Inventory of Wildlife Habitat Quality in the Lower Souris Watershed

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For Lower Souris Watershed Committee Inc.
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1.0 Introduction

The purpose of this inventory was to determine the quality of wildlife habitat in the Lower Souris River Watershed. This inventory is part of the Lower Souris Ecological Goods and Services project. The wildlife habitat types of interest for this study are riparian (lentic and lotic), native grassland, forest, cropland and tame grassland area. This list is essentially exhaustive of all land cover types. Historically the Lower Souris watershed would have been fescue grassland with occasional aspen.

To inventory the quality of wildlife habitat in the Lower Souris an assessment technique was required that captures a wide range of habitat characteristics. The methods chosen were rangeland health and riparian health. These assessment protocols evolved out of range management science to assess the ability of ecosystems to perform essential ecosystem functions. For example, riparian health assessment techniques use a variety of biotic and abiotic measurements to determine the extent to which a riparian area is performing filtration, sediment trapping, biomass production, erosion control and groundwater recharge (Adams et al. 2005). Range health assessments measure the extent to which grasslands (tame or native) perform hydrologic functions, cycle nutrients, produce biomass and control erosion (Adams et al. 2005). These assessments are usually performed by a walk through assessment and ocular estimates of key site indicators. This is an efficient sampling method and is a good indicator of land management impacts on a site. Each indicator is given a score and scores are summed to give a total percent health. Dependent on the percent health sites are described as either: healthy, healthy with problems or unhealthy.

Many of the variables gathered in range and riparian assessments are good correlates of habitat structure for wildlife. For example, range condition (a component of range health) was found to be a predictor of habitat quality for grassland songbirds in Saskatchewan (Davis 2005). Warren (2004) found that range health was a good predictor of habitat quality for waterfowl in east central Alberta. In general, healthy rangeland and riparian areas will have tall structure, heavy cover and little bare ground. Unhealthy rangeland and riparian areas typically will have low habitat structure. It is important to note that wildlife species preference for high or low habitat structure is variable and it may desirable to have a variety of habitat structure on the landscape. For a more detailed discussion please see White (2007) in this volume.

A range health assessment technique does not exist for cropland so cropland habitat was classified as cereal, oilseed or summerfallow.

2.0 Methods

Forest, native grassland, lentic riparian areas (wetland) and lotic riparian areas (streams) were assessed by the health assessment methods developed by Saskatchewan PCAP

Greencover Committee (2008 a,b,c). Tame grasslands were assessed following Adams et al. (2005). Each of these methods involves making ocular estimates on 5-12 key indicator variables for the assessed area. Each key variable (e.g. percent human caused bare ground) is given a score out of a possible total. All scores are added and divided by the possible total to give a final percent range or riparian health. Variables assessed for each method are presented on sample data sheets in Appendix I. Each field assessment consisted of walking a wandering transect through the field to be assessed (usually a quarter section), then filling out the data sheet based on observations made. For tame and native grassland assessments, a transect of ten 0.25 m^2 quadrats at five meter intervals was used to supplement ocular estimates. In each quadrat, species percent biomass, litter biomass and bareground were recorded. Where multiple small wetlands or forest groves existed within a single field, all wetlands or groves were visited and then a single assessment filled out for the field.

To determine appropriate sample sizes for this project, an *a prioiri* power calculation was done on two independent data sets. Forty seven riparian assessments were gathered in 2004 giving an average riparian health of 63% and a standard deviation of 8%. A power calculation was made assuming that the 95% confidence intervals were to be plus or minus 5 %. The following formula was used for the calculation.

$N = [(1.96 \times S)/Error]^2$

N = the sample size required for the desired 95% confidence intervals
S = the standard deviation of the population
Error = the confidence interval desired plus or minus the mean

So for the riparian data set, a desired sample size of 10 assessments was calculated.

For the Lower Souris Watershed for a total of 45 tame and native grassland assessments were also available (unpublished data). Results were averaged and yielded an overall rangeland health of 65% and a standard deviation of 19. For this data set, a desired sample size of 55 was calculated. These data sets had different methodologies than used for the assessments in this project; however they provide an estimate of the relative sample size required for this project.

Actual assessments were performed by two contractors hired by the Lower Souris Watershed. Contractors attended three days of training in June 3-5, 2008. They spent two days in June calibrating ocular estimates and reviewing methods before conducting any assessments. Assessments were performed between June 15 and September 15. Each contractor has a target of provide 250 completed assessments (60 lotic, 60 lentic, 55 tame, 55 native, 20 forest). Half of each of the riparian and forest assessments were to be completed with an upland cropland use. Each contractor was provided with a list of 300 random land locations to select from and could perform one of each type of assessment on that quarter section and one adjacent quarter section. Data was entered into excel spreadsheets and a random 5% sample of data sheets were double checked for data entry errors. A total of 379 assessments were completed. Fewer assessments were completed

than targeted for by about 25%. The time required to complete each assessment was underestimated. However, more than enough assessments were completed to meet the calculated desired sample size.

