



Farm Plan Environment Module

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# Forage cropping management





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## Chapter Overview

This chapter is broken down into 7 steps outlined below. Each step includes background information as well as a completed example of templates associated with that step. Blank templates are included with hard copies of the resource or can be downloaded from [beeflambnz.com/farmplan](http://beeflambnz.com/farmplan).

### ► **STEP 1 – Why is Forage Cropping important to my farm system?**

Outline your main reasons for forage cropping and why it is important to your farm system. Then identify the catchment context in which you are forage cropping and any specific forage cropping goals you have. These may link back to catchment context and goals already completed in the Freshwater and Introduction chapters.

*Template FC1 - Why is Forage Cropping important to my farm system?*

*Template FC2 - Catchment Context and Forage Cropping Goals*

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### ► **STEP 2 – Description of Forage Cropping**

Record an outline of your forage crop programme including details of crops sown and which stock classes will graze them.

*Template FC3 - Forage Crop Programme*

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### ► **STEP 3 – Identify Risks, Opportunities and Management Actions**

Identify possible risks and opportunities from forage cropping and the factors contributing to the risk or enabling the opportunity. Assess the level of risk using the risk assessment matrix. Identify management actions that have been or could be taken. Table 6.1 provides guidance.

*Template FC4 - Forage Cropping Risk Assessment and Management Actions*

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### ► **STEP 4 – Winter Grazing Paddock Plan**

Map your areas of forage cropping including identifying key paddock features and complete paddock plans for your winter grazing paddocks.

*Template FC5 - Winter Grazing paddock plan*

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### ► **STEP 5 – Adverse Weather Plan**

Set out plans for adverse weather events

*Template FC6 - Adverse weather event planning*

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### ► **STEP 6 – Forage Cropping Action Plan**

Building on the management actions identified in previous steps, document a forage cropping action plan with details of those things that need to be implemented.

*Template FC7 - Forage Cropping Action Plan*

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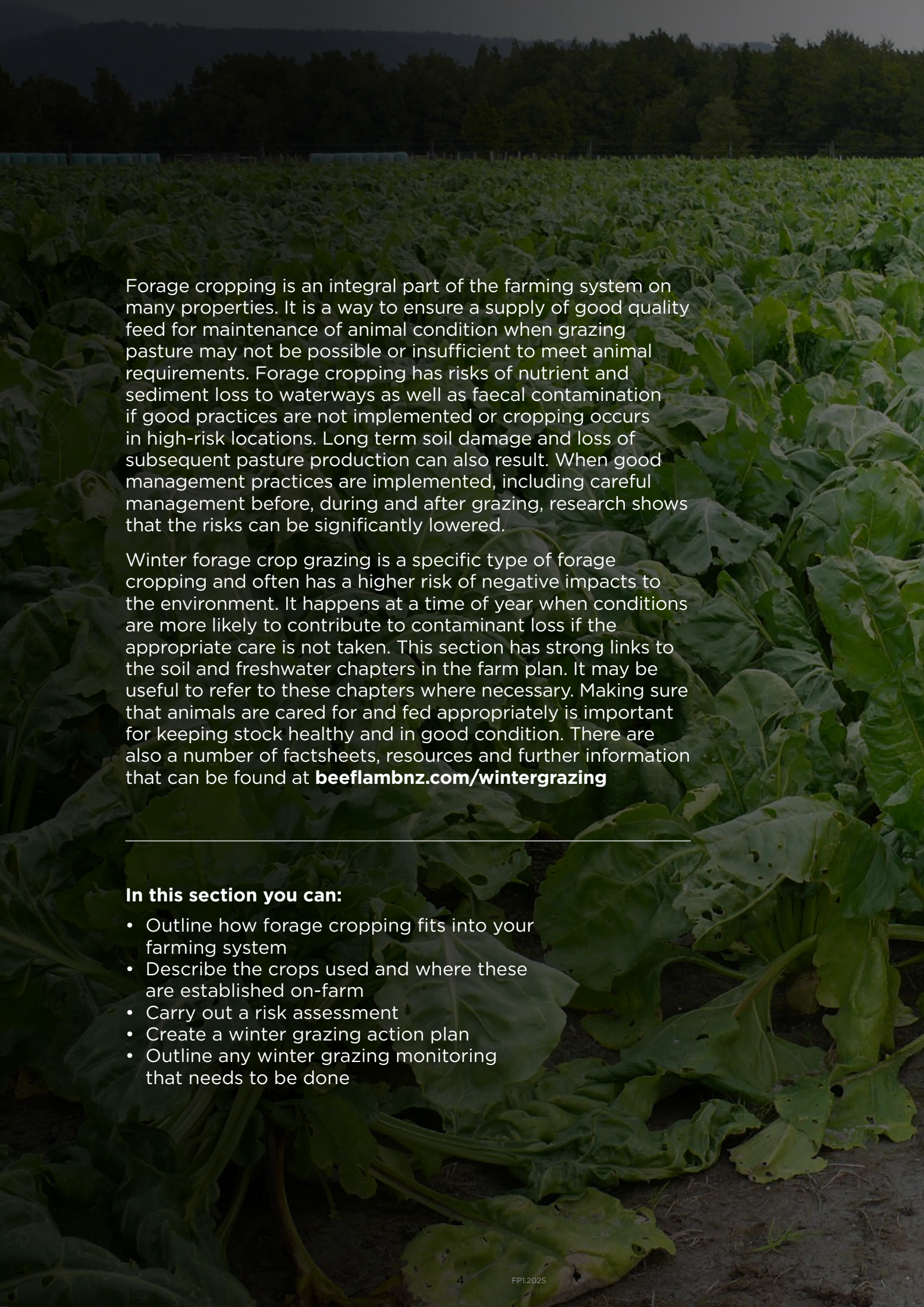
### ► **STEP 7 – Monitoring and Review of Forage Cropping**

Monitor and take photos throughout the season and review your forage cropping programme each year.

*Template FC8 - Forage Cropping Monitoring and Review*

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Additional supporting resources are available at [beeflambnz.com/farmplan](http://beeflambnz.com/farmplan) and on the B+LNZ Knowledge Hub.



Forage cropping is an integral part of the farming system on many properties. It is a way to ensure a supply of good quality feed for maintenance of animal condition when grazing pasture may not be possible or insufficient to meet animal requirements. Forage cropping has risks of nutrient and sediment loss to waterways as well as faecal contamination if good practices are not implemented or cropping occurs in high-risk locations. Long term soil damage and loss of subsequent pasture production can also result. When good management practices are implemented, including careful management before, during and after grazing, research shows that the risks can be significantly lowered.

Winter forage crop grazing is a specific type of forage cropping and often has a higher risk of negative impacts to the environment. It happens at a time of year when conditions are more likely to contribute to contaminant loss if the appropriate care is not taken. This section has strong links to the soil and freshwater chapters in the farm plan. It may be useful to refer to these chapters where necessary. Making sure that animals are cared for and fed appropriately is important for keeping stock healthy and in good condition. There are also a number of factsheets, resources and further information that can be found at [beeflambnz.com/wintergrazing](https://beeflambnz.com/wintergrazing)

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**In this section you can:**

- Outline how forage cropping fits into your farming system
- Describe the crops used and where these are established on-farm
- Carry out a risk assessment
- Create a winter grazing action plan
- Outline any winter grazing monitoring that needs to be done

## ► STEP 1 – Why is Forage Cropping important to my farm system?

Forage crops grown on-farm for supplementary feed are an important part of farm systems. They are often utilised as part of a resilient farm system to ensure adequate feed for stock when grass growth has slowed and there are potential feed gaps, such as during the winter or in summer-dry areas. They are also used if a high-quality feed is needed to finish stock or increase production.

A forage crop is an area of crop that is grown to feed stock, usually directly from where the crop is grown (*in situ*). Forage crops include cereals (such as sorghum, barley, oats, rye-corn and triticale), brassicas (such as kale, turnips and swedes), fodder beet and maize and can include annual ryegrass.

