

INTRODUCTION

Grazing livestock successfully is all about management. You strive for the best production on the hoof, while sustaining pasture quality and minimizing environmental impact.

Grazing livestock on pastures near water presents particular challenges.

Driving along county roads, you've probably seen the best and the worst when it comes to livestock access to streambanks and other riparian areas. On one side of the road, a modest number of cattle graze in the floodplain of a small creek. The pasture looks green, the banks stable and the water clear.

But on the other side, livestock are in an exercise yard with bare soil, and have free access to the same creek. The impact is obvious.

A key message of this book is that grazing riparian areas can be beneficial when properly planned and managed. This book will help you develop a workable plan that balances production and environmental goals for riparian pastures.



**There are only two choices
for streamside grazing:
exclude or manage!**

**Developing a grazing management plan or GMP
will result in a streamside grazing system that's
tailor-made to your operation.**

The GMP process involves:

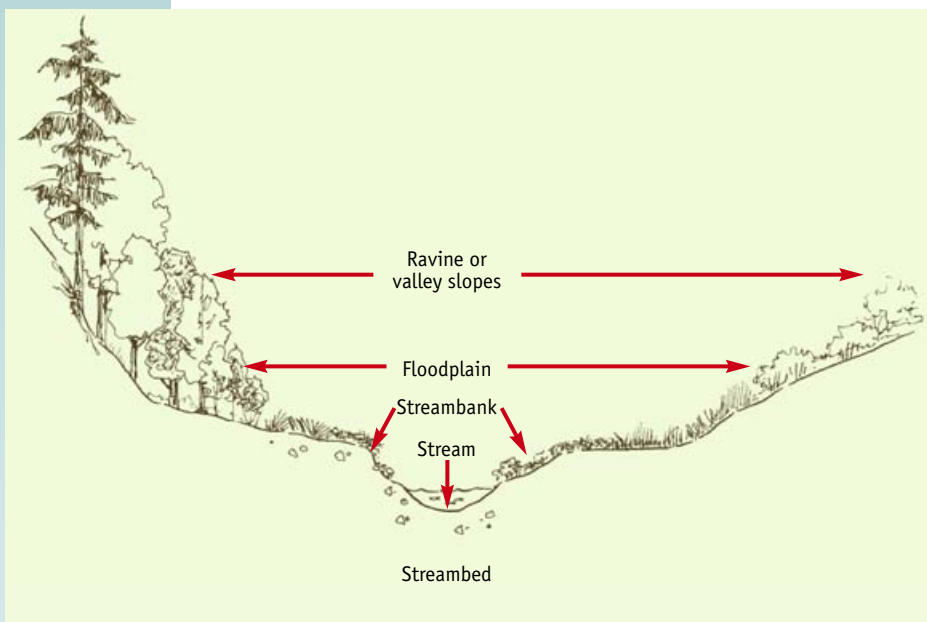
- **assessing risk**
- **planning action**
- **completing an inventory of resources, and**
- **scheduling improvements.**

Picture the areas adjacent to streams, drains, rivers, lakes, ponds and wetlands, and you recognize that riparian areas – healthy ones at least! – feature diverse vegetation. They support a variety of plant forms such as grasses, sedges, rushes, forbs (broad-leaved herbs), shrubs and trees. This is due to their above-average soil moisture, fertility, and soil organic matter levels.

RIPARIAN AREAS

Riparian areas are the transitional zones between bodies of surface water and upland areas. Riparian areas consist of:

- ▶ banks or shores
- ▶ the floodplain, and
- ▶ near-upland or ravine slopes.



Riparian areas consist of banks or shores, floodplains, and ravine slopes. In many riparian areas, the boundaries between them are not sharply defined. Instead, there is a gradual transition from one “community” to the next.

In North America, most areas with an abundance of grassed riparian vegetation evolved with grazing wildlife having unlimited access to the palatable lush plants, shade and water. Although the original grazers were deer, moose and caribou (ungulates) rather than cattle, horses, sheep and goats, the dynamic was the same. After a period of grazing or disturbance, most native riparian plant species regrew.

Some riparian areas suffered when graziers displaced wildlife with continuously grazing livestock. Dense numbers of domestic grazing livestock, when limited to a confined area and with little stimulus to move from one area to another, would trample streambanks, congregate in the shade and cool breezes next to streams, and overgraze the vegetation.

