0.11	38				
Dalea purpurea			0.3	0.3	0.3	0.11	38		0.3	0.15	50
Echinacea angustifolia	0.3	0.3		0.3	0.3	0.23	63	1		0.50	50
Erigeron ochroleucus											
Erigeron pumilus	0.3	0.3		0.3		0.09	31				
Eriogonum flavum											
Erysimum inconspicuum		0.3				0.06	19	0.3	0.3	0.30	100
Gaillardia aristata						0.02	6				
Gaura coccinea			0.3	0.3		0.08	25	0.3		0.15	50
Geum triflorum						0.02	6				
Glycyrrhiza lepidota						0.02	6				
Gutierrezia sarothrae	1	0.3	0.3	0.3	0.3	0.19	50				
Haplopappus spinulosus	0.3			0.3		0.28	38	0.3		0.15	50

TABLE B4

PERCENT CANOPY COVER BY CLASS/SPECIES FOR 2 PLOTS IN THE SHALLOW CLAYEY, 16 PLOTS IN THE SHALLOW LOAMY AND 2 PLOTS IN THE SHALLOW SANDY ECOLOGICAL SITES – VEGETATION STUDY AREA
STARK COUNTY, NORTH DAKOTA, 2006-2007

	SHALLOW LOAMY							SHALLOW SANDY			
	PLOT NUMBER					Mean	Const-	PLOT		Mean	Const-
	SwLy-12	SwLy-13	SwLy-14	SwLy-15	SwLy-16	Cover	ancy	SwSy-1	SwSy-2	Cover	ancy
						n=16				n=2	
Helianthus rigidus					0.3	0.06	19				
Hymenoxys acaulis			0.3			0.06	19				
Lactuca oblongifolia						0.08	13		0.3	0.15	50
Lesquerella ludoviciana					0.3	0.02	6	0.3		0.15	50
Liatriis punctata	0.3		0.3	1	1	0.26	56	0.3		0.15	50
Linum perenne						0.02	6				
Lithospermum incisum						0.04	13		0.3	0.15	50
Lygodesmia juncea	0.3		0.3	0.3	0.3	0.21	69		0.3	0.15	50
Mirabilis linearis									0.3	0.15	50
Opuntia fragilis	0.3	0.3				0.04	13		1	0.50	50
Opuntia polyacantha	0.3	3		1		0.49	50	0.3	2	1.15	100
Oxytropis lambertii		0.3				0.04	13				
Oxytropis sericea			1			0.10	19	0.3	0.3	0.30	100
Penstemon albidus						0.08	25				
Penstemon angustifolius								0.3		0.15	50
Penstemon eriantherus									0.3	0.15	50
Penstemon gracilis						0.02	6				
Phlox hoodii	0.3	0.3	0.3	1	0.3	0.36	75	0.3		0.15	50
Polygala alba			0.3	0.3	0.3	0.09	31				
Potentilla pensylvanica		0.3				0.06	19				
Psoralea argophylla	0.3	0.3		0.3		0.36	75		0.3	0.15	50
Psoralea esculenta				0.3		0.04	13				
Ratibida columnifera	0.3	1				0.28	50				
Senecio canus			0.3			0.04	13				
Sisyrinchium montanum		0.3				0.02	6				
Solidago missouriensis						0.27	25	0.3		0.15	50
Solidago mollis	1					0.23	25				
Solidago nemoralis			1			0.10	19				
Solidago ptarmicoides						0.02	6				
Solidago rigida						0.21	19				
Sphaeralcea coccinea	0.3	2				0.28	44				
Thermopsis rhombifolia				2		0.39	25				
Vicia americana						0.02	6				
TOTAL NPF	8.5	16.9	18.1	13.8	4.3	11.79	100	8.1	6.3	7.20	100

TABLE B4

PERCENT CANOPY COVER BY CLASS/SPECIES FOR 2 PLOTS IN THE SHALLOW CLAYEY, 16 PLOTS IN THE SHALLOW LOAMY AND 2 PLOTS IN THE SHALLOW SANDY ECOLOGICAL SITES – VEGETATION STUDY AREA
STARK COUNTY, NORTH DAKOTA, 2006-2007

	SHALLOW LOAMY							SHALLOW SANDY			
	PLOT NUMBER					Mean	Const-	PLOT		Mean	Const-
	SwLy-12	SwLy-13	SwLy-14	SwLy-15	SwLy-16	Cover	ancy	SwSy-1	SwSy-2	Cover	ancy
						n=16				n=2	
INTRODUCED PERENNIAL FORBS											
Convolvulus arvensis						0.02	6				
Medicago sativa						0.04	13				
Taraxacum officinale					0.3	0.18	25				
TOTAL IPF	0.0	0.0	0.0	0.0	0.3	0.24	25	0.0	0.0	0.00	0
FERNS AND ALLIES											
Selaginella densa			0.3			2.04	38				
TOTAL F&A	0.0	0.0	0.3	0.0	0.0	2.04	38	0.0	0.0	0.00	0
NATIVE ANNUAL/BIENNIAL FORBS											
Androsace septentrionalis						0.02	6				
Arabis holboellii		0.3	0.3		0.3	0.13	44		0.3	0.15	50
Collomia linearis		0.3				0.02	6				
Draba reptans	0.3					0.02	6				
Erysimum asperum		0.3				0.04	13				
Grindelia squarrosa	0.3	0.3			0.3	0.87	56				
Hedeoma hispidum	0.3					0.04	13				
Lepidium densiflorum		0.3				0.02	6		0.3	0.15	50
Linum rigidum	0.3	0.3	0.3		0.3	0.15	50		0.3	0.15	50
Lotus purshianus		0.3				0.04	13				
Orthocarpus luteus		0.3				0.08	25				
Plantago patagonica	1	2				0.43	38				
Polygonum douglasii								0.3		0.15	50
TOTAL NAF	2.2	4.4	0.6	0.0	0.9	1.84	81	0.3	0.9	0.60	100
INTRODUCED ANNUAL/BIENNIAL FORBS											
Descurainia sophia		0.3				0.04	13				
Medicago lupulina						0.31	6				
Melilotus officinalis				0.3	1	0.10	19				
Tragopogon dubius		0.3		0.3		0.11	38	0.3		0.15	50
TOTAL IAF	0.0	0.6	0.0	0.6	1.0	0.56	56	0.3	0.0	0.15	50

TABLE B4

**PERCENT CANOPY COVER BY CLASS/SPECIES FOR 2 PLOTS IN THE SHALLOW CLAYEY, 16 PLOTS IN THE SHALLOW LOAMY AND 2 PLOTS IN THE SHALLOW SANDY ECOLOGICAL SITES – VEGETATION STUDY AREA
STARK COUNTY, NORTH DAKOTA, 2006-2007**

	SHALLOW LOAMY							SHALLOW SANDY			
	PLOT NUMBER					Mean	Const-	PLOT		Mean	Const-
	SwLy-12	SwLy-13	SwLy-14	SwLy-15	SwLy-16	Cover	ancy	SwSy-1	SwSy-2	Cover	ancy
						n=16				n=2	
NATIVE SHRUBS											
Artemisia cana		2		0.3		0.39	25				
Calylophus serrulatus						0.02	6				
Prunus pumila						0.06	6				
Rosa arkansana			1		0.3	0.35	31				
Rosa woodsii						0.14	13	1		0.50	50
Symphoricarpos occidentalis						0.06	6				
TOTAL NATIVE SHRUBS	0.0	2.0	1.0	0.3	0.3	1.03	69	1.0	0.0	0.50	50
TOTAL VEGETATION (Stratified)	63.0	88.2	70.5	82.9	76.1	82.84	100	87.0	60.8	73.90	100

Footnotes given on index page B-ii.

TABLE B5

PERCENT CANOPY COVER BY CLASS AND SPECIES FOR 1 PLOT IN THE CLAYPAN AND
16 PLOTS IN THE THIN CLAYPAN ECOLOGICAL SITES – VEGETATION STUDY AREA
STARK COUNTY, NORTH DAKOTA, 2006-2007

	CLAY-PAN	THIN CLAYPAN																Mean Cover	Const- ancy		
	PLOT	PLOT NUMBER																			
	Cp-1	TCp-1	TCp-2	TCp-3	TCp-4	TCp-5	TCp-6	TCp-7	TCp-8	TCp-9	TCp-10	TCp-11	TCp-12	TCp-13	TCp-14	TCp-15	TCp-16				
	n=1																			n=16	
SITE PARAMETERS*																					
Slope (percent)	4	7	3	3	8	5	8	2	1	3-4	4	3	4	6	7	15	6				
Aspect (degrees)	330-050	085	007	210	081	329	310	188	270	012	298	147	193	157	197	180	143				
Topography	Bot	Lower	Mid	Mid	Upper	Mid	Upper	Lower	Lower	Terrace	Toe	Mid	Mid	Lower	Mid	Lower	Mid				
Configuration	V	Und	S	Und	Und	Und	X	Und	S	S	Und	S	Und	V	X	V	S				
Soil	DM-AB	DH-A	DH-B	DH-B	DH-B	DH-B	DH-B	RS-A	RS-A	RS-A	RS-A	RS-B	RS-B	RS-B	RS-B	RS-B	RS-B				
Ecological Site	Cp	TCp	TCp	TCp	TCp	TCp	TCp	TCp	TCp	TCp	TCp	TCp	TCp	TCp	TCp	TCp	TCp				
Investigator	LL/PC	LL/PC	LL/PC	JB/CB	LL/PC	KS/DC	KS/ED	LL/PC	DC/JB	KS/ED	LL/MT	LL/PC	LL/PC	DC/JB	LL/PC	JB	LL/PC				
Date	9-7-06	8-18-06	8-23-06	9-5-06	8-22-06	6-12-07	6-12-07	9-6-06	9-8-06	6-13-07	6-12-07	8-23-06	8-23-06	8-21-06	8-20-06	9-5-06	8-22-06				
GROUND COVER																					
Bare Ground	25	8	78	67	46	15	16	35	82	12	20	35	37	8	10	28	22	32.44	100		
Rock		0.3	0.3	0.3	2			0.3	0.3			0.3	0.3				0.3	0.28	56		
Litter	70	60	19	30	45	71	69	58	15	79	74	60	56	86	86	68	68	59.00	100		
Lichens		18	1		3	8	9	0.3	0.3	2	2	1	2	0.3	0.3	1	4	3.26	94		
Moss		8					0.3	0.3		0.3	0.3					0.3		0.59	38		
Water																					
Basal Vegetation	5	6	2	3	4	6	6	6	3	7	4	4	5	6	4	3	6	4.69	100		
VEGETATION STRUCTURE (nonstratified cover)																					
Total Vegetation	58	72	24	31	47	80	84	83	38	88	84	50	74	59	78	38	68	62.38	100		
Perennial Graminoids	58	66	18	29	43	55	68	70	32	70	60	41	56	55	77	31	64	52.19	100		
Annual Graminoids						0.3					3							0.21	13		
Perennial Forbs	0.3	3	4	5	7	36	38	14	1	32	23	7	16	6	1	5	4	12.63	100		
Annual/Biennial Forbs	0.3	1	3	0.3	0.3	14	8	7	1	30	11	3	4	4	0.3	4	2	5.81	100		
Shrubs		6			0.3	5	8	0.3	7	13	11	0.3						3.18	56		
Trees																					

TABLE B5

PERCENT CANOPY COVER BY CLASS AND SPECIES FOR 1 PLOT IN THE CLAYPAN AND
16 PLOTS IN THE THIN CLAYPAN ECOLOGICAL SITES – VEGETATION STUDY AREA
STARK COUNTY, NORTH DAKOTA, 2006-2007

CLASS\SPECIES	CLAY-PAN	THIN CLAYPAN																Mean Cover	Const- ancy		
	PLOT	PLOT NUMBER																			
	Cp-1	TCp-1	TCp-2	TCp-3	TCp-4	TCp-5	TCp-6	TCp-7	TCp-8	TCp-9	TCp-10	TCp-11	TCp-12	TCp-13	TCp-14	TCp-15	TCp-16				
	n=1																			n=16	
NATIVE PERENNIAL GRAMINOIDS (Cool Season)																					
Agropyron dasystachyum		1				17	3				1								1.38	25	
Agropyron smithii		6			2	14	15	13	7	16	20	14	14	5	32	1	9		10.50	88	
Agropyron trachycaulum			5																0.31	6	
Calamagrostis montanensis					2			0.3				0.3	0.3	0.3					0.20	31	
Carex eleocharis		0.3		0.3	1	1	1			2		3	4	7			3		1.41	63	
Carex filifolia					3	0.3													0.21	13	
Carex heliophila													1	10					0.69	13	
Eleocharis xyridiformis	0.3																				
Hordeum jubatum	20		3																0.19	6	
Koeleria pyramidata		5	0.3		5	1	5	6		1		1	4	8		1	3		2.52	75	
Poa glaucifolia	13																				
Poa juncifolia			1					0.3	25	8									2.14	25	
Poa sandbergii		0.3	0.3		0.3	16	18			24	18	1	1	4	1	3	2		5.56	81	
Puccinellia nuttalliana	13		4																0.25	6	
Scirpus maritimus	0.3																				
Stipa comata													2	6					0.50	13	
Stipa viridula				0.3	2	0.3		12	0.3			6	3	6					1.87	50	
TOTAL NPG(C)	46.6	12.6	13.6	0.6	15.3	49.6	42.0	31.6	32.3	51.0	39.0	25.3	26.3	33.3	49.0	5.0	17.0		27.72	100	
NATIVE PERENNIAL GRAMINOIDS (Warm Season)																					
Bouteloua gracilis		5		0.3	1	5	8	8		1	1	11	15	35	40	2			8.27	81	
Buchloe dactyloides		54		3	26	4	28	28	1	16		4	17	1		12	55		15.56	81	
Distichlis spicata	15		2	15												10			1.69	19	
Muhlenbergia cuspidata					4														0.25	6	
Schedonnardus paniculatus				0.3															0.02	6	
TOTAL NPG(W)	15.0	59.0	2.0	18.6	31.0	9.0	36.0	36.0	1.0	17.0	1.0	15.0	32.0	36.0	40.0	24.0	55.0		25.79	100	

TABLE B5

PERCENT CANOPY COVER BY CLASS AND SPECIES FOR 1 PLOT IN THE CLAYPAN AND
16 PLOTS IN THE THIN CLAYPAN ECOLOGICAL SITES – VEGETATION STUDY AREA
STARK COUNTY, NORTH DAKOTA, 2006-2007

