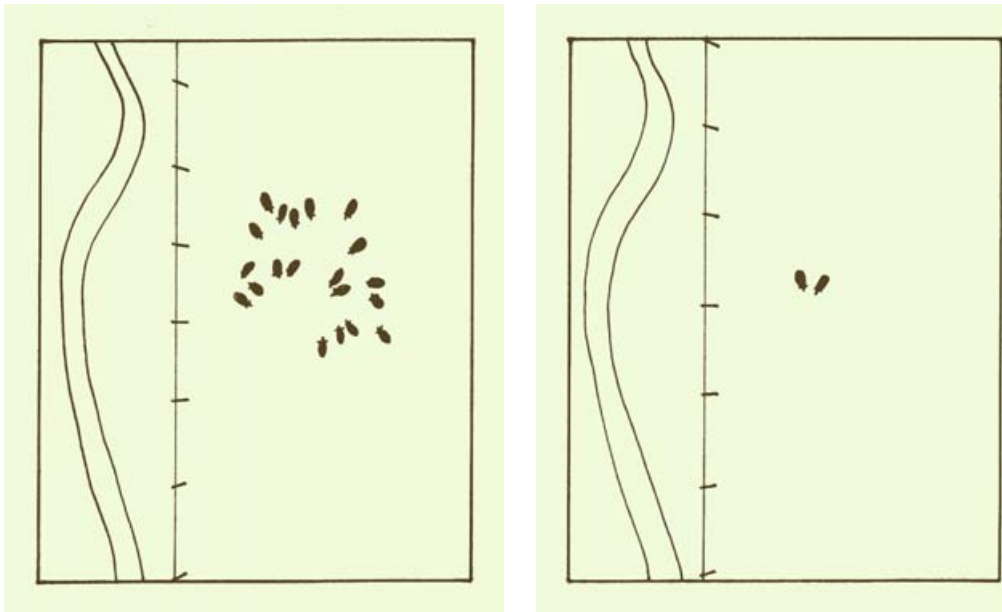


STEP 3. CONDUCT A RISK ASSESSMENT (FOR EXTENSIVELY PASTURED RIPARIAN AREAS)



Stocking rate is considered the most significant factor in streamside grazing management. Overgrazing in high-density pastures leads to poor pasture condition and environmental damage.

The risk assessment examines the environmental risks related to the sensitivity of the area, the condition of its features, and the management practices in place.

Generally, the risk is greater with livestock density. **If the density is greater than or equal to 1 NU/ac/yr, it is considered high-density** and is more commonly associated with livestock holding areas, dry lots and exercise yards (i.e., for dairy). At this density, most pastures could not be sustained and feed has to be imported. Furthermore, deposited manure and runoff from these intensive areas would have to be managed to reduce the risk of impact on adjacent surface and ground waters.

The risk assessment discussed here is for streamside grazing, **where the density is less than 1 NU/ac/yr**, and therefore considered low-density (extensive) grazing.

The rationale for choosing actions in this category is as follows:

- ▶ if the problem is severe, it's considered the same as intensive and should be managed the same
- ▶ if the problem is moderate, then use BMPs to get a benefit similar to exclusion
- ▶ if the problem is minor, then choose BMPs to address critical areas or key functions of interest.

In high-density pastured areas, livestock access to watercourses/riparian areas must be restricted. In most cases, a permanent fence is best!





Severe

If your overall score exceeds 60, then your grazing situation is high risk and must exclude livestock from the watercourse.



Moderate

If you score 40–60, you must plan and act. Start by identifying where you got the poorest marks – site features, management, etc. If it was management, plan and follow through on a few changes. This may be enough to improve your situation and your risk category.



Minor/Low Risk

For a low score, a few changes (e.g., to timing and feeding, or graze and rest techniques) may be sufficient.

A risk/site assessment is the best way to determine the nature and extent of problems. The next step is to demonstrate how the problem would be addressed. The Grazing Management Plan (GMP), to follow, will help you respond to an on-site assessment with clearly defined steps that integrate production targets with environmental goals and practicality.