Forage crops can also be used as part of the pasture renewal programme. Often as pastures age, the species composition changes and over a period of years, less palatable and less nutritious species can dominate a pasture. Weeds, pests and diseases can also become a problem. Pastures are often resown on a rotation of a period of 10 years or more, but this will be dependent on the farm system, soil type, pasture species and farm management objectives.

Intensive winter grazing is a common part of forage cropping and happens at a time of year when soils may be more vulnerable to damage. The higher stocking intensity of animals also adds to the risk of sediment and nutrient loss and damage to soils. Animal health also needs to be managed carefully due to the prevailing climatic and soil conditions and can be influenced by the crop type and amount/type of supplement also fed. If you are grazing a winter forage crop during the winter months you must undertake it in accordance with relevant regulations.

In **Template FC1** in “Our Plan” (example below) outline the main reasons for forage cropping. These might be things such as:

- Pasture renewal
- Providing additional feed to fill summer or winter feed gaps
- Limiting the impact stock may have on pastures

If forage cropping is used for winter grazing, also outline how winter grazing currently fits, or will fit into your farming system.

### Why is Forage Cropping important to my farm system?

|                                     |  |
|-------------------------------------|--|
| <input checked="" type="checkbox"/> | Pasture renewal  |
| <input checked="" type="checkbox"/> | Providing additional feed to fill summer or winter feed gaps |
| <input checked="" type="checkbox"/> | Limiting the impact stock may have on pastures               |
| <input checked="" type="checkbox"/> | Other: (please describe below)                               |

*To replace ryegrass endophyte with one better for animal welfare and production  
Weed control for establishment of lucerne stands*



Example

FC1



Blank templates can be found in **Our Plan** section and at [beeflambnz.com/farmplan](https://beeflambnz.com/farmplan)

# Catchment Context and Forage Cropping Goals

## Catchment Context

As part of planning forage cropping, consider the wider catchment and catchment values and what impact your cropping and winter grazing activities could have. Your local catchment group or your Regional Council may already have some documentation on catchment context, challenges, values and objectives. These values can be things such as maintaining or improving ecosystem health, and providing for māhinga kai. Consider any catchment context already completed in the Freshwater chapter.

## Forage Cropping Goals

It is a good idea to record the high-level objectives and goals of your forage cropping. Refer to any overall farm vision, values and goals already completed in the Introduction chapter. Also consider the wider catchment context.

Some examples are:

- Keep animals healthy, with adequate feed and with appropriate shelter
- Minimise the risk of sediment, nutrient and faecal losses to waterways
- Keep stock out of waterways
- Have a written (winter) grazing plan
- Have a plan for adverse weather events to reduce risk to stock and the environment
- Minimise soil and pugging damage
- Undertake forage cropping in accordance with relevant regional rules and regulations

Record your Catchment context and forage cropping goals in **Template FC2** in “Our Plan” (example below).

## Catchment Context and Forage Cropping Goals

|   |                              |
|---|------------------------------|
| <b>Catchment Context</b>  | <b>Date:</b> 1 February 2021 |
| <i>The catchment values the ability to swim in waterways and provide for māhinga kai</i>                |                              |
| <b>Forage Cropping Goals</b>  |                              |
| <i>Keep stock out of waterways with appropriate buffer areas</i>  |                              |
| <i>Create a winter grazing plan each year</i>   |                              |
| <i>Use strategic grazing techniques for wintering to minimise sediment loss</i>                         |                              |
| <i>Replant winter paddocks as soon as practical after winter to reduce nutrient and sediment losses</i> |                              |
| <i>Keep animals well-fed and in good condition</i>  |                              |



Example

FC2

 Blank templates can be found in **Our Plan** section and at [beeflambnz.com/farmplan](https://beeflambnz.com/farmplan)

## STEP 2 – Description of Forage Cropping

It is good to have a written record of your current forage cropping programme. This may include an overview of your programme including things such as crop rotation order as well as the specifics of your cropping plan for the current year. Fill out **Template FC3** Forage Crop Programme in “Our Plan”. An example is filled in below.

### Forage Crop Programme

|   |  |                                  |                                   |
|---|--|----------------------------------|-----------------------------------|
| Overview of Crop Programme:                           | 2 years of crop followed by 8 years of pasture |                                  |                                   |
| Year:   | 2021-22  |                                  |                                   |
| Crop type sown  | Kale   | Summer turnips                   | Swedes                            |
| Season or month the forage crop fed                   | Winter   | Summer                           | Winter                            |
| What month do you usually sow?                        | October  | September                        | November                          |
| Pre-crop establishment                                | Spray 3 weeks pre-sowing                       | Spray 3 weeks pre-sowing         | Spray 3 weeks pre-sowing          |
| Crop establishment method                             | Direct drilled                                 | Direct drilled                   | Full cultivation and ridged       |
| Location/Land management units used                   | Lower flats                                    | Easy rolling block               | Lower flats                       |
| Area sown in crop (ha)                                | 14ha   | 10ha                             | 4ha                               |
| Typical yield (t DM/ha)                               | 14   | 11.5                             | 18t                               |
| Fertiliser used                                       | DAP 200kg/ha                                   | 150kg/ha DAP                     | DAP 350kg/ha sown<br>SSkg/ha urea |
| What class(es) of stock graze this crop and how many? | R1 and R2 Beef cattle                          | Mixed age ewes/ cattle as needed | MA ewes                           |
| Other supplement to be fed with crop                  |  |                                  |                                   |



Example

FC3

Blank templates can be found in **Our Plan** section and at [beeflambnz.com/farmplan](https://beeflambnz.com/farmplan)



## Winter Grazing Regulations:

### Staying up to date with changing regulations:

There are national and regional rules and regulations that need to be adhered to if you are grazing forage crops in winter. These relate to both environmental management and animal welfare.

More information on the rules that may apply and the additional information that needs to be collected can be found at [beeflambnz.com/wintergrazing](https://beeflambnz.com/wintergrazing). You should also make contact with your regional council if you aren't sure how rules might apply in your region or if you might need a resource consent to graze forage crops.

Some key definitions from the National Environment Standards for Freshwater (2020) subpart 3 Intensive Winter Grazing are:

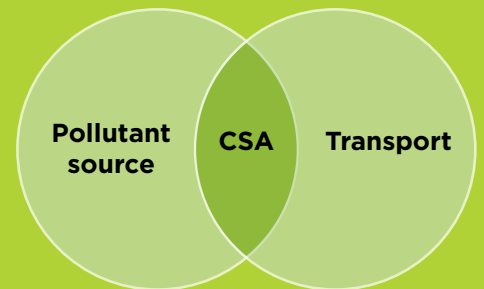
- **Intensive winter grazing:** grazing livestock on an annual forage crop at any time in the period that begins on 1 May and ends with the close of 30 September of the same year.
- **Annual forage crop:** a crop, other than pasture, that is grazed in the place where it is grown.