	CLAY-PAN	THIN CLAYPAN																Mean Cover	Const- ancy		
	PLOT	PLOT NUMBER																			
	Cp-1	TCp-1	TCp-2	TCp-3	TCp-4	TCp-5	TCp-6	TCp-7	TCp-8	TCp-9	TCp-10	TCp-11	TCp-12	TCp-13	TCp-14	TCp-15	TCp-16				
	n=1																			n=16	
INTRODUCED PERENNIAL GRAMINOIDS																					
Agropyron cristatum	0.3		2	10								0.3				2		0.89	25		
Bromus inermis				2	1			0.3				1	1			1		0.39	38		
Poa pratensis		0.3	0.3			6	8	10	1	30	28	3	2					5.54	63		
TOTAL IPG	0.3	0.3	2.3	12.0	1.0	6.0	8.0	10.3	1.0	30.0	28.0	4.3	3.0	0.0	0.0	3.0	0.0	6.83	81		
NATIVE ANNUAL GRAMINOIDS																					
Festuca octoflora						0.3												0.02	6		
TOTAL NAG	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.02	6		
INTRODUCED ANNUAL GRAMINOIDS																					
Bromus japonicus											3							0.19	6		
TOTAL IAG	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0	0.19	6		
NATIVE PERENNIAL FORBS																					
Achillea millefolium	0.3	0.3			1	4	16	1		18	4	1	2	0.3		0.3	0.3	3.01	75		
Allium textile							2			1	0.3							0.21	19		
Antennaria microphylla							0.3											0.02	6		
Antennaria neglecta						0.3				0.3				0.3				0.06	19		
Antennaria parvifolia		0.3											0.3	0.3				0.06	19		
Artemisia frigida		0.3	1	1	1	0.3	0.3	0.3	0.3	0.3	0.3	0.3	2	0.3	0.3	0.3	0.3	0.54	100		
Artemisia ludoviciana				0.3				1								0.3		0.10	19		
Aster commutatus				0.3	1	2	1			0.3	0.3	1	3	0.3		2		0.70	63		
Aster pansus								2				0.3	0.3					0.16	19		
Astragalus agrestis						1	1			1	0.3		0.3					0.23	31		
Astragalus crassicaarpus														0.3				0.02	6		
Astragalus gilviflorus					0.3													0.02	6		
Astragalus gracilis						0.3												0.02	6		
Astragalus lotiflorus						0.3												0.02	6		
Astragalus missouriensis				0.3								0.3						0.04	13		

TABLE B5

PERCENT CANOPY COVER BY CLASS AND SPECIES FOR 1 PLOT IN THE CLAYPAN AND
16 PLOTS IN THE THIN CLAYPAN ECOLOGICAL SITES – VEGETATION STUDY AREA
STARK COUNTY, NORTH DAKOTA, 2006-2007

	CLAY-PAN	THIN CLAYPAN																	Mean Cover	Const- ancy
	PLOT	PLOT NUMBER																		
	Cp-1	TCp-1	TCp-2	TCp-3	TCp-4	TCp-5	TCp-6	TCp-7	TCp-8	TCp-9	TCp-10	TCp-11	TCp-12	TCp-13	TCp-14	TCp-15	TCp-16			
	n=1																	n=16		
Cerastium arvense						0.3	0.3												0.04	13
Cirsium flodmanii								1											0.06	6
Cirsium undulatum													0.3	0.3			0.3		0.06	19
Comandra umbellata					0.3														0.02	6
Dalea purpurea					0.3														0.02	6
Echinacea angustifolia					0.3														0.02	6
Eriogonum pauciflorum			2																0.13	6
Erysimum inconspicuum									0.3										0.02	6
Gaura coccinea		0.3							0.3				0.3						0.06	19
Gutierrezia sarothrae		1	0.3	3	0.3	0.3	0.3				0.3	1	2	0.3		2	0.3	0.69	75	
Hymenoxys richardsonii					0.3	0.3												0.04	13	
Liatis punctata															0.3			0.02	6	
Lithospermum incisum					0.3													0.02	6	
Lomatium foeniculaceum						2	3			2	2							0.56	25	
Lygodesmia juncea														0.3	0.3			0.04	13	
Mertensia lanceolata					0.3													0.02	6	
Musineon divaricatum					0.3	0.3			0.3	0.3								0.08	25	
Opuntia fragilis											0.3	0.3	0.3				0.3	0.08	25	
Opuntia polyacantha		0.3	0.3		0.3	4	0.3		1		1	1	2			0.3	0.3	0.68	69	
Oxytropis sericea					0.3													0.02	6	
Penstemon albidus					0.3													0.02	6	
Penstemon gracilis							0.3											0.02	6	
Phlox hoodii					1	1	1	1		0.3								0.27	31	
Potentilla pensylvanica					0.3	0.3												0.04	13	
Psoralea argophylla					0.3	3	0.3					0.3	1	2	0.3	0.3		0.47	50	
Psoralea esculenta					0.3													0.02	6	
Ratibida columnifera				0.3	0.3	0.3	0.3	2		0.3		0.3	0.3	1				0.32	56	
Solidago missouriensis								0.3		2								0.14	13	
Solidago mollis								0.3										0.02	6	
Sphaeralcea coccinea		0.3			0.3	0.3	0.3	1		0.3		0.3	1	1			0.3	0.32	63	
Vicia americana		0.3				2	14			4	8							1.77	31	
Viola nuttallii										0.3								0.02	6	
TOTAL NPF	0.3	3.1	3.6	5.2	7.9	22.9	41.3	9.9	1.6	30.7	16.8	7.1	15.4	7.0	1.2	5.8	1.8	11.33	100	

TABLE B5

PERCENT CANOPY COVER BY CLASS AND SPECIES FOR 1 PLOT IN THE CLAYPAN AND
16 PLOTS IN THE THIN CLAYPAN ECOLOGICAL SITES – VEGETATION STUDY AREA
STARK COUNTY, NORTH DAKOTA, 2006-2007

	CLAY-PAN	THIN CLAYPAN																Mean Cover	Const- ancy		
	PLOT	PLOT NUMBER																			
	Cp-1	TCp-1	TCp-2	TCp-3	TCp-4	TCp-5	TCp-6	TCp-7	TCp-8	TCp-9	TCp-10	TCp-11	TCp-12	TCp-13	TCp-14	TCp-15	TCp-16				
	n=1																			n=16	
INTRODUCED PERENNIAL FORBS																					
Convolvulus arvensis												0.3							0.02	6	
Medicago sativa				0.3				0.3		0.3		0.3	0.3			0.3			0.11	38	
Taraxacum officinale			1		0.3	8	5	5		6	8				0.3				2.16	56	
TOTAL IPF	0.0	0.0	1.0	0.3	0.3	8.0	5.0	5.3	0.0	6.3	8.0	0.6	1.3	0.0	0.3	0.3	0.0	2.29	75		
FERNS AND ALLIES																					
Selaginella densa						14													0.88	6	
TOTAL F&A	0.0	0.0	0.0	0.0	0.0	14.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.88	6	
NATIVE ANNUAL/BIENNIAL FORBS																					
Androsace septentrionalis						1	0.3			0.3	0.3								0.12	25	
Arabis divaricarpa						0.3	0.3			0.3									0.06	19	
Arabis holboellii														0.3					0.02	6	
Collomia linearis										0.3	0.3								0.04	13	
Descurainia pinnata							0.3												0.02	6	
Descurainia richardsonii										2	1								0.19	13	
Draba reptans						0.3	0.3			0.3	1								0.12	25	
Ellisia nyctelea										0.3									0.02	6	
Erysimum asperum										0.3				0.3	0.3				0.06	19	
Euphorbia spathulata										2									0.13	6	
Grindelia squarrosa		1	0.3	0.3	0.3	0.3	0.3	7	1	0.3		1	4	4		4	2		1.61	88	
Hedeoma hispidum						1	0.3			0.3									0.10	19	
Lappula redowskii											0.3								0.02	6	
Lepidium densiflorum						0.3	0.3			2	1								0.23	25	
Linum rigidum						0.3	0.3	0.3				0.3							0.08	25	
Lotus purshianus										0.3				0.3					0.04	13	
Plantago elongata						3				1	0.3								0.27	19	
Plantago patagonica						5	0.3			0.3	0.3			0.3			0.3		0.41	38	
Polygonum arenastrum	0.3		0.3							0.3									0.04	13	
Suaeda depressa	0.3																				
Veronica peregrina										1									0.06	6	
TOTAL NAF	0.6	1.0	0.6	0.3	0.3	11.5	2.7	7.6	1.0	11.0	4.5	1.3	4.3	5.2	0.0	4.0	2.3	3.60	94		

TABLE B5

PERCENT CANOPY COVER BY CLASS AND SPECIES FOR 1 PLOT IN THE CLAYPAN AND
16 PLOTS IN THE THIN CLAYPAN ECOLOGICAL SITES – VEGETATION STUDY AREA
STARK COUNTY, NORTH DAKOTA, 2006-2007

	CLAY-PAN	THIN CLAYPAN																Mean Cover	Const- ancy	
	PLOT	PLOT NUMBER																		
	Cp-1	TCp-1	TCp-2	TCp-3	TCp-4	TCp-5	TCp-6	TCp-7	TCp-8	TCp-9	TCp-10	TCp-11	TCp-12	TCp-13	TCp-14	TCp-15	TCp-16			
	n=1																			n=16
INTRODUCED ANNUAL/BIENNIAL FORBS																				
Descurainia sophia										2	1							0.19	13	
Draba nemorosa						2	1			2	0.3							0.33	25	
Kochia scoparia	0.3		3	0.3														0.21	13	
Lactuca serriola										0.3								0.02	6	
Medicago lupulina		0.3				1	5			2								0.52	25	
Melilotus officinalis						1			0.3		0.3	2			0.3			0.24	31	
Thlaspi arvense						0.3	0.3			18	5							1.48	25	
Tragopogon dubius						0.3	0.3			0.3								0.06	19	
TOTAL IAF	0.3	0.3	3.0	0.3	0.0	4.6	6.6	0.0	0.3	24.6	6.6	2.0	0.0	0.0	0.3	0.0	0.0	3.04	63	
NATIVE SHRUBS																				
Artemisia cana		2				3	8		7	13	11							2.75	38	
Atriplex nuttallii									0.3			0.3						0.04	13	
Ceratoides lanata		4		0.3		2	0.3											0.41	25	
Rosa woodsii								0.3										0.02	6	
Symphoricarpos occidentalis										0.3								0.02	6	
TOTAL NATIVE SHRUBS	0.0	6.0	0.0	0.0	0.3	5.0	8.3	0.3	7.3	13.3	11.0	0.3	0.0	0.0	0.0	0.0	0.0	3.24	56	
TOTAL VEGETATION (Stratified)		63.1	82.3	26.1	37.3	56.1	130.9	149.9	101.0	44.5	183.9	117.9	55.9	82.3	81.5	90.8	42.1	76.1	84.91	100

Footnotes given on index page B-ii.

TABLE B6

**PERCENT CANOPY COVER BY CLASS AND SPECIES FOR 5 PLOTS IN THE SANDY ECOLOGICAL SITE –
VEGETATION STUDY AREA
STARK COUNTY, NORTH DAKOTA, 2006-2007**

	SANDY						
	PLOT NUMBER					Mean	Const-
	Sy-1	Sy-2	Sy-3	Sy-4	Sy-5	Cover	ancy
						n=5	
SITE PARAMETERS*							
Slope (percent)	7	34	25	18	20		
Aspect (degrees)	090	193	205	046	018		
Topography	Mid	Upper	Sh	Lower	Mid		
Configuration	Und	Und	X-S	V	V		
Soil	MG-AB	MG-AB	MG-AB	PL-DEF	PL-DEF		
Ecological Site	Sy	Sy	Sy	Sy	Sy		
Investigator	LL/PC	DC/JB	DC/JB	LL/PC	LL/PC		
Date	8-20-06	8-20-06	8-20-06	9-6-06	9-6-06		
GROUND COVER							
Bare Ground	24	30	15	15	12	19.20	100
Rock		10	2		1	2.60	60
Litter	72	54	78	75	80	71.80	100
Lichens		0.3	0.3	4	2	1.32	80
Moss				0.3	0.3	0.12	40
Water							
Basal Vegetation	4	6	5	6	5	5.20	100
VEGETATION STRUCTURE (nonstratified cover)							
Total Vegetation	78	48	65	76	60	65.40	100
Perennial Graminoids	76	34	59	58	55	56.40	100
Annual Graminoids		0.3	0.3			0.12	40
Perennial Forbs	3	13	20	30	7	14.60	100
Annual/Biennial Forbs	0.3	3	0.3	1	0.3	0.98	100
Shrubs		0.3			2	0.46	40
Trees							

TABLE B6

**PERCENT CANOPY COVER BY CLASS AND SPECIES FOR 5 PLOTS IN THE SANDY ECOLOGICAL SITE –
VEGETATION STUDY AREA
STARK COUNTY, NORTH DAKOTA, 2006-2007**

	SANDY						
	PLOT NUMBER					Mean	Const-
	Sy-1	Sy-2	Sy-3	Sy-4	Sy-5	Cover	ancy
						n=5	
CLASS\SPECIES							
NATIVE PERENNIAL GRAMINOIDS							
(Cool Season)							
Agropyron dasystachyum		0.3		2	4	1.26	60
Agropyron smithii	3	4	0.3	9		3.26	80
Agropyron spicatum				0.3		0.06	20
Aristida purpurea		0.3				0.06	20
Calamagrostis montanensis		0.3	0.3	0.3	0.3	0.24	80
Carex eleocharis	13		3	0.3		3.26	60
Carex filifolia		14	2	15	1	6.40	80
Carex heliophila		0.3	25		12	7.46	60
Koeleria pyramidata	3			7	2	2.40	60
Poa sandbergii				3		0.60	20
Stipa comata	9	1	10	18	6	8.80	100
Stipa viridula	1		1			0.40	40
TOTAL NPG(C)	29.0	20.2	41.6	54.9	25.3	34.20	100
NATIVE PERENNIAL GRAMINOIDS							
(Warm Season)							
Andropogon scoparius		0.3			3	0.66	40
Bouteloua gracilis		9	20	14	1	8.80	80
Buchloe dactyloides	40	6	3			9.80	60
Calamovilfa longifolia		2	2		15	3.80	60
Muhlenbergia cuspidata		0.3				0.06	20
TOTAL NPG(W)	40.0	17.6	25.0	14.0	19.0	23.12	100
INTRODUCED PERENNIAL GRAMINOIDS							
Agropyron cristatum	10			0.3	2	2.46	60
Poa pratensis	10			1	15	5.20	60
TOTAL IPG	20.0	0.0	0.0	1.3	17.0	7.66	60

TABLE B6

**PERCENT CANOPY COVER BY CLASS AND SPECIES FOR 5 PLOTS IN THE SANDY ECOLOGICAL SITE –
VEGETATION STUDY AREA
STARK COUNTY, NORTH DAKOTA, 2006-2007**

	SANDY						
	PLOT NUMBER					Mean	Const-
	Sy-1	Sy-2	Sy-3	Sy-4	Sy-5	Cover	ancy
						n=5	
NATIVE ANNUAL GRAMINOIDS							
Festuca octoflora		0.3				0.06	20
TOTAL NAG	0.0	0.3	0.0	0.0	0.0	0.06	20
INTRODUCED ANNUAL GRAMINOIDS							
Bromus japonicus			0.3			0.06	20
TOTAL IAG	0.0	0.0	0.3	0.0	0.0	0.06	20
NATIVE PERENNIAL FORBS							
Achillea millefolium	0.3					0.06	20
Anemone patens				0.3	0.3	0.12	40
Artemisia campestris		1				0.20	20
Artemisia dracunculus		0.3	0.3	0.3	0.3	0.24	80
Artemisia frigida	0.3	0.3	0.3	0.3	0.3	0.30	100
Artemisia ludoviciana	1	5	15	0.3	5	5.26	100
Aster commutatus			0.3		0.3	0.12	40
Aster pansus					0.3	0.06	20
Astragalus adsurgens		0.3				0.06	20
Astragalus lotiflorus		0.3	0.3			0.12	40
Campanula rotundifolia					0.3	0.06	20
Chrysopsis villosa		0.3	0.3		0.3	0.18	60
Cirsium flodmanii			0.3			0.06	20
Cirsium undulatum				0.3		0.06	20
Comandra umbellata		0.3				0.06	20
Dalea purpurea		0.3				0.06	20
Echinacea angustifolia		2	1		0.3	0.66	60
Erysimum inconspicuum		0.3	0.3			0.12	40
Gaura coccinea			0.3			0.06	20
Glycyrrhiza lepidota		0.3				0.06	20
Haplopappus spinulosus		0.3		0.3		0.12	40
Liatis punctata		0.3		0.3		0.12	40
Lithospermum incisum	0.3	0.3	0.3	0.3		0.24	80