3.0 Results

Om average, native grasslands and forest habitats are currently unhealthy while riparian areas (lentic and lotic) and tame grasslands are healthy with problems (Table 1).

Table 1: Summary of health assessments in the Lower Souris River Watershed 2008

Assessment type	Number of assessments	Average percent health
Native Grassland	62	33
Tame	78	73
Forest	42	39
Lotic	79	73
Lentic	118	75
	379	

3.1 Native grassland

Eighty-one percent of the native grasslands rated as unhealthy (Figure 1). This was mostly due to changes in species composition (score: 12/40), absent vegetation layers (score: 4/10) and reduced litter (score: 3/30). The changes in species composition are most likely due to the replacement of native species such as rough fescue (*Festuca campestris*) and green needle grass (*Stipa viridula*) by disturbance induced species such as Kentucky bluegrass (*Poa pratensis*). The absence of vegetation layers is mostly due to the absence of tall and mid height grasses. The average litter was only 224lbs/acre compared to the recommended level of 1000 lbs/acre for these types of grasslands. The results from the native grassland assessment therefore suggest that most of the native grassland habitat in the Lower Souris watershed is subject to overgrazing.

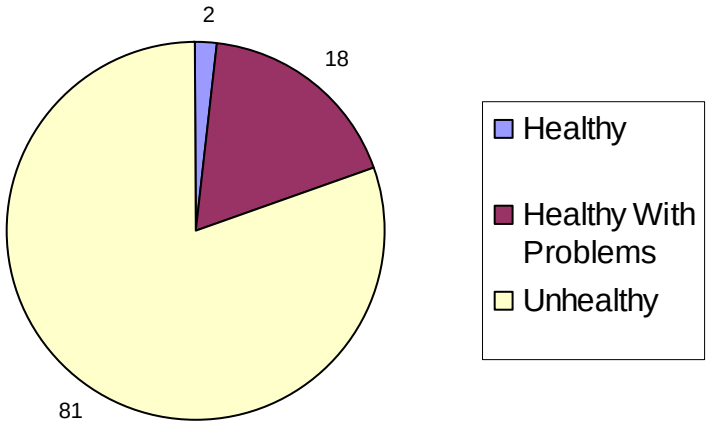

Figure1: Percent of native grassland health assessments that rated as healthy, healthy with problems or unhealthy in the Lower Souris River Watershed

3.2 Tame grassland

Tame grasslands health assessments were almost equally divided between healthy and healthy with problems with only a small number rated as unhealthy (Figure 2). The apparent health of tame grasslands is likely due to hayland and large acreages of recently seeded tame grasslands are present in the watershed. These tame grasslands have not been subjected to long term grazing pressure and therefore tend to be healthier. Where tame grasslands did loose scores was with litter load (7/15 points) and invasive weeds (3/6) points. Tame grasslands had an average load of 290 lbs/acre of a recommended 400 lbs/acre. This variable litter load likely correlates well with habitat structure. Overall, most of the tame grasslands in the Lower Souris watershed appear to be have tall or intermediate height structure.

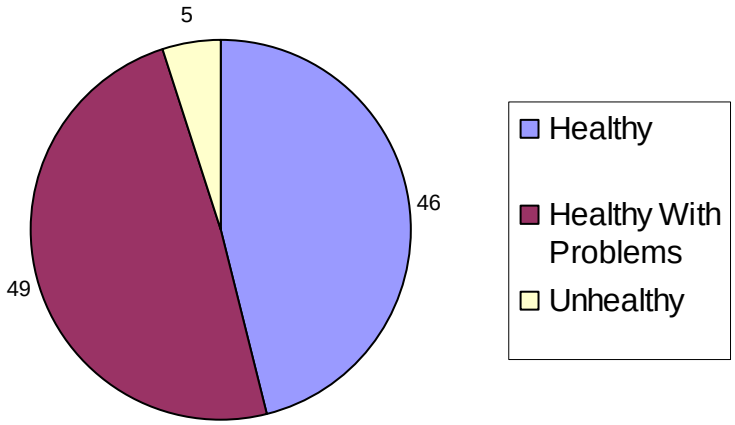

Figure 2: Percent of tame grassland health assessments that rated as healthy, healthy with problems or unhealthy in the Lower Souris River Watershed

3.3 Forest

The majority of forest assessments rated as unhealthy (Figure 3). Most of the points were lost in the forest assessment due to changes in species composition (12/40) and loss of structure (7/20). The change in species composition reflects a loss of native forbs species and the invasion of exotic grasses such as Kentucky bluegrass and smooth brome. These changes may or may not be due to grazing pressure. Change in structure reflects the loss of the tall shrub layer, which is likely due to grazing pressure. Overall forested area of the Lower Souris appear to have low structure.