A risk assessment helps you understand how risky a situation is and why it's risky. It's a great tool to help you plan suitable BMPs. This risk assessment has several dimensions:

- ▶ management risks – characteristics you can control, e.g., water source, grazing practices
- ▶ off-site problems – to address concerns about downstream or nearby users of the same resource, e.g., downstream fisheries, waterfowl habitat area
- ▶ impact – evidence of problems, e.g., bank damage.

In the risk assessment for low-density grazing (see next page), these dimensions are grouped and ranked from low risk to very high risk. Each cell in the box has a description of features that help determine risk level. Each risk level has an associated score or risk. The higher the score, the greater the risk.



Where the impact of streamside grazing is minimal, an alternative water source may be sufficient.

Some surface waters are important habitat areas. Graziers should monitor these areas more regularly for impact.



Site conditions such as bank stability are key diagnostic tools.



“The risk assessment was not difficult to complete and provided a good indication of the areas that needed to be improved.

“In little more time than it took to walk along the streambank, the assessment sheet provided an excellent guide to identify the areas that were a potential environmental risk.”

– Ian McKillop, beef producer, southwestern Ontario, and President, Ontario Cattlemen’s Association

RISK ASSESSMENT CATEGORY	LOW RISK	MEDIUM RISK	HIGH RISK	VERY HIGH RISK
MANAGEMENT PRACTICE				
A. GRAZING DENSITY AND DURATION (pg. 78)	<p>2</p> <ul style="list-style-type: none"> • Low density (≤ 0.25 NU/ac/yr) OR • Moderate density with integrated GMP 	<p>4</p> <ul style="list-style-type: none"> • Moderate density (0.25–0.5 NU/ac/yr) OR • High density with integrated GMP 	<p>7</p> <ul style="list-style-type: none"> • High density (0.5–1.0 NU/ac/yr) OR • Very high density with integrated GMP 	<p>10</p> <ul style="list-style-type: none"> • Very high density (>1.0 NU/ac/yr)
B. SEASON (OR CONDITIONS) OF ACCESS TO RIPARIAN AREA (pg. 79)	<p>2</p> <ul style="list-style-type: none"> • No access OR • Controlled access in summer 	<p>4</p> <ul style="list-style-type: none"> • Unrestricted access in summer only 	<p>7</p> <ul style="list-style-type: none"> • Unrestricted access in spring or fall 	<p>10</p> <ul style="list-style-type: none"> • Unrestricted year long access
C. LIVESTOCK ACCESS AND CROSSINGS (pg. 80)	<p>0</p> <ul style="list-style-type: none"> • Exclusion with fencing • No crossings 	<p>4</p> <ul style="list-style-type: none"> • Part of pasture fenced OR • Controlled access plus bank protection • Bridge or mid-level crossings plus fencing 	<p>7</p> <ul style="list-style-type: none"> • Non-fencing options to control access OR • Controlled access – no bank protection OR • Bed-level crossing 	<p>10</p> <ul style="list-style-type: none"> • Unrestricted access • Numerous random crossings
D. LOCATION OF SUPPLEMENTS, SALT, SHELTER (pg. 81)	<p>2</p> <ul style="list-style-type: none"> • All items located >50 m from top of bank 	<p>4</p> <ul style="list-style-type: none"> • All items located 20–50 m from top of bank 	<p>7</p> <ul style="list-style-type: none"> • Any of these items located 5–20 m from top of bank 	<p>10</p> <ul style="list-style-type: none"> • Any one of these items located within 5 m from top of bank
E. LOCATION AND SOURCE OF WATER (pg. 82)	<p>2</p> <ul style="list-style-type: none"> • Alternative water located >50 m from surface water 	<p>4</p> <ul style="list-style-type: none"> • Alternative water located 10–50 m away OR • Controlled access plus bed and bank protection 	<p>7</p> <ul style="list-style-type: none"> • Water provided using controlled access without bank or bed protection • Alternative water located <10 m away 	<p>10</p> <ul style="list-style-type: none"> • No alternative water source in grazed riparian area

