



Common Concepts behind the Measurements

What are the Key Pieces?

Riparian health evaluation knits together physical (soils and hydrology) and vegetation features, because no one factor or characteristic provides a complete picture of site health or trend in health. These evaluations rely heavily on vegetation characteristics because many vegetation features integrate the effects of soil and hydrologic factors which form and operate in riparian areas. Plants are more visible than soil or hydrologic characteristics. They may provide an early indication of riparian health, help you see the past history of use and help you to understand the successional trend on the site.

There is a close relationship between physical and vegetation features. Riparian reaches with significant changes in hydrology and soil will show changes in plant community structure and potential. Changes in vegetation, the “glue” of riparian systems, may have a rebounding effect on hydrology and soils as well.



How Much is There?

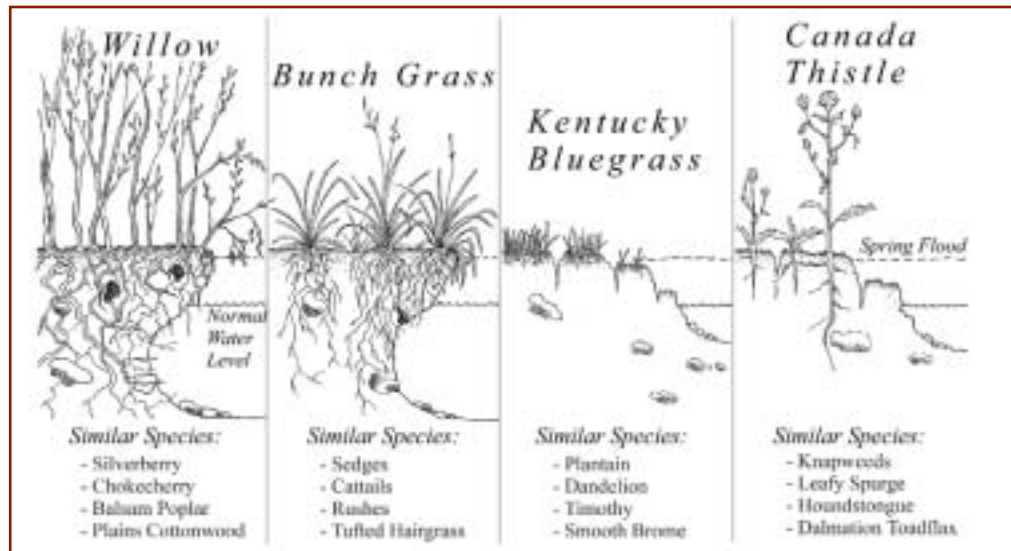
Many of the measurements deal with the element of “coverage”, that is, how much of the riparian area measured is covered, influenced or affected by vegetation or structural changes. The categories are usually expressed in percentages of the reach area. For example, in the illustration below, weeds cover about 3% of the riparian reach. Of the total canopy cover of trees, 16% is composed of seedlings or saplings. These measurements allow you to assign a score.





What's there and is it the right stuff?

The types of plants on the riparian area provide insight into health, so plant identification is important. Plants provide an indication of trend toward or away from the potential of the site (what the site could be). Coverage of native plants, woody species, weeds and disturbance-caused species provide clues to trends and to management influences. Utilization rates of some plants (e.g. woody species) that are key to riparian function provide clues to the ability of these plants to persist. The type of plants present is also an indicator of their effectiveness in performing several key functions like binding banks and shorelines together against the forces of erosion.



What is the right stuff? Willow and bunch grasses provide deep, binding root mass, while Kentucky bluegrass and Canada thistle do not.

A Guide to the Right Riparian Stuff

Vegetation Type

Riparian System	Vegetation Type						
	Trees	Preferred Shrubs	Other Shrubs	Native Grasses Forbs	Introduced Grass	Disturbance Species	Weeds
Large River	E	G	P	P	P	P	P
Small River	E	E/G	F/P	F/P	P	P	P
Large Stream	E	E	F	F	P	P	P
Small Stream	E	E	G	G	P	P	P
Intermittent Stream	E	E	E	E	G/F	P	P
Lake	E	E	G	G/F	P	P	P
Wetlands	E	E	E	E	F/P	P	P

Legend:

E=Excellent - these species have all the necessary properties of deep, binding and large root mass appropriate to riparian type or size.

G=Good - species meet most of the requirements for holding bank and shore materials together.

F=Fair - plants have marginal ability to perform stabilizing function.

P=Poor - vegetation unable to hold banks or shore together under normal circumstances.

Trees - e.g. cottonwoods, aspen, conifers, birch.