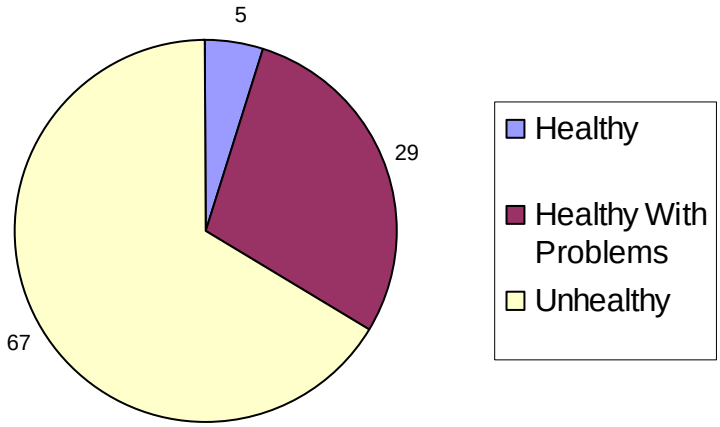

Figure 3: Percent of forest health assessments that rated as healthy, healthy with problems or unhealthy in the Lower Souris River Watershed

3.4 Riparian areas

Most of the lotic riparian areas assessed (62%) rated healthy with problems (Figure 4). No single factor was rated extremely low. However problem areas included invasive species, reduction in tall woody species and physical disturbance of the riparian area. The reduction of tall woody species would suggest that about one third of the lotic riparian areas have tall habitat structure and around two thirds has intermediate habitat structure.

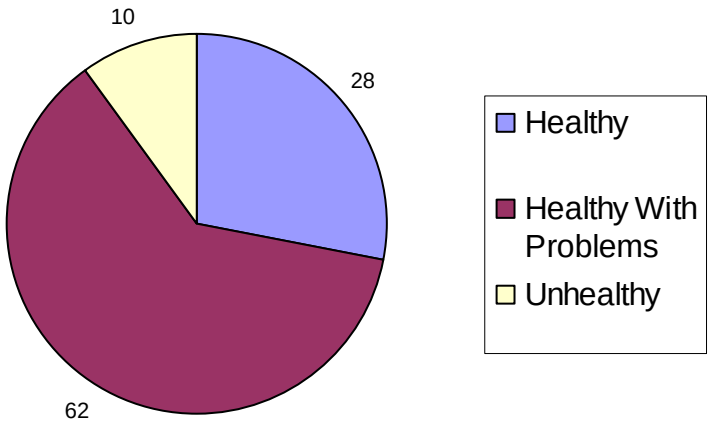

Figure 4: Percent of lotic riparian health assessments that rated as healthy, healthy with problems or unhealthy in the Lower Souris River Watershed

Forty one percent of lentic health assessments rated as healthy (Figure 5). Areas were points were lost include invasive species, reduction in woody species and physical disturbance. Similar to the lotic assessments the reduction of tall woody species would suggest that the lentic riparian areas have 40% tall habitat structure and around 40% intermediate habitat structure.

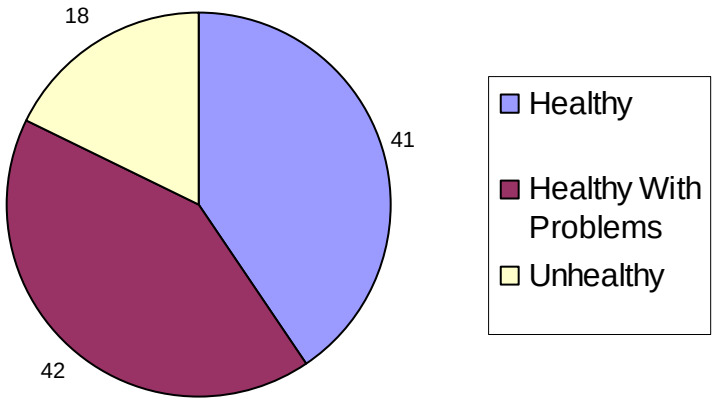

Figure 5: Percent of lentic riparian health assessments that rated as healthy, healthy with problems or unhealthy in the Lower Souris River Watershed