TABLE B6

**PERCENT CANOPY COVER BY CLASS AND SPECIES FOR 5 PLOTS IN THE SANDY ECOLOGICAL SITE –
VEGETATION STUDY AREA
STARK COUNTY, NORTH DAKOTA, 2006-2007**

	SANDY						
	PLOT NUMBER					Mean	Const-
	Sy-1	Sy-2	Sy-3	Sy-4	Sy-5	Cover	ancy
						n=5	
Lygodesmia juncea	0.3	0.3	0.3	0.3		0.24	80
Opuntia fragilis			1			0.20	20
Opuntia polyacantha		0.3				0.06	20
Oxytropis lambertii		0.3				0.06	20
Oxytropis sericea				0.3	0.3	0.12	40
Penstemon albidus		0.3				0.06	20
Phlox hoodii		1	0.3			0.26	40
Psoralea argophylla	0.3	1	0.3			0.32	60
Ratibida columnifera	0.3		2			0.46	40
Solidago missouriensis		1			0.3	0.26	40
Sphaeralcea coccinea		0.3		0.3		0.12	40
Verbena bracteata	0.3		0.3			0.12	40
Vicia americana					0.3	0.06	20
TOTAL NPF	3.1	16.1	22.9	3.3	8.3	10.74	100
INTRODUCED PERENNIAL FORBS							
Convolvulus arvensis	0.3		0.3			0.12	40
Euphorbia esula				3		0.60	20
Medicago sativa				2		0.40	20
Taraxacum officinale				4	0.3	0.86	40
TOTAL IPF	0.3	0.0	0.3	9.0	0.3	1.98	80
FERNS AND ALLIES							
Selaginella densa				22		4.40	20
TOTAL F&A	0.0	0.0	0.0	22.0	0.0	4.40	20
NATIVE ANNUAL/BIENNIAL FORBS							
Arabis holboellii				0.3		0.06	20
Grindelia squarrosa	0.3	1				0.26	40
Hedeoma hispidum		0.3	0.3			0.12	40
Lepidium densiflorum			0.3			0.06	20
Linum rigidum		0.3	0.3			0.12	40
Lotus purshianus		0.3				0.06	20
Orthocarpus luteus		0.3				0.06	20
Plantago patagonica		1				0.20	20
TOTAL NAF	0.3	3.2	0.9	0.3	0.0	0.94	80

TABLE B6

**PERCENT CANOPY COVER BY CLASS AND SPECIES FOR 5 PLOTS IN THE SANDY ECOLOGICAL SITE –
VEGETATION STUDY AREA
STARK COUNTY, NORTH DAKOTA, 2006-2007**

	SANDY						
	PLOT NUMBER					Mean	Const-
	Sy-1	Sy-2	Sy-3	Sy-4	Sy-5	Cover	ancy
						n=5	
INTRODUCED ANNUAL/BIENNIAL FORBS							
Descurainia sophia		0.3	0.3			0.12	40
Melilotus officinalis				1		0.20	20
Tragopogon dubius				0.3	0.3	0.12	40
TOTAL IAF	0.0	0.3	0.3	1.3	0.3	0.44	80
NATIVE SHRUBS							
Rosa woodsii					2	0.40	20
Symphoricarpos occidentalis		0.3				0.06	20
TOTAL NATIVE SHRUBS	0.0	0.3	0.0	0.0	2.0	0.46	40
TOTAL VEGETATION (Stratified)							
	92.7	58.0	91.3	106.1	72.2	84.06	100

Footnotes given on index page B-ii.

TABLE B7

**PERCENT CANOPY COVER BY CLASS AND SPECIES FOR EIGHT PLOTS IN THE CLAYEY ECOLOGICAL SITE –
VEGETATION STUDY AREA
STARK COUNTY, NORTH DAKOTA, 2006-2007**

	CLAYEY									
	PLOT NUMBER								Mean	Const-
	Cy-1	Cy-2	Cy-3	Cy-4	Cy-5	Cy-6	Cy-7	Cy-8	Cover	ancy
										n=8
SITE PARAMETERS*										
Slope (percent)	3	6	15	5	3	3	1	4		
Aspect (degrees)	150	240	245	250	130	250	325	047		
Topography	Swale	Mid	LowMid	Lower	Lower	Bench	Ter	Should		
Configuration	V	Und	Und	S	Und	S (X)	S	X		
Soil	LR-A	RT-CD	RT-CD	RT-CD	SE-A	SE-A	SE-A	SE-B		
Ecological Site	Cy	Cy	Cy	Cy	Cy	Cy	Cy	Cy		
Investigator	DC/JB	DC/JB	KS/DB	DC/JB	LL/PC	LL/PC	DC/JB	DC/JB		
Date	8-21-06	8-19-06	8-18-06	8-19-06	8-21-06	8-19-06	8-19-06	8-19-06		
GROUND COVER										
Bare Ground	5	70	34	10	10	23	20	40	26.50	100
Rock					0.3				0.04	13
Litter	88	26	60	85	81	67	75	46	66.00	100
Lichens	0.3	1	1	0.3	4	4	0.3	8	2.36	100
Moss		0.3	1	0.3		2		0.3	0.49	63
Water										
Basal Vegetation	7	3	4	5	5	4	5	6	4.88	100
VEGETATION STRUCTURE (nonstratified cover)										
Total Vegetation	69	56	64	65	80	82	64	58	67.25	100
Perennial Graminoids	63	55	60	63	75	70	58	57	62.63	100
Annual Graminoids						1		0.3	0.16	25
Perennial Forbs	7	1	19	0.3	4	6	3	2	5.29	100
Annual/Biennial Forbs	2	0.3	2	1	4	4	0.3	0.3	1.74	100
Shrubs		1	4	5		18	9		4.63	63
Trees										

TABLE B7

**PERCENT CANOPY COVER BY CLASS AND SPECIES FOR EIGHT PLOTS IN THE CLAYEY ECOLOGICAL SITE –
VEGETATION STUDY AREA
STARK COUNTY, NORTH DAKOTA, 2006-2007**

	CLAYEY									
	PLOT NUMBER								Mean	Const-
	Cy-1	Cy-2	Cy-3	Cy-4	Cy-5	Cy-6	Cy-7	Cy-8	Cover	ancy
										n=8
CLASS\SPECIES										
NATIVE PERENNIAL GRAMINOIDS										
(Cool Season)										
Agropyron dasystachyum			1						0.13	13
Agropyron smithii	13	43	27	25	12	15	15	20	21.25	100
Calamagrostis montanensis			0.3						0.04	13
Carex eleocharis	3		3		2	5	2		1.88	63
Carex filifolia								2	0.25	13
Koeleria pyramidata	1	5	3		5	6	0.3	5	3.16	88
Poa sandbergii	4	5	0.3	2	3	2	2	3	2.66	100
Stipa comata	1		15		1	6	2	5	3.75	75
Stipa viridula	3	1	13	2			5	0.3	3.04	75
TOTAL NPG(C)	25.0	54.0	62.6	29.0	23.0	34.0	26.3	35.3	36.15	100
NATIVE PERENNIAL GRAMINOIDS										
(Warm Season)										
Bouteloua gracilis	2		0.3	35	5	33	20	30	15.66	88
Buchloe dactyloides	45	10	3	5	48		1	1	14.13	88
Distichlis spicata						12			1.50	13
Muhlenbergia cuspidata			0.3						0.04	13
Schedonnardus paniculatus		0.3	0.3					0.3	0.11	38
TOTAL NPG(W)	47.0	10.3	3.9	40.0	53.0	45.0	21.0	31.3	31.44	100
INTRODUCED PERENNIAL GRAMINOIDS										
Agropyron cristatum			1					0.3	0.16	25
Poa compressa							0.3		0.04	13
Poa pratensis	1	0.3	11	4	8	5	18	2	6.16	100
TOTAL IPG	1.0	0.3	12.0	4.0	8.0	5.0	18.3	2.3	6.36	100
NATIVE ANNUAL GRAMINOIDS										
Festuca octoflora						1		0.3	0.16	25
TOTAL NAG	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.3	0.16	25

TABLE B7

**PERCENT CANOPY COVER BY CLASS AND SPECIES FOR EIGHT PLOTS IN THE CLAYEY ECOLOGICAL SITE –
VEGETATION STUDY AREA
STARK COUNTY, NORTH DAKOTA, 2006-2007**

	CLAYEY									
	PLOT NUMBER								Mean	Const-
	Cy-1	Cy-2	Cy-3	Cy-4	Cy-5	Cy-6	Cy-7	Cy-8	Cover	ancy
									n=8	
NATIVE PERENNIAL FORBS										
Achillea millefolium	4	0.3	1	0.3	1	0.3	2		1.11	88
Antennaria parvifolia					0.3			0.3	0.08	25
Artemisia dracunculus								0.3	0.04	13
Artemisia frigida	2	0.3	9		0.3	2	0.3	0.3	1.78	88
Aster commutatus			0.3			1	0.3		0.20	38
Astragalus agrestis			0.3						0.04	13
Astragalus missouriensis			0.3						0.04	13
Cirsium flodmanii					1				0.13	13
Cirsium undulatum					0.3				0.04	13
Erysimum inconspicuum	0.3							0.3	0.08	25
Geum triflorum					0.3				0.04	13
Gutierrezia sarothrae			8			0.3			1.04	25
Liatris punctata								0.3	0.04	13
Lygodesmia juncea						0.3			0.04	13
Opuntia fragilis	0.3	0.3	1		0.3	0.3	0.3	0.3	0.35	88
Opuntia polyacantha					0.3				0.04	13
Penstemon albidus			0.3					0.3	0.08	25
Polygala alba								0.3	0.04	13
Potentilla pensylvanica								0.3	0.04	13
Psoralea argophylla		0.3	0.3		0.3	0.3			0.15	50
Ratibida columnifera			0.3		0.3	1			0.20	38
Solidago mollis			0.3						0.04	13
Sphaeralcea coccinea	0.3	0.3	0.3	0.3	0.3	0.3	0.3		0.26	88
Vicia americana			0.3						0.04	13
TOTAL NPF	6.9	1.5	21.7	0.6	4.7	5.8	3.2	2.7	5.89	100
INTRODUCED PERENNIAL FORBS										
Taraxacum officinale		0.3	1			1			0.29	38
TOTAL IPF	0.0	0.3	1.0	0.0	0.0	1.0	0.0	0.0	0.29	38
FERNS AND ALLIES										
Selaginella densa								0.3	0.04	13
TOTAL F&A	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.04	13

TABLE B7

**PERCENT CANOPY COVER BY CLASS AND SPECIES FOR EIGHT PLOTS IN THE CLAYEY ECOLOGICAL SITE –
VEGETATION STUDY AREA
STARK COUNTY, NORTH DAKOTA, 2006-2007**

	CLAYEY									
	PLOT NUMBER								Mean	Const-
	Cy-1	Cy-2	Cy-3	Cy-4	Cy-5	Cy-6	Cy-7	Cy-8	Cover	ancy
										n=8
NATIVE ANNUAL/BIENNIAL FORBS										
Chenopodium leptophyllum							0.3		0.04	13
Collomia linearis				0.3					0.04	13
Grindelia squarrosa	2		0.3	0.3	4	2	0.3	0.3	1.15	88
Lepidium densiflorum				0.3					0.04	13
Linum rigidum			0.3					0.3	0.08	25
Orthocarpus luteus			0.3			0.3			0.08	25
Plantago patagonica		0.3	0.3	0.3		2		0.3	0.40	63
TOTAL NAF	2.0	0.3	1.2	1.2	4.0	4.3	0.6	0.9	1.81	100
INTRODUCED ANNUAL/BIENNIAL FORBS										
Descurainia sophia				0.3			0.3		0.08	25
Medicago lupulina			1						0.13	13
Melilotus officinalis						0.3			0.04	13
Tragopogon dubius	0.3		0.3			0.3			0.11	38
TOTAL IAF	0.3	0.0	1.3	0.3	0.0	0.6	0.3	0.0	0.35	63
NATIVE SHRUBS										
Artemisia cana		1	4	5		18	9		4.63	63
Rosa woodsii			0.3						0.04	13
Symphoricarpos occidentalis			0.3						0.04	13
TOTAL NATIVE SHRUBS	0.0	1.0	4.6	5.0	0.0	18.0	9.0	0.0	4.70	63
TOTAL VEGETATION (Stratified)										
	82.2	67.7	108.3	80.1	92.7	114.7	78.7	73.1	87.19	100

Footnotes given on index page B-ii.

TABLE B8

**PERCENT CANOPY COVER BY CLASS AND SPECIES FOR 2 PLOTS
IN THE LOAMY AND 4 PLOTS IN THE LOAMY OVERFLOW ECOLOGICAL SITES,
SOUTH HEART COAL BASELINE STUDY AREA, STARK COUNTY, NORTH DAKOTA, 2006-2007.**

	LOAMY				LOAMY OVERFLOW					
	PLOT		Mean	Const-	PLOT NUMBER				Mean	Const-
	Ly-1	Ly-2	Cover	ancy	LyOv-1	LyOv-2	LyOv-3	LyOv-4	Cover	ancy
	n=2			n=4						
SITE PARAMETERS*										
Slope (percent)	1	19			2	2	2	2		
Aspect (degrees)	348	170			300	289	029	352		
Topography	Ter	Mid			Bot	lowTer	lowTer	lowTer		
Configuration	S	Und			Und	S	S	Und		
Soil	AD-AB	AR-CD			HL-A ch	HL-A ch	HL-A ch	HL-A ch		
Ecological Site	Ly	Ly			LyOv	LyOv	LyOv	LyOv		
Investigator	LL/MT	LL/PC			LL/PC	LL/PC	LL/PC	LL/PC		
Date	6-14-07	8-23-06			9-10-06	9-9-06	9-9-06	9-9-06		
GROUND COVER										
Bare Ground	4	38	21.00	100	2	2	5	4	3.25	100
Rock		3	1.50	50						
Litter	85	53	69.00	100	93	93	90	90	91.50	100
Lichens	4	1	2.50	100						
Moss	3		1.50	50						
Water										
Basal Vegetation	4	5	4.50	100	5	5	5	6	5.25	100
VEGETATION STRUCTURE (nonstratified cover)										
Total Vegetation	94	64	79.00	100	76	81	88	88	83.25	100
Perennial Graminoids	92	59	75.50	100	42	38	24	23	31.75	100
Annual Graminoids	1		0.50	50						
Perennial Forbs	0.3	4	2.15	100	8	7	25	17	14.25	100
Annual/Biennial Forbs	1	0.3	0.65	100						
Shrubs		0.3			38	45	55	56	48.50	100
Trees							0.3	0.3	0.15	50

TABLE B8

**PERCENT CANOPY COVER BY CLASS AND SPECIES FOR 2 PLOTS
IN THE LOAMY AND 4 PLOTS IN THE LOAMY OVERFLOW ECOLOGICAL SITES,
SOUTH HEART COAL BASELINE STUDY AREA, STARK COUNTY, NORTH DAKOTA, 2006-2007.**

