

**The Sturgeon River
Riparian Health Assessment
Report, 2001**

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EXECUTIVE SUMMARY

A problem faced by conservation organisations wishing to conduct conservation, enhancement and protection programs in a geographical area is to determine the current state of habitat in the study area. The development of a riparian protection and enhancement program in the Alberta Conservation Association's Northern East Slopes (NES) region has resulted in the need to conduct assessments on priority streams. The Sturgeon River is one watercourse in the NES that was identified as a high priority. Results from a field assessment in the summer of 2001 will help prioritise habitat that needs to be protected, and habitat where enhancement techniques could be used.

The Sturgeon River is currently being affected by agricultural land use practices throughout most of the drainage. Agricultural land use will likely continue to be a major factor for years to come along the Sturgeon River due to the areas capability to support such practices.

Overall the banks were in good condition in the areas assessed along the Sturgeon River, however the riparian area was cleared of mature vegetation in many places and there was little recruitment of new trees to stabilise the banks as older trees die or are harvested. The areas of bank instability found along the Sturgeon River are largely associated with intensive livestock operations. The areas being impacted by other land use activities, such as cultivation, were not as severe as those impacted by cattle activity on the Sturgeon River, however there is still a lack of recruitment of rooted vegetation such as grasses and shrubs, which are primary successors. Improvement in grazing management practices and a reduction of other land-use activities along the river should result in greater biodiversity in affected areas and a healthier riparian area.

Results from the riparian health assessment identified some relatively intact habitat that should be protected, and also degraded habitat that could be enhanced. The first step that needs to occur in order to improve the health of the riparian area along the Sturgeon River are information and education initiatives aimed at promoting good stewardship practices and natural stream processes and function.

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Sheldon Kowalchuk also produced maps for the fieldwork, and the author conducted G.I.S. tasks to identify disturbance areas. The format for this report was taken from "Edson River Riparian Health Assessment Report, 2000" by Sheldon Kowalchuk and D'Arcy Campbell (Kowalchuk, 2000).

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1.0 INTRODUCTION

Through the Buck for Wildlife program, anglers have been actively involved with riparian habitat protection since 1973. The Alberta Conservation Association was established in 1997 and took over the Buck for Wildlife program at that time. Historically the main method of enhancing and protecting riparian areas was to construct fence along important watercourses for the purpose of excluding grazing and cultivation in these areas. A review of the Buck For Wildlife (BFW) Streambank Fencing Program was conducted in recent years and a new program was developed and named the Buck for Wildlife East Slopes Riparian Management Program (McLeod, 2000). Under the new program streams have been ranked according to their fisheries potential and a matrix has been developed to determine the amount of funding that would be available to conduct riparian enhancement projects on priority streams. The Sturgeon River has been identified as a high priority stream in the Northern East Slopes region, and in order to determine the current state of the riparian area along the river, a riparian health assessment was conducted. The assessment will help guide riparian protection and enhancement activities to areas of highest priority.

This document reports results obtained during an assessment that was conducted on the mainstem of the Sturgeon River during the spring and summer of 2001. The report will also be used to identify priority areas for possible enhancement projects, as well as areas that have relatively healthy riparian zones.

1.1 Project Purpose

- To assess the current health of the riparian area along the Sturgeon River in order to prioritise habitat protection and enhancement activities.
- Use the results from the assessment to determine high priority areas where the riparian areas are being impacted by human-induced landuse activities.
- Use the assessment as the basis for the beginning of raising awareness regarding riparian health and the importance of riparian areas in the Sturgeon River watershed.

Following the riparian health assessment on the Sturgeon River, other goals related to the implementation of projects are:

- To work with landowners to create on-the-ground projects that will be beneficial to the fish and wildlife resource.
- To pursue partnership opportunities with government agencies and agricultural organisations in the delivery of habitat enhancement projects.
- To raise the level of awareness regarding riparian areas in the watershed.

2.0 METHODS

2.1 Study Site

The location of the Sturgeon River watershed in relation to the rest of the province of Alberta is displayed in Figure 1. The Sturgeon River drainage is located entirely in the "White Zone", which is the settled portion, managed by Public Lands (Figure 2). The Sturgeon River watershed is located in the Foothills and Boreal Forest Natural Regions. Portions of the watershed lie in the Lower Foothills Subregion and the Dry Mixedwood Subregion.



Figure 1. Location of the Sturgeon River watershed in the province of Alberta.