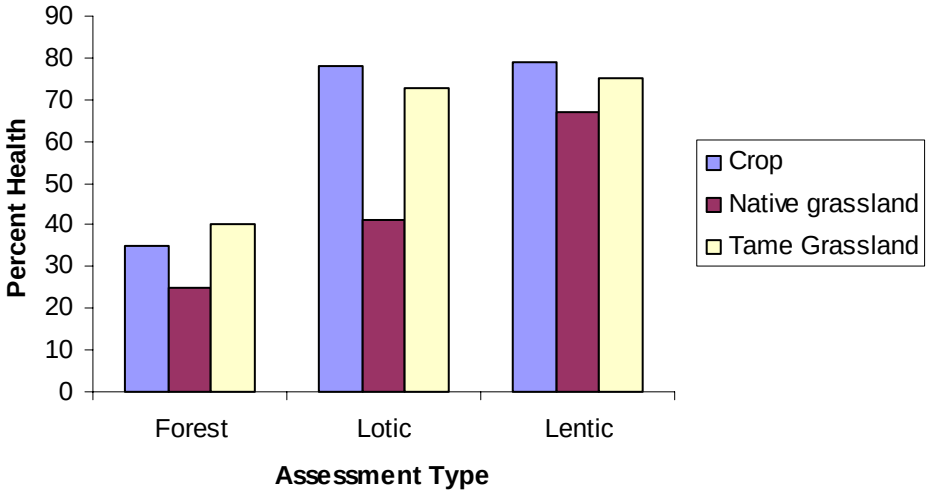

Figure 6: Average Percent health of forest, lotic riparian areas and lentic riparian areas surrounded by tame grassland, native grassland and cropland in the Lower Souris watershed.

Data was also collected on the upland habitat surrounding forest, lentic and lotic areas assessed. Figure 6 shows the percent health of these areas surrounded by cropland, tame grassland or native grassland. Riparian areas and forest tend to be in poorer health when surrounded by native grassland. This result is likely because native grasslands appear to be grazed heavily, the associated habitats are likely grazed hard as well.

3.5 Cropland

A total of 75 riparian assessments had cropland reported as upland (Figure 7). Most reported cereals as the upland habitat.

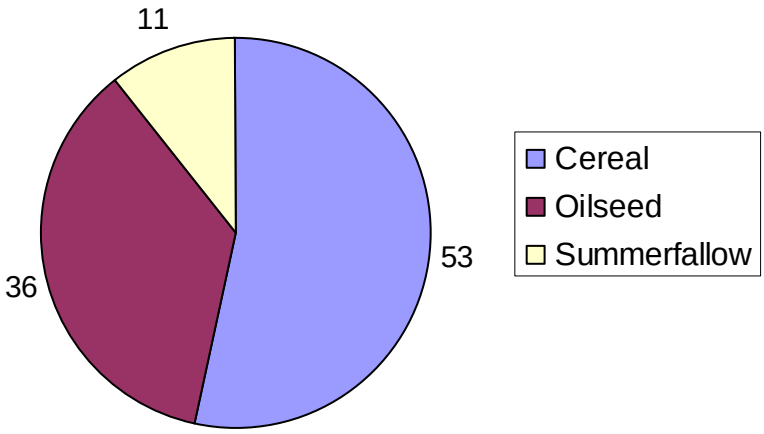

Figure 7: Percent of each cropland habitat types assessed in the Lower Souris River watershed

4.0 Conclusion

This information presented in this report when combined with the habitat inventory completed by Boychuk et al. (2008) will provide the basis for policy recommendations in the Lower Souris EGS project.

Literature Cited

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Appendix I – Sample Data Sheets for Completing Health Assessments

Saskatchewan Grassland Range Health Assessment – Field Worksheet

Plot _____ Observer _____ Date _____ Photo # _____

Legal Location _____

GPS Coordinates (NAD 83)

Latitude _____ Longitude _____ Easting _____ Northing _____

Ecoregion _____ Ecosite _____ Soil Map Unit _____

DOMINANT PLANT COMMUNITY SPECIES

Grasses & Grasslikes	Dry Weight (%)	Forbs	Dry Weight (%)	Shrubs	Cover (%)	Trees	Cover (%)