Other requirements you should be aware of include:

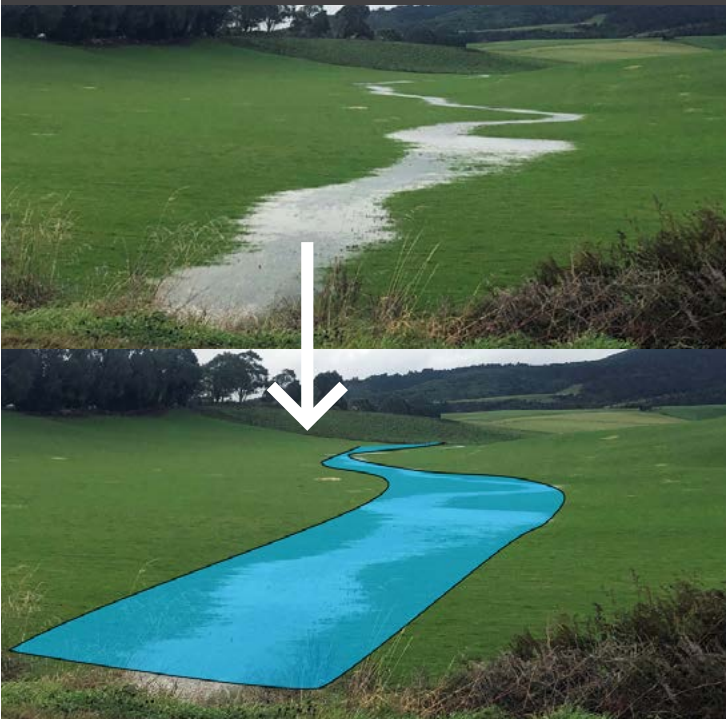
- Animal welfare regulations and codes of practice
- Stock exclusion
- Freshwater farm planning requirements
- Traceability (eg NAIT)

## What is a Critical Source Area (CSA)?

Critical source areas are areas in a paddock or on a farm that can contribute to relatively large amounts of nutrient and sediment losses to waterways. They are a landscape feature such as a gully, swale, or depression that accumulates runoff from adjacent land and delivers, or has the potential to deliver, one or more contaminants to one or more rivers, lakes, wetlands, or drains, or their beds (regardless of whether there is any water in them at the time).



### Photos showing examples of Critical Source Areas



## ► STEP 3 – Identify Risks, Opportunities and Management Actions

There is likely to be some common risks and actions between this section and those risks and actions identified in the soil and freshwater chapters. Having the land management units mapped and their strengths and weakness identified (completed in the introduction chapter) will help to determine if you are winter forage grazing in the most appropriate areas on your farm to minimise the impacts on the environment and animals.

### Risk Identification

Forage cropping, particularly in winter can pose significant risks. Waterways can be at risk through sediment, nutrient and faecal/microbial contamination. Soils are also at risk of short and long-term damage, through compaction, pugging, loss of soil structure and reduced infiltration potential. There are also risks associated with animal welfare and people in relation to winter grazing.

**Table 6.1** outlines some common risks, impacts and potential factors contributing to those risks associated with the grazing of forage crops. You can use this for ideas when completing **Template FC4** in “Our Plan”. An example is provided after Table 6.1. There is also space in the template to add other risks that you identify with your forage cropping areas.

### Risk Assessment

Some paddocks and land areas will pose higher risks than others based on the characteristics of the topography, soil, and site. These are things that can’t always be controlled but they can be managed so that the risks to freshwater, soil, humans and animal health are lowered.

For each factor contributing to risk identified, use the Risk Assessment Matrix to assess the likelihood and consequence and determine if the risk level is high, medium or low. The risk level can then be recorded in **Template FC4** in “Our Plan”. This will help you target your management actions and determine if grazing of forage crops is appropriate in that paddock, at that time of year or with that class of livestock.

### Risk Assessment Matrix

| Likelihood | Consequence |         |        |
|------------|-------------|---------|--------|
|            | Slight      | Serious | Major  |
| Low        | Low         | Low     | Medium |
| Medium     | Low         | Medium  | High   |
| High       | Medium      | High    | High   |

## Management Actions

The final column in **Table 6.1** provides examples of some possible management actions that could be taken to manage the various risks identified. In addition to the examples provided in Table 6.1 some other general considerations for managing forage cropping, particularly in winter include:

- Plan early for stock class, animal welfare, access, biosecurity, and the use of catch crops – use a feed budget to work out appropriate crop type and area of crop.
- Record what you are doing and where. Make sure you share it with staff, contractors and anyone involved in winter grazing.
- Consider proximity to waterways and gullies, as well as flood risks.
- Soil type can determine the suitability of a paddock as well as impact productivity, nutrient loss and animal welfare.
- Use a catch-crop where possible and practical, to reduce nutrient loss, minimise bare soil and increase feed production.

It may help to think about actions required at each stage eg:

- Planning and paddock selection
- Crop establishment
- Grazing management
- Post crop management

You can use these for ideas when completing **Template FC4** in “Our Plan” and identifying management actions for each of the factors contributing to risk you have included.

Then for each management action categorise it as: completed, ongoing or new.

- Completed actions require no ongoing implementation you may like to note the location if applicable.
- Ongoing actions are actions you are currently doing or have done and need to continue doing into the future.
- New actions are those you plan to start.

An example is provided after Table 6.1.

There are more great resources and factsheets about forage cropping and winter grazing risks and risk management that can be found on the link **beeflambnz.com/wintergrazing**. You can also attend B+LNZ workshops on forage cropping and winter grazing.



**Table 6.1 Risks and Management Options for Forage Cropping**

| Risks and Opportunities of Forage Cropping | Impact  | Some potential factors contributing to risk  | Examples of possible management actions   |
|--|---|--|---|
| <p><b>Sediment and Phosphorus loss</b></p> | <p>Phosphorous and sediment can be transported in overland flow. Phosphorous entering waterways may cause excess algae growth in water bodies. Sediment can reduce or change habitat by smothering and clogging spaces in the stream bed making it less suitable for a wide diversity of stream life.</p> | <p><b>Slope Risk</b></p> <ul style="list-style-type: none"> <li>• Steeper slopes have greater risk</li> </ul> <p><b>Erosion risk</b></p> <ul style="list-style-type: none"> <li>• If erosion is visible or likely within the area to be cropped it will be a higher risk</li> <li>• Stock type (deer and large cattle are more likely to cause erosion)</li> </ul> <p><b>Overland transport of sediment and nutrients</b></p> <ul style="list-style-type: none"> <li>• Paddock is prone to flooding</li> <li>• Presence of a Critical Source Area within the paddock</li> <li>• Waterway is within or close to the paddock being winter grazed</li> <li>• Surface flow within paddock to be winter grazed will flow directly into nearby waterway</li> <li>• Soils are heavy or poorly drained</li> <li>• Soil surface is pugged or damaged reducing water infiltration</li> <li>• Cultivation is done via a method where soil is exposed (i.e. not direct drill)</li> <li>• Cultivation is done down the slope rather than across it</li> <li>• High soil Olsen P levels</li> </ul> | <p><b>Slow the flow of water over the surface of exposed soils</b></p> <ul style="list-style-type: none"> <li>• Maintain as much vegetation down slope as possible. This could include the use of strategic directional grazing moving breaks from top of paddock down the slope with long-narrow feed breaks</li> <li>• Cropping on less steep areas - if it is too steep for a tractor, then it is too steep to break feed a winter crop</li> </ul> <p><b>Reduce the likelihood of contaminants entering waterways</b></p> <ul style="list-style-type: none"> <li>• Buffer strips established within a paddock to slow the flow of water and trap sediment and nutrients</li> <li>• Riparian buffer strips or ungrazed areas established around Critical Source Areas and waterways (note this must be 5m width for waterways)</li> <li>• Sowing of crops along, rather than up and down, the slope of the paddock where safe to do so</li> <li>• Sediment is prevented from entering larger waterbody via sediment trap/dam</li> <li>• Start grazing in areas of a paddock that are the least risk to waterways (often this will mean starting grazing in areas furthest from waterways)</li> </ul> <p><b>Reduce the time and extent of bare soil exposed to stock and the elements</b></p> <ul style="list-style-type: none"> <li>• Regularly back-fence to reduce the stock impact on bare soil</li> <li>• Use of direct drilling or minimum till cultivation</li> <li>• Re-sow the paddock as soon as is it practical to do so (based on weather and soil moisture levels) and/or consider establishing a catch crop.</li> <li>• Leave Critical Source Areas uncropped and ungrazed</li> <li>• Leave some residual crop after grazing where practical</li> <li>• Consider mixed swards or undersowing with another forage that will regrow and maintain ground cover</li> </ul> |
| <p><b>Faecal microbial loss</b></p>        | <p>Pathogens or microbes such as <i>E. Coli</i> may potentially have an impact on human or animal health if they are able to enter into waterways.</p>  | <p><b>Contamination of freshwater</b></p> <ul style="list-style-type: none"> <li>• Water can directly flow overland from the paddock being winter grazed into a waterway</li> <li>• Stock have unrestricted access to waterways</li> <li>• Drinking water bore or takes are close to paddocks or downstream of winter grazed area</li> <li>• Winter Grazing is occurring on stony soils close to a drinking water bore</li> </ul>  | <p><b>Stock have limited or no access to waterways or contaminant transport pathways</b></p> <ul style="list-style-type: none"> <li>• Critical source areas uncropped and ungrazed and can provide a buffer zone</li> <li>• Stock water reticulation system operating effectively and efficiently</li> <li>• Baillage/feed sites and water troughs where stock tend to congregate are away from waterways and critical source areas</li> <li>• Intensive winter grazing is avoided near drinking water bores and takes</li> </ul>   |