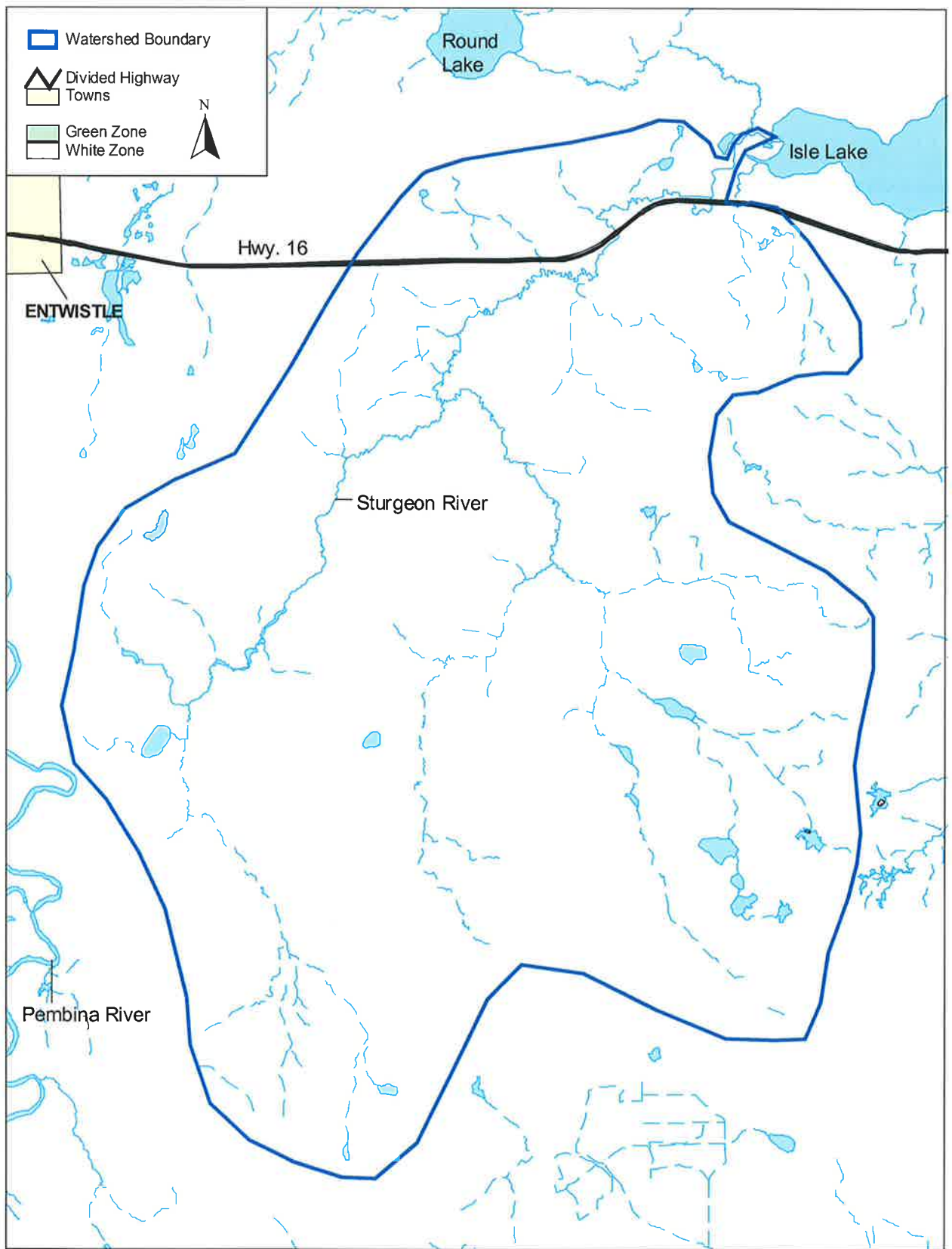


Figure 2. Map of the Sturgeon River watershed.

2.2 Site Selection

An assessment of the riparian area along the Sturgeon River was conducted due to the large amount of land use activities that are affecting the general health of the stream and its banks. The assessment was performed on the mainstem of the river and began at the mouth of the Sturgeon River, where it flows into Isle Lake, and proceeded upstream towards its headwaters. The assessment ended in township 52 and range 7, west of the fifth meridian where the river became too small to continue assessing it.

