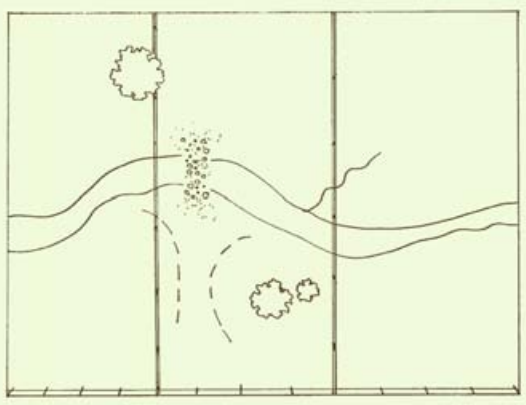
STEP 5. ANALYZE, INTERPRET, AND SELECT A MANAGEMENT SYSTEM

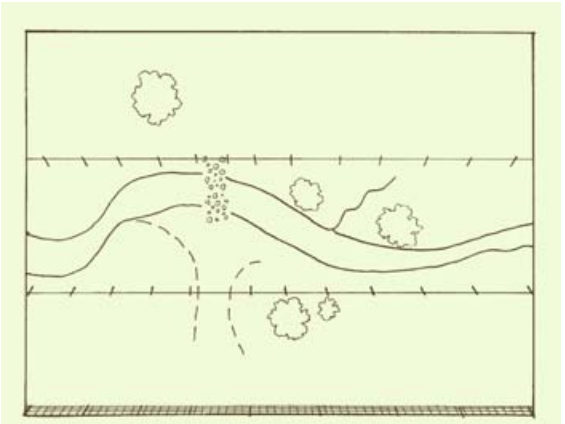
Here are some questions to consider when selecting a grazing management system for your riparian areas.

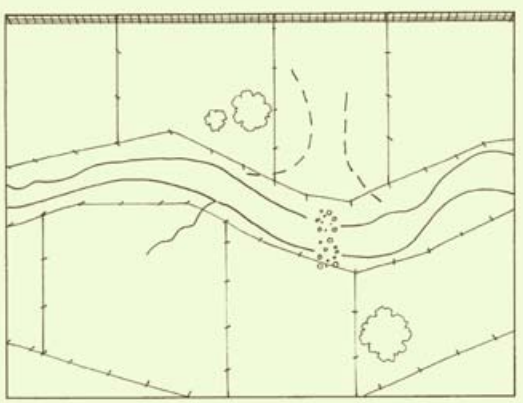
- Will environmental damage be minimized? Will season of access be addressed? Will site condition be addressed?
- Will production be optimized? Will it address the needs and behaviours of grazing livestock?
- Is it affordable?
- Will the layout (number of paddocks and selection of management features) be compatible with site features? Will it be site-specific?
- Will the planned stocking rates and density, and the frequency and duration of grazing and rest periods be sustainable? Will it lower the potential for re-grazing plants before they fully recover from previous grazing events?



Riparian – upland

Corridor fencing



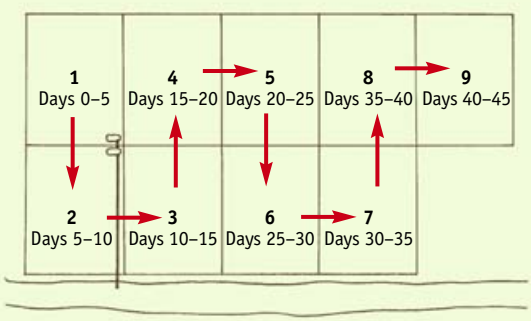


Riparian pasture

PADDOCK SIZE AND LAYOUT

The layout and fencing component of a grazing plan involves determining:

- how many paddocks are required and their size and shape – with respect to local conditions
- the type of fence and locations
- how water will be provided.



Proper layout takes into consideration the size and location of paddocks as they relate to the location of sensitive areas and positioning of alternative water.

NUMBER OF PADDOCKS FOR A ROTATIONAL GRAZING MANAGEMENT SYSTEM

Rest Period

- a rest period allows time for the forage plants to regrow, producing forage for the next grazing cycle
- the length of a rest period varies throughout the growing season
- the minimum number of paddocks in a system depends on the length of the rest period required by the forages
- when preparing your plan, use an average or longer length of time (25–30 days)
  - using less than the average length of time will result in a plan with too few paddocks or paddocks that are too large

Grazing Period

- the length of a grazing period in each paddock is based on the desired level of management, availability of labour, performance objective for the livestock, and growth characteristics of forages
- grazing periods longer than six days will damage new regrowth
- grazing of new growth diminishes the ability of the forage plants to regrow quickly, resulting in an overall yield reduction for the pasture
- a shorter grazing period is associated with livestock operations where livestock performance is essential, such as with milking cows
- longer grazing periods are more typical of beef cow/calf operations, ewe/lamb operations, and maintaining dry cows

The ***minimum*** number of paddocks ***for each herd*** in the pasture system is equal to:

$$\text{Paddock Number} = \frac{\text{Rest period (days)}}{\text{Number of grazing days/paddock (days)}} + 1$$

e.g., **30 days rest and 3 days per paddock**
Number of paddocks = 30/3 + 1 = 11

For more details, please see pg. 78.