CLASS/SPECIES	LOAMY				LOAMY OVERFLOW					
	PLOT		Mean	Const-	PLOT NUMBER				Mean	Const-
	Ly-1	Ly-2	Cover	ancy	LyOv-1	LyOv-2	LyOv-3	LyOv-4	Cover	ancy
			n=2						n=4	
NATIVE PERENNIAL GRAMINOIDS (Cool Season)										
Agropyron smithii	25	18	21.50	100	0.3	5			1.33	50
Calamagrostis montanensis		0.3	0.15	50						
Carex eleocharis	2		1.00	50						
Carex filifolia	5	22	13.50	100						
Juncus balticus							0.3		0.08	25
Koeleria pyramidata	3	3	3.00	100						
Poa sandbergii	8	1	4.50	100						
Stipa comata	7	2	4.50	100		0.3			0.08	25
Stipa viridula	3		1.50	50		4			1.00	25
TOTAL NPG(C)	53.0	46.3	49.65	100	0.3	9.3	0.3	0.0	2.48	75
NATIVE PERENNIAL GRAMINOIDS (Warm Season)										
Bouteloua gracilis	14	17	15.50	100						
Buchloe dactyloides	6		3.00	50						
Calamovilfa longifolia		1	0.50	50		0.3		0.3	0.15	50
Muhlenbergia cuspidata		0.3	0.15	50						
TOTAL NPG(W)	20.0	18.3	19.15	100	0.0	0.3	0.0	0.3	0.15	50
INTRODUCED PERENNIAL GRAMINOIDS										
Agropyron cristatum	2		1.00	50						
Bromus inermis					42	6	3		12.75	75
Poa pratensis	25		12.50	50		25	21	23	17.25	75
TOTAL IPG	27.0	0.0	13.50	50	42.0	31.0	24.0	23.0	30.00	100
NATIVE ANNUAL GRAMINOIDS										
Festuca octoflora	1		0.50	50						
TOTAL NAG	1.0	0.0	0.50	50	0.0	0.0	0.0	0.0	0.00	0

TABLE B8

**PERCENT CANOPY COVER BY CLASS AND SPECIES FOR 2 PLOTS
IN THE LOAMY AND 4 PLOTS IN THE LOAMY OVERFLOW ECOLOGICAL SITES,
SOUTH HEART COAL BASELINE STUDY AREA, STARK COUNTY, NORTH DAKOTA, 2006-2007.**

	LOAMY				LOAMY OVERFLOW					
	PLOT		Mean	Const-	PLOT NUMBER				Mean	Const-
	Ly-1	Ly-2	Cover	ancy	LyOv-1	LyOv-2	LyOv-3	LyOv-4	Cover	ancy
			n=2						n=4	
NATIVE PERENNIAL FORBS										
Achillea millefolium								0.3	0.08	25
Artemisia frigida		0.3	0.15	50						
Artemisia ludoviciana					0.3	1		14	3.83	75
Aster commutatus		1	0.50	50						
Aster pansus		0.3	0.15	50			0.3	0.3	0.15	50
Astragalus missouriensis		0.3	0.15	50						
Echinacea angustifolia		0.3	0.15	50						
Gaura coccinea		0.3	0.15	50						
Glycyrrhiza lepidota							0.3		0.08	25
Gutierrezia sarothrae		0.3	0.15	50						
Haplopappus spinulosus		0.3	0.15	50						
Helianthus maximiliani							0.3		0.08	25
Liatris punctata		0.3	0.15	50						
Monarda fistulosa								3	0.75	25
Phlox hoodii		0.3	0.15	50						
Psoralea argophylla		0.3	0.15	50						
Solidago gigantea							0.3		0.08	25
Solidago missouriensis						1		0.3	0.33	50
Solidago mollis								0.3	0.08	25
Sphaeralcea coccinea		1	0.50	50						
Vicia americana					0.3	0.3			0.15	50
TOTAL NPF	0.0	5.0	2.50	50	0.6	2.3	1.2	18.2	5.58	100
INTRODUCED PERENNIAL FORBS										
Cirsium arvense					8				2.00	25
Convolvulus arvensis		0.3	0.15	50						
Euphorbia esula	0.3		0.15	50		5	25		7.50	50
TOTAL IPF	0.3	0.3	0.30	100	8.0	5.0	25.0	0.0	9.50	75

TABLE B8

**PERCENT CANOPY COVER BY CLASS AND SPECIES FOR 2 PLOTS
IN THE LOAMY AND 4 PLOTS IN THE LOAMY OVERFLOW ECOLOGICAL SITES,
SOUTH HEART COAL BASELINE STUDY AREA, STARK COUNTY, NORTH DAKOTA, 2006-2007.**

	LOAMY				LOAMY OVERFLOW					
	PLOT		Mean	Const-	PLOT NUMBER				Mean	Const-
	Ly-1	Ly-2	Cover	ancy	LyOv-1	LyOv-2	LyOv-3	LyOv-4	Cover	ancy
			n=2						n=4	
NATIVE ANNUAL/BIENNIAL FORBS										
Androsace septentrionalis	0.3		0.15	50						
Draba reptans	0.3		0.15	50						
Grindelia squarrosa		0.3	0.15	50						
Hedeoma hispidum		0.3	0.15	50						
Plantago patagonica		0.3	0.15	50						
TOTAL NAF	0.6	0.9	0.75	100	0.0	0.0	0.0	0.0	0.00	0
INTRODUCED ANNUAL/BIENNIAL FORBS										
Draba nemorosa	1		0.50	50						
TOTAL IAF	1.0	0.0	0.50	50	0.0	0.0	0.0	0.0	0.00	0
NATIVE SHRUBS										
Artemisia cana					2	4	0.3	0.3	1.65	100
Ceratoides lanata		0.3	0.15	50						
Rosa arkansana		0.3	0.15	50						
Rosa woodsii						0.3	3	3	1.58	75
Symphoricarpos occidentalis					36	42	52	54	46.00	100
TOTAL NATIVE SHRUBS	0.0	0.6	0.30	50	38.0	46.3	55.3	57.3	49.23	100
NATIVE TREES										
Fraxinus pennsylvanica							0.3	0.3	0.15	50
TOTAL NATIVE TREES	0.0	0.0	0.00	0	0.0	0.0	0.3	0.3	0.15	50
TOTAL VEGETATION (Stratified)	102.9	71.4	87.15	100	88.9	94.2	106.1	99.1	97.08	100

Footnotes given on index page B-ii.

TABLE B9

**PERCENT CANOPY COVER BY CLASS AND SPECIES FOR 21 PLOTS IN THE LOAMY TERRACE AND 4 PLOTS IN THE LOAMY TERRACE (OCCASIONALLY CLAYEY TERRACE) ECOLOGICAL SITES – VEGETATION STUDY AREA
STARK COUNTY, NORTH DAKOTA, 2006-2007**

	LOAMY TERRACE															
	PLOT NUMBER															
	LyT-1	LyT-2	LyT-3	LyT-4	LyT-5	LyT-6	LyT-7	LyT-8	LyT-9	LyT-10	LyT-11	LyT-12	LyT-13	LyT-14	LyT-15	LyT-16
SITE PARAMETERS*																
Slope (percent)	2-3	1	3	2	0-1	0	2-3	2	1	1	1	3-4	3-4	4	2-3	2-3
Aspect (degrees)	050	300	037	331	0	0	152	060	113	113	108	061/ 328	062/ 313	342/ 058	326	180
Topography	lowTer	Ter	Ter	Ter	Ter	Ben	Ter	Ben	Ben	Ben	Ben	Ter	Ter/Bnk	Ter	Ter	Ter
Configuration	S	Und	S	Und	S	S	S	S	S	S	S	S	S(V)	S	S(V)	S-V
Soil	HL-A	HL-A	HL-A s/s	HL-A s/s	HL-A s/s	HL-A s/s	HL-A s/s	HL-A s/s	HL-A s/s	HL-A s/s	HL-A s/s	HL-A s/s	HL-A s/s	HL-A s/s	HL-A s/s	HL-A s/s
Ecological Site	LyT	LyT	LyT	LyT	LyT	LyT	LyT	LyT	LyT	LyT	LyT	LyT	LyT	LyT	LyT	LyT
Investigator	KS/DB	DC/DB	LL/PC	LL/PC	DC/DB	DC/DB	KS/DB	LL/PC	LL/PC	LL/PC	LL/PC	KS/DB	KS/DB	KS/DB	KS/DB	KS/DB
Date	9-7-06	9-8-06	8-20-06	8-20-06	8-20-06	8-20-06	8-18-06	8-19-06	8-19-06	8-19-06	8-19-06	8-19-06	8-19-06	8-19-06	8-19-06	8-20-06
GROUND COVER																
Bare Ground	3	15	5	7	8	2	0.3	6	7	21	12	5	38	10	2	12
Rock																
Litter	90	77	88	88	86	92	94	88	88	75	83	89	54	83	90	80
Lichens		0.3			0.3	0.3	0.3	0.3	0.3	0.3	0.3		3	0.3	0.3	
Moss		0.3	2	0.3			1	2	0.3	0.3	0.3	0.3				1
Water																
Basal Vegetation	7	8	5	5	6	6	4	4	4	3	4	6	5	7	8	7
VEGETATION STRUCTURE (nonstratified cover)																
Total Vegetation	74	72	65	70	70	85	70	83	72	57	60	78	60	72	84	94
Perennial Graminoids	70	70	23	33	60	75	64	60	51	49	54	74	58	70	79	88
Annual Graminoids							0.3		0.3							
Perennial Forbs	4	7	10	12	19	0.3	0.3	6	5	4	3	2	3	2	9	17
Annual/Biennial Forbs	5	2			2	0.3	3	1	2	3	1	4	3	2	1	5
Shrubs	2	7	44	39	15	23	22	37	24	5	5	6	7	3	14	19
Trees			0.3													

TABLE B9

PERCENT CANOPY COVER BY CLASS AND SPECIES FOR 21 PLOTS IN THE LOAMY TERRACE AND 4 PLOTS IN THE LOAMY TERRACE (OCCASIONALLY CLAYEY TERRACE) ECOLOGICAL SITES – VEGETATION STUDY AREA
STARK COUNTY, NORTH DAKOTA, 2006-2007

	LOAMY TERRACE															
	PLOT NUMBER															
	LyT-1	LyT-2	LyT-3	LyT-4	LyT-5	LyT-6	LyT-7	LyT-8	LyT-9	LyT-10	LyT-11	LyT-12	LyT-13	LyT-14	LyT-15	LyT-16
CLASS/SPECIES																
NATIVE PERENNIAL GRAMINOIDS																
(Cool Season)																
Agropyron dasystachyum							12	4								
Agropyron smithii	38	30	1	8	6	15	24	14	26	21	27	58	26	22	28	11
Agropyron trachycaulum			2	0.3												14
Calamagrostis montanensis					0.3										0.3	
Carex brevior			10	9												0.3
Carex eleocharis		15			5	3	0.3	4	3	3		1	1	5	2	
Carex filifolia								0.3								
Carex heliophila					2			1			2					
Carex laeviconica			0.3													
Hordeum jubatum																
Koeleria pyramidata							3	3	1			1	4	1	4	
Poa juncifolia							0.3									
Poa sandbergii							2					0.3	1			
Puccinellia cusickii																
Stipa comata		20			1		4	10						18	4	
Stipa viridula	3	8	5	3	18	15	3	8	7	4	6	4	4	3	15	2
TOTAL NPG(C)	41.0	73.0	18.3	20.3	32.3	33.0	48.6	44.3	37.0	28.0	35.0	64.0	35.3	50.0	53.3	27.3
NATIVE PERENNIAL GRAMINOIDS																
(Warm Season)																
Bouteloua gracilis		1			7		22	14		2	1	0.3	20	28	32	3
Buchloe dactyloides												2				1
Calamovilfa longifolia					0.3											
Distichlis spicata																
Muhlenbergia cuspidata																
Spartina pectinata																
TOTAL NPG(W)	0.0	1.0	0.0	0.0	7.3	0.0	22.0	14.0	0.0	2.0	1.0	0.3	22.0	28.0	32.0	4.0

TABLE B9

PERCENT CANOPY COVER BY CLASS AND SPECIES FOR 21 PLOTS IN THE LOAMY TERRACE AND 4 PLOTS IN THE LOAMY TERRACE (OCCASIONALLY CLAYEY TERRACE) ECOLOGICAL SITES – VEGETATION STUDY AREA
STARK COUNTY, NORTH DAKOTA, 2006-2007

	LOAMY TERRACE															
	PLOT NUMBER															
	LyT-1	LyT-2	LyT-3	LyT-4	LyT-5	LyT-6	LyT-7	LyT-8	LyT-9	LyT-10	LyT-11	LyT-12	LyT-13	LyT-14	LyT-15	LyT-16
INTRODUCED PERENNIAL GRAMINOIDS																
Agropyron cristatum	8			0.3	0.3		3				2					0.3
Agropyron repens																
Bromus inermis		6		1					4		3					28
Poa pratensis	40	20	7	14	35	50	7	10	14	22	18	18	16	12	20	56
TOTAL IPG	48.0	26.0	7.0	15.3	35.3	50.0	10.0	10.0	18.0	22.0	23.0	18.0	16.0	12.0	20.0	84.3
NATIVE ANNUAL GRAMINOIDS																
Festuca octoflora							0.3		0.3							
TOTAL NAG	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NATIVE PERENNIAL FORBS																
Achillea millefolium	2	0.3	1	0.3	1	0.3		4	0.3	1	1		0.3		3	2
Allium textile																
Antennaria neglecta																
Antennaria parvifolia		0.3														
Artemisia frigida		1						1		0.3					0.3	0.3
Artemisia ludoviciana		2	4	1	16	0.3			4	2	1	2	1	1	5	7
Aster commutatus	0.3	0.3			1				0.3				0.3			3
Aster pansus			0.3	0.3					0.3							
Aster simplex				0.3												
Astragalus adsurgens																
Astragalus agrestis																
Astragalus bisulcatus																
Cirsium flodmanii			0.3	0.3	0.3				0.3	1	0.3					3
Comandra umbellata																
Erigeron glabellus																
Erysimum inconspicuum								0.3						0.3	0.3	0.3
Gaura coccinea		0.3														
Gutierrezia sarothrae												1				
Haplopappus spinulosus								0.3								
Hymenoxys richardsonii																
Linum perenne			0.3													
Lithospermum incisum		0.3														

TABLE B9

PERCENT CANOPY COVER BY CLASS AND SPECIES FOR 21 PLOTS IN THE LOAMY TERRACE AND 4 PLOTS IN THE LOAMY TERRACE (OCCASIONALLY CLAYEY TERRACE) ECOLOGICAL SITES – VEGETATION STUDY AREA
STARK COUNTY, NORTH DAKOTA, 2006-2007

	LOAMY TERRACE															
	PLOT NUMBER															
	LyT-1	LyT-2	LyT-3	LyT-4	LyT-5	LyT-6	LyT-7	LyT-8	LyT-9	LyT-10	LyT-11	LyT-12	LyT-13	LyT-14	LyT-15	LyT-16
<i>Lomatium foeniculaceum</i>																
<i>Monarda fistulosa</i>			3	10												
<i>Musineon divaricatum</i>																
<i>Opuntia fragilis</i>																
<i>Opuntia polyacantha</i>																
<i>Penstemon albidus</i>																
<i>Phlox hoodii</i>																
<i>Potentilla pensylvanica</i>																
<i>Psoralea argophylla</i>					0.3		0.3	0.3				0.3	1	1		
<i>Ratibida columnifera</i>					0.3		1	0.3	0.3			0.3		0.3	1	
<i>Solidago missouriensis</i>			0.3	0.3	0.3						0.3	0.3				
<i>Solidago mollis</i>																
<i>Solidago rigida</i>		0.3														
<i>Sphaeralcea coccinea</i>							0.3					0.3				
<i>Toxicodendron rydbergii</i>			0.3													
<i>Vicia americana</i>																
TOTAL NPF	2.3	4.8	9.5	12.5	19.2	0.6	0.6	6.9	5.5	4.6	2.6	2.0	3.8	2.3	9.9	16.6
INTRODUCED PERENNIAL FORBS																
<i>Cirsium arvense</i>																0.3
<i>Convolvulus arvensis</i>		0.3														
<i>Euphorbia esula</i>												0.3				
<i>Medicago sativa</i>					0.3											
<i>Rumex crispus</i>			0.3													
<i>Rumex domesticus</i>																
<i>Taraxacum officinale</i>	2	3														0.3
TOTAL IPF	2.0	3.3	0.3	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.6
FERNS AND ALLIES																
<i>Equisetum laevigatum</i>		0.3			0.3											
<i>Selaginella densa</i>																
TOTAL F&A	0.0	0.3	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