RISK ASSESSMENT CATEGORY	LOW RISK	MEDIUM RISK	HIGH RISK	VERY HIGH RISK
SENSITIVITY OF RIPARIAN AREA				
F. TYPE OF SURFACE WATER (pg. 83)	2 <ul style="list-style-type: none"> Rivers >30 m wide Lakes with bedrock or coarse-textured shores 	3 <ul style="list-style-type: none"> Rivers <30 m wide Drainage ditches Channelized creeks Other warm-water channels 	4 <ul style="list-style-type: none"> Cool- and cold-water streams Flowing water with shallow to bedrock riparian areas 	5 <ul style="list-style-type: none"> Wetlands, natural ponds, reservoirs, sink holes, recharge areas
G. HABITAT DESIGNATION (pg. 83)	2 <ul style="list-style-type: none"> Low-level importance 	3 <ul style="list-style-type: none"> Habitat with moderate level of importance – such as habitat for provincially common and/or widespread species Migration corridors 	4 <ul style="list-style-type: none"> Very important habitat – such as areas adjacent to species-at-risk critical habitat, habitat for species of special concern, or habitat for provincially rare species, or habitat used by specially protected wildlife listed under Fish and Wildlife Conservation Act 	5 <ul style="list-style-type: none"> Life Science ANSI Designated fishery Critical habitat for threatened and endangered species Wetlands
H. SOURCE FOR DRINKING WATER (pg. 84)	2 <ul style="list-style-type: none"> Downstream urban intake >10 km 	3 <ul style="list-style-type: none"> Downstream urban intake 2–10 km 	4 <ul style="list-style-type: none"> Downstream urban intake 1–2 km 	5 <ul style="list-style-type: none"> Downstream urban intake <1 km
I. RECREATIONAL USE (pg. 85)	2 <ul style="list-style-type: none"> Downstream recreational use >10 km 	3 <ul style="list-style-type: none"> Downstream recreational use 2–10 km 	4 <ul style="list-style-type: none"> Downstream recreational use 1–2 km 	5 <ul style="list-style-type: none"> Downstream recreational use <1 km
J. IMPACT ON BANK CONDITION (pg. 86)	2 <ul style="list-style-type: none"> Banks are stable Banks are vegetated Tree roots hold soil material in place No sloughing from hoof damage 	4 <ul style="list-style-type: none"> Banks are mostly vegetated and stable Some woody plants hold soils in place Some evidence of damage and sloughing from hooves 	7 <ul style="list-style-type: none"> Banks showing signs of instability Bank vegetation heavily grazed Little evidence of soils held by plant roots Noticeable (>25% of area) evidence of sloughing from hooves 	10 <ul style="list-style-type: none"> Banks highly unstable Bank vegetation nearly grazed out and trampled No evidence of soils held by roots Most of the banks slumping due to hoof action
Total Score:				

Low Risk: <20 points
 Moderate Risk: 20–39 points
 High Risk: 40–60 points
 Very High Risk: >60 points

MANAGEMENT PRACTICES

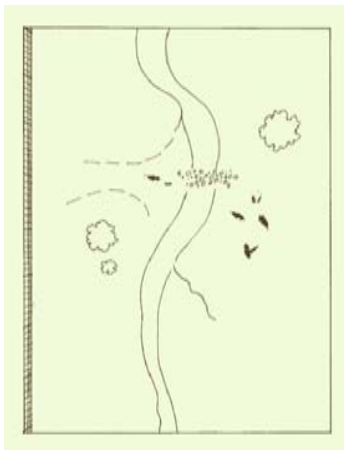
A. Grazing duration and intensity for riparian area

LOW RISK	MODERATE RISK	HIGH RISK	VERY HIGH RISK
2	4	7	10
<ul style="list-style-type: none"> • Low density (≤ 0.25 NU/ac/yr) OR • Moderate density with integrated GMP 	<ul style="list-style-type: none"> • Moderate density (0.25–0.5 NU/ac/yr) OR • High density with integrated GMP 	<ul style="list-style-type: none"> • High density (0.5–1.0 NU/ac/yr) OR • Very high density with integrated GMP 	<ul style="list-style-type: none"> • Very high density (>1.0 NU/ac/yr)