PADDOCK SIZE REQUIRED FOR AVERAGE GROWTH CONDITIONS

Paddock Size

- size is based on providing an adequate supply of available forage to meet the herd's requirements
- forages do not grow at the same rate throughout the season
  - cool-season grass growth is very rapid in the spring, slows considerably during the hot summer months of July and August, and increases somewhat again in the fall
  - for a given herd, the area required to produce the necessary forage for the planned grazing period will not be the same throughout the grazing season
- to deal with this variability in growth:
  - plan using average growing conditions
  - vary the length of the grazing period throughout the grazing season when paddock size is fixed
  - vary the size of the paddock when the size is not fixed, as in a strip grazing system

Formula:

Paddock Size = Forage Demand × Residency ÷ Forage Supply

Calculation:

_____ ac = _____ lbs/day × _____ days/rotation ÷ _____ lbs/ac/rotation

- paddock size times the minimum number of paddocks provides the minimum required size of the total pasture unit
- if the existing pasture is larger than this minimum area, more paddocks can be planned for
- this will likely provide more than enough forage in the spring, some of which could then be harvested for hay
- having more paddocks than the required minimum will reduce the risk of running out of forage during the midsummer slump that cool-season pastures normally experience
- if the acreage of the required minimum number of pastures is more than the existing pasture acreage, additional acreage should be devoted to pasture to avoid running out of usable forage during the midsummer slump

Cool-season grasses grow best in the spring and fall. They can be harvested as hay in larger paddocks during seasons where growth exceeds grazing capacity.

Warm-season grasses grow best during the summer months – providing an ongoing supply of high quality forage when cool-season grasses cannot.

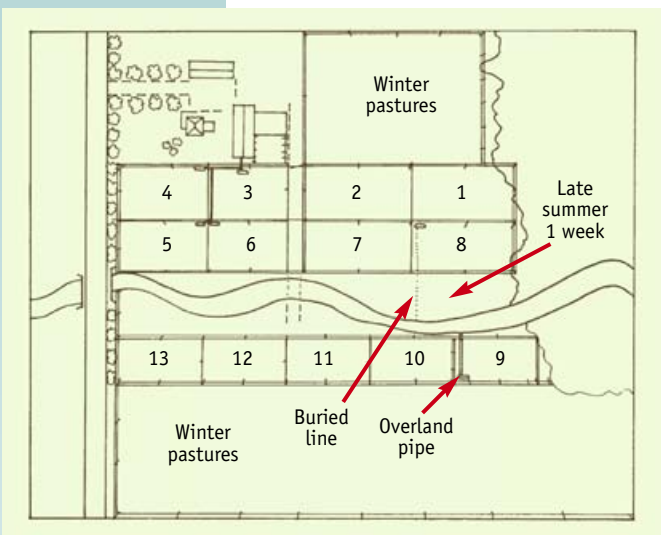
PADDOCK LAYOUT

- information gathered during the inventory process is useful when determining the paddock layout
- some adjustments need to be made to the size of each paddock so they have equal productivity
- each paddock should have:
  - similar soils and slope (e.g., floodplain, ravine slope, upland)
  - similar forages
- paddock layout will also be influenced by the location of lanes for the movement of livestock
  - these lanes should connect all paddocks so that livestock can be moved to any paddock from the one they currently occupy, allowing for maximum flexibility in forage management

Paddocks should be sized and positioned based on forage demand and quality, site condition and uniformity.

Paddock Shape

- paddocks should be as square as possible to promote more uniform grazing
- long, narrow paddocks are usually overgrazed at one end and underutilized at the other end



- paddocks should be planned so that livestock do not have to travel more than 244 metres (800 ft) to get water
  - this will encourage more water consumption by livestock and more uniform grazing within the paddock
  - livestock tend to utilize the forages close to water much more than forages farther from the water
- additional adjustments may be required based on access to water sources, which may have an impact on the shape of the paddocks in a grazing system, particularly in situations where natural water sources, such as ponds and streams, are utilized

FENCE DESIGN AND LAYOUT

The kind of fence that should be installed depends on:

- its purpose
- kind and class of livestock to be contained
- operator preference
- predator control
- cost.

Permanent or temporary fences may define paddocks within the grazing unit. During initial stages of paddock layout, many producers prefer to use temporary fences to create paddocks and lanes. This allows for easy adjustment of the layout as producers learn what size paddock they need, how to move livestock easily, and how forages react to managed grazing. After gaining experience, producers usually install some type of permanent fence to define paddocks and lanes.

In management-intensive grazing systems, permanent fencing can be used to enclose the entire pasture area and for lanes.