Preferred Shrubs - e.g. willows, saskatoon, dogwood, alder, silverberry, chokecherry.

Other Shrubs - e.g. rose, snowberry (buckbrush), shrubby cinquefoil.

Native Grasses, Forbs - e.g. sedges, cattails, tufted hairgrass, other bunch grasses and sod-forming grasses.

Introduced Grasses - e.g. Kentucky blue grass, timothy, smooth brome.

Disturbance Species - e.g. common dandelion, stinkweed, foxtail barley, plantains.

Weed Species - e.g. knapweeds, Canada thistle, leafy spurge.



How much have we changed things?

Riparian health can often be linked directly to current management or the effects of previous management. The degree to which banks and shorelines have been structurally altered or their vegetation has been changed or modified is an important measure. Because water is the driver of riparian systems, determining the degree of flow or level manipulation is important.



Shoreline or fence line contrasts help us understand that changes have happened to riparian areas. Both are measures of how much we have changed the vegetation or structurally altered the bank or shore.



What ruler do we use for measurement?

Most of the characteristics rated in health evaluation are based on measurements using your eyes and your judgment. The eye is a remarkable measuring device. It may seem imprecise, but with training and practice, the methods are repeatable and reasonably accurate. Extreme precision is not the goal for health evaluation since it is not an attempt to determine an absolute value, but rather, a broad impression of riparian condition.





How do the measurements link to health?

Riparian health reflects the ability of the site to perform eight basic ecological functions. The characteristics we measure help us understand the potential of the site to perform these functions and the degree to which the functions may be impaired.

In more detailed health evaluation, beyond the checklists, each characteristic measured has a range of values that translate into the site's potential to perform several functions. The breaks between the values indicate significant differences, or changes in potential. These were arrived at with expert review and opinion; the breaks represent inflections or thresholds significant enough to indicate change. The characteristics are weighted differently; this indicates that all of the characteristics do not contribute equally to ecological function. This weighting system reflects the relative importance of the characteristic, the influence or relationship to other characteristics and the significance of a characteristic to an ecological function or functions. Some characteristics, like the ability of a stream to access it's floodplain, are the foundation. Without them, most, or all other functions could not occur.



This riparian area is "healthy, with problems". Can you identify the missing pieces?

Measurement

	<i>Function</i>							
	Trap Sediment	Bind Banks	Store Water	Recharge Aquifer	Filter/Buffer	Dissipate Energy	Biodiversity	Primary Productivity
Vegetation cover	✓	✓	✓	✓	✓	✓	✓	✓
Weeds	✗	✗	-	-	-	✗	✗	✗
Disturbance Species	-	✗	-	-	-	✗	✗	✗
Woody regeneration	✓	✓	✓	✓	✓	✓	✓	✓
Wood utilization	-	✗	-	-	✗	✗	✗	✗
Dead wood	-	✗	-	-	-	✗	✗	✗
Deep roots	✓	✓	✓	✓	✓	✓	-	-
Bare ground	✗	✗	-	✗	✗	✗	✗	✗
Compaction	-	✗	-	✗	-	-	-	✗
Site alteration	✗	✗	✗	✗	✗	✗	✗	✗
Floodplain accessible	✓	✓	✓	✓	✓	✓	✓	✓
Water manipulation	✗	✗	✗	✗	✗	✗	✗	✗

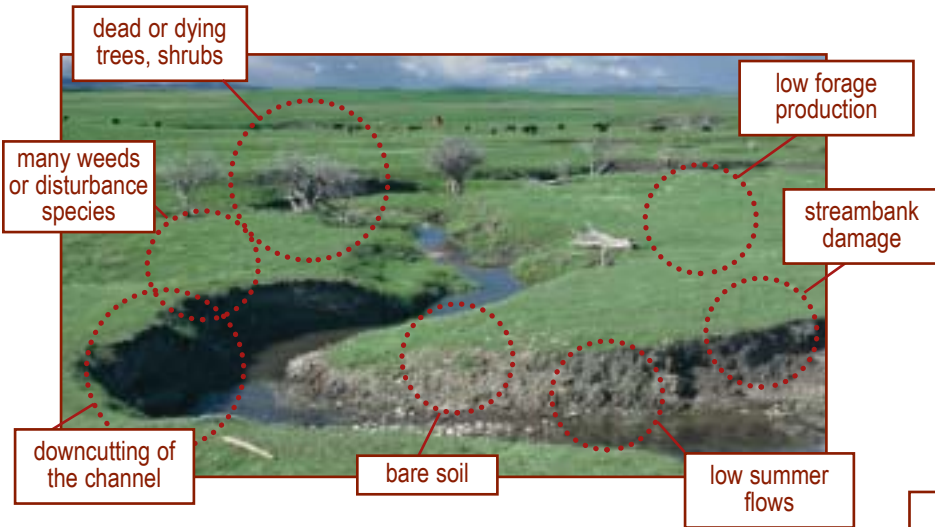
- ✓ major role in performing this function
- ✗ major impact on, or impairment of this function
- minor effect or impact



How do I check the health of my riparian area?