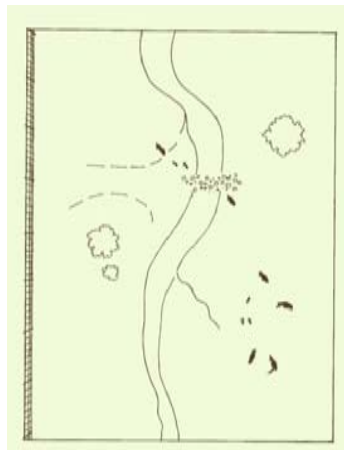
TYPE OF LIVESTOCK	<0.25 NU/AC/YR	0.26–0.50 NU/AC/YR	0.51–1.00 NU/AC/YR	> 1.00 NU/AC/YR
BEEF COW (1 PAIR /NU)	<ul style="list-style-type: none"> • 1 cow/calf pair/ac for less than 3 months 	<ul style="list-style-type: none"> • 1 cow/calf pair/ac for <6 months OR • 2 pair/ac for <3 months 	<ul style="list-style-type: none"> • 1.0 cow/calf pair for 12 months OR • 1–2 cow/calf pairs for 6 months 	<ul style="list-style-type: none"> • >1.0 cow/calf pair for 12 months OR • >2 cow/calf pairs for 6 months
BEEF STOCKER (2.0 HEAD/ NU)	<ul style="list-style-type: none"> • <2 head for 3 months 	<ul style="list-style-type: none"> • 1 head/ac for 12 months OR • 1–2 head for 6 months 	<ul style="list-style-type: none"> • 1–2 head/ac for 12 months OR • 3–4 head for 6 months 	<ul style="list-style-type: none"> • >2 head for 12 months OR • >4 head for 6 months
SHEEP (8.0 EWES/NU – INCLUDING LAMBS, REPLACEMENTS, RAMS)	<ul style="list-style-type: none"> • <2 ewes (+ lambs) for 12 months OR • <4 ewes for 6 months/ac 	<ul style="list-style-type: none"> • 2–3 ewes (+ lambs) for 12 months OR • >4–7 ewes for 6 months/ac 	<ul style="list-style-type: none"> • 4–8 ewes (+ lambs) for 12 months OR • >8–16 ewes for 6 months/ac 	<ul style="list-style-type: none"> • >8 ewes (+ lambs) for 12 months OR • >16 ewes for 6 months/ac
HORSE (MEDIUM-SIZED + UNWEANED FOAL) (2.0 HEAD/ NU)	<ul style="list-style-type: none"> • <2 head for 6 months 	<ul style="list-style-type: none"> • 1 head/ac for 12 months OR • 2–3 head for 6 months 	<ul style="list-style-type: none"> • 1–2 head/ac for 12 months OR • 3–4 head for 6 months 	<ul style="list-style-type: none"> • >2 head for 12 months OR • >4 head for 6 months
DAIRY COW	<ul style="list-style-type: none"> • 1 cow/ac for <3 months 	<ul style="list-style-type: none"> • 1 cow/ac for <6 months OR • 2 cows/ac for <3 months 	<ul style="list-style-type: none"> • 1 cow for 12 months OR • 1–2 cows for 6 months 	<ul style="list-style-type: none"> • 1–2 cows for 12 months OR • 2–3 cows for 6 months

B. Season of access (or conditions) to riparian area

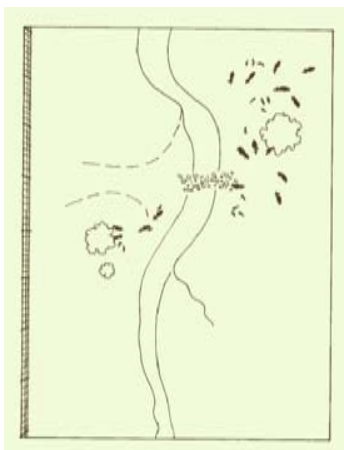
LOW RISK	MODERATE RISK	HIGH RISK	VERY HIGH RISK
2	4	7	10
<ul style="list-style-type: none"> • No access or OR • Controlled access in summer 	<ul style="list-style-type: none"> • Unrestricted access in summer only 	<ul style="list-style-type: none"> • Unrestricted access in spring, summer and fall 	<ul style="list-style-type: none"> • Unrestricted year-long access



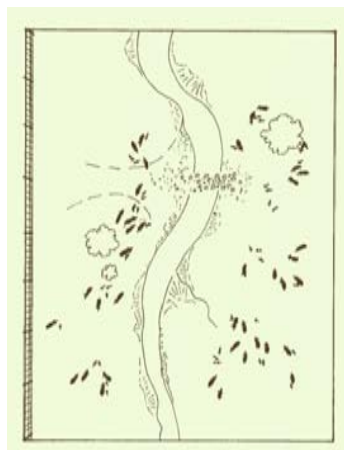
Density rating: Low



Density rating: Moderate



Density rating: High



Density rating: Very high

Unrestricted access in summer only is considered a moderate risk.