VEGETATION STATUS

Question 1. What is the **plant community?**		
Plant community composition closely resembles the reference plant community for the site and alteration of the plant community by disturbances is minimal. *Example: Dry Mixed Prairie, Loam Ecosite,* northern wheatgrass – needle-and-thread (Reference plant community).	40	
Compared to the reference plant community, the plant community shows minor alteration in plant species composition due to disturbances. Disturbance impact is light to moderate. *Example: Dry Mixed Prairie, Loam Ecosite,* Needle-and-thread - June Grass - Pasture Sage - blue grama.	30	
Compared to the reference plant community, the plant community shows moderate alteration due to disturbances. Disturbance impact on plant community composition is moderate to heavy. *Example: Dry Mixed Prairie, Loam Ecosite,* blue grama -needle-and-thread – sedge- western wheatgrass.	15	
Compared to the reference plant community, the plant community shows significant alterations due to disturbances. Disturbance impact is heavy to very heavy. Plants are mostly native. Some tall-growing, non-native plants may be present. *Example 1: Dry Mixed Prairie, Loam Ecosite, Blue grama – pasture sage – June grass Example 2: Kentucky bluegrass*	7	
Compared to the reference plant community, the plant community shows extreme to severe alterations due to disturbances. Disturbance impact is severe to very severe. Production is mostly from low-growing, non-native, disturbance induced plants. *Example: Dandelion – Plantain*	0	
	Score	
Question 2. Are the expected **vegetation layers** present?		
The life form layers closely resemble the reference plant community.	10	
Compared to the reference, 1 life form layer is absent or considerably reduced.	7	
Compared to the reference, 2 life form layers are absent or considerably reduced.	3	
Compared to the reference, 3 life form layers are absent or considerably reduced.	0	
	Score	
Question 3. Are **Invasive/Noxious species** present? **Y** or **N** Which species? _____		
Question 3.1 What is the **cover** of **Invasive/Noxious species?**		
No invasive/noxious species	5	
Invasive/noxious species present but less than 1% cover	3	
Invasive/noxious weeds present with a total canopy cover over 1%	0	
	Score	
Question 3.2 What is the **distribution** of **Invasive/Noxious species?**		
No invasive/noxious species on the site	5	
Invasive/noxious species are present at a low level (density distribution class 1)	3	
Invasive/noxious species are present at a moderate to high level (density distribution classes 2 to 13)	0	
	Score	
	(A) TOTAL SCORE FOR VEGETATION STATUS	

Saskatchewan Grassland Range Health Assessment

HYDROLOGIC FUNCTION & SOIL PROTECTION

Question 4.1 Is there more **soil erosion** than expected for this site? Y or N		
No signs of soil erosion or not beyond the natural extent* for the site *Note: see workbook for information on erosion features	10	
Some evidence of soil erosion	7	
Moderate amounts of soil erosion	3	
Extreme amounts of soil erosion	0	
	Score	
Question 4.2. Is there more **bare soil** than expected for this site? Y or N		
10% or less of exposed soil is human-caused	5	
Greater than 10 and up to 20% of exposed soil is human-caused	3	
Greater than 20 and up to 50% of exposed soil is human-caused.	2	
Greater than 50% of exposed soil is human-caused.	0	
Actual ____% less Expected ____% = _____% Human Caused **Club Moss _____%**	**Score**	
Question 5. Is the expected amount of **litter** present?		
Litter amounts are more or less uniform across site litter standing crop (lb./ac.) is in the range of 65 to 100% of expected amounts under moderate disturbance.	25	
Litter amounts are somewhat patchy across the site and litter standing crop (lb./ac.) is in the range of 35 to 65% of expected amounts under moderate disturbance.	13	
The distribution of litter is not uniform across the site. Litter standing crop (lb./ac.) is in the range of less than 35% of amounts expected under moderate disturbance.	0	
	Score	
(B) TOTAL SCORE FOR HYDROLOGIC FUNCTION & SOIL PROTECTION		

Range Health Scores

(A) Vegetation status (out of 60)

(B) Hydrologic function & soil protection (out of 40)

Overall score (out of 100)

Healthy 75%-100% — Healthy with Problems 50%-74% — Unhealthy < 50%

Class	Abundance of species in polygon	Distribution	Score
0	None		5
1	Rare		3
2	A few sporadically occurring individual plants		0
3	A single patch		
4	A single patch plus a few sporadically occurring plants		
5	Several sporadically occurring plants		
6	A single patch plus several sporadically occurring plants		
7	Several well-spaced patches		
8	A few patches plus several sporadically occurring plants		
9	Several well-spaced patches		
10	Continuous uniform occurrences of well-spaced plants		
11	Continuous occurrence of plants with a few gaps in distribution		
12	Continuous dense occurrence of plants		
13	Continuous occurence of plants		

NOTES:

Saskatchewan Forest Range Health Assessment – Indicator Method

Plot _____ Observer _____ Date _____ Photo # _____

Legal Location _____

GPS Coordinates (NAD 83)

Latitude _____ Longitude _____ Easting _____ Northing

Ecoregion _____ Ecosite _____ Soil Map Unit _____

Dom. Tree Species _____ Canopy Height _____ Crown Closure _____

DOMINANT PLANT SPECIES

Grasses & Grasslikes	Cover (%)	Forbs	Cover (%)	Shrubs	Cover (%)	Trees	Cover (%)