You may have already observed several things on a riparian area with which you are familiar. Some of these observations may concern you.

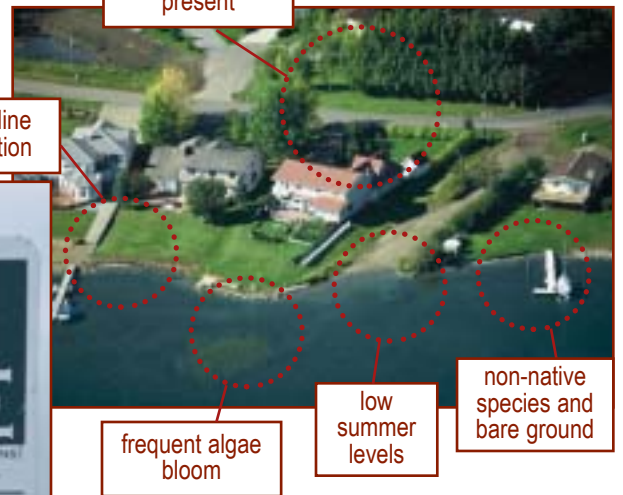
These could be signs that riparian health is declining



Getting an aerial perspective is a good start to checking riparian health. It provides insights on how much change has occurred. The Alberta Conservation Association has developed a videography tool to help lakeshore owners gain an aerial perspective of riparian areas.



Fish are a good measure of riparian health because they rely on riparian areas for habitat, water quality and maintaining streamflows and lake levels. If fish populations are in decline, riparian health might be one of the issues to resolve.



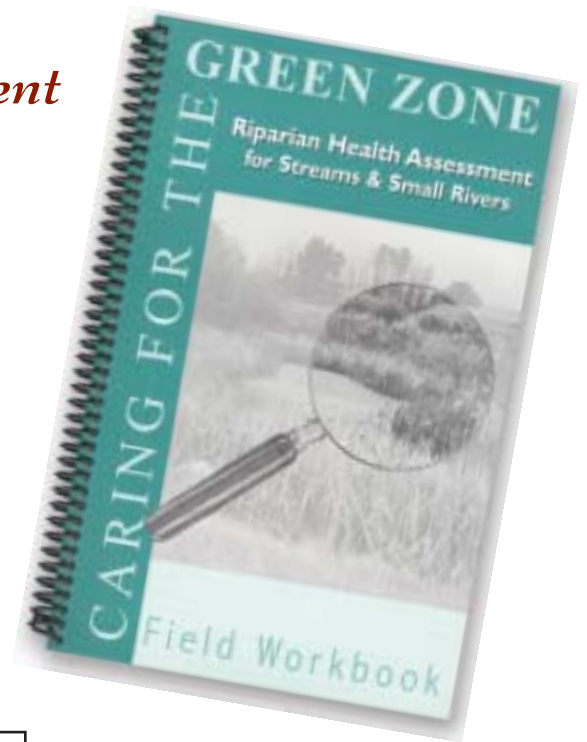
Riparian Health Checklist

To find out if your concerns are valid, first determine what type of riparian area you have. Are you on a river, a stream, a wetland or a lake? You could start with a simple checklist. If you are concerned about a lake or wetland, use our Lakeshore Riparian Health Checklist (Looking at My Lakeshore Fact Sheet); if it is a stream or river, use our Streambank Riparian Health Checklist (Looking at My Streambank Fact Sheet). Checklists help you understand if some of the symptoms are present that indicate declines in riparian health. Checklists don't measure health, but give you a clue as to issues and concerns. A checklist will help you determine if there are enough concerns to go to the next level of health evaluation.



Riparian Health Assessment

Riparian health assessment puts your initial observations into a format that allows you to understand the significance of your concerns and to measure the condition of the riparian area against a standard. This is what your doctor does when you have a checkup. Nine to sixteen measurements make up a riparian health assessment. These measurements relate to the ability of the riparian area to perform key ecological functions that translate into health. Riparian health assessment is a survey that landowners, resource managers and others can use to quickly check the health status of an area. Field workbooks and field forms are available for riparian health assessments of streams and small rivers, lakes and wetlands, and large rivers.