Unrestricted access all season long poses a very high risk. Excluding livestock from riparian areas during late winter and early spring lowers the risk of soil compaction and runoff.

Sheep and goats are an exception. They won't go in water.

Implications

Livestock tend to congregate in preferred locations to access shade, palatable forage and surface water. When livestock have access throughout the year, the pasture forage species and site conditions have little time to recover. Poor pasture cover and compaction of soils and banks are common when access is unrestricted.

When livestock are allowed access in spring or fall, there is a higher risk of compaction, as soils are often saturated in riparian areas. In early spring, new forage vegetation will have difficulty recovering from intensive grazing. In fall, intensive grazing will reduce over-wintering for some pasture species.

Carefully managed, summer access to streamside pasture will have minimal impact on forage cover and site conditions.

C. Livestock access and crossings			
LOW RISK	MODERATE RISK	HIGH RISK	VERY HIGH RISK
2	4	7	10
<ul style="list-style-type: none"> • Exclusion with fencing • No crossings 	<ul style="list-style-type: none"> • Part of pasture fenced OR • Controlled access + bank protection OR • Bridge or mid-level crossings plus fencing 	<ul style="list-style-type: none"> • Non-fencing options to control access OR • Controlled access – no bank protection OR • Bed-level crossing 	<ul style="list-style-type: none"> • Unrestricted access • Numerous random crossings



Controlled access is considered a moderate risk.



Unrestricted access is considered a very high risk.



Bed-level crossings require permanent fencing to be effective.

Implications

In unmanaged streamside pastures, the greater the access, the higher the risk of bank damage and direct contamination.

Where pasture exists on both sides of a stream or drain, the impact on the riparian area is related to the type of crossing and the duration of access.

A fenced crossing limits the area and duration of access. Mid-level and bridge crossings virtually eliminate access for livestock crossings.

Crossings without fencing – using deflecting boulders, shrubs or natural features such as old ravines or cuts in the bank – can be reasonable approaches to managing access to localize impact.