**Table 6.1 Risks and Management Options for Forage Cropping** *continued*

| Risks and Opportunities of Forage Cropping   | Impact  | Some potential factors contributing to risk   | Examples of possible management actions   |
|--|---|---|---|
| <p><b>Nitrogen loss</b></p> <p>Nitrogen can potentially enter waterways and cause excess algae growth. Nitrogen usually moves through the soil profile with water. High nitrogen leaching can also impact nitrate levels in drinking water impacting human health.</p> | <p><b>Nitrogen Leaching</b></p> <ul style="list-style-type: none"> <li>• Winter grazing is occurring on free-draining/stony soils</li> <li>• Sub-surface drains are present within paddock</li> <li>• Soils are left bare for more than 2 weeks post grazing</li> </ul> <p><b>Nitrogen sources</b></p> <ul style="list-style-type: none"> <li>• Higher density stocking will mean more animals in a given area, leading to higher deposition of N</li> <li>• Crops have differing concentrations of N and may alter the amount of N excreted by animals</li> <li>• Urinary concentration of N is often higher in mature cattle compared to sheep, deer or younger cattle</li> </ul> | <p><b>Nitrogen Leaching</b></p> <ul style="list-style-type: none"> <li>• Winter grazing is occurring on free-draining/stony soils</li> <li>• Sub-surface drains are present within paddock</li> <li>• Soils are left bare for more than 2 weeks post grazing</li> </ul> <p><b>Nitrogen sources</b></p> <ul style="list-style-type: none"> <li>• Higher density stocking will mean more animals in a given area, leading to higher deposition of N</li> <li>• Crops have differing concentrations of N and may alter the amount of N excreted by animals</li> <li>• Urinary concentration of N is often higher in mature cattle compared to sheep, deer or younger cattle</li> </ul>   | <p><b>Record the inputs, utilisation, and losses of nutrients from the farming system</b></p> <ul style="list-style-type: none"> <li>• Use of nutrient modelling tool to understand and manage nitrogen losses occurring on-farm</li> <li>• Soil nutrient status is used to guide post-grazing plant nutrient requirements and fertiliser application</li> </ul> <p><b>Low Nitrogen Feeds</b></p> <ul style="list-style-type: none"> <li>• Use of a low-N feed such as a fodder beet crop (note that the management benefit can be lost if high yields are used to increase stock density)</li> <li>• Use of supplementary feeds with low Nitrogen (like Grass Silage) to reduce the overall content of Nitrogen in the diet, and thus urine</li> </ul> <p><b>Utilise excess nutrients</b></p> <ul style="list-style-type: none"> <li>• Establishment of a 'catch crop' to soak up excess nutrients remaining in soil</li> <li>• For heavier soils, fallow periods are kept to a minimum</li> </ul> <p><b>Limit risk of nutrient concentration transport via above or below ground drainage</b></p> <ul style="list-style-type: none"> <li>• Exclude stock from drains</li> <li>• Avoid grazing cattle in paddocks with tile or mole drains and if this is done, limit grazing to lower stock classes and total stocking units</li> </ul> <p><b>Avoid high risk areas or soil types</b></p> <ul style="list-style-type: none"> <li>• Avoid grazing cattle on stony soils or limit grazing to lower stock classes and total stocking units</li> </ul>  |
| <p><b>Soil damage</b></p> <p>Soil health and structure is damaged impacting on nutrient and sediment flow pathways as well as productive capacity of the soil in the future.</p>   | <p><b>Stock class type</b></p> <ul style="list-style-type: none"> <li>• Heavier stock classes increase the risk of damage</li> <li>• Supplementary feeding areas and water troughs are not located in drier parts of the paddock</li> </ul> <p><b>Soil Type</b></p> <ul style="list-style-type: none"> <li>• Soils that are not free draining are more at risk to damage and pugging and compaction</li> </ul> <p><b>Crop type</b></p> <ul style="list-style-type: none"> <li>• Crops with higher yields may mean animals are concentrated on a smaller area of crop which will increase risk</li> <li>• Cultivation can increase risk of soil loss and damage</li> </ul>           | <p><b>Limit stock movements and concentration</b></p> <ul style="list-style-type: none"> <li>• Portable troughs and reticulated water system for clean stock drinking water</li> <li>• Back-fencing behind sheep and cattle, especially cattle</li> <li>• Paddock has multiple entry/exit points to prevent stock congregation around one gateway</li> </ul> <p><b>Limit heavy machinery use on fragile soils</b></p> <ul style="list-style-type: none"> <li>• Place baleage/additional feed in paddock before it is too wet to access</li> </ul> <p><b>Reduce structural damage risk to soils</b></p> <ul style="list-style-type: none"> <li>• Stock can be moved to an alternative area, such as a run-off block or laneway, to prevent damage to soil or animal health during storm events</li> <li>• Rotate paddocks that are being winter grazed so that the same area is not pugged year after year. The same paddock should not be continually cropped for more than 5 years in a row.</li> <li>• Exclude stock from steep or erosion prone parts of a paddock, as stock presence is likely to cause extensive soil damage and more erosion. This is especially the case for deer</li> </ul> <p><b>Minimise fence pacing and wallowing by deer</b></p> <ul style="list-style-type: none"> <li>• Provide a 'safe' wallow that is not connected to a waterway</li> <li>• Have weaner deer in a paddock out of the line-of sight of hinds to reduce fence pacing</li> <li>• Provide shelter to reduce fence pacing</li> </ul> <p><b>Establishment method</b></p> <ul style="list-style-type: none"> <li>• Use minimum tillage or direct drilling to minimise soil damage and loss</li> <li>• Allow soils time to dry sufficiently before establishment</li> </ul> | <p><b>Limit stock movements and concentration</b></p> <ul style="list-style-type: none"> <li>• Portable troughs and reticulated water system for clean stock drinking water</li> <li>• Back-fencing behind sheep and cattle, especially cattle</li> <li>• Paddock has multiple entry/exit points to prevent stock congregation around one gateway</li> </ul> <p><b>Limit heavy machinery use on fragile soils</b></p> <ul style="list-style-type: none"> <li>• Place baleage/additional feed in paddock before it is too wet to access</li> </ul> <p><b>Reduce structural damage risk to soils</b></p> <ul style="list-style-type: none"> <li>• Stock can be moved to an alternative area, such as a run-off block or laneway, to prevent damage to soil or animal health during storm events</li> <li>• Rotate paddocks that are being winter grazed so that the same area is not pugged year after year. The same paddock should not be continually cropped for more than 5 years in a row.</li> <li>• Exclude stock from steep or erosion prone parts of a paddock, as stock presence is likely to cause extensive soil damage and more erosion. This is especially the case for deer</li> </ul> <p><b>Minimise fence pacing and wallowing by deer</b></p> <ul style="list-style-type: none"> <li>• Provide a 'safe' wallow that is not connected to a waterway</li> <li>• Have weaner deer in a paddock out of the line-of sight of hinds to reduce fence pacing</li> <li>• Provide shelter to reduce fence pacing</li> </ul> <p><b>Establishment method</b></p> <ul style="list-style-type: none"> <li>• Use minimum tillage or direct drilling to minimise soil damage and loss</li> <li>• Allow soils time to dry sufficiently before establishment</li> </ul> |