TABLE B9

PERCENT CANOPY COVER BY CLASS AND SPECIES FOR 21 PLOTS IN THE LOAMY TERRACE AND 4 PLOTS IN THE LOAMY TERRACE (OCCASIONALLY CLAYEY TERRACE) ECOLOGICAL SITES – VEGETATION STUDY AREA
STARK COUNTY, NORTH DAKOTA, 2006-2007

	LOAMY TERRACE															
	PLOT NUMBER															
	LyT-1	LyT-2	LyT-3	LyT-4	LyT-5	LyT-6	LyT-7	LyT-8	LyT-9	LyT-10	LyT-11	LyT-12	LyT-13	LyT-14	LyT-15	LyT-16
NATIVE ANNUAL/BIENNIAL FORBS																
Amaranthus retroflexus																
Ambrosia artemisiifolia																
Androsace septentrionalis																
Arabis holboellii																
Atriplex subspicata		0.3														
Chenopodium leptophyllum																
Collomia linearis					0.3			0.3								0.3
Conyza canadensis		0.3														
Draba reptans																
Grindelia squarrosa	0.3	2			1			0.3	2	3	0.3		1		0.3	5
Hedeoma hispidum								0.3								
Iva xanthifolia	0.3										1					
Lappula redowskii																
Lepidium densiflorum																
Linum rigidum								0.3								
Monolepis nuttalliana																
Orthocarpus luteus								0.3	0.3				0.3			
Plantago elongata																
Plantago patagonica								1	0.3						0.3	
Polygonum arenastrum	1															
Polygonum ramosissimum																
TOTAL NAF	1.6	2.6	0.0	0.0	1.3	0.0	1.9	1.2	2.0	3.0	1.3	0.0	1.3	0.3	0.6	5.0
INTRODUCED ANNUAL/BIENNIAL FORBS																
Atriplex heterosperma																
Chenopodium album	0.3								0.3		0.3					
Descurainia sophia	3	0.3			1	0.3	1	0.3			0.3		0.3	2	1	
Draba nemorosa							0.3									
Kochia scoparia	0.3	0.3											0.3			
Lactuca serriola																
Malva rotundifolia																
Medicago lupulina							0.3					4	2			
Melilotus officinalis									0.3							0.3

TABLE B9

PERCENT CANOPY COVER BY CLASS AND SPECIES FOR 21 PLOTS IN THE LOAMY TERRACE AND 4 PLOTS IN THE LOAMY TERRACE (OCCASIONALLY CLAYEY TERRACE) ECOLOGICAL SITES – VEGETATION STUDY AREA
STARK COUNTY, NORTH DAKOTA, 2006-2007

	LOAMY TERRACE															
	PLOT NUMBER															
	LyT-1	LyT-2	LyT-3	LyT-4	LyT-5	LyT-6	LyT-7	LyT-8	LyT-9	LyT-10	LyT-11	LyT-12	LyT-13	LyT-14	LyT-15	LyT-16
Polygonum convolvulus																
Sisymbrium loeselii																
Thlaspi arvense																
Tragopogon dubius							0.3									0.3
TOTAL IAF	3.6	0.6	0.0	0.0	1.0	0.3	1.6	0.6	0.6	0.0	0.6	4.0	2.6	2.0	1.0	0.6
NATIVE SHRUBS																
Artemisia cana			0.3		15		22	37	24	5	5	6	7	3	14	
Atriplex nuttallii																
Crataegus rotundifolia			0.3	0.3												
Prunus americana			0.3													
Ribes setosum			0.3	0.3												
Rosa arkansana		0.3										0.3				
Rosa woodsii			2													1
Symphoricarpos occidentalis	2	7	40	38	0.3	23			0.3		0.3		0.3		0.3	18
TOTAL NATIVE SHRUBS	2.0	7.3	43.2	38.6	15.3	23.0	22.0	37.0	24.3	5.0	5.3	6.0	7.6	3.0	14.3	19.0
NATIVE TREES																
Ulmus americana			0.3													
TOTAL NATIVE TREES	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL VEGETATION (Stratified)	100.5	118.9	78.6	86.7	112.3	106.9	107.0	114.0	87.7	64.6	68.8	94.3	88.9	97.6	131.1	157.4

Footnotes given on index page B-ii.

TABLE B9

PERCENT CANOPY COVER BY CLASS AND SPECIES FOR 21 PLOTS IN THE LOAMY TERRACE AND 4 PLOTS IN THE LOAMY TERRACE (OCCASIONALLY CLAYEY TERRACE) ECOLOGICAL SITES – VEGETATION STUDY AREA
STARK COUNTY, NORTH DAKOTA, 2006-2007

	LOAMY TERRACE							LOAMY TERRACE (OCCASIONALLY CLAYEY TERRACE)						LyT COMPOSITE	
	PLOT NUMBER					Mean	Const-	PLOT NUMBER				Mean	Const-	Mean	Const-
	LyT-17	LyT-18	LyT-19	LyT-20	LyT-21	Cover	ancy	LyT-22	LyT-23	LyT-24	LyT-25	Cover	ancy	Cover	ancy
						n=21						n=4		n=25	
SITE PARAMETERS*															
Slope (percent)	0-1	3	15	0-1	0-1			2-4	2-4	2	2				
Aspect (degrees)	190	326	010	0	0			042	045	274/ 320	183				
Topography	Ter	Ben	L	Ter	Ter			Ter	Ter	Bot	Ter				
Configuration	S	Und	X	S	S			S	S	V	S				
Soil	HL-A s/s	HL-A s/s	SO-A s/s	SO-A s/s	SO-A s/s			FV-A	FV-A	FV-A s/s	FV-A s/s				
Ecological Site	LyT	LyT	LyT	LyT	LyT			LyT (CyT)	LyT (CyT)	LyT (CyT)	LyT (CyT)				
Investigator	DC/JB	LL/MT	LL/PC	DC/JB	DC/JB			KS/DB	KS/DB	LL/PC	LL/MT				
Date	9-8-06	6-13-07	8-19-06	8-19-06	8-19-06			9-7-06	9-7-06	9-10-06	6-13-07				
GROUND COVER															
Bare Ground	45	23	30	8	25	13.54	100	5	6	2	2	3.75	100	11.97	100
Rock			0.3		0.3	0.03	10							0.02	8
Litter	46	66	64	86	69	79.81	100	91	88	94	89	90.50	100	81.52	100
Lichens	0.3	5	2	0.3	1	0.70	76				5	1.25	25	0.78	68
Moss	0.3	3	0.3			0.54	62				0.3	0.08	25	0.47	56
Water															
Basal Vegetation	9	3	3	6	5	5.48	100	4	6	4	4	4.50	100	5.32	100
VEGETATION STRUCTURE (nonstratified cover)															
Total Vegetation	75	70	56	64	65	71.24	100	68	78	86	86	79.50	100	72.56	100
Perennial Graminoids	74	46	51	62	60	60.52	100	62	75	85	26	62.00	100	60.76	100
Annual Graminoids						0.03	10							0.02	8
Perennial Forbs	3	18	9	0.3	7	6.71	100	3	4	2	12	5.25	100	6.48	100
Annual/Biennial Forbs	1	10	4	0.3	3	2.50	90	12	5	0.3	25	10.58	100	3.80	92
Shrubs		8	5	4	8	14.14	95		3	0.3	72	18.83	75	14.89	92
Trees						0.01	5							0.01	4

TABLE B9

PERCENT CANOPY COVER BY CLASS AND SPECIES FOR 21 PLOTS IN THE LOAMY TERRACE AND 4 PLOTS IN THE LOAMY TERRACE (OCCASIONALLY CLAYEY TERRACE) ECOLOGICAL SITES – VEGETATION STUDY AREA
STARK COUNTY, NORTH DAKOTA, 2006-2007

CLASS\SPECIES	LOAMY TERRACE							LOAMY TERRACE (OCCASIONALLY CLAYEY TERRACE)						LyT COMPOSITE	
	PLOT NUMBER					Mean	Const-	PLOT NUMBER				Mean	Const-	Mean	Const-
	LyT-17	LyT-18	LyT-19	LyT-20	LyT-21	Cover	ancy	LyT-22	LyT-23	LyT-24	LyT-25	Cover	ancy	Cover	ancy
						n=21						n=4		n=25	
NATIVE PERENNIAL GRAMINOIDS (Cool Season)															
Agropyron dasystachyum		9				1.19	14				3	0.75	25	1.12	16
Agropyron smithii	40	8	9	18	15	21.19	100	26	28		4	14.50	75	20.12	96
Agropyron trachycaulum		0.3				0.79	19							0.66	16
Calamagrostis montanensis						0.03	10							0.02	8
Carex brevior					0.3	0.93	19							0.78	16
Carex eleocharis				2	0.3	2.12	62		7			1.75	25	2.06	56
Carex filifolia			5			0.25	10							0.21	8
Carex heliophila					1	0.29	19							0.24	16
Carex laeviconica	7					0.35	10			36		9.00	25	1.73	12
Hordeum jubatum	0.3					0.01	5							0.01	4
Koeleria pyramidata		2	7		0.3	1.25	48				0.3	0.08	25	1.06	44
Poa juncifolia						0.01	5							0.01	4
Poa sandbergii		18	3	1	0.3	1.22	33							1.02	28
Puccinellia cusickii		5				0.24	5							0.20	4
Stipa comata		0.3	0.3	0.3	0.3	2.77	48							2.33	40
Stipa viridula	10	1	0.3	6	7	6.30	100		8			2.00	25	5.61	88
TOTAL NPG(C)	57.3	43.6	24.6	27.3	24.5	38.95	100	26.0	43.0	36.0	7.3	28.08	100	37.21	100
NATIVE PERENNIAL GRAMINOIDS (Warm Season)															
Bouteloua gracilis		4	18	40	30	10.59	71		0.3		4	1.08	50	9.06	68
Buchloe dactyloides	1	2				0.29	19							0.24	16
Calamovilfa longifolia						0.01	5							0.01	4
Distichlis spicata		0.3	15			0.73	10							0.61	8
Muhlenbergia cuspidata			0.3			0.01	5							0.01	4
Spartina pectinata										52		13.00	25	2.08	4
TOTAL NPG(W)	1.0	6.3	33.3	40.0	30.0	11.63	76	0.0	0.3	52.0	4.0	14.08	75	12.02	76

TABLE B9

PERCENT CANOPY COVER BY CLASS AND SPECIES FOR 21 PLOTS IN THE LOAMY TERRACE AND 4 PLOTS IN THE LOAMY TERRACE (OCCASIONALLY CLAYEY TERRACE) ECOLOGICAL SITES – VEGETATION STUDY AREA
STARK COUNTY, NORTH DAKOTA, 2006-2007

	LOAMY TERRACE							LOAMY TERRACE (OCCASIONALLY CLAYEY TERRACE)						LyT COMPOSITE	
	PLOT NUMBER					Mean	Const-	PLOT NUMBER				Mean	Const-	Mean	Const-
	LyT-17	LyT-18	LyT-19	LyT-20	LyT-21	Cover	ancy	LyT-22	LyT-23	LyT-24	LyT-25	Cover	ancy	Cover	ancy
						n=21						n=4		n=25	
INTRODUCED PERENNIAL GRAMINOIDS															
Agropyron cristatum				2	3	0.90	38	32	6			9.50	50	2.28	40
Agropyron repens										4		1.00	25	0.16	4
Bromus inermis	0.3			1		2.06	33			0.3	0.3	0.15	50	1.76	36
Poa pratensis	30			5	15	19.48	90	16	45		20	20.25	75	19.60	88
TOTAL IPG	30.3	0.0	0.0	8.0	18.0	22.44	90	48.0	51.0	4.3	20.3	30.90	100	23.79	92
NATIVE ANNUAL GRAMINOIDS															
Festuca octoflora						0.03	10							0.02	8
TOTAL NAG	0.0	0.0	0.0	0.0	0.0	0.03	10	0.0	0.0	0.0	0.0	0.00	0	0.02	8
NATIVE PERENNIAL FORBS															
Achillea millefolium		3	0.3	0.3	3	1.10	81				5	1.25	25	1.12	72
Allium textile		1				0.05	5							0.04	4
Antennaria neglecta		0.3				0.01	5				0.3	0.08	25	0.02	8
Antennaria parvifolia						0.01	5							0.01	4
Artemisia frigida		0.3	3		0.3	0.31	38				0.3	0.08	25	0.27	36
Artemisia ludoviciana	0.3				2	2.31	71				3	0.75	25	2.06	64
Aster commutatus		1	0.3		0.3	0.32	43	0.3			0.3	0.15	50	0.30	44
Aster pansus						0.04	14							0.04	12
Aster simplex						0.01	5			1		0.25	25	0.05	8
Astragalus adsurgens		0.3	0.3			0.03	10							0.02	8
Astragalus agrestis		0.3				0.01	5				0.3	0.08	25	0.02	8
Astragalus bisulcatus		0.3				0.01	5							0.01	4
Cirsium flodmanii						0.26	33							0.22	28
Comandra umbellata		0.3	0.3			0.03	10							0.02	8
Erigeron glabellus		0.3				0.01	5				0.3	0.08	25	0.02	8
Erysimum inconspicuum						0.06	19							0.05	16
Gaura coccinea						0.01	5							0.01	4
Gutierrezia sarothrae		0.3	3			0.20	14							0.17	12
Haplopappus spinulosus			0.3			0.03	10							0.02	8
Hymenoxys richardsonii		0.3				0.01	5							0.01	4
Linum perenne			0.3			0.03	10							0.02	8
Lithospermum incisum					0.3	0.03	10							0.02	8

TABLE B9

PERCENT CANOPY COVER BY CLASS AND SPECIES FOR 21 PLOTS IN THE LOAMY TERRACE AND 4 PLOTS IN THE LOAMY TERRACE (OCCASIONALLY CLAYEY TERRACE) ECOLOGICAL SITES – VEGETATION STUDY AREA
STARK COUNTY, NORTH DAKOTA, 2006-2007