D. Location of feed, salt and shelters – constructed shelters

LOW RISK

2

- All items located >50 m from top of bank

MODERATE RISK

4

- All items located 20–50 m from top of bank

HIGH RISK

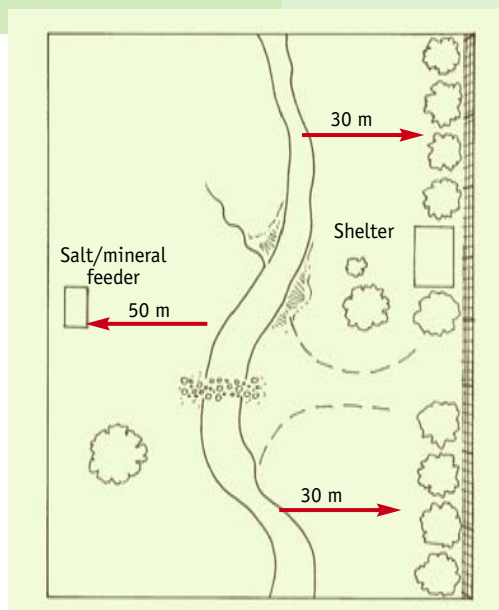
7

- Any of these items located 5–20 m from top of bank

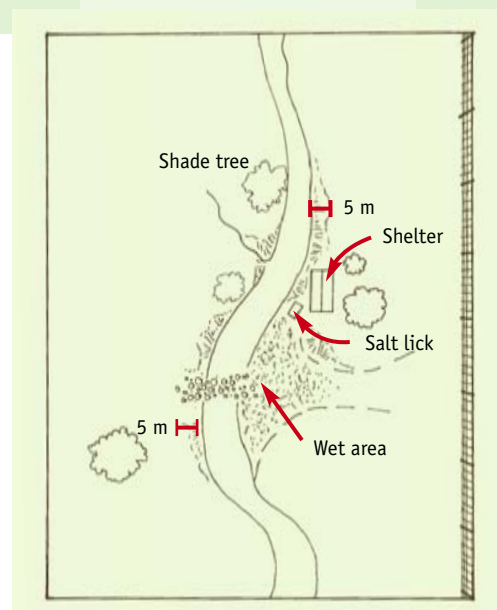
VERY HIGH RISK

10

- Any of these items located within 5 m from top of bank



Livestock tend to congregate around salt, feed and shelter stations. Locating these shelters 20–50 metres (65–164 ft) from the top of a bank/shore is considered a moderate risk.



Locating feed, salt or shade shelters within 5 metres (16 ft) of the top of a bank is considered a very high risk.

Implications

Livestock grazing in riparian areas are attracted to the lush forage, shade, shelter and drinking water found in most streamside pasture areas. Access problems are most often related to animal behaviour. For example, bank instability may be most intense near the preferred access points for drinking water.

Livestock behaviour can be managed by relocating livestock needs away from sensitive areas. By providing alternative water, livestock can be lured to places that are more accessible and provide similar or greater satisfaction.

Grazier research and observation suggest that the impact can be cumulative. So, if alternative water and a salt source are located near shade, away from surface water, access is minimized.

E. Location and source of water

LOW RISK

2

- Alternative water located >50 m from surface water

MODERATE RISK

4

- Alternative water located 10–50 m away OR
- Controlled access plus bed and bank protection

HIGH RISK

7

- Water provided using controlled access without bank or bed protection
- Alternative water located <10 m away

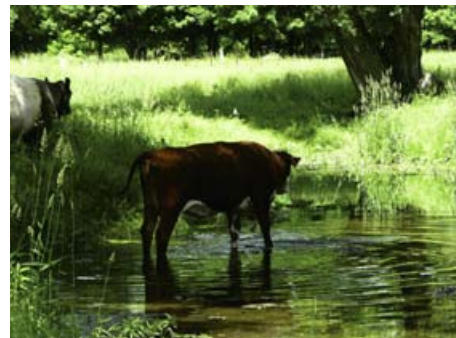
VERY HIGH RISK

10

- No alternative water source in grazed riparian area



Alternative water located 10–50 metres (33–164 ft) from surface water is considered a moderate risk.



If no alternative water source is provided, livestock will regularly access surface water.

For descriptions of alternative water systems, please see pages 58–59.

SENSITIVITY OF RIPARIAN AREA

F. Type of surface water

LOW RISK	MODERATE RISK	HIGH RISK	VERY HIGH RISK
2	3	4	5
<ul style="list-style-type: none"> • Rivers >30 m wide • Lakes with bedrock or coarse-textured shores 	<ul style="list-style-type: none"> • Rivers <30 m wide • Drainage ditches • Channelized creeks • Other warm-water channels 	<ul style="list-style-type: none"> • Cool- and cold-water streams • Flowing water with shallow to bedrock riparian areas 	<ul style="list-style-type: none"> • Wetlands, natural ponds, reservoirs, sinkholes, recharge areas

Implications

Lower-order streams or smaller bodies of surface water are at greater risk of damage from grazing livestock. It's more likely that livestock numbers will be concentrated in a small area, and opportunities for dilution will be fewer.

Contact your local office of the Ministry of Natural Resources or Conservation Authority to determine whether there is any special designation on your property.



Wetlands and ponds are very sensitive to continual access.



Livestock access poses a greater risk to cold-water streams.

G. Habitat designation

LOW RISK	MODERATE RISK	HIGH RISK	VERY HIGH RISK
2	3	4	5
<ul style="list-style-type: none"> • Low level of importance 	<ul style="list-style-type: none"> • Habitat with moderate level of importance – such as habitat for provincially common and/or widespread species • Migration corridors 	<ul style="list-style-type: none"> • Very important habitat – such as areas adjacent to species-at-risk critical habitat, habitat for species of special concern, or habitat for provincially rare species, or habitat used by specially protected wildlife listed under Fish and Wildlife Conservation Act 	<ul style="list-style-type: none"> • Life Science ANSI • Designated fishery • Critical habitat for threatened and endangered species • Wetlands

For further information, contact your local Conservation Authority or office of the Ministry of Natural Resources.