2.3 Survey Design

Prior to the fieldwork, quarter section maps were prepared using ArcView 3.1 software (ESRI, 2000) for the areas that were ground truthed. Two landowners were reluctant to grant access to their land for various reasons; therefore, not all of the river within the survey area could be assessed. The resulting five incomplete quarter sections are as follows: SW 28-53-6-W5M, NW 21-53-6-W5M, NE 20-53-6-W5M, NW 20-53-6-W5M, and SW 34-52-7-W5M.

The survey consisted of staff conducting a visual assessment of the streambanks along the Sturgeon River. ACA staff conducted the assessment by walking along the banks of the river, allowing the observer to make an assessment of both banks. When a new quarter section was encountered, a representative photo was taken at the upstream end, using either a digital or film based camera, to display what the land looked like at consistent and unbiased locations.

As biological staff observed banks that were unstable, they were marked on quarter section maps. A geographical location was also taken using a Garmin Type II Plus or a Garmin 12 XL GPS. Individual disturbance sites were recorded on field data sheets (Appendix 1). Disturbance sites were identified as sites that were impacted by human activities (i.e. unstable banks caused by grazing, logging, poor bridge crossings, lawns, etc.). A list of all disturbance sites identified along the Sturgeon River is located in Appendix 2 and a map of all the disturbance sites found on the Sturgeon River is located in Appendix 3. Photos of most disturbance sites were taken, and the reason for the disturbance was also recorded. On some quarter sections, where many disturbance sites occurred, photos were taken of a sub-sample of the disturbance sites

At the end of each quarter section, summary notes were compiled regarding the landuse activities, an estimated distance on how close the activities occurred from the channel's edge, the stability of the banks and the estimated pool/riffle/run ratio for the section of stream assessed.

The four different categories of bank stability were stable, slightly unstable, moderately unstable, and highly unstable. These different categories were defined by the following (Hvenegaard, 1998):

Stable: banks well vegetated or such that they are not susceptible to erosion.

Slightly Unstable: >50% of banks in section are stable, limited indication of silt contribution.

Moderately Unstable: <50% of banks in section are stable, some indications of silt.

Highly Unstable: massive bank slumping, large deposits of silt.

Following the completion of the field assessments, data was organised in the office. All photos were labelled and raw data sheets were organised in a binder. Disturbance sites were re-numbered beginning at the downstream end of the creek and proceeding upstream. Geographical Information System software (ArcView 3.2a) (ESRI, 2000) was used to place disturbance sites on a map for report preparation. A digital shapefile was created to identify the geographical location of the disturbance site, as well as the corresponding site number. The disturbance sites were placed in the appropriate location, by using both the UTM's obtained from the field, and the disturbance locations recorded on the maps to derive the correct location.

Appendix 4 includes, for all sections assessed in the Sturgeon River watershed, a map of the section surveyed with disturbance sites numbered, followed by summary reports for each quarter assessed within that section, followed by photos of disturbance sites found in that section.

All digital and hard copy data is stored on ACA computers in the Edson ACA office.

2.4 Data Interpretation

The assessment that occurred on the Sturgeon River in 2001 was designed to be a coarse filter; to determine which areas along the Sturgeon River were being impacted by human-induced activity. This assessment may provide fewer details than riparian health assessments conducted by other agencies, however it is less time consuming and less costly, and is useful in identifying areas of concern.

3.0 RESULTS AND DISCUSSION

The Sturgeon River is a watercourse that had many instances of degraded riparian habitat, due mainly to farms with cultivation or livestock impacts. A map showing all the quarter sections assessed and associated priority rankings is found in Figure 3.

Figure 3 shows all the quarter sections assessed on the Sturgeon River, beginning from SW 20-53-6-W5M to the last quarter assessed in SE 28-52-7-W5M. The map also displays the ranking assigned to each quarter section, from natural state to high priority, for every quarter section assessed. The range of disturbance sites used to rank the priority levels is specific to this drainage.

Overall the Sturgeon River appears to be in good shape with a few problem areas. Of the 19 quarter sections assessed, it was found that 6 were in a natural state (having 0 disturbances), 4 were ranked as low priority (having 1-2 disturbances), 6 were ranked as moderate priority (having 3-4 disturbances), and 3 were ranked as high priority (having 5-7 disturbances).

The quarter sections with the greatest number of disturbance sites were found mainly on land that was being impacted by livestock grazing and watering. The quarter sections with the least amount of disturbance sites were found on land that was in a natural state, undisturbed by human-induced activities. Such activities include cutting trees down to improve grazing conditions, haying to the waters edge, grazing and watering livestock, numerous bridge crossings, and littering in the creek. The numerous farms in the watershed have impacted the width of the riparian area along the Sturgeon River, which has contributed to a relatively low habitat value for fish and wildlife, due to a lack of forage for wildlife and increased siltation in the water, affecting fish populations.