| Risks and Opportunities of Forage Cropping | Impact   | Some potential factors contributing to risk  | Examples of possible management actions  |
|--|--|--|--|
| <b>Cultural and Social Values</b>          | Your values or catchment values could be at risk from winter grazing activities.                               | <ul style="list-style-type: none"> <li>• Winter grazing in close proximity to sites or areas of cultural or social significance such as areas used for māhinga kai (traditional food gathering)</li> </ul>   | <ul style="list-style-type: none"> <li>• Be aware of sites or locations that are socially important to the community or of cultural significance</li> <li>• Understand any potential impact forage crop activities may have on these locations and ensure practices are in place to manage these.</li> </ul>   |
| <b>Animal Welfare</b>                      | Animal health and wellbeing is compromised and limits the production of high value products.                   | <p><b>Climate and shelter</b></p> <ul style="list-style-type: none"> <li>• Limited provision of adequate shelter and a dry resting place (areas retained in grass, stand-off area, or an alternative paddock to move stock to when conditions are wet)</li> <li>• Temperature conditions are cold for significant lengths of time</li> <li>• Animals birthing in a winter crop paddock without stand-off area</li> </ul> <p><b>Feed and water</b></p> <ul style="list-style-type: none"> <li>• Limited supply of good quality feed and non-convenient access to clean water</li> <li>• No use of feed budgeting to ensure animals nutritional needs are being met</li> </ul> <p><b>Soil surface</b></p> <ul style="list-style-type: none"> <li>• Limited soil surfaces that animals can comfortably lie down on</li> <li>• Soil surface is excessively wet and/or muddy increasing an animal health risk</li> </ul> <p><b>Transition to crop</b></p> <ul style="list-style-type: none"> <li>• Transition time on and off a forage crop is curtailed</li> </ul> | <p><b>Animals are transitioned onto crops well and have appropriate feed and shelter</b></p> <ul style="list-style-type: none"> <li>• Stock are given required time and space to safely adjust their diet to the crop</li> <li>• Stock have sufficient feed allocation though good feed budgeting</li> <li>• Animals have protection from adverse weather (like storms)</li> <li>• Stock are able to lie down and rest comfortably for sufficient periods to meet their behavioural needs.</li> <li>• Stock have access to sufficient supply of clean drinking water</li> <li>• Animals are removed from crop prior to birthing</li> </ul> |
| <b>People</b>                              | People are a key part of the winter grazing system as they are required to make decisions and carry out tasks. | <p><b>Planning and management</b></p> <ul style="list-style-type: none"> <li>• No plan or lack of planning</li> <li>• Lack understanding or training for staff</li> <li>• Poor decision making</li> </ul>  | <p><b>Appropriate training, knowledge and equipment</b></p> <ul style="list-style-type: none"> <li>• Give appropriate training to staff</li> <li>• Have effective communication with all people involved with winter grazing</li> <li>• Make sure you stay updated with current regulatory requirements and latest information</li> <li>• Keep equipment well serviced</li> </ul>  |

## Forage Cropping Risk Assessment and Management Actions

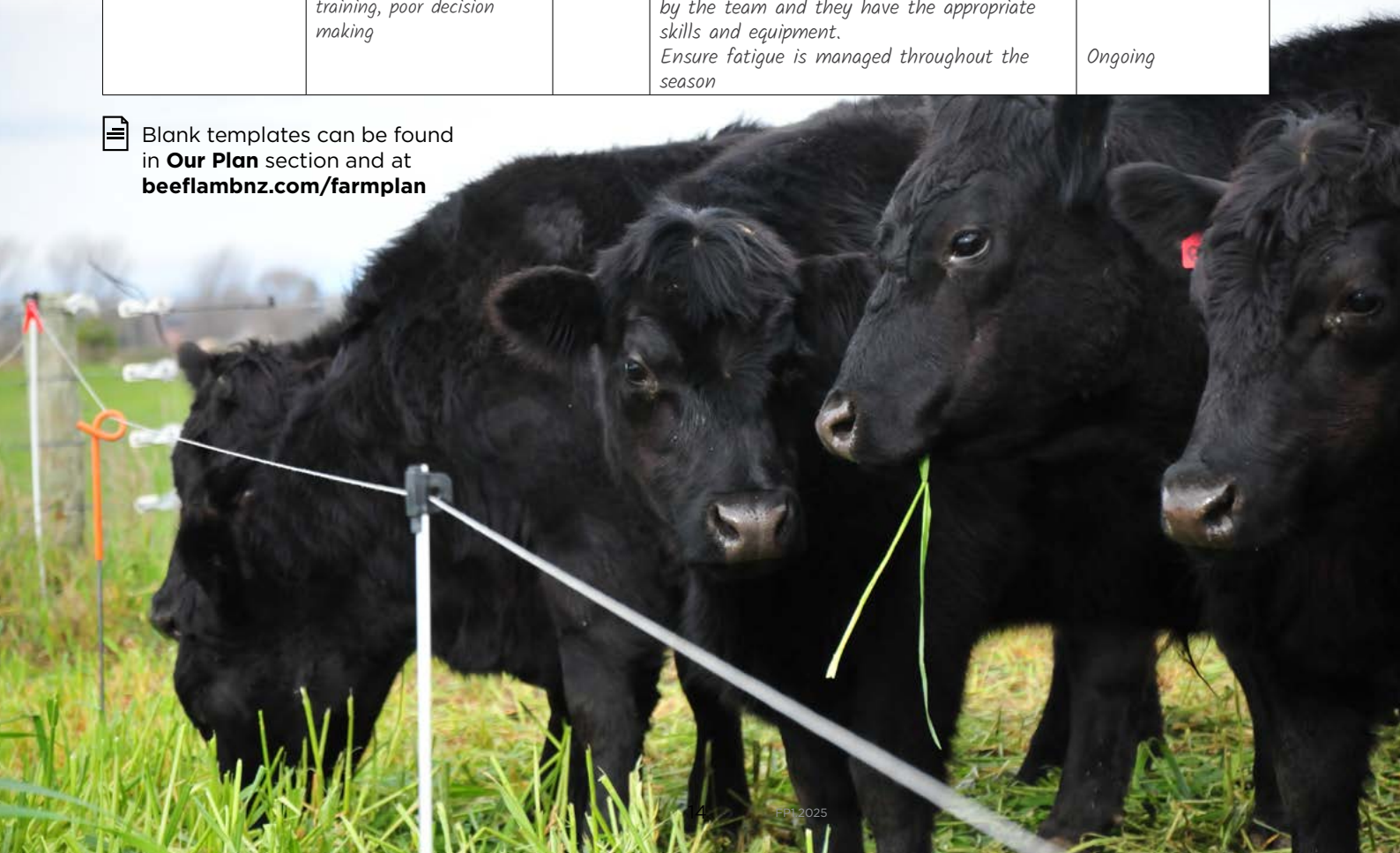
| Risks of forage crop management                       | Factors contributing to risk   | Risk level               | Management Actions   | Action completed, ongoing or new           |
|---|--|--------------------------|--|--|
| <i>Sediment and Phosphorus loss</i>                   | <i>Steep slopes leading to erosion</i>   | <i>Medium</i>            | <i>Don't establish crops on steep area, if its too steep for a tractor its too steep to break feed a winter crop<br/>Sowing plantain under brassica to maintain as much vegetative cover during and after grazing as possible</i>                              | <i>Ongoing<br/>New</i>                     |
| <i>Sediment and Phosphorus loss</i>                   | <i>Overland transport of sediment and nutrients</i>  | <i>Medium</i>            | <i>Ungrazed buffer strips established around Critical Source Areas and waterways<br/>Maintain as much vegetation down slope as possible<br/>Start grazing in areas of a paddock that are the least risk to waterways and use strategic directional grazing</i> | <i>Ongoing/new<br/>Ongoing<br/>Ongoing</i> |
| <i>Faecal microbial Loss contaminating freshwater</i> | <i>Water can directly flow overland from the paddock being winter grazed into a waterway<br/>Stock have unrestricted access to waterways</i> | <i>Medium<br/>Low</i>    | <i>Stock are excluded from waterways by a 5m vegetated buffer strip<br/>Reticulated stock water is provided</i>  | <i>Completed<br/>Completed</i>             |
| <i>Nitrogen loss</i>                                  | <i>Winter grazing is occurring on free draining/ stony soils<br/>Bare soils post grazing</i>   | <i>High<br/>High</i>     | <i>Use Overseer to understand nitrogen losses occurring on farm<br/>Establish a 'catch crop' as soon as practicable after grazing</i>  | <i>Ongoing<br/>Ongoing</i>                 |
| <i>Soil damage</i>                                    | <i>Heavier stock classes can cause greater pugging<br/>Location of supplementary feed and water source</i>                                   | <i>Medium<br/>Medium</i> | <i>Young stock are grazed on the highest risk paddocks and crops<br/>Location of supplementary feed is shifted with breaks</i>   | <i>Ongoing<br/>Ongoing</i>                 |
| <i>Animal Welfare</i>                                 | <i>Transition onto crop impacting animal health<br/>Lack of shelter in adverse events</i>  | <i>Medium<br/>Medium</i> | <i>Stocks transition onto crop is well managed and not rushed<br/>Adverse event management plan in place, stock able to be shifted to another paddock</i>  | <i>Ongoing<br/>Ongoing</i>                 |
| <i>Human Factors</i>                                  | <i>Lack of planning or training, poor decision making</i>  | <i>Low</i>               | <i>Ensure a plan is in place that is understood by the team and they have the appropriate skills and equipment.<br/>Ensure fatigue is managed throughout the season</i>  | <i>Ongoing<br/>Ongoing</i>                 |