Today, the challenge for graziers with streamside pastures is to manage for production while reducing the impact of access.

Recent research indicates that livestock prefer alternative water sources to water from ponds, wetlands, streams and creeks.



Agricultural settlement often followed surface waters and riparian areas. With time, high-density livestock access led to overgrazing and trampled streambanks.

THE ROLE OF RIPARIAN AREAS

Although riparian areas often constitute a small portion of the landscape, they perform many valuable functions, including:

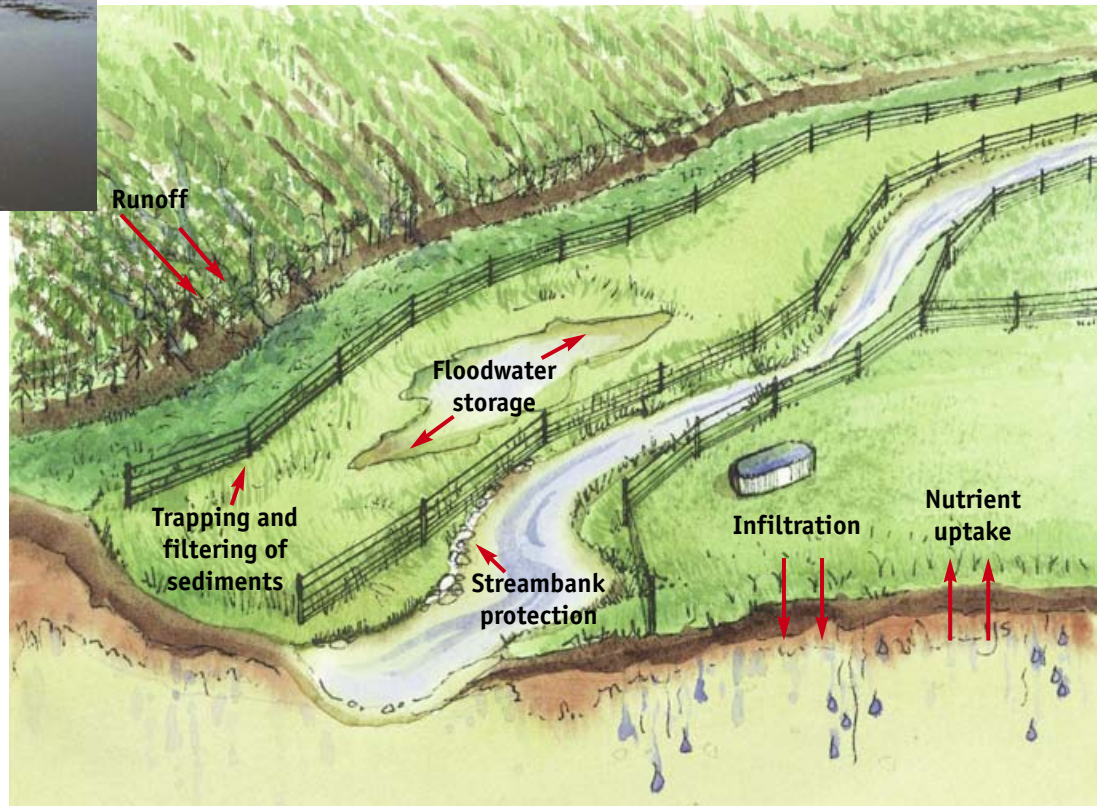
- ▶ recharging aquifers
- ▶ storing water
- ▶ reducing the impact and frequency of floods
- ▶ filtering sediments
- ▶ improving water quality
- ▶ increasing bank stability and reducing erosion potential
- ▶ providing habitat for many insect-eating birds.

The quality of vegetation largely determines the effectiveness of riparian areas. Healthy, lush vegetation, for example, can take up more nutrients, such as nitrate and phosphate, from upland runoff.

An understanding of riparian areas will form the basis of your management plan for streamside grazing. We'll take an in-depth look at them in the following chapter.



Riparian areas perform important ecological functions. A key one is storing water, which reduces the impact of flooding.