The number of disturbance sites found in a particular quarter section will help determine the priority level for future streambank fencing projects. All disturbance sites identified in 2001 are displayed in Appendix 3 as well as on the Indian Resource Satellite (I.R.S.) imagery section maps in Appendix 4. The overall health of the riparian area on the Sturgeon River will most likely decrease due to the amount of agricultural activity along the river unless action is taken to control the degradation of the affected areas.

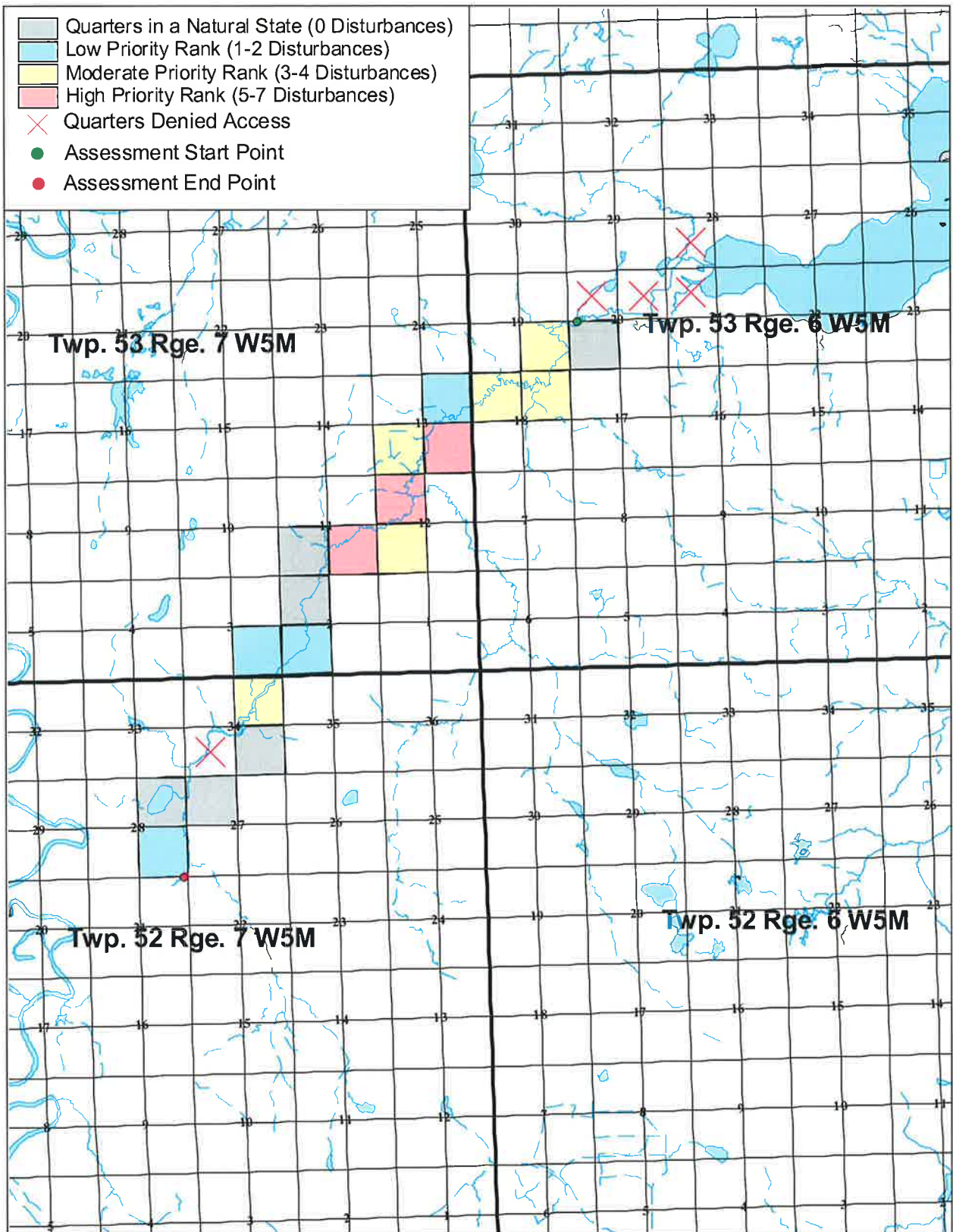


Figure 3. Map of ranked quarter sections along the Sturgeon River assessed in 2001.