Example

FC4

Blank templates can be found in **Our Plan** section and at [beeflambnz.com/farmplan](https://beeflambnz.com/farmplan)



## ► **STEP 4 – Winter Grazing Paddock Plan**

### **Maps of Forage Cropping**

All paddocks or areas considered to be forage cropped need to be identified on a map, if you haven't already completed this in the introduction chapter. Having the land management units mapped and their strengths and weakness identified will help to determine if you are winter forage grazing in the most appropriate areas on your farm to reduce environmental losses and avoid damage to your soils.

Please include key paddock features such as:

- Paddock boundaries
- Waterways
- Critical source areas
- Wetlands
- Drains
- Soil type
- Slope
- Areas prone to erosion
- Cultivation setbacks

### **Identify Management Actions**

Strategic winter grazing uses a range of techniques to minimise sediment and nutrient loss. Research has shown that when used in combination, the techniques can reduce sediment loss by up to 80% when compared to non strategic winter grazing methods. Soil loss and structural damage can be reduced and will help keep valuable topsoil on your paddock. Strategic grazing usually involves grazing down the slope, (usually fences run across the slope starting with breaks at the top and then moving towards the bottom), regular back fencing and no grazing in critical source areas.

In addition to the examples provided in Table 6.1 some paddock level considerations you may wish to consider when completing your paddock plan include:

- Look after your stock – provide adequate feed, shelter, fresh clean water, and areas for resting
- Keep stock out of waterways and Critical Source Areas
- Leave ungrazed buffer zones around Critical Source Areas
- Graze from the top down in sloping paddocks, and from the opposite end of a paddock to a waterway if present
- Use long and narrow breaks, particularly with cattle
- Back-fence to protect soils while allowing animals access to shelter in adverse weather events

Additional fact sheets on winter grazing management can be found at [beeflambnz.com/farmplan](http://beeflambnz.com/farmplan)

### **Winter Grazing Paddock Plan**

Utilising the maps you have completed and the management actions you have identified create paddock plans for your winter grazing areas completing **Template FC5** in “Our Plan”. An example is provided on the following page. You may also consider using an aerial photo as a base to draw your paddock plan onto or utilise online tools such as Google Earth.

Your paddock plan should identify key physical paddock features, particularly those contributing to risk such as: slope direction, waterways, critical source areas, water troughs, gates and shelter.

It should document how your management actions will be implemented in that paddock considering its physical features. For example: the direction of cultivation, the direction of grazing, areas being left ungrazed or as buffer zones and location of supplementary feed. You should also record any additional notes, actions or considerations that may not be specific features on the map.

Your paddock plan is a helpful tool in explaining to others involved in your winter grazing how and why your management actions are carried out. It also helps demonstrate to those in compliance how you are managing your risks.

# Winter grazing paddock plan

On your paddock map draw on or indicate:

| Physical features of this paddock |              |
|-----------------------------------|--------------|
| Feature                           | Key (symbol) |
| Fences and gates                  |              |
| Slope direction                   |              |
| Waterways and drains              |              |
| Critical source areas             |              |
| Waterlines and troughs            |              |
| Shelter                           |              |

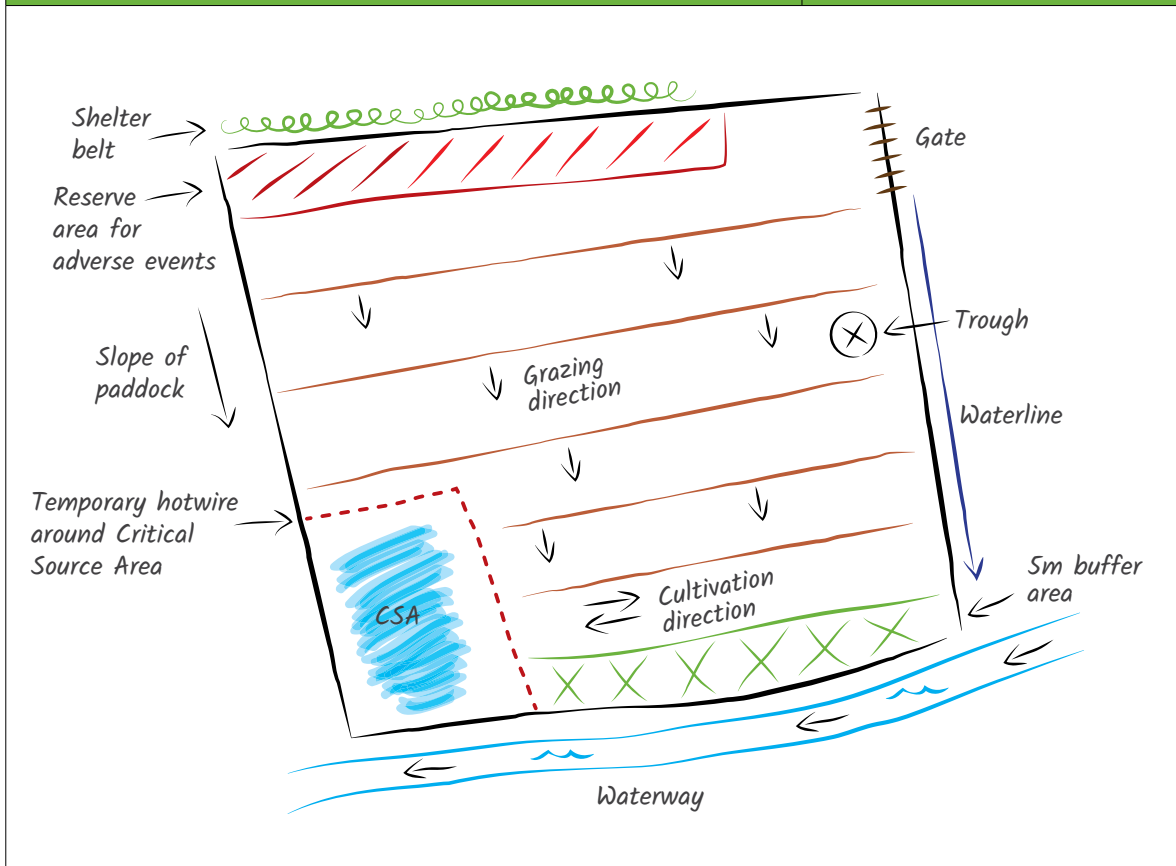
| Action plan for this paddock                            |              |
|---|--------------|
| Feature   | Key (symbol) |
| Cultivation direction                                   |              |
| Grazing direction (which way the breaks will move)      |              |
| Areas not grazed  |              |
| Buffer areas around waterways and critical source areas |              |
| Other (such as backfences or reserve areas)             |              |
| Other   |              |