Well-managed streamside pastures serve the same function as vegetated buffer strips: protecting natural areas from the cumulative effects of upland management practices.

THE BENEFITS OF GRAZING MANAGEMENT

Well-managed riparian areas can yield many economic and environmental benefits. Here are 12, just for starters:

- ▶ reduced soil erosion potential – less disturbance means less erosion and runoff
- ▶ improved filtering ability – well-vegetated riparian areas are more effective filters for runoff
- ▶ increased flood control – more vegetation translates into better storage of floodwaters
- ▶ improved water quality and quantity – healthier riparian areas yield better quality water
- ▶ better livestock health – because reduced access makes for less mud and fewer cases of foot-rot and injury
- ▶ higher forage production – through improved pasture and grazing management
- ▶ greater animal gains – more palatable forage means improved livestock performance
- ▶ increased forage utilization efficiency – improved management means improved forage use
- ▶ better brush and weed management – managed pastures have fewer weeds
- ▶ enriched wildlife habitat – managed pastures provide better fish and wildlife habitat
- ▶ higher economic value of the land – managed pastures provide greater returns
- ▶ improved recreation opportunities and aesthetic value – there's more to enjoy!

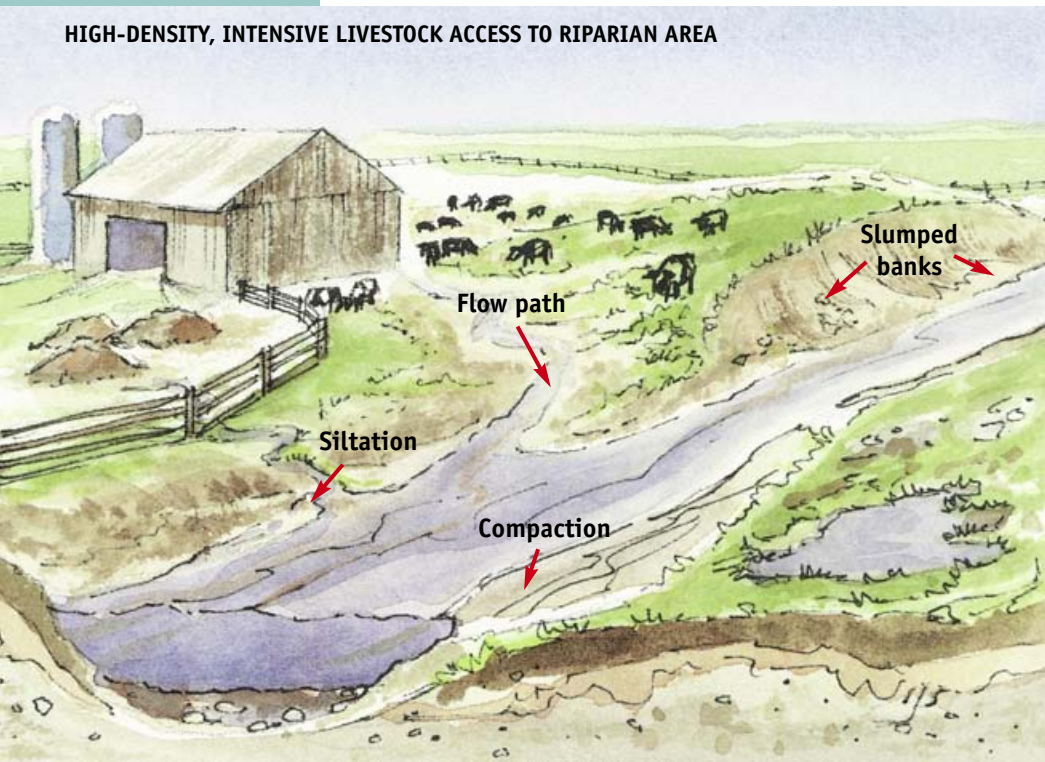
Implementing best management practices for intensive pasture and grazing will increase your production of high quality forages.



THE ENVIRONMENTAL CHALLENGES OF GRAZING

Livestock access can impair riparian functions. The nature and extent of livestock's impact vary with the sensitivity of the grazed riparian area, the intensity of access (i.e., number of livestock in a given space), and the duration and timing of access.