WATER SYSTEM DESIGN AND LAYOUT

Livestock must have adequate water to process forages effectively. A well-planned and installed water system will provide sufficient water with minimal disturbance to soil and to the water source itself.

Common sources of water for livestock are streams, ponds, lakes, and wells. Research shows that there can be a significant increase in animal performance and improved herd health if the drinking water is clean and free from sediments, nutrients, pesticides, algae, bacteria, and other contaminants. Because it's cleaner, well water is a preferred source.

Most livestock watering systems consist of a pump, a delivery system (usually a pipeline), and a trough or tank for the livestock to drink from.

Well-planned water delivery systems are more efficient and practical to operate.

Location of Drinking Facilities

- make drinking facilities available in every paddock
- locate drinking facilities so that livestock do not have to travel excessive distances to drink (if possible)
- in systems where livestock must travel long distances to water, forages tend to be over-utilized near the water, and under-utilized in areas of the paddock that are farthest from the water
- other problems associated with this situation include uneven manure distribution in the paddock and diminished animal performance

DELIVERY SYSTEM

Once the paddock layout is established and the water sources identified, the delivery system must be accommodated.

- if water is to be hauled, access by the tanker needs to extend to each storage tank
- if water is to be delivered through a pipeline, the route must be determined so that each paddock in the system has access to the water
  - pipeline layout should follow the shortest route to minimize cost and maintenance problems – this will ultimately determine the general area in which the watering tanks will be placed
- water tanks should be placed on soils that can support heavy traffic and provide easy access by livestock without crowding
- permanently installed tanks should have some type of heavy use treatment around them to prevent the formation of a mudhole
- portable tanks offer the most flexibility
  - their location can be changed frequently by adding a length of pipeline between the coupler and the tank and placing the tank(s) in a different location
  - tanks can be moved as often as necessary to manage grazing and avoid creation of barren areas and mudholes
- fine-textured materials around the water trough are preferred over coarse-textured materials because the latter can injure livestock feet
- if animals must traverse lanes that are in unstable areas, such as wet draws, please see the next section on protecting sensitive areas

MANAGEMENT OF SENSITIVE AREAS

Preventing Muddy Areas

Permanent watering stations will be subject to heavy use since they're often used to provide water for more than one paddock. Water spillage and leakage, which are inevitable, add to the mud problem. As a consequence, you'll need protective materials around watering sites.

Here's the recommended method of building pads for water stations.

1. Prepare a good subgrade by removing debris and vegetation along with at least 20 centimetres (8 in.) of topsoil.
2. Compact the subgrade.
3. Lay down a geotextile fabric.

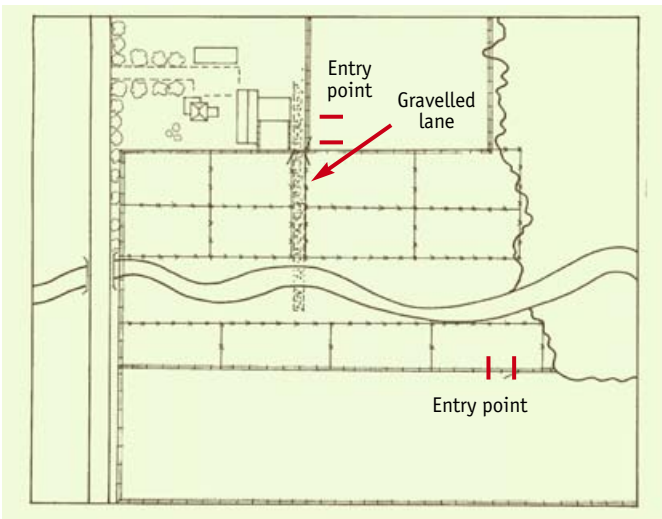
4. Place a 15-centimetre (6-in.) layer of coarse aggregate on the geotextile fabric and top with a 7.5-cm (3-in.) layer of fine aggregate.
5. Allow for a lane width of 3.5–4.5 metres (12–15 ft).
6. Extend pads around tanks by 6–7.5 metres (20–25 ft).

Some pasture areas such as this salt block location will have heavy use.

Heavy Use Area Planning

Some areas of the pasture system will be used so much that the best option is to place some type of protective material to prevent the formation of mudholes. Two such areas are those that surround watering facilities and the alleyways used for livestock movement.

Use maps to identify and plan the management of heavy use areas, such as lanes.



Planning livestock lanes

Livestock lanes will help you control livestock movement. Properly planned lanes allow livestock to move from one paddock to another. They'll also keep livestock out of paddocks that you want to bar them from, for whatever reason, e.g., paddocks that have been recently grazed. Here are some tips:

- the areas within the lanes can normally be grazed along with an adjacent paddock, unless the lane is covered with some type of protective material
- the locations of livestock lanes should avoid potential erosion, concentrated water flow, and flooding
- avoid placing lanes up and down hills, in wetlands, or on organic soils.