	LOAMY TERRACE							LOAMY TERRACE (OCCASIONALLY CLAYEY TERRACE)						LyT COMPOSITE	
	PLOT NUMBER					Mean	Const-	PLOT NUMBER				Mean	Const-	Mean	Const-
	LyT-17	LyT-18	LyT-19	LyT-20	LyT-21	Cover	ancy	LyT-22	LyT-23	LyT-24	LyT-25	Cover	ancy	Cover	ancy
						n=21						n=4		n=25	
Lomatium foeniculaceum		1				0.05	5							0.04	4
Monarda fistulosa						0.62	10							0.52	8
Musineon divaricatum		0.3				0.01	5							0.01	4
Opuntia fragilis					0.3	0.01	5							0.01	4
Opuntia polyacantha		3				0.14	5							0.12	4
Penstemon albidus			0.3			0.01	5							0.01	4
Phlox hoodii		0.3	0.3			0.03	10							0.02	8
Potentilla pensylvanica					0.3	0.01	5							0.01	4
Psoralea argophylla		1	0.3		1	0.26	43							0.22	36
Ratibida columnifera		0.3	0.3		0.3	0.21	48				0.3	0.08	25	0.19	44
Solidago missouriensis		2	1		0.3	0.23	38				1	0.25	25	0.23	36
Solidago mollis									1			0.25	25	0.04	4
Solidago rigida		1	0.3			0.08	14							0.06	12
Sphaeralcea coccinea		0.3				0.04	14							0.04	12
Toxicodendron rydbergii						0.01	5							0.01	4
Vicia americana		0.3				0.01	5				1	0.25	25	0.05	8
TOTAL NPF	0.3	17.2	10.3	0.3	8.1	6.66	100	0.3	1.0	1.0	11.8	3.53	100	6.16	100
INTRODUCED PERENNIAL FORBS															
Cirsium arvense						0.01	5			1		0.25	25	0.05	8
Convolvulus arvensis	0.3					0.03	10	0.3				0.08	25	0.04	12
Euphorbia esula						0.01	5			0.3		0.08	25	0.02	8
Medicago sativa						0.01	5	0.3	0.3			0.15	50	0.04	12
Rumex crispus						0.01	5							0.01	4
Rumex domesticus								0.3	0.3			0.15	50	0.02	8
Taraxacum officinale	3	2				0.49	24	2	3		1	1.50	75	0.65	32
TOTAL IPF	3.3	2.0	0.0	0.0	0.0	0.58	38	2.9	3.6	1.3	1.0	2.20	100	0.84	48
FERNS AND ALLIES															
Equisetum laevigatum						0.03	10							0.02	8
Selaginella densa		1				0.05	5							0.04	4
TOTAL F&A	0.0	1.0	0.0	0.0	0.0	0.08	14	0.0	0.0	0.0	0.0	0.00	0	0.06	12

TABLE B9

**PERCENT CANOPY COVER BY CLASS AND SPECIES FOR 21 PLOTS IN THE LOAMY TERRACE AND 4 PLOTS IN THE LOAMY TERRACE (OCCASIONALLY CLAYEY TERRACE) ECOLOGICAL SITES – VEGETATION STUDY AREA
STARK COUNTY, NORTH DAKOTA, 2006-2007**

	LOAMY TERRACE							LOAMY TERRACE (OCCASIONALLY CLAYEY TERRACE)						LyT COMPOSITE		
	PLOT NUMBER					Mean	Const-	PLOT NUMBER				Mean	Const-	Mean	Const-	
	LyT-17	LyT-18	LyT-19	LyT-20	LyT-21	Cover	ancy	LyT-22	LyT-23	LyT-24	LyT-25	Cover	ancy	Cover	ancy	
						n=21						n=4		n=25		
NATIVE ANNUAL/BIENNIAL FORBS																
Amaranthus retroflexus								0.3					0.08	25	0.01	4
Ambrosia artemisiifolia	0.3					0.01	5								0.01	4
Androsace septentrionalis		0.3				0.01	5								0.01	4
Arabis holboellii		0.3				0.01	5				0.3	0.08	25	0.02	8	
Atriplex subspicata	0.3					0.03	10	0.3				0.08	25	0.04	12	
Chenopodium leptophyllum					0.3	0.01	5							0.01	4	
Collomia linearis						0.04	14							0.04	12	
Conyza canadensis					0.3	0.03	10	0.3				0.08	25	0.04	12	
Draba reptans		0.3				0.01	5							0.01	4	
Grindelia squarrosa	0.3	0.3	4	0.3	2	1.05	71		0.3			0.08	25	0.90	64	
Hedeoma hispidum		0.3				0.03	10				0.3	0.08	25	0.04	12	
Iva xanthifolia	0.3					0.08	14	3				0.75	25	0.18	16	
Lappula redowskii		0.3				0.01	5							0.01	4	
Lepidium densiflorum		2				0.10	5							0.08	4	
Linum rigidum		0.3	0.3			0.04	14							0.04	12	
Monolepis nuttalliana		0.3				0.01	5							0.01	4	
Orthocarpus luteus		0.3				0.06	19							0.05	16	
Plantago elongata		4				0.19	5							0.16	4	
Plantago patagonica		0.3	0.3			0.10	24							0.09	20	
Polygonum arenastrum	0.3					0.06	10	1				0.25	25	0.09	12	
Polygonum ramosissimum										0.3		0.08	25	0.01	4	
TOTAL NAF	1.5	9.0	4.6	0.3	2.6	1.91	81	4.9	0.3	0.3	0.6	1.53	100	1.85	84	
INTRODUCED ANNUAL/BIENNIAL FORBS																
Atriplex heterosperma									0.3			0.08	25	0.01	4	
Chenopodium album						0.04	14	1	0.3			0.33	50	0.09	20	
Descurainia sophia				0.3	1	0.51	57	3	3			1.50	50	0.67	56	
Draba nemorosa		0.3				0.03	10							0.02	8	
Kochia scoparia						0.04	14	1	1			0.50	50	0.12	20	
Lactuca serriola		0.3				0.01	5							0.01	4	
Malva rotundifolia								1				0.25	25	0.04	4	
Medicago lupulina	0.3	2				0.41	24		0.3		25	6.33	50	1.36	28	
Melilotus officinalis	0.3		0.3			0.06	19							0.05	16	

TABLE B9

PERCENT CANOPY COVER BY CLASS AND SPECIES FOR 21 PLOTS IN THE LOAMY TERRACE AND 4 PLOTS IN THE LOAMY TERRACE (OCCASIONALLY CLAYEY TERRACE) ECOLOGICAL SITES – VEGETATION STUDY AREA
STARK COUNTY, NORTH DAKOTA, 2006-2007

	LOAMY TERRACE							LOAMY TERRACE (OCCASIONALLY CLAYEY TERRACE)						LyT COMPOSITE	
	PLOT NUMBER					Mean	Const-	PLOT NUMBER				Mean	Const-	Mean	Const-
	LyT-17	LyT-18	LyT-19	LyT-20	LyT-21	Cover	ancy	LyT-22	LyT-23	LyT-24	LyT-25	Cover	ancy	Cover	ancy
						n=21						n=4		n=25	
Polygonum convolvulus								0.3				0.08	25	0.01	4
Sisymbrium loeselii								1				0.25	25	0.04	4
Thlaspi arvense								0.3				0.08	25	0.01	4
Tragopogon dubius						0.03	10	0.3			0.3	0.15	50	0.05	16
TOTAL IAF	0.6	2.6	0.3	0.3	1.0	1.14	86	7.9	4.9	0.0	25.3	9.53	75	2.48	84
NATIVE SHRUBS															
Artemisia cana		8	5	4	7	7.73	71				32	8.00	25	7.77	64
Atriplex nuttallii		0.3				0.01	5							0.01	4
Crataegus rotundifolia						0.03	10							0.02	8
Prunus americana						0.01	5							0.01	4
Ribes setosum						0.03	10							0.02	8
Rosa arkansana						0.03	10		2			0.50	25	0.10	12
Rosa woodsii						0.14	10							0.12	8
Symphoricarpos occidentalis					1	6.21	57		1	0.3	48	12.33	75	7.19	60
TOTAL NATIVE SHRUBS	0.0	8.3	5.0	4.0	8.0	14.20	95	0.0	3.0	0.3	80.0	20.83	75	15.26	92
NATIVE TREES															
Ulmus americana						0.01	5							0.01	4
TOTAL NATIVE TREES	0.0	0.0	0.0	0.0	0.0	0.01	5	0.0	0.0	0.0	0.0	0.00	0	0.01	4
TOTAL VEGETATION (Stratified)	94.3	90.0	78.1	80.2	92.2	97.62	100	90.0	107.1	95.2	150.3	110.65	100	99.71	100

Footnotes given on index page B-ii.

TABLE B10

PERCENT CANOPY COVER BY CLASS AND SPECIES FOR 47 PLOTS IN THE TAME PASTURE VEGETATION TYPE – VEGETATION STUDY AREA
STARK COUNTY, NORTH DAKOTA, 2006-2007

	TAME PASTURE																
	PLOT NUMBER																
	TP-1	TP-2	TP-3	TP-4	TP-5	TP-6	TP-7	TP-8	TP-9	TP-10	TP-11	TP-12	TP-13	TP-14	TP-15	TP-16	TP-17
SITE PARAMETERS*																	
Slope (percent)	4	5	3	2-3	5	4	2	4	3-8	4-12	6	5	7	6	1	1	3
Aspect (degrees)	045	073	090	038	038	0	021	358	352	045	051	347	040	180	340	330	120
Topography	Lower	Mid	Lower	Mid	Mid	Mid	Mid	Ridge	Bot	Bot	Mid	Mid	Mid	Mid	Bench	Bench	Lower
Configuration	S	V (S)	Und	Und	Und	Und	Und	X	V	V	S	X (S)	S	Und	S	S	S
Soil	DM-AB	DM-AB	DM-AB	DM-AB	DM-AB	DM-AB	JG-AB	GL-A	LR-B	LR-B	MU-B	MU-B	RT-CD	RT-CD	SE-A	SE-A	SE-A
Ecological Site	Cp	Cp	Cp	Cp	Cp	Cp	Cp	Cy	Cy	Cy	Cy	Cy	Cy	Cy	Cy	Cy	Cy
Investigator	LL/PC	DC/JB	DC/JB	LL/PC	LL/PC	LL/PC	LL/PC	LL/MT	KS/ED	KS/ED	LL/PC	LL/PC	DC/JB	DC/JB	DC/JB	DC/JB	DC/JB
Date	9-7-06	8-21-06	9-7-06	9-7-06	8-21-06	8-22-06	8-23-06	6-14-07	6-13-07	6-13-07	9-7-06	9-7-06	9-7-06	9-6-06	8-22-06	8-22-06	9-8-06
GROUND COVER																	
Bare Ground	48	20	37	41	40	27	37	18	2		44	40	40	60	55	60	57
Rock				1	0.3		0.3				0.3	0.3	0.3	0.3		0.3	
Litter	47	72	58	53	57	67	59	79	93	93	50	55	54	31	41	35	39
Lichens		0.3	0.3	0.3		0.3		0.3			0.3	0.3	1	2		0.3	0.3
Moss																0.3	
Water																	
Basal Vegetation	5	8	5	5	3	6	4	3	5	7	5	5	5	7	4	5	4
VEGETATION STRUCTURE (nonstratified cover)																	
Total Vegetation	44	67	58	45	64	74	50	85	92	96	42	45	63	46	51	61	57
Perennial Graminoids	38	65	57	38	61	70	47	83	82	48	32	37	63	45	50	59	46
Annual Graminoids																	
Perennial Forbs	5	3	2	8	4	2	6	5	3	32	11	8	2	2	2	1	14
Annual/Biennial Forbs	2	1	0.3	1	1	2	2	0.3	2	7	0.3	2	0.3	0.3	0.3	0.3	1
Shrubs					0.3				34	62						3	
Trees																	

TABLE B10

PERCENT CANOPY COVER BY CLASS AND SPECIES FOR 47 PLOTS IN THE TAME PASTURE VEGETATION TYPE – VEGETATION STUDY AREA
STARK COUNTY, NORTH DAKOTA, 2006-2007

	TAME PASTURE																
	PLOT NUMBER																
	TP-1	TP-2	TP-3	TP-4	TP-5	TP-6	TP-7	TP-8	TP-9	TP-10	TP-11	TP-12	TP-13	TP-14	TP-15	TP-16	TP-17
CLASS\SPECIES																	
NATIVE PERENNIAL GRAMINOIDS																	
(Cool Season)																	
Agropyron dasystachyum																	
Agropyron smithii		6			5	0.3	1	2						4		6	
Agropyron trachycaulum																	
Carex eleocharis		4			0.3	3		3					0.3	0.3			2
Carex filifolia						1		5									
Carex heliophila													0.3				
Carex laeviconica																	
Hordeum jubatum																	
Koeleria pyramidata		0.3			0.3			16				0.3					
Poa juncifolia																	
Poa sandbergii		0.3						2									
Stipa comata								6									0.3
Stipa viridula		0.3			2												
TOTAL NPG(C)	0.0	10.9	0.0	0.0	7.6	4.3	1.0	34.0	0.0	0.0	0.0	0.3	0.0	4.6	0.3	6.0	2.3
NATIVE PERENNIAL GRAMINOIDS																	
(Warm Season)																	
Bouteloua gracilis		1	0.3			0.3		7					0.3				
Buchloe dactyloides	2	50	0.3		40	43		2						33	4		3
Distichlis spicata			4														
Schedonnardus paniculatus	1												0.3		0.3		
Sporobolus cryptandrus																	
TOTAL NPG(W)	3.0	51.0	4.6	0.0	40.0	43.3	0.0	9.0	0.0	0.0	0.0	0.0	0.6	33.0	4.3	0.0	3.0

TABLE B10

PERCENT CANOPY COVER BY CLASS AND SPECIES FOR 47 PLOTS IN THE TAME PASTURE VEGETATION TYPE – VEGETATION STUDY AREA
STARK COUNTY, NORTH DAKOTA, 2006-2007

	TAME PASTURE																
	PLOT NUMBER																
	TP-1	TP-2	TP-3	TP-4	TP-5	TP-6	TP-7	TP-8	TP-9	TP-10	TP-11	TP-12	TP-13	TP-14	TP-15	TP-16	TP-17
INTRODUCED PERENNIAL GRAMINOIDS																	
Agropyron cristatum	30	17	30	18	13	22	40	10			14	18	22	13	43	18	42
Agropyron intermedium							3										
Agropyron repens																	
Bromus biebersteinii					4												
Bromus inermis	6	4	27	19	2	13	5	27	82	16	15	18	43		7	40	1
Dactylis glomerata																	
Poa compressa																	
Poa pratensis			1	4			3	3		34	2	2	1	0.3	2	0.3	
TOTAL IPG	36.0	21.0	58.0	41.0	19.0	35.0	51.0	40.0	82.0	50.0	31.0	38.0	66.0	13.3	52.0	58.3	43.0
NATIVE ANNUAL GRAMINOIDS																	
Festuca octoflora																	
TOTAL NAG	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NATIVE PERENNIAL FORBS																	
Achillea millefolium	1	0.3	0.3	0.3	0.3		0.3				0.3	0.3	0.3		0.3		0.3
Allium textile																	
Antennaria neglecta													0.3				
Antennaria parvifolia						0.3									0.3		
Artemisia frigida	3	0.3	0.3	5	0.3	0.3					0.3	0.3	0.3	1	0.3		4
Artemisia ludoviciana																	
Aster commutatus					0.3												
Aster pansus							0.3				0.3					0.3	
Astragalus agrestis																	
Astragalus flexuosus																	
Astragalus gilviflorus																	
Astragalus lotiflorus												0.3					
Astragalus missouriensis													0.3				
Cirsium undulatum				0.3													
Cynoglossum boreale																	
Echinacea angustifolia		0.3															
Gaura coccinea																	
Geum aleppicum										0.3							

TABLE B10

PERCENT CANOPY COVER BY CLASS AND SPECIES FOR 47 PLOTS IN THE TAME PASTURE VEGETATION TYPE – VEGETATION STUDY AREA
STARK COUNTY, NORTH DAKOTA, 2006-2007