HIGH-DENSITY, INTENSIVE LIVESTOCK ACCESS TO RIPARIAN AREA



Livestock will eat accessible and palatable vegetation. Over time, they'll graze most existing vegetation, damage what can't be eaten, and trample the roots of trees and shrubs. This will diminish the area's filtering ability and wildlife value.

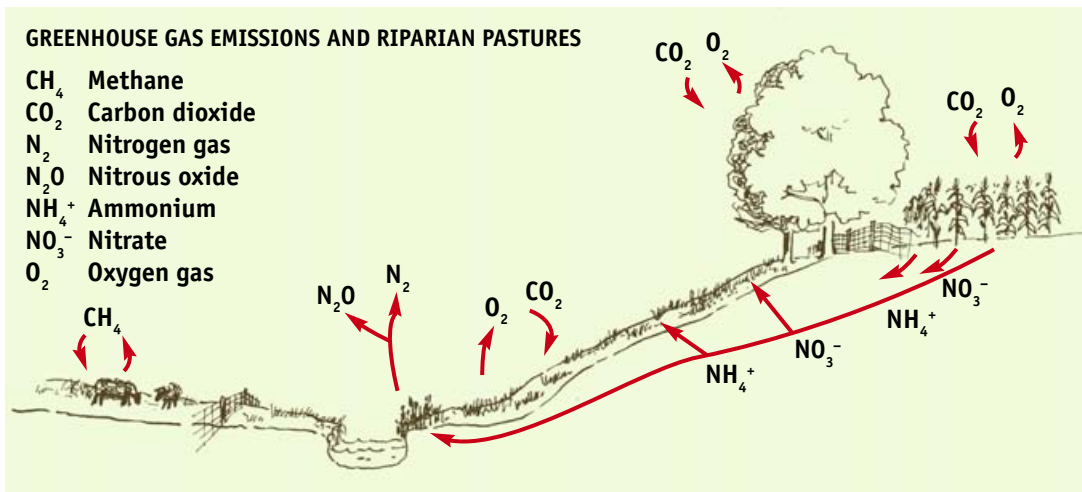
Hooves can compact soils, especially when conditions are wet, and soils can take years to rehabilitate. Infiltration rates decrease; runoff increases.

Hoof pressure above banks and shores can cause bank failure and slumping. This leads to more erosion, flooding and channel widening – making it more hazardous to livestock.

Livestock access to the streambed can stir up silt and deposit livestock wastes directly in the stream. Water can become contaminated as a result, posing a risk to both human and herd health, and degrading fish habitat.



This symbol indicates that a recommended practice or approach may be in violation of the federal Fisheries Act, which forbids the deposit of manure and other “deleterious substances” in streams or other water bodies that act as fish habitat. For a complete copy of the Act, go to: <http://laws.justice.gc.ca/en/F-14/index.html>



Unmanaged pastures can be a net source of greenhouse gas emissions. Grazing ruminants and poorly drained pasturelands produce methane. Deposited manures and soils release ammonia and nitrous oxide.

The good news is that greenhouse gas emissions can be reduced. Using BMPs, pastures can become a net “sink” for carbon dioxide and nitrogen compounds. Here’s why...

Improved and well-managed pastures yield higher quality forages. Higher quality forages generate less methane from ruminants and a more efficient feed-to-product ratio.

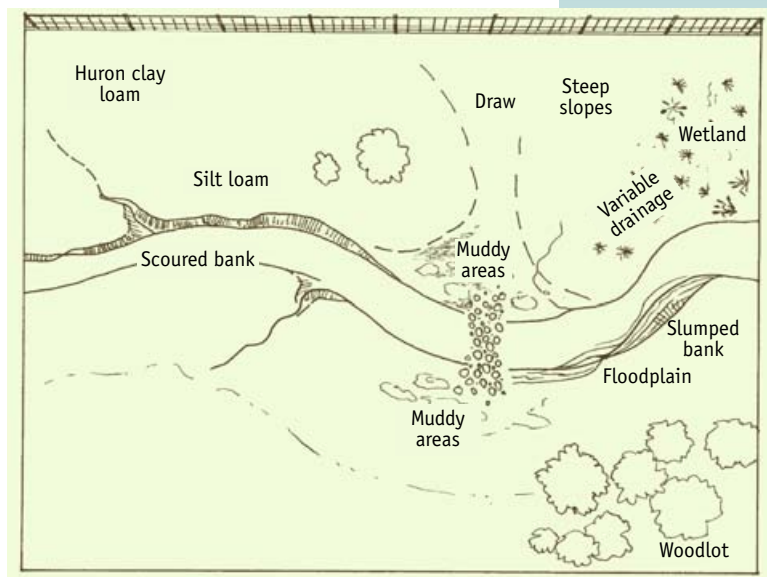
Well-managed pastures are more nitrogen-use efficient and will lessen the anaerobic conditions that promote emissions.