3.1 Future Direction

An effort will be made to work with the landowners that currently have land-use activities that are compatible with the environment and display good land stewardship. The following is a listing of all of the quarter sections that were found to be in good condition.

Table 1. Quarter sections on the Sturgeon River in a natural state.

Quarter Sections along the Sturgeon River Found to be in a Natural State			
SW 20-53-6-W5M	SW 11-53-7-W5M	NW 2-53-7-W5M	SE 34-52-7-W5M
NW 27-52-7-W5M	NE 28-52-7-W5M		

Efforts will also be aimed at working with landowners that have unhealthy or degraded riparian areas. The following is a listing of all the quarter sections that contained disturbances. Quarter sections of low priority appear in blue, moderate in yellow, and high in red.

Table 2. Ranked quarter sections with disturbances on the Sturgeon River.

Quarter Sections along the Sturgeon River with Priority Ranked Disturbances			
NE 13-53-7-W5M	SW 2-53-7-W5M	SE 3-53-7-W5M	SW 28-52-7-W5M
SE 19-53-6-W5M	NE 18-53-6-W5M	NW 18-53-6-W5M	SW 13-53-7-W5M
SW 12-53-7-W5M	NE 34-52-7-W5M	SE 13-53-7-W5M	NW 12-53-7-W5M
SE 11-53-7-W5M			

Habitat securement agreements will be pursued with parties that are interested in protecting riparian areas as well as the surrounding upland habitat. Co-operator signs will be installed to promote the habitat stewardship program and recognise the contribution of the landowner towards the protection of fish and wildlife habitat.

In future years, gathering background information on water quality and fish populations in the watershed to help determine the current state of the river will be important. To continue holding information and education workshops for the public will also be an important task. Through these workshops, the landowners and general public within the Sturgeon River watershed would gain a better understanding regarding the importance of riparian areas and be shown how impacts from current land-use activities may be reduced with small, inexpensive actions. Information and education activities will raise the profile regarding good land stewardship and provide the public with a better understanding regarding the importance of these areas.

4.0 SUMMARY

The riparian assessment conducted on the Sturgeon River identified a number of land-use activities that were having a negative impact on the health of the land along the stream. The list of impacts on the riparian area includes agricultural activities (mainly cattle grazing and watering), landscaping, and bridge construction throughout the watershed. The results from the assessment were not all negative, as some quarter sections surveyed had riparian areas that were considered in excellent shape.

If any effort at improving the riparian health along the Sturgeon River is going to occur, information and education is going to be of utmost importance. Most importantly, the residents need to be aware of how streams function, the importance of riparian areas and how changes in existing activities can be made to improve the overall health of the Sturgeon River. Education efforts need to be targeted at landowners using riparian resources, so that they are aware of the impacts on the stream as well as ways of improving the health of the riparian area.

Recommendations following the riparian assessment on the Sturgeon River and this report are to continue riparian information and education efforts in the Sturgeon River watershed area, and to work with landowners to protect critical habitats.

5.0 LITERATURE CITED

- ESRI (Environmental Systems Research Institute, Inc.). 2000. The Geographic Information System for Everyone, Version 3.2a for Windows. Redlands, California.
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APPENDICES

Appendix 1.

Riparian Assessment Data Form Used on the Sturgeon River

2001 Riparian Health Assessment Data Sheet

Date: _____ Stream: _____
 Surveyor: _____ Legal Description: _____
 Vegetation Type: _____ Stage: _____
 Landuse: _____ Buildings: _____
 Siltation: _____

Site	Easting	Northing	Photo No.	Photo Description	Reason for Instability	Comments

Is there cultivation/haying: _____ Stable: _____ Pool: _____
 grazing/logging: _____ Slightly Unstable: _____ Riffle: _____
 How far from streambank: _____ Moderately Unstable: _____ Run: _____
 Highly Unstable: _____

Comments: _____

Appendix 2.

