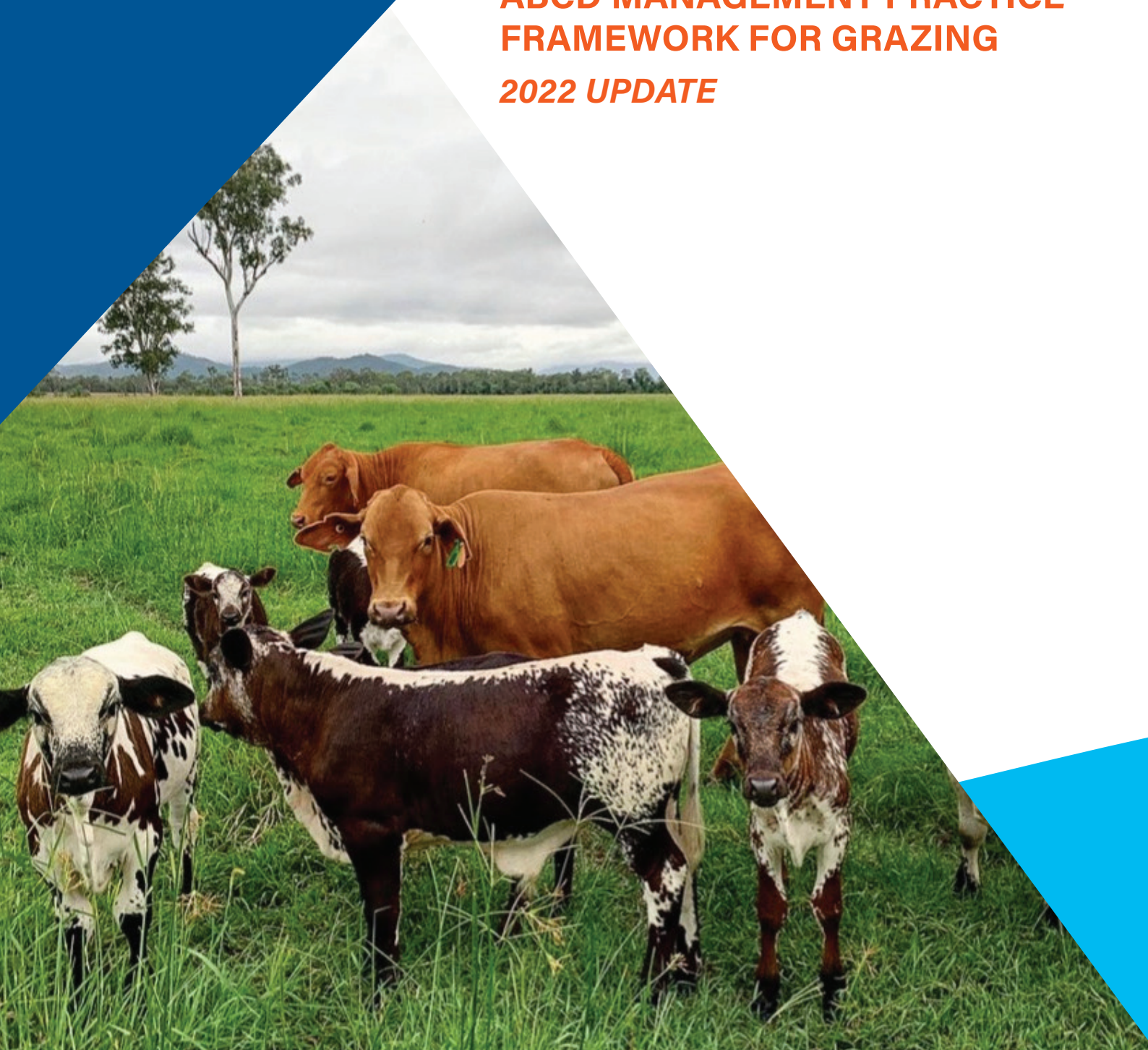




Mackay Whitsundays Isaac Region
**ABCD MANAGEMENT PRACTICE
FRAMEWORK FOR GRAZING**
2022 UPDATE



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1. Introduction

This document is the third update of the original 2010-11 Mackay Whitsunday Region Grazing Management Practices ABCD Management Framework. The ABCD Management Framework is designed to communicate different standards of management practices for each land use for different water quality parameters (i.e., soil management, nutrient management, pesticide management). The framework provides standard definitions of a progression of improvements to water quality from D class ("Dated") management practices with the lowest corresponding water quality outcomes, through C class ("Conventional" or "Common"), B class ("Best Practice") and finally to A class ("Aspirational") or yet unproven management practices (Folkers, et al., 2014).