Rivers designated as fisheries are important habitat and are very sensitive to land uses near them.



Although they're not natural habitat, municipal drains can be moderately important fish habitat.

H. Source for drinking water

LOW RISK

MODERATE RISK

HIGH RISK

VERY HIGH RISK

2

- Downstream urban intake >10 km

3

- Downstream urban intake 2–10 km

4

- Downstream urban intake 1–2 km

5

- Downstream urban intake <1 km

Pastures near water intakes for municipal drinking water pose a high potential risk if less than 1 km upstream.



Implications

Municipalities taking surface water to treat as urban drinking water are obviously very concerned with its quality. Water taken from polluted sources will contain natural and human-activity-generated chemical, physical and biological contaminants.

Physical contaminants can be screened out. Chemical contaminants can be treated. Most biological contaminants – bacteria and larger pathogens – require chlorination and filtering, respectively, for removal. But recent events are a reminder that no treatment system is risk-free. One of the key concerns is the transmission of waterborne pathogens from livestock to people.

Not all pathogens are persistent. Many are susceptible to the impact of dilution, exposure and distance traveled. Pathogen populations diminish substantially with distance from source to point of water-taking.

I. Recreational use (e.g., beaches, town docks, swimming holes)

LOW RISK	MODERATE RISK	HIGH RISK	VERY HIGH RISK
2	3	4	5
<ul style="list-style-type: none"> Downstream recreational use >10 km 	<ul style="list-style-type: none"> Downstream recreational use 2–10 km 	<ul style="list-style-type: none"> Downstream recreational use 1–2 km 	<ul style="list-style-type: none"> Downstream recreational use <1 km

Surface waters are a shared resource. Recreation is a legitimate use of rural Ontario waterways.

**Implications**

Livestock access can lead to the addition of manure nutrients, pathogens and sediment to surface waters.

As discussed on pg. 84, not all pollutants are persistent. They are subject to the forces of dilution, exposure, natural treatment and absorption. The impact of these forces increases with distance traveled from source to point of recreational water use.

Manure-based nutrients can encourage excessive plant and algal growth – reducing the quality of recreational use. Waterborne pathogens can also reduce the quality of swimming/recreation use areas.

J. Bank condition

LOW RISK

2

- Banks are stable
- Banks are vegetated
- Tree roots hold soil material in place
- No sloughing from hoof damage



Best bank condition: cross-section of channel is cup-shaped; no slumping or sloughing.

MODERATE RISK

4

- Banks are mostly vegetated and stable
- Some woody plants hold soils in place
- Some evidence of damage and sloughing from hooves



Good bank condition: cross-section of channel almost cup-shaped; minimal slumping or sloughing.

HIGH RISK

7

- Banks showing signs of instability
- Bank vegetation present but heavily grazed
- Little evidence of soils held by plant roots
- Noticeable (>25% of area) evidence of sloughing from hooves



Fair bank condition: heavily grazed to overgrazed; noticeable areas of slumping and hoof damage.

VERY HIGH RISK

10

- Banks highly unstable
- Bank vegetation nearly grazed out and trampled
- No evidence of soils held by roots
- Most of the banks slumping due to hoof action



Poor bank condition: overgrazed; obvious slumping and sloughing.

“The risk assessment worksheet is an eye opener for a producer to help look for possible problems he or she would never realize existed. When walking the stream-banks, one can then assess the current conditions and start thinking about immediate improvements and further corrective actions.”

– Klaus Wand, beef producer, Parry Sound District

Implications

Natural channels form stable banks. When natural watercourses are forming, sinuous channels are shaped from the surrounding geological material. The banks are relatively stable because they are held in place by the dense rooting of streamside vegetation networks.

Banks become unstable when this natural vegetative cover is removed by land clearing and grazing. They lose the natural “gabion-basket” effect provided by tree and shrub roots.

Grazed streamside areas support mostly grassed vegetation. Grasses provide fibrous rooting which, if healthy, will provide adequate bank support.

Grazing frequency and compaction will weaken the vegetation, the rooting system and the stability of the soil. Bank instability increases with grazing density and damage, which makes it one of the most reliable indicators for the overall health of streamside pastures.