	TAME PASTURE																
	PLOT NUMBER																
	TP-1	TP-2	TP-3	TP-4	TP-5	TP-6	TP-7	TP-8	TP-9	TP-10	TP-11	TP-12	TP-13	TP-14	TP-15	TP-16	TP-17
Gutierrezia sarothrae	0.3	0.3	1		0.3		0.3				9	0.3	0.3				
Haplopappus spinulosus																	
Helianthus maximiliani																	
Helianthus rigidus																	
Iva axillaris	0.3																
Lactuca oblongifolia										1							
Lesquerella ludoviciana								0.3									
Liatris punctata														0.3			
Lithospermum incisum																	
Lygodesmia juncea																	
Lysimachia ciliata										0.3							
Mirabilis linearis			0.3														
Opuntia fragilis		0.3			0.3	0.3								0.3	0.3	0.3	
Opuntia polyacantha		1			3									0.3			
Oxytropis sericea																	
Penstemon albidus								0.3									
Polygala alba								0.3									
Polygonum amphibium										3							
Potentilla pensylvanica						0.3											
Psoralea argophylla				0.3													
Ratibida columnifera	0.3			0.3							0.3						0.3
Rumex mexicanus																	
Senecio plattensis																	
Solidago canadensis																	
Solidago mollis																	
Solidago rigida																	
Sphaeralcea coccinea		0.3	0.3			0.3	0.3						0.3	0.3	0.3	0.3	
Toxicodendron rydbergii										0.3							
Urtica dioica									3	28							
TOTAL NPF	4.9	2.8	2.2	6.2	4.5	1.5	1.5	0.6	3.0	32.9	10.2	1.2	1.8	2.2	1.5	0.9	4.6

TABLE B10

PERCENT CANOPY COVER BY CLASS AND SPECIES FOR 47 PLOTS IN THE TAME PASTURE VEGETATION TYPE – VEGETATION STUDY AREA
STARK COUNTY, NORTH DAKOTA, 2006-2007

	TAME PASTURE																
	PLOT NUMBER																
	TP-1	TP-2	TP-3	TP-4	TP-5	TP-6	TP-7	TP-8	TP-9	TP-10	TP-11	TP-12	TP-13	TP-14	TP-15	TP-16	TP-17
INTRODUCED PERENNIAL FORBS																	
Convolvulus arvensis				2							2	7					10
Euphorbia esula								5									
Medicago sativa	0.3	0.3	0.3		0.3		4				0.3		1	0.3	0.3	0.3	0.3
Rumex crispus																	
Rumex domesticus										1							
Taraxacum officinale	0.3		0.3	0.3			1			0.3		0.3		0.3			
TOTAL IPF	0.6	0.3	0.6	2.3	0.3	0.0	5.0	5.0	0.0	1.3	2.3	7.3	1.0	0.6	0.3	0.3	10.3
FERNS AND ALLIES																	
Selaginella densa		0.3												0.3			
TOTAL F&A	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0
NATIVE ANNUAL/BIENNIAL FORBS																	
Ambrosia trifida									0.3								
Androsace septentrionalis								0.3									
Arabis holboellii								0.3									
Chenopodium leptophyllum						0.3								0.3			
Draba reptans																	
Euphorbia glyptosperma																	
Galium aparine										7							
Grindelia squarrosa	2	1	0.3	0.3	1	1	2				0.3	0.3	0.3	0.3	0.3	0.3	1
Hedeoma hispidum						0.3											
Lepidium densiflorum																	
Linum rigidum																	
Lupinus pusillus								0.3									
Orthocarpus luteus																	
Plantago patagonica													0.3				
Polygonum arenastrum																0.3	
TOTAL NAF	2.0	1.0	0.3	0.3	1.0	1.6	2.0	0.9	0.3	7.0	0.3	0.3	0.3	0.6	0.6	0.6	1.0

TABLE B10

PERCENT CANOPY COVER BY CLASS AND SPECIES FOR 47 PLOTS IN THE TAME PASTURE VEGETATION TYPE – VEGETATION STUDY AREA
STARK COUNTY, NORTH DAKOTA, 2006-2007

	TAME PASTURE																
	PLOT NUMBER																
	TP-1	TP-2	TP-3	TP-4	TP-5	TP-6	TP-7	TP-8	TP-9	TP-10	TP-11	TP-12	TP-13	TP-14	TP-15	TP-16	TP-17
INTRODUCED ANNUAL/BIENNIAL FORBS																	
Atriplex heterosperma																	
Chenopodium album		0.3						0.3									0.3
Descurainia sophia																	
Draba nemorosa						0.3											
Kochia scoparia		0.3													0.3		
Lactuca serriola																	
Melilotus officinalis				0.3							0.3	2					
Polygonum convolvulus										0.3							
Salsola iberica																	
Sisymbrium loeselii																	
Thlaspi arvense									2								
Tragopogon dubius												0.3					
TOTAL IAF	0.0	0.6	0.0	0.3	0.0	0.3	0.3	0.0	2.0	0.3	0.3	2.3	0.0	0.0	0.3	0.3	0.0
NATIVE SHRUBS																	
Artemisia cana																	3
Atriplex nuttallii																	
Rosa arkansana																	
Rosa woodsii					0.3				0.3	4							
Symphoricarpos occidentalis									34	60							
TOTAL NATIVE SHRUBS	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	34.3	64.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
TOTAL VEGETATION (Stratified)	46.5	87.9	65.7	50.1	72.7	86.0	60.8	89.5	121.6	155.5	44.1	49.4	69.7	54.6	59.3	69.4	64.2

Footnotes given on index page B-ii.

TABLE B10

PERCENT CANOPY COVER BY CLASS AND SPECIES FOR 47 PLOTS IN THE TAME PASTURE VEGETATION TYPE – VEGETATION STUDY AREA
STARK COUNTY, NORTH DAKOTA, 2006-2007

	TAME PASTURE															
	PLOT NUMBER															
	TP-18	TP-19	TP-20	TP-21	TP-22	TP-23	TP-24	TP-25	TP-26	TP-27	TP-28	TP-29	TP-30	TP-31	TP-32	TP-33
SITE PARAMETERS*																
Slope (percent)	3	6	1	2	2	2	2	3	7	12	5	2-3	1-2	1-2	3	2
Aspect (degrees)	008	099	128	104	124	110	064	125	282	170	200	338	124	114	070	322
Topography	Mid	Upper	Bot	Ter	Ter	Ter	Ter	Bot	Lower	Mid	Lower	FloTer	FloTer	FloTer	Terrace	Bench
Configuration	S	Und	S(V)	Und	S	X (S)	Und	Und	V (S)	S	S	S	S	S	S	X
Soil	SE-B	SE-B	AD-AB	AD-AB	AD-AB	AD-AB	AD-AB	AD-AB	SN-AB	SO-ABC	SO-ABC	HL-A	EH-A	EH-A	FV-A	WN-A
Ecological Site	Cy	Cy	Ly	Ly	Ly	Ly	Ly	Ly	Ly	Ly	Ly	LyT	LyT (CyT)	LyT (CyT)	LyT (CyT)	SwCy
Investigator	LL/PC	LL/MT	JB/CB	JB/CB	JB/CB	JB/CB	JB	JB	LL/PC	DC/JB	DC/JB	KS/DB	KS/ED	KS/ED	LL/PC	KS/DC
Date	9-8-06	6-14-07	8-23-06	8-23-06	8-23-06	8-23-06	9-5-06	9-5-06	8-22-06	9-6-06	9-8-06	9-9-06	6-14-07	6-14-07	9-11-06	8-18-06
GROUND COVER																
Bare Ground	54	33	0.3	0.3	0.3	10	12	2	55	10	52	1	0.3	5	15	61
Rock									0.3							
Litter	40	63	91	91	91	84	84	92	38	85	43	93	94	88	79	35
Lichens	0.3	0.3				0.3	0.3	0.3	4	0.3	0.3					
Moss			0.3	0.3	0.3	0.3		0.3		0.3						1
Water																
Basal Vegetation	6	3	9	9	8	6	4	6	3	5	5	6	6	7	6	3
VEGETATION STRUCTURE (nonstratified cover)																
Total Vegetation	55	77	95	82	80	68	53	87	42	67	51	83	76	94	62	47
Perennial Graminoids	52	77	91	75	80	66	51	77	40	66	47	82	76	94	60	44
Annual Graminoids																
Perennial Forbs	5	0.3	9	3	1	5	7	5	1	1	5	0.3	0.3	3	1	1
Annual/Biennial Forbs	0.3	0.3	2	0.3	0.3	0.3		0.3	2	0.3	0.3	0.3	0.3			0.3
Shrubs				21		0.3		19				0.3			1	5
Trees																

TABLE B10

PERCENT CANOPY COVER BY CLASS AND SPECIES FOR 47 PLOTS IN THE TAME PASTURE VEGETATION TYPE – VEGETATION STUDY AREA
STARK COUNTY, NORTH DAKOTA, 2006-2007

CLASS\SPECIES	TAME PASTURE															
	PLOT NUMBER															
	TP-18	TP-19	TP-20	TP-21	TP-22	TP-23	TP-24	TP-25	TP-26	TP-27	TP-28	TP-29	TP-30	TP-31	TP-32	TP-33
NATIVE PERENNIAL GRAMINOIDS (Cool Season)																
Agropyron dasystachyum			0.3													
Agropyron smithii		3	25			5		1	0.3			2				
Agropyron trachycaulum			15			5										
Carex eleocharis						0.3	0.3			0.3	0.3					
Carex filifolia		2								2						
Carex heliophila	4															
Carex laeviconica			2	2	1			3								
Hordeum jubatum																
Koeleria pyramidata		6							0.3	0.3	2					
Poa juncifolia																
Poa sandbergii	1	1														
Stipa comata		1				0.3				0.3						
Stipa viridula											1					
TOTAL NPG(C)	5.0	13.0	42.3	2.0	1.0	10.6	0.3	4.0	0.6	2.9	2.3	3.0	0.0	0.0	0.0	0.0
NATIVE PERENNIAL GRAMINOIDS (Warm Season)																
Bouteloua gracilis						12	4			3	0.3					
Buchloe dactyloides	3	3					0.3		10		8			1		
Distichlis spicata																
Schedonnardus paniculatus																0.3
Sporobolus cryptandrus																
TOTAL NPG(W)	3.0	3.0	0.0	0.0	0.0	12.0	4.3	0.0	10.0	3.0	8.3	0.0	0.0	1.0	0.0	0.3

TABLE B10

PERCENT CANOPY COVER BY CLASS AND SPECIES FOR 47 PLOTS IN THE TAME PASTURE VEGETATION TYPE – VEGETATION STUDY AREA
STARK COUNTY, NORTH DAKOTA, 2006-2007

	TAME PASTURE															
	PLOT NUMBER															
	TP-18	TP-19	TP-20	TP-21	TP-22	TP-23	TP-24	TP-25	TP-26	TP-27	TP-28	TP-29	TP-30	TP-31	TP-32	TP-33
INTRODUCED PERENNIAL GRAMINOIDS																
Agropyron cristatum	8	22		66	20	40	45	40	19	63	37	4		0.3	40	35
Agropyron intermedium																
Agropyron repens													1	46		
Bromus biebersteinii																
Bromus inermis	18	25	26	5	68	1		8	14		2	10	70	28	2	10
Dactylis glomerata														2		
Poa compressa																
Poa pratensis	22	20	50	7	4	10	3	30	0.3			74	22	55	22	
TOTAL IPG	48.0	67.0	76.0	78.0	92.0	51.0	48.0	78.0	33.3	63.0	39.0	88.0	93.0	131.3	64.0	45.0
NATIVE ANNUAL GRAMINOIDS																
Festuca octoflora																
TOTAL NAG	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NATIVE PERENNIAL FORBS																
Achillea millefolium	0.3		0.3							0.3						
Allium textile																
Antennaria neglecta																
Antennaria parvifolia											0.3					0.3
Artemisia frigida	1					0.3			0.3	0.3	3					0.3
Artemisia ludoviciana			2	0.3	0.3	1	1	1								0.3
Aster commutatus	0.3										0.3					
Aster pansus	0.3		0.3	0.3	0.3			0.3								
Astragalus agrestis			0.3													
Astragalus flexuosus																
Astragalus gilviflorus																
Astragalus lotiflorus																
Astragalus missouriensis											0.3					
Cirsium undulatum										0.3						
Cynoglossum boreale													0.3			
Echinacea angustifolia																
Gaura coccinea	0.3															
Geum aleppicum																

TABLE B10

PERCENT CANOPY COVER BY CLASS AND SPECIES FOR 47 PLOTS IN THE TAME PASTURE VEGETATION TYPE – VEGETATION STUDY AREA
STARK COUNTY, NORTH DAKOTA, 2006-2007

	TAME PASTURE															
	PLOT NUMBER															
	TP-18	TP-19	TP-20	TP-21	TP-22	TP-23	TP-24	TP-25	TP-26	TP-27	TP-28	TP-29	TP-30	TP-31	TP-32	TP-33
Gutierrezia sarothrae	1								0.3							
Haplopappus spinulosus																
Helianthus maximilianii			5					0.3								
Helianthus rigidus																
Iva axillaris																
Lactuca oblongifolia																
Lesquerella ludoviciana																
Liatis punctata																
Lithospermum incisum																
Lygodesmia juncea										0.3	0.3					
Lysimachia ciliata																
Mirabilis linearis										0.3						
Opuntia fragilis																1
Opuntia polyacantha							1							0.3		
Oxytropis sericea																
Penstemon albidus																
Polygala alba																
Polygonum amphibium								0.3								
Potentilla pensylvanica																
Psoralea argophylla											0.3					
Ratibida columnifera											0.3					
Rumex mexicanus								0.3								
Senecio plattensis																
Solidago canadensis				2												
Solidago mollis						1	3	0.3		0.3						
Solidago rigida											0.3					
Sphaeralcea coccinea	0.3					0.3	1		0.3	0.3	1			0.3	0.3	
Toxicodendron rydbergii																
Urtica dioica																
TOTAL NPF	3.5	0.0	7.9	2.6	0.6	2.6	6.0	2.5	0.9	2.1	6.1	0.0	0.3	0.0	1.2	1.6

TABLE B10

PERCENT CANOPY COVER BY CLASS AND SPECIES FOR 47 PLOTS IN THE TAME PASTURE VEGETATION TYPE – VEGETATION STUDY AREA
STARK COUNTY, NORTH DAKOTA, 2006-2007

	TAME PASTURE															
	PLOT NUMBER															
	TP-18	TP-19	TP-20	TP-21	TP-22	TP-23	TP-24	TP-25	TP-26	TP-27	TP-28	TP-29	TP-30	TP-31	TP-32	TP-33
INTRODUCED PERENNIAL FORBS																
<i>Convolvulus arvensis</i>			1													
<i>Euphorbia esula</i>		0.3						1				0.3	0.3	3		
<i>Medicago sativa</i>				0.3		3	1	2	0.3		0.3					
<i>Rumex crispus</i>			0.3		0.3			0.3								
<i>Rumex domesticus</i>																
<i>Taraxacum officinale</i>	2	0.3	0.3	0.3										0.3		
TOTAL IPF	2.0	0.6	1.6	0.6	0.3	3.0	1.0	3.3	0.3	0.0	0.3	0.3	0.3	3.3	0.0	0.0
FERNS AND ALLIES																
<i>Selaginella densa</i>																
TOTAL F&A	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NATIVE ANNUAL/BIENNIAL FORBS																
<i>Ambrosia trifida</i>			2	0.3												
<i>Androsace septentrionalis</i>		0.3								0.3						
<i>Arabis holboellii</i>																
<i>Chenopodium leptophyllum</i>								0.3								
<i>Draba reptans</i>		0.3														
<i>Euphorbia glyptosperma</i>																
<i>Galium aparine</i>																
<i>Grindelia squarrosa</i>									2		0.3					0.3
<i>Hedeoma hispidum</i>																
<i>Lepidium densiflorum</i>		0.3														
<i>Linum rigidum</i>											0.3					
<i>Lupinus pusillus</i>																
<i>Orthocarpus luteus</i>																
<i>Plantago patagonica</i>											0.3					
<i>Polygonum arenastrum</i>	0.3			0.3				0.3								
TOTAL NAF	0.3	0.9	2.0	0.6	0.0	0.0	0.0	0.6	2.0	0.3	0.9	0.0	0.0	0.0	0.0	0.3

TABLE B10

PERCENT CANOPY COVER BY CLASS AND SPECIES FOR 47 PLOTS IN THE TAME PASTURE VEGETATION TYPE – VEGETATION STUDY AREA
STARK COUNTY, NORTH DAKOTA, 2006-2007

	TAME PASTURE															
	PLOT NUMBER															
	TP-18	TP-19	TP-20	TP-21	TP-22	TP-23	TP-24	TP-25	TP-26	TP-27	TP-28	TP-29	TP-30	TP-31	TP-32	TP-33
INTRODUCED ANNUAL/BIENNIAL FORBS																
Atriplex heterosperma					0.3											
Chenopodium album						0.3										
Descurainia sophia											0.3					
Draba nemorosa	0.3															
Kochia scoparia																0.3
Lactuca serriola													0.3			
Melilotus officinalis			0.3						0.3		0.3					
Polygonum convolvulus																
Salsola iberica																
Sisymbrium loeselii												0.3				
Thlaspi arvense																
Tragopogon dubius													0.3			
TOTAL IAF	0.3	0.0	0.3	0.0	0.3	0.3	0.0	0.0	0.3	0.0	0.3	0.6	0.6	0.0	0.0	0.3
NATIVE SHRUBS																
Artemisia cana																5
Atriplex nuttallii																
Rosa arkansana				1		0.3		1								
Rosa woodsii																
Symphoricarpos occidentalis				20				18				0.3			1	
TOTAL NATIVE SHRUBS	0.0	0.0	0.0	21.0	0.0	0.3	0.0	19.0	0.0	0.0	0.0	0.3	0.0	0.0	1.0	5.0
TOTAL VEGETATION (Stratified)	62.1	84.5	130.1	104.8	94.2	79.8	59.6	107.4	47.4	71.3	57.2	92.2	94.2	135.6	66.2	52.5

Footnotes given on index page B-ii.