VEGETATION STATUS

Question 1. What is the plant community?		
Plant community resembles the reference community for the site. The full range of native species found in the reference community is present. Decreaser species (both shrubs and herbs) are abundant and vigorous. *Example*: aspen / low-bush cranberry / rose / tall forb	40	
Minor changes from the reference plant community. Decreaser species are less abundant or less vigorous than in the reference community, and there has been some increase in shorter or less palatable species. *Example*: aspen / rose / low-bush cranberry / low forb	30	
Moderate changes from the reference plant community. Decreaser species have been substantially reduced or eliminated, and replaced by shorter or less palatable species. Non-native species have increased in abundance. *Example*: aspen / rose / clover	15	
Significant changes from the reference plant community. Non-native species have become dominant, accompanied by unpalatable native species. *Example*: aspen / Kentucky blue grass / dandelion	0	
	Score	
Question 2. Are the expected vegetation layers present?		
All vegetation layers are present. The structure of the forest resembles the reference plant community.	20	
One vegetation layer is absent or significantly reduced (less than half of the cover in the reference community).	10	
Two vegetation layers are absent or significantly reduced (less than half of the cover in the reference community).	5	
Three vegetation layers are absent or significantly reduced (less than half of the cover in the reference community).	0	
	Score	
Question 3. Are invasive species present?		
No invasive species present.	10	
Invasive species present but cover less than 1%.	5	
Cover of invasive species more than 1%.	0	
	Score	
	(A) TOTAL SCORE FOR VEGETATION STATUS	

HYDROLOGIC FUNCTION AND SOIL PROTECTION

Question 4.1. Is there more soil erosion than expected for this site?		
No signs of soil erosion	5	
Some signs of soil erosion at small scale (e.g. small rills or occasional hoof-shearing)	3	
Signs of soil erosion at large scale (e.g. well-defined flow patterns or frequent trailing and hoof-shearing)	1	
Obvious signs of soil erosion at large scale, with movement of soil off the site	0	
	Score	

Question 4.2. Is there more bare soil than expected for this site?		
Less than 1% of area is bare soil that can be attributed to management impacts	10	
1% to 5% of area is bare soil that can be attributed to management impacts	7	
5% to 15% of area is bare soil that can be attributed to management impacts	3	
More than 15% of area is bare soil that can be attributed to management impacts	0	
	Score	

Question 5. How thick is the surface organic layer (LFH)?		
Thickness similar to ungrazed areas on the same site. Not compacted.	15	
Thickness reduced by 20-30% on moist sites, 30-40% on dry sites, compared to ungrazed areas on the same site. Somewhat compacted.	10	
Thickness reduced by 30-40% on moist sites, 40-50% on dry sites, compared to ungrazed areas on the same site. Compacted.	5	
Thickness reduced by >40% on moist sites, >50% on dry sites, compared to ungrazed areas on the same site. Very compacted.	0	
	Score	

(B) TOTAL SCORE FOR HYDROLOGIC FUNCTION & SOIL PROTECTION

RANGE HEALTH SCORE

(A) Vegetation status (out of 70)	
(B) Hydrologic function and soil protection (out of 30)	
Overall score (out of 100)	

75 – 100%	Healthy
50 – 74%	Healthy with problems
< 50%	Unhealthy

Major Decreaser Species

Decreaser herbs - forbs		page*	**Decreaser herbs - grasses**		page*
wild sarsaparilla	*Aralia nudicaulis*	196	awned wheat grass	*Agropyron trachycaulum*	260
showy aster	*Aster conspicuus*	183	slender wheat grass	*Agropyron subsecundum*	260
hawk's-beard	*Crepis* spp.		fringed brome grass	*Bromus ciliatus*	272
fairybells	*Disporum trachycarpum*	83	northern awnless brome	*Bromus pumpellianus*	273
fireweed	*Epilobium angustifolium*	149	marsh reed grass	*Calamagrostis canadensis*	265
cow-parsnip	*Heracleum lanatum*	153	northern reed grass	*Calamagrostis inexpansa*	264
cream-coloured vetchling	*Lathyrus ochroleucus*	141	tall sedges	*Carex spp.*	
purple peavine	*Lathyrus venosus*	140	Canada wild rye	*Elymus canadensis*	261
tall lungwort	*Mertensia paniculata*	201	hairy wild rye	*Elymus innovatus*	
spreading sweet-cicely	*Osmorhiza depauperata*	153	rough-leaved rice grass	*Oryzopsis asperifolia*	267
American vetch	*Vicia americana*	140	northern rice grass	*Oryzopsis pungens*	
			fowl blue grass	*Poa palustris*	271
			purple oat grass	*Schizachne purpurascens*	273

Decreaser shrubs					
saskatoon	*Amelanchier alnifolia*	56	choke cherry	*Prunus virginiana*	57
red-osier dogwood	*Cornus stolonifera*	54	low bush-cranberry	*Viburnum edule*	64
pin cherry	*Prunus pensylvanica*	57	high bush-cranberry	*Viburnum opulus*	65