This framework is an essential component of delivering the Reef 2050 Water Quality Improvement Plan 2017-2022 (WQIP). It is also used at a State and Federal level to model impacts of government policy and incentive programs.

The framework is periodically revised by the MWI Reef Catchments (RCL) Grazing Regional Working Group (GRWG) to ensure that the framework continues to advocate scientifically robust principles and identify new management practices that are now considered Best Practice or Aspirational. This report collates the updates provided by the GRWG in 2015, 2018 and again in 2022.

2. Principles of ABCD Management Practice Framework

ABCD Management Practice Framework describes a continuum of practices that are recommended to improve water quality and land resource condition. The framework categorises agricultural practices as:

- A (Aspirational)
- B (Best Practice or Best Management)
- C (Conventional)
- D (Dated)

For grazing systems, the frameworks describe practices impacting upon land condition, soil erosion and water quality. Each catchment has a framework based on land management practices relevant to that region.

While the frameworks look to promote activities that will improve water quality, to be 'best management' each practice also needs to be economically sustainable for the landholder. Often activities identified within A class are known to reduce pollutant loads but they are not described as B class (best management) until there is evidence that they are at a minimum financially neutral, or preferably financially beneficial (Folkers, et al., 2014). Table 1 describes the practices that meet the standard for each management class and the expected effect on resource condition.

Table 1: Description of practices for each management class and effect on resource condition.

Class		Description Of Practice	Effect On Resource Condition
A	Aspirational	<ul style="list-style-type: none"> New and innovative practices adopted by graziers that require further validation to determine industry wide environmental, social and economic costs/benefits. Validation requires R&D and if appropriate, some validated practices will become recommended BMP. Development of Farm Management Plans and utilisation of new and innovative technology. 	<ul style="list-style-type: none"> Validated practices likely to achieve medium to long term target resource condition goals if widely adopted. Some practices may have good environmental outcomes which may not be universally endorsed as feasible by industry and community.
	Best practices	<ul style="list-style-type: none"> Currently promoted practices referred to as BMP. Widely promoted by industry to achieve current and future industry expectations and community standards. Development of Farm Management Plans and utilisation of common technology. 	<ul style="list-style-type: none"> Practice likely to achieve short to medium-term target resource condition goals if widely adopted.
	Conventional	<ul style="list-style-type: none"> Common practices widely adopted by industry which meet only basic current industry expectations and community standards. 	<ul style="list-style-type: none"> Practice unlikely to achieve short- term target resource condition goals if widely adopted.
	Dated	<ul style="list-style-type: none"> Practices superseded or unacceptable by current industry expectations and community standards. 	<ul style="list-style-type: none"> Practice likely to degrade resource condition if widely adopted

It is important to specify the current resource condition (where applicable), set resource condition targets and timeframes, as well as the year of reference for the level of classification. This provides a common reference point and allows the framework to be used when communicating with government; water quality researchers; social scientists; economists; industry research and extension organisations; and land managers. This framework is integral to reporting on:

- The expected water quality improvement that can be achieved through improved management practices
- The social and economic costs and benefits of adopting improved management practices
- The level of adoption of management practices required to achieve water quality targets
- The emphasis on the importance of detailed farm management planning and record keeping to achieving improved water quality outcomes
- The importance of holistic management, rather than a single technology or individual practice
- The type and scope of action such as Market Based Incentives (MBIs) required to achieve water quality targets.

Figure 1 illustrates the conceptual flow of the ABCD Framework. Water Quality improvement grants are used as incentives for graziers in recognition of the fact that they are absorbing the cost of practice change that will have a public benefit. These grants are supported by extension, research and development provided by NRM groups, departmental staff, and private entities.