TABLE B10

PERCENT CANOPY COVER BY CLASS AND SPECIES FOR 47 PLOTS IN THE TAME PASTURE VEGETATION TYPE – VEGETATION STUDY AREA
STARK COUNTY, NORTH DAKOTA, 2006-2007

	TAME PASTURE															Mean	Const-
	PLOT NUMBER																
	TP-34	TP-35	TP-36	TP-37	TP-38	TP-39	TP-40	TP-41	TP-42	TP-43	TP-44	TP-45	TP-46	TP-47	Cover	ancy	
n=47																	
SITE PARAMETERS*																	
Slope (percent)	8	1	11	10	14	10	15	5	5-8	2	3	2	5	1			
Aspect (degrees)	045	100	198	239	176	177	188	326	248	038	040	354	354	218			
Topography	Mid	Ridge	Mid	Lower	Mid	Mid	Lower	Bench	Mid	Ridge	Ridge	Lower	Swale	Mid			
Configuration	X	S	S	S	X (S)	S	X (S)	X	Und	S	S (X)	S	V	S			
Soil	CB-C	CB-DE	CB-DE	CB-DE	CB-DE	CB-DE	CB-DE	TY-ABC	TY-ABC	TY-ABC	TY-ABC	RS-A	RS-A	RS-B			
Ecological Site	SwLy	SwLy	SwLy	SwLy	SwLy	SwLy	SwLy	Sy	Sy	Sy	Sy	TCp	TCp	TCp			
Investigator	LL/PC	DC/JB	LL/PC	JB/CB	LL/PC	JB/CB	LL/JB	KS/DB	KS/DB	LL/MT	LL/MT	LL/PC	LL/PC	JB/CB			
Date	9-8-06	9-8-06	8-22-06	8-22-06	8-22-06	8-22-06	8-22-06	9-8-06	9-7-06	6-14-07	6-14-07	8-23-06	8-22-06	9-5-06			
GROUND COVER																	
Bare Ground	25	47	43	12	39	10	41	28	16	14	18	45	65	54	29.66	98	
Rock		0.3	0.3		0.3		0.3	0.3		0.3	0.3	0.3	0.3	0.3	0.14	40	
Litter	67	44	52	82	56	81	54	67	79	83	77	47	31	42	64.60	100	
Lichens	3	4		0.3		1			0.3	0.3	1	2	0.3	0.3	0.52	62	
Moss				0.3						0.3	0.3				0.09	23	
Water																	
Basal Vegetation	5	5	5	6	5	8	5	5	5	3	3	6	3	3	5.21	100	
VEGETATION STRUCTURE (nonstratified cover)																	
Total Vegetation	68	57	53	67	72	76	75	70	72	78	78	68	36	41	65.32	100	
Perennial Graminoids	58	53	51	64	67	75	70	70	70	77	77	60	34	38	60.91	100	
Annual Graminoids										0.3					0.01	2	
Perennial Forbs	4	7	4	5	2	1	5	0.3	4	2	2	3	0.3	3	4.27	100	
Annual/Biennial Forbs	9	2	0.3	0.3	2		2	1	1	0.3	0.3	7	1	1	1.23	91	
Shrubs					3							0.3	1	1	3.22	30	
Trees																	

TABLE B10

PERCENT CANOPY COVER BY CLASS AND SPECIES FOR 47 PLOTS IN THE TAME PASTURE VEGETATION TYPE – VEGETATION STUDY AREA
STARK COUNTY, NORTH DAKOTA, 2006-2007

CLASS/SPECIES	TAME PASTURE															Mean	Const- ancy
	PLOT NUMBER														Cover		
	TP-34	TP-35	TP-36	TP-37	TP-38	TP-39	TP-40	TP-41	TP-42	TP-43	TP-44	TP-45	TP-46	TP-47		n=47	
NATIVE PERENNIAL GRAMINOIDS (Cool Season)																	
Agropyron dasystachyum																0.01	2
Agropyron smithii	1		1		0.3				4	0.3	4	4	1		1.62	45	
Agropyron trachycaulum															0.43	4	
Carex eleocharis		0.3						4		18	9			0.3	0.97	34	
Carex filifolia		0.3									7				0.37	13	
Carex heliophila															0.09	4	
Carex laeviconica															0.17	9	
Hordeum jubatum													1		0.02	2	
Koeleria pyramidata	1	1			1					4	16	2			1.07	30	
Poa juncifolia						0.3									0.01	2	
Poa sandbergii	0.3										0.3			0.3	0.11	15	
Stipa comata	6	18	10	0.3	35	1	4			6	18				2.26	30	
Stipa viridula		0.3	6	1		0.3	1					6			0.38	19	
TOTAL NPG(C)	8.3	19.9	17.0	1.3	36.3	1.6	5.0	4.0	4.0	28.3	54.3	12.0	1.0	1.6	7.51	77	
NATIVE PERENNIAL GRAMINOIDS (Warm Season)																	
Bouteloua gracilis	4	12	2		2			34	18		4				2.22	34	
Buchloe dactyloides											1	27	8	27	5.65	40	
Distichlis spicata															0.09	2	
Schedonnardus paniculatus							0.3					0.3			0.05	13	
Sporobolus cryptandrus			1	1	2		0.3								0.09	9	
TOTAL NPG(W)	4.0	12.0	3.0	1.0	4.0	0.0	0.6	34.0	18.0	0.0	5.0	27.3	8.0	27.0	8.10	68	

TABLE B10

**PERCENT CANOPY COVER BY CLASS AND SPECIES FOR 47 PLOTS IN THE TAME PASTURE VEGETATION TYPE – VEGETATION STUDY AREA
STARK COUNTY, NORTH DAKOTA, 2006-2007**

	TAME PASTURE															Mean	Const-
	PLOT NUMBER																
	TP-34	TP-35	TP-36	TP-37	TP-38	TP-39	TP-40	TP-41	TP-42	TP-43	TP-44	TP-45	TP-46	TP-47	n=47		
INTRODUCED PERENNIAL GRAMINOIDS																	
Agropyron cristatum	47	23	30	58	26	74	48	48	58	40	5	30	17	12	27.77	91	
Agropyron intermedium							0.3								0.07	4	
Agropyron repens															1.00	4	
Bromus biebersteinii															0.09	2	
Bromus inermis	0.3	3	1	5	3	0.3	21			12	18		11		14.61	85	
Dactylis glomerata															0.04	2	
Poa compressa				0.3	4		0.3								0.10	6	
Poa pratensis	4		5		2	0.3	2	0.3	2	3	1				8.33	70	
TOTAL IPG	51.3	26.0	36.0	63.3	35.0	74.6	71.6	48.3	60.0	55.0	24.0	30.0	28.0	12.0	52.01	100	
NATIVE ANNUAL GRAMINOIDS																	
Festuca octoflora										0.3					0.01	2	
TOTAL NAG	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.01	2	
NATIVE PERENNIAL FORBS																	
Achillea millefolium														1	0.13	32	
Allium textile											0.3				0.01	2	
Antennaria neglecta															0.01	2	
Antennaria parvifolia															0.03	9	
Artemisia frigida	0.3	3	0.3	0.3	0.3		0.3	0.3	2						0.58	55	
Artemisia ludoviciana															0.13	15	
Aster commutatus	0.3											1			0.05	11	
Aster pansus															0.05	17	
Astragalus agrestis															0.01	2	
Astragalus flexuosus											0.3				0.01	2	
Astragalus gilviflorus							0.3								0.01	2	
Astragalus lotiflorus															0.01	2	
Astragalus missouriensis															0.01	4	
Cirsium undulatum															0.01	4	
Cynoglossum boreale															0.01	2	
Echinacea angustifolia															0.01	2	
Gaura coccinea		0.3			0.3									0.3	0.03	9	
Geum aleppicum															0.01	2	

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STARK COUNTY, NORTH DAKOTA, 2006-2007

	TAME PASTURE															Mean	Const-
	PLOT NUMBER																
	TP-34	TP-35	TP-36	TP-37	TP-38	TP-39	TP-40	TP-41	TP-42	TP-43	TP-44	TP-45	TP-46	TP-47	n=47		
	Gutierrezia sarothrae		2	0.3	0.3			2					0.3				0.38
Haplopappus spinulosus							0.3		0.3							0.01	4
Helianthus maximiliani																0.11	4
Helianthus rigidus			0.3													0.01	2
Iva axillaris														0.3		0.01	4
Lactuca oblongifolia																0.02	2
Lesquerella ludoviciana																0.01	2
Liatris punctata																0.01	2
Lithospermum incisum					0.3											0.01	2
Lygodesmia juncea			0.3		0.3		0.3	0.3	0.3							0.04	15
Lysimachia ciliata																0.01	2
Mirabilis linearis									0.3							0.02	6
Opuntia fragilis	3		0.3	1					0.3			0.3				0.16	26
Opuntia polyacantha														0.3		0.13	13
Oxytropis sericea							0.3									0.01	2
Penstemon albidus											0.3					0.01	4
Polygala alba		0.3														0.01	4
Polygonum amphibium																0.07	4
Potentilla pensylvanica																0.01	2
Psoralea argophylla														0.3		0.02	6
Ratibida columnifera		0.3										0.3				0.04	15
Rumex mexicanus														0.3		0.01	4
Senecio plattensis		0.3														0.01	2
Solidago canadensis																0.04	2
Solidago mollis																0.10	9
Solidago rigida																0.01	2
Sphaeralcea coccinea	1	0.3	0.3				0.3	0.3	0.3		0.3		0.3			0.20	51
Toxicodendron rydbergii																0.01	2
Urtica dioica																0.66	4
TOTAL NPF	4.6	6.5	1.8	1.6	1.2	0.0	3.8	0.9	3.5	0.0	1.2	1.9	0.3	2.5		3.20	89

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PERCENT CANOPY COVER BY CLASS AND SPECIES FOR 47 PLOTS IN THE TAME PASTURE VEGETATION TYPE – VEGETATION STUDY AREA
STARK COUNTY, NORTH DAKOTA, 2006-2007

	TAME PASTURE															Mean	Const-
	PLOT NUMBER														Cover		
	TP-34	TP-35	TP-36	TP-37	TP-38	TP-39	TP-40	TP-41	TP-42	TP-43	TP-44	TP-45	TP-46	TP-47		n=47	
	INTRODUCED PERENNIAL FORBS																
Convolvulus arvensis			0.3													0.47	13
Euphorbia esula										2	2					0.30	17
Medicago sativa		1	2	4	1	1	1					1		0.3	0.55	53	
Rumex crispus																0.02	6
Rumex domesticus																0.02	2
Taraxacum officinale		0.3												0.3	0.14	30	
TOTAL IPF	0.0	1.3	2.3	4.0	1.0	1.0	1.0	0.0	0.0	2.0	2.0	1.0	0.0	0.6	1.50	83	
FERNS AND ALLIES																	
Selaginella densa	0.3															0.02	6
TOTAL F&A	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.02	6	
NATIVE ANNUAL/BIENNIAL FORBS																	
Ambrosia trifida																0.06	6
Androsace septentrionalis										0.3						0.03	9
Arabis holboellii		0.3	0.3	0.3	0.3											0.03	11
Chenopodium leptophyllum													0.3			0.03	9
Draba reptans																0.01	2
Euphorbia glyptosperma					0.3					0.3						0.01	4
Galium aparine																0.15	2
Grindelia squarrosa		1	0.3	0.3			2	1	1			7	0.3	1	0.57	55	
Hedeoma hispidum																0.01	2
Lepidium densiflorum										0.3	0.3					0.02	6
Linum rigidum	0.3	0.3														0.02	6
Lupinus pusillus										0.3	0.3					0.02	6
Orthocarpus luteus		0.3														0.01	2
Plantago patagonica	0.3															0.02	6
Polygonum arenastrum																0.03	9
TOTAL NAF	0.6	1.9	0.6	0.6	0.6	0.0	2.0	1.0	1.0	1.2	0.6	7.0	0.6	1.0	0.99	83	

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	PLOT NUMBER																
	TP-34	TP-35	TP-36	TP-37	TP-38	TP-39	TP-40	TP-41	TP-42	TP-43	TP-44	TP-45	TP-46	TP-47	n=47		
INTRODUCED ANNUAL/BIENNIAL FORBS																	
Atriplex heterosperma																0.01	2
Chenopodium album																0.03	9
Descurainia sophia																0.01	2
Draba nemorosa																0.01	4
Kochia scoparia								0.3					0.3			0.03	11
Lactuca serriola																0.01	2
Melilotus officinalis	9			0.3	1				0.3				0.3			0.31	23
Polygonum convolvulus																0.01	2
Salsola iberica					0.3											0.01	2
Sisymbrium loeselii																0.01	2
Thlaspi arvense																0.04	2
Tragopogon dubius		0.3			0.3											0.03	9
TOTAL IAF	9.0	0.3	0.0	0.3	1.6	0.0	0.0	0.3	0.3	0.0	0.0	0.3	0.3	0.0		0.48	57
NATIVE SHRUBS																	
Artemisia cana														1		0.19	6
Atriplex nuttallii												0.3		1		0.03	4
Rosa arkansana																0.05	6
Rosa woodsii					3											0.16	9
Symphoricarpos occidentalis																2.84	13
TOTAL NATIVE SHRUBS	0.0	0.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	1.0	1.0		3.27	30
TOTAL VEGETATION (Stratified)	78.1	67.9	60.7	72.1	82.7	77.2	84.0	88.5	86.8	86.8	87.1	79.8	39.2	45.7		77.08	100

Footnotes given on index page B-ii.