Example  
FC5

| Notes, Actions and Considerations   |  |
|---|--|
| <ul style="list-style-type: none"> <li>• Cultivate across slope</li> <li>• 3 days feed in reserve area</li> <li>• No grazing or cultivation in CSA</li> </ul> | <ul style="list-style-type: none"> <li>• Direct drilled crop</li> <li>• Start grazing at top of slope and move to bottom</li> <li>• Will use portable trough and regular back fencing</li> </ul> |

|                         |    |       |                 |
|-------------------------|----|-------|-----------------|
| Paddock name or number: | 21 | Date: | 1 February 2021 |
|-------------------------|----|-------|-----------------|



Blank templates can be found in **Our Plan** section and at [beeflambnz.com/farmplan](http://beeflambnz.com/farmplan)

## ► STEP 5 – Adverse weather plan

We can't predict the future, but we can plan for it. During winter there are usually some particularly bad weather events, either storms, cold weather and snow or high rainfall events. There is a need to have a contingency plan for cold weather and storm events as these may have a large impact on the environment and animals. Typically this includes planning to allow more feed and shelter for stock, and where possible options to keep stock further away from waterways or wet areas and put them in areas less prone to mud.

Some actions you may consider using during adverse events are:

- Feed an area of crop saved in a drier, lower risk part of the paddock, or a different paddock further away from waterways, preferably with some shelter such as a shelter belt. This will help keep water ways and critical source areas protected.
- Use races/laneways, yards, rough grass areas away from waterways as stand-off areas for animals.
- Utilise tree blocks that have a lower risk of environmental losses and provide shelter.
- Budget more feed as stock will require more feed to stay warm. Allow for an extra 10% above usual winter intake during cold and wet conditions.
- Consider offering larger breaks with several days allowance at once.
- Grass support block paddocks can be used when the weather is poor, and there are options to utilise feed supplements while on these areas.
- Get livestock to sheltered areas with reticulated drinking water available whenever possible.

In **Template FC6** in “Our Plan” record what plans you have in place to identify when stock should be moved to an alternative location, what and where this area is, and any other actions you may take to reduce the risk to soil or animal health if there is a serious storm or adverse weather event. An example is provided below.

### Adverse weather event planning

|   | Location or area that stock will go to  | Feed type and allocation  | Number of days of feed budgeted for adverse events | Preparation before winter        | Conditions when stock will return to regular winter grazing                                     |
|---|---|---|--|----------------------------------|---|
| <b>If there is an adverse (large) rainfall event</b>  | <i>Will move animals to grass area next to yards</i>                                      | <i>Baleage put next to yards<br/>Have enough for ad lib feeding.</i>      | <i>14 days</i>                                     | <i>Place bales next to yards</i> | <i>When rain stops and waterways have lowered levels, paddock has no surface water</i>          |
| <b>If there is an adverse (very cold) storm event</b> | <i>As above but if a large snow event also have tree block available to put stock in.</i> | <i>As above. Also have bales in reserve if have to feed in tree block</i> | <i>As above</i>                                    | <i>As above</i>                  | <i>When storm is over and paddock is not too wet and waterways levels dropped/snow cleared.</i> |



Example

FC6

 Blank templates can be found in **Our Plan** section and at [beeflambnz.com/farmplan](https://beeflambnz.com/farmplan)

## STEP 6 – Forage Cropping Action Plan

Building on the management actions identified in step 3, your winter grazing paddock plans from step 4 and your adverse weather plan from step 5 you should now document a forage cropping action plan by completing **Template FC7** in “Our Plan”. This includes details of those actions that need to be implemented include the action to be taken, location, priority, assigning a timeframe and a person responsible. An example is provided below.

You can find out more about management actions for forage cropping at [beeflambnz.com/wintergrazing](https://beeflambnz.com/wintergrazing)

### Forage Cropping Action Plan

| Action   | Location, Land Management Unit or paddock | Priority (Low, Medium, High) | Planned Timeframe          | Person responsible and others involved | Date completed and evidence of completion   |
|--|---|------------------------------|----------------------------|--|---|
| <i>Moving breaks from top of paddock down the slope with long-narrow feed breaks</i>   | <i>Top Block</i>                          | <i>High</i>                  | <i>June 2021 - ongoing</i> | <i>Manager, Staff</i>                  | <i>Photo stored in ‘winter grazing’ in Environment folder on desktop</i>  |
| <i>Not cropping the CSA at the bottom of the hill and leaving a 5m buffer strip</i>  | <i>Whole farm</i>                         | <i>High</i>                  | <i>June 2021 -ongoing</i>  | <i>Manager, Staff</i>                  | <i>Photo stored in ‘winter grazing’ in Environment folder on desktop</i>  |
| <i>Use of nutrient modelling tool to understand and manage nitrogen losses occurring on-farm</i>   | <i>Lower flats</i>                        | <i>High</i>                  | <i>Jan 2021</i>            | <i>Manager, Fertiliser Rep</i>         | <i>Feb 2021 - OVERSEER nutrient file link and summary stored in ‘winter grazing’ in Environment folder on desktop</i> |
| <i>Sowing a catch crop to soak up excess nutrients remaining in soil</i>   | <i>Lower flats</i>                        | <i>Medium</i>                | <i>Sept 2021</i>           | <i>Contractor</i>                      | <i>December 2021</i>  |
| <i>Back-fencing regularly behind sheep and cattle</i>  | <i>Whole farm</i>                         | <i>Medium</i>                | <i>August 2021</i>         | <i>Staff</i>                           |   |
| <i>Check with catchment group for sensitive sites close by</i>   | <i>Whole farm</i>                         | <i>Medium</i>                | <i>March 2021</i>          | <i>Manager, Staff</i>                  | <i>June 2021</i>  |
| <i>Stock are transitioned properly<br/>Animals have protection from adverse weather events<br/>Stock are able to lie down and rest comfortably<br/>Feed requirements are calculated with a feed budget</i> | <i>Whole farm</i>                         | <i>High</i>                  | <i>September 2020</i>      | <i>Manager, All staff</i>              | <i>October 2021<br/>Notes in diary</i>  |
| <i>All staff to attend B+LNZ wintering workshop and weekly farm meetings to discuss winter grazing progress and issues</i>   | <i>Whole farm</i>                         | <i>Medium</i>                | <i>June 2021 - ongoing</i> | <i>Manager, All staff</i>              | <i>Notes in diary</i>   |



Example  
FC7

Blank templates can be found in **Our Plan** section and at [beeflambnz.com/farmplan](https://beeflambnz.com/farmplan)

## ► **STEP 7 – Monitoring and Review of Forage Cropping**

Throughout the season it is important to monitor your forage cropping, particularly over the grazing period. This will be important for all types of forage cropping systems. If you monitor during the season you can make adjustments where necessary to reduce the risks. You can use this information to refine your forage cropping system in future seasons. If you are winter forage crop grazing make sure you are familiar with your local regional council requirements as in some situations you may need to let them know of any issues or changes to your plan.