*page number of photo and description in Johnson et al. (1995): *Plants of the Western Boreal Forest and Aspen Parkland*

RIPARIAN HEALTH ASSESSMENT - FIELD SHEET

Landowner/lessee:_____ Date:_____ Reach No:_____

Stream/River: _____

Site Description:_____

_____

		Scores or N/A	
		Actual	*Possible*
1. Vegetative Cover of Floodplain and Streambanks			
6 *4* *2* *0*		___	___
2. Invasive Plant Species			
3 *2* *1* *0*	(cover)	___	___
3 *2* *1* *0*	(density)	___	___
3. Disturbance-increaser Undesirable Herbaceous Species			
3 *2* *1* *0*		___	___
4. Preferred Tree and Shrub Establishment and Regeneration			
6 *4* *2* *0*		___	___
5. Utilization of Preferred Trees and Shrubs			
3 *2* *1* *0*		___	___
6. Standing Decadent and Dead Woody Material			
3 *2* *1* *0*		___	___
7. Streambank Root Mass Protection			
6 *4* *2* *0*		___	___
8. Human-Caused Bare Ground			
6 *4* *2* *0*		___	___
9. Streambank Structurally Altered by Human Activity			
6 *4* *2* *0*		___	___
10. Streambank Subject to Active Lateral Cutting (erosion)			
6 *4* *2* *0*		___	___
11. Reach Structurally Altered by Human Activity (excl. banks)			
3 *2* *1* *0*		___	___
12. Stream Channel Incisement (vertical stability)			
9 *6* *3* *0*		___	___
	TOTAL	___	___

Score out total	17	23	29	32	34	37	40	46	52
%	30	40	51	56	60	65	70	80	91
	← *Unhealthy* →				← *Healthy With Problems* →			← *Healthy* →	

RIPARIAN HEALTH ASSESSMENT - FIELD SHEET

Landowner/lessee:_____ Date: _____ Reach No.: _____

Wetland/Slough/Lake:_____

Site Description:_____

_____

	Scores or N/A	
	Actual	*Possible*
1. Vegetative Cover of Riparian Area		
6 4 2 0	____	____
2. Invasive Plant Species		
Canopy Cover		
3 2 1 0	____	____
Density Distribution		
3 2 1 0	____	____
3. Disturbance-Caused Undesirable Herbaceous Species		
3 2 1 0	____	____
4. Preferred Tree and Shrub Establishment and Regeneration		
6 4 2 0	____	____
5. Utilization of Preferred Trees and Shrubs		
3 2 1 0	____	____
6. Human Alteration of Riparian Area - Vegetation		
6 4 2 0	____	____
7. Human Alteration of Riparian Area - Physical		
12 8 4 0	____	____
8. Human-Caused Bare Ground		
6 4 2 0	____	____
9. Degree of Artificial Addition / Removal of Water		
9 6 3 0	____	____
TOTAL	____	____

Health Score = Total actual score / Total possible score = _____

%	0-59	60-79	80-100
	← Unhealthy →	← Healthy With Problems →	← Healthy →

Tame Pasture Health Questions

Question #1 *Do introduced forage species dominate the site?*

Major goals when developing tame pasture are to successfully establish and maintain a high proportion of introduced forage species. Introduced (i.e. seeded) forage species include seeded and volunteer species such as timothy, brome grasses, alfalfa, clovers, creeping red fescue, quack grass and Kentucky bluegrass.

If the site has 50% or greater cover from introduced species, answer question 1A. If the site has less than 50% cover from introduced species, answer question 1B. Use the percent cover examples on the back page as a guide.

Question #1A *Is this a tame pasture?*

Estimate the canopy cover (%) of all introduced species combined. Do not include the cover of any other plants such as native species, nuisance or noxious weeds and woody plants.

Score:
8 = 90% or greater cover is from introduced species
6 = between 75 - 89% cover is from introduced species
3 = 50-74% cover is from introduced forage species.

Question #1B *Is this a modified tame pasture?*

Estimate the canopy cover (%) of introduced species, and desirable native species that are considered complimentary forage. Desirable native species include peavine, vetch, hairy wild rye, marsh reed grass, native wheat grasses, Parry's oat grass, and rough fescue. Nuisance or noxious weeds, woody plants and undesirable native species that increase with disturbance or have poor forage value (e.g. strawberry, pussytoes and yarrow) are not included in this estimate.

Score:
6 = 75% or greater cover from desirable native species and introduced forage species
3 = 40 - 74% cover from desirable native species and introduced forage species
0 = less than 40% cover from desirable native species and introduced forage species

Question #2 *What kind of plants are on the site?*

Grazing and other disturbances can cause a reduction in desirable species and an increase in more grazing resistant species such as Kentucky bluegrass, quackgrass, creeping red fescue and white clover. Under continued long term disturbance (continuous heavy grazing, year after year) the cover of weedy or disturbance induced species can increase. Weedy species includes nuisance weeds such as dandelion, foxtail barley, hawk's beard, flixweed and mustards. Do not include noxious or restricted weeds. Disturbance induced species include strawberry, pussy toes, yarrow and rough hairgrass. Use the percent cover examples on the back page as a guide.