Higher forage productivity will result in a larger root mass and thus increase the amount of carbon stored in the soil.

THE GRAZING MANAGEMENT PLANNING PROCESS

Grazing management is a process with a purpose. The process is designed to help you reach your goals as they relate to production, and economic and environmental sustainability. It follows the logic of knowing what you have, knowing what you need and want, setting a schedule, getting the resources, and following the plan.

This map shows natural and management features that indicate site-suitability of BMPs and/or limit management options.



PLANNING PROCESS

STEP	DETAILS (see pp. 66-95 for in-depth info)
1. SET GOALS	<ul style="list-style-type: none"> • balance production needs with local conditions • aim for production, and economic and environmental sustainability
2. TAKE INVENTORY OF STREAMSIDE-GRAZING AREA	<ul style="list-style-type: none"> • list and describe soil features, soil types, sensitivity and production, as well as potential for leaching and runoff based on soil type and slope • list and describe sensitive features: bedrock outcrops, wetlands, shallow water tables • list current management practices
3. CONDUCT A RISK ASSESSMENT	<ul style="list-style-type: none"> • assess the physical, management and off-site risks to the grazed riparian area
4. DETERMINE FORAGE REQUIREMENTS	<ul style="list-style-type: none"> • calculate in detail the forage requirements and expected paddock yield throughout the season
5. ANALYZE, INTERPET, AND SELECT A MANAGEMENT SYSTEM	<ul style="list-style-type: none"> • consider and select the most suitable grazing management system to meet goals set in Step 1
6. DEVELOP ACTION PLAN	<ul style="list-style-type: none"> • specify action, date, resources, approvals, costs and follow-up • design layout and fencing • list management inputs and considerations • address sensitive areas with plans to mitigate impact or to restrict access
7. IMPLEMENT THE PLAN	<ul style="list-style-type: none"> • get advice, get permits, and get going!
8. MONITOR AND UPDATE THE PLAN	<ul style="list-style-type: none"> • check on pasture response to BMPs • update plan accordingly



A key step in the grazing management planning process for streamside pastures is inventory. Knowing your soils, slopes and location of sensitive areas leads to more effective planning.

ABOUT THIS BOOK

The first part of the book is reference information regarding best management practices for streamside grazing.

The middle section explains how to develop a grazing management plan (GMP) – its components, process and assumptions.

This is followed by a workbook, including the GMP risk assessment and action plan. More reference information can be found at the back of the book to help plan and implement your GMP.

KEY CONCEPTS

This book concerns the science and management of pasture management in the vicinity of surface water and riparian areas. The working definition of **pasture** is a managed area and system of forage management for grazing livestock. Pastures require careful oversight to sustain the forage needs of grazing livestock without need of regular supplementing with additional feeds.

Pastures are normally associated with low livestock densities or moderate levels of density with intensive rotational grazing systems.

Outdoor confined areas with high livestock densities and regularly supplemented feeds are referred to as **yards, drylots or loafing areas**. Livestock should be excluded from surface water in these areas.

In riparian areas, the BMP for intensively grazing livestock is exclusion – especially with high-density stocking rates.

The BMP for low-density areas is to exclude where evidence warrants, according to the results of your risk assessment.

Otherwise, the strategy for low-density grazing near riparian areas should be to mimic exclusion by using a suite of BMPs. Use the risk assessment and GMP to pinpoint where access-related problems exist and which BMPs would be best to address them.

Complement these measures with a well-planned grazing system, high quality pasture, a suitable fencing system, and non-fencing approaches such as alternative water sources.

We'll explore all of these concepts and practices in the rest of this book.