Details of Disturbance Sites Identified during the Riparian Health Assessment along the Sturgeon River

Sturgeon River Human Disturbance Site Location and Description

Site #	Legal Land Description	Easting	Northing	Bank	Reason For Instability	Comments
1	SE 19-53-6-W5M	641470	5940234	LUB	logging	tree removal
2	SE 19-53-6-W5M	641391	5939942	LUB	livestock	exposed bank
3	SE 19-53-6-W5M	641461	5939893	RUB	road	tree removal
4	NE 18-53-6-W5M	641060	5939287	RUB	landscaping	tree removal
5	NE 18-53-6-W5M	641000	5939326	LUB	haying	insufficient buffer zone
6	NE 18-53-6-W5M	640976	5939266	RUB	trail	tree removal
7	NE 18-53-6-W5M	640904	5939144	RUB	trail	tree removal
8	NW 18-53-6-W5M	640192	5939134	RUB	cattle	sediment input
9	NW 18-53-6-W5M	640098	5938937	RUB	livestock	sediment input
10	NW 18-53-6-W5M	640055	5938952	RUB	livestock	sediment input
11	NE 13-53-7-W5M	639779	5938845	RUB	watering area	cattle watering area
12	NE 13-53-7-W5M	639632	5938752	RUB	cattle	sediment input
13	SE 13-53-7-W5M	639292	5938440	LUB	grazing	sediment input
14	SE 13-53-7-W5M	639245	5938435	RUB	cultivation	sediment input
15	SE 13-53-7-W5M	639242	5938374	LUB	cattle	deteriorating bank
16	SE 13-53-7-W5M	639199	5938343	RUB	cattle	deteriorating bank
17	SE 13-53-7-W5M	639227	5938271	RUB	watering area	cattle watering area
18	SE 13-53-7-W5M	639172	5938138	RUB	watering area	deteriorating bank
19	SE 13-53-7-W5M	639171	5938081	RUB	watering area	sediment input
20	SW 13-53-7-W5M	639153	5938117	LUB	watering area	sediment input
21	SW 13-53-7-W5M	639119	5938020	RUB	grazing	sediment input
22	SW 13-53-7-W5M	639078	5937968	LUB	grazing	slumping bank
23	SW 13-53-7-W5M	639091	5937847	LUB	cultivation	sediment input
24	NW 12-53-7-W5M	638880	5937567	LUB	cattle	slumping bank
25	NW 12-53-7-W5M	638972	5937346	both*	crossing	cattle crossing
26	NW 12-53-7-W5M	638977	5937243	LUB	watering area	sediment input
27	NW 12-53-7-W5M	638880	5937134	RUB	livestock	sediment input
28	NW 12-53-7-W5M	638816	5937115	RUB	cattle	eroding bank
29	NW 12-53-7-W5M	638592	5937015	RUB	watering area	cattle watering area
30	SW 12-53-7-W5M	638529	5936945	RUB	watering area	cattle watering area
31	SW 12-53-7-W5M	638478	5936918	RUB	livestock	bank slumping
32	SW 12-53-7-W5M	638403	5936893	RUB	crossing	livestock crossing
33	SE 11-53-7-W5M	638208	5936904	LUB	livestock	sediment input
34	SE 11-53-7-W5M	638130	5936896	LUB	livestock	sediment input
35	SE 11-53-7-W5M	638113	5936889	LUB	watering area	livestock watering area
36	SE 11-53-7-W5M	638042	5936812	LUB	livestock	sediment input
37	SE 11-53-7-W5M	637836	5936658	both*	watering area	livestock watering area
38	SE 11-53-7-W5M	637668	5936612	both*	crossing	livestock crossing
39	SW 2-53-7-W5M	637200	5934929	RUB	haying	bank slumping
40	SW 2-53-7-W5M	636977	5934776	RUB	landscaping	grass mowed to river
41	SE 3-53-7-W5M	636736	5934517	RUB	livestock	sediment input
42	NE 34-52-7-W5M	636699	5934407	LUB	bridge	exposed bank
43	NE 34-52-7-W5M	636533	5934270	RUB	watering area	cattle track impact
44	NE 34-52-7-W5M	636276	5933892	RUB	watering area	cattle track impact

* Both right upper bank and left upper bank affected.

Appendix 2. Cont'd.

Site #	Legal Land Description	Easting	Northing	Bank	Reason For Instability	Comments
45	SE 28-52-7-W5M	635262	5931599	both*	road	tree removal
46	SE 28-52-7-W5M	635263	5931382	both*	road	tree removal

* Both right upper bank and left upper bank affected.

Appendix 3.

Map of the Sturgeon River Watershed with Disturbance Sites found in
2001

Appendix 3. Map of the Sturgeon River watershed with disturbance sites found in 2001.