RIPARIAN HEALTH ASSESSMENT - FIELD SHEET				
Landowner/lessee: _____		Date: _____		Reach No.: _____
Stream/River: _____				
Site Description: _____				
				Scores of 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. Pudding, Hummocking and/or Rutting				
3	2	1	0	_____
11. Stream Channel Incisement (vertical stability)				
9	6	3	0	_____
TOTAL				_____

this one is for Streams and Small Rivers

some questions may not apply

possible scores are the maximum available for each question

actual scores are those you measure

a description is provided of what is measured and how to measure it on other pages

your observations will allow you to assign a score

different questions are weighted differently based on the relative contribution to health

add up the individual scores and compare to the possible score



Riparian Health Inventory

Riparian health inventory is an in-depth measurement of riparian health. Inventories are conducted by resource specialists with extensive training and knowledge of riparian systems. Approximately 80 parameters are measured to provide a comprehensive and detailed evaluation of riparian health. These detailed measurements are used to determine watershed condition, aid in preparation of management plans and provide a tool for monitoring. A summary of an inventory may be provided in the same format as the field sheet of a riparian health assessment.



Riparian Health Training

Interested in more information on how to do these measurements? You might consider taking in a riparian awareness presentation. It will help you understand riparian areas better and allow you to use a checklist, to start you down the road. That's getting your feet wet! Wading into it will require some training in riparian health assessment. You will learn the basics of evaluating the riparian health of a stream, river, wetland or lake. With the knowledge from a workshop and some experience from field training you will be able to apply riparian health assessment procedure on your own place. Community groups, municipalities, counties and watershed groups will find these workshops useful in understanding the procedures of riparian health assessment and in interpreting the results of watershed level riparian health inventories. Detailed riparian health inventories require significant levels of training, plus a background in vegetation identification and other aspects of riparian landscapes. Diving into that level is a serious commitment! The Riparian Health Training Fact Sheet is a good place to start to determine the level that is right for you.



Take a Picture!

One of the best things you can do to help see the trend in riparian health is take a picture and follow-up with photographs in subsequent years. Combined with health evaluations, it will give you a visual reminder of where you began and where you are now. Make sure there is a visible landmark in the photograph, and remember to take the photograph from the same place at approximately the same time of year.



In 1995 this reach of stream had some significant riparian health issues, but management changes were underway, including the establishment of this photo point.



By 2000, some recovery has occurred, in terms of fewer weeds and regeneration of balsam poplars.



What do the riparian health scores tell me?

You've worked it out on your own, or you have the results in front of you. You can see the scores for each measurement on the field sheet. At the bottom is a percentage based on your actual score and the total possible score. What does it all mean?

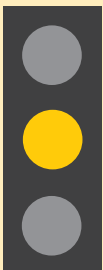
Functions Performed



A health score of 80% or greater means the reach has scored in the top category called **“healthy”**. This tells you that all riparian functions are being performed and the reach exhibits a high level of riparian condition. Healthy, functioning riparian areas are resilient, stable and provide a long list of benefits and values.



- Trap sediment ✓
- Build and maintain banks ✓
- Store flood water and energy ✓
- Recharge the aquifer ✓
- Filter and buffer water ✓
- Reduce and dissipate energy ✓
- Maintain biodiversity ✓
- Create primary productivity ✓



A health score from 60 to 79% puts the reach in the **“healthy, with problems”** category. Many riparian functions are still being performed, but some signs of stress are apparent. The reach may not be as capable of rebounding from floods and use, it may be vulnerable to erosion and some of the potential of the riparian area has been lost. This is like an amber warning light indicating there could be problems ahead and management changes should be considered. At the same time, with effective management changes, a return to a healthier condition is within your grasp.



- Trap sediment ?
- Build and maintain banks ?
- Store flood water and energy ✓
- Recharge the aquifer ✓
- Filter and buffer water ?
- Reduce and dissipate energy X
- Maintain biodiversity ?
- Create primary productivity ✓



A health score of less than 60% means the reach is in the **“unhealthy”** category. Most riparian functions are severely impaired or have been lost. The reach has lost most of its resiliency, stability is compromised and much of the potential of the riparian area has been sacrificed. At this point, red lights are flashing and we need to stop and reflect on current management. Immediate changes are necessary to keep the reach from declining further and to begin the process of healing and restoration.



- Trap sediment X
- Build and maintain banks X
- Store flood water and energy X
- Recharge the aquifer ?
- Filter and buffer water X
- Reduce and dissipate energy X
- Maintain biodiversity X
- Create primary productivity X