Score:

Tame Desirable Species 2.1
8 = 75% or greater cover from desirable species and minor amounts of grazing resistant species present. Shift in composition is light to moderate 4 = 40-74% cover from desirable species. Increase in grazing resistant species. Shift in composition is moderate to heavy 0 = less than 40% cover from desirable species. Grazing resistant species dominate. Shift in composition heavy to very heavy

Weedy Disturbance Species 2.2
8 = 25 % or less cover is from weedy or disturbance induced species
4 = 26-49% cover is from weedy or disturbance induced species
0 = 50% or greater cover is from weedy or disturbance induced species.


8


4


0

Tame Pasture Health Questions

Question #3 *Is the site covered by litter?*

Litter is plant residue left over from previous years' production. Litter protects the soil against wind and water erosion. It buffers against dry conditions by aiding moisture retention and reducing soil moisture loss. Litter also enhances forage production through water, mineral and nutrient cycling. This question is scored based on the amount and distribution of litter across the site. Litter amounts are estimated by hand-raking a 50 cm x 50cm (18 inch x 18 inch) plot. Use the litter examples on the back page as a guide.

Score:

15 = Litter is thick and distributed evenly; less than 5% of the site has reduced litter. Hand raking yields one handful of litter (≈450 lb/ac)
10 = Litter is patchy; 5-25% of the site has reduced litter. Hand raking yields 1/2 to 1 handful of litter (≈250 - 450 lb/ac)
5 = Litter is thin; 26-67% of the site has sparse or no litter. Hand raking yields 1/4 to 1/2 handful of litter (≈125 - 250 lb/ac)
0 = Litter is sparse or absent for the majority of the site (greater than 67%). Hand raking yields less than 1/4 handful of litter (less than 125 lb/ac)

Question #4 *Is there accelerated soil erosion?*

Soil loss is a serious concern since erosion tends to remove the most valuable fractions from the soil (silts, clays and organic matter). Vegetation and litter protects the soil surface from raindrop impact, detains overland flow, improves infiltration and permeability, and protects the soil surface from erosion. Depending on the species within a pasture seed mix and the development methods, some pastures will be expected to have more exposed soil. For example, pasture establishment with wide row spacings of tufted species will result in more exposed soil than pastures established by broadcasting with rhizomatous species. Bunch type pastures are dominated by tufted species like crested wheatgrass, meadow brome, orchard grass and timothy. Rhizomatous pastures are dominated by creeping rooted species such as smooth brome, creeping red fescue, reed canary grass and creeping-rooted varieties of alfalfa.

Score:

Erosion 4.1 6 = no evidence of soil movement 4 = some evidence of soil movement
2 = moderate amounts of soil movement 0 = extreme amounts of soil movement

Bare Soil 4.2 3 = 10% or less human caused bare soil for bunch type pasture or less than 5% for creeping rooted type pasture
2 = 11-20% human caused bare soil for bunch type pasture or less than 6 to 10% for creeping rooted pasture
1 = 21 to 49% human caused bare soil for bunch type pasture or 11 to 15% for creeping rooted pasture
0 = 50% or greater human caused bare soil for bunch type pasture or greater than 15% for creeping rooted pasture

Question #5 *Are noxious weeds present?*

Noxious weeds most often invade pasture where management practices have created bare soil and openings in the vegetation canopy. Effective grazing management strives to maintain plant vigor and maximum vegetation cover thereby reducing the potential for weed invasion. Use the percent cover examples and density distribution chart on the back page as a guide.

Score:

Canopy Cover 5.1 3 = No noxious weeds 2 = canopy cover less than 1 % 1 = canopy cover 1-15 % 0 = canopy cover greater than 15 %

Density Distribution 5.2 3 = no weeds 2 = class 1-3 1 = class 4-7 0 = class 8-12

Question #6 *Is woody regrowth present?*

Canopy cover and density distribution of tree and shrub species are used to determine whether the woody regrowth on the site is acting as a complimentary forage or a competing species. If the woody regrowth is competing with the forages on the site, some method of control and/or management changes should be considered. Use the percent cover examples and density distribution chart on the back page as a guide.

Score:

Canopy Cover 6.1 4 = canopy cover less than 5% 2 = canopy cover between 5 and 15 % 0 = canopy greater than 15 %

Density Distribution 6.2 2 = low density (classes 0-4) 1 = moderate density (classes 5-8) 0 = high density (classes 9-12)