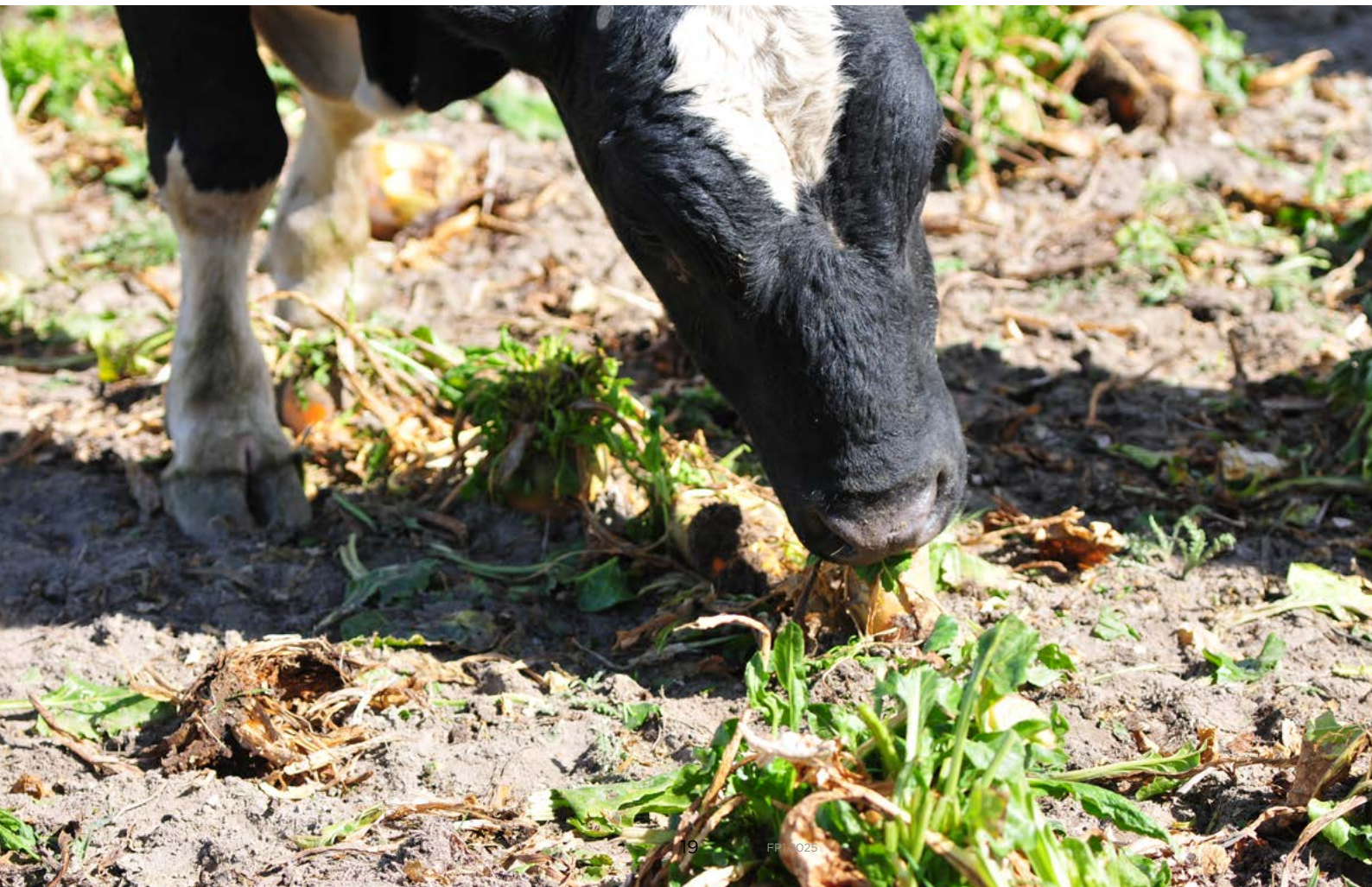
At the end of the season or cropping period it is important to reflect and review on:

- 1) What worked well
- 2) Areas that need improvement
- 3) Things that you learned over the cropping period or action that you will implement next season.

Taking photos can be a useful way to record observations in the field. If possible take some representative photos with the location recorded (geolocated- using the GPS in your mobile phone, or location noted in a diary). This will help show the good management actions that you are using to reduce the risk of contaminant losses. Photos can also serve as a reminder of things that need to be improved.

Taking some photos before the forage crop is grazed, some during and some after grazing will help keep a record of the winter forage crop grazing.

Fill out **Template FC8** in “Our Plan” or use the questions to help record your observations from over the forage cropping season. Use this information in future years to help refine your grazing management and forage crop grazing plan. An example of FC8 is given on the next page.



## Forage Cropping Monitoring and Review



Example

FC8

| Year:   | 2024 | Yes/<br>No | Notes   |
|---|------|------------|---|
| Was the paddock sown to plan?   | Yes  | Yes        | Left Critical Source Areas uncultivated   |
| Was the paddock grazed to plan?   | Yes  | Yes        | Grazed, top to bottom and away from Critical Source Areas   |
| Were you able to avoid significant pugging in the paddock(s)?   | Yes  | Yes        | Paddock 15 got too wet. Moved animals into next paddock which was drier underfoot, put animals back into 15 when it dried out                     |
| Do you have some photos of the forage cropping paddocks before, during and after grazing?   | Yes  | Yes        | A before, during and after picture for each paddock   |
| Do you have locations recorded for each photo e.g. geolocated with GPS on mobile phone camera?  | Yes  | Yes        | Locations of photos taken in mobile phone with GPS enabled. Also noted in farm diary where each photo taken                                       |
| Have you saved photos in a place you can easily access?   | Yes  | Yes        | Saved on computer in "Winter photos" folder   |
| Have you taken some notes over the forage cropping season?  | Yes  | Yes        | Noted comments in farm diary and asked staff to report back too.  |
| Did you need to action your adverse weather event plan for extreme weather?   | Yes  | Yes        | Large snow event, actioned adverse weather plan when I heard the forecast. Moved stock to near yards, where there was long grass area and baleage |
| Did you have sufficient feed and area allocated for your adverse weather plan?  | Yes  | Yes        | Allowed for more feed during the cold   |
| Did you sow any catch crops?  | Yes  | Yes        | Put in on stony lower flats paddocks that were dry enough to sow catch crop with direct drilling. Too wet on other paddocks in top block          |
| <b>Based on your check, at the end of the season or cropping period it's important to reflect and review on:</b>  |      |            |   |
| <b>1) What worked well</b>  |      |            |   |
| <ul style="list-style-type: none"> <li>Adverse event area worked well, kept stock happy and warm in the snowstorm. It also reduced the pugging.</li> <li>Non cultivation of critical source areas worked well, just need to work with contractor to make sure right areas left unsprayed and uncultivated.</li> <li>Top to bottom grazing- worked well and looked like less pugging at end of winter, just need to make sure that had portable troughs for water</li> </ul> |      |            |   |
| <b>2) Areas that need improvement</b>   |      |            |   |
| <ul style="list-style-type: none"> <li>Back fencing more regularly- need to talk with staff</li> <li>Getting the baleage and supplements in the right place before winter</li> <li>Have more portable troughs for water so will make it easier to backfence</li> <li>Planning earlier</li> </ul>  |      |            |   |
| <b>3) Things that you learnt over the cropping period or action that you will implement next season?</b>  |      |            |   |
| <ul style="list-style-type: none"> <li>Planning winter grazing earlier next season</li> <li>Adverse event planning made it easier as I had the feed and areas ready-to-go</li> <li>Will reserve some crop in dry parts of wintering paddocks and use if very wet and then save area next to yards if more shelter needed for animals</li> </ul>   |      |            |   |



Blank templates can be found in **Our Plan** section and at [beeflambnz.com/farmplan](https://beeflambnz.com/farmplan)

**For further information please see:**

**[beeflambnz.com/farmplan](https://beeflambnz.com/farmplan)**

**[beeflambnz.com/wintergrazing](https://beeflambnz.com/wintergrazing)** and the B+LNZ Knowledge Hub.

The other chapters in the B+LNZ Farm Plan: Environment Module are:

- Introduction
- Managing soil health
- Freshwater ecosystem health
- Integrating native biodiversity
- Responding to a changing climate
- Waste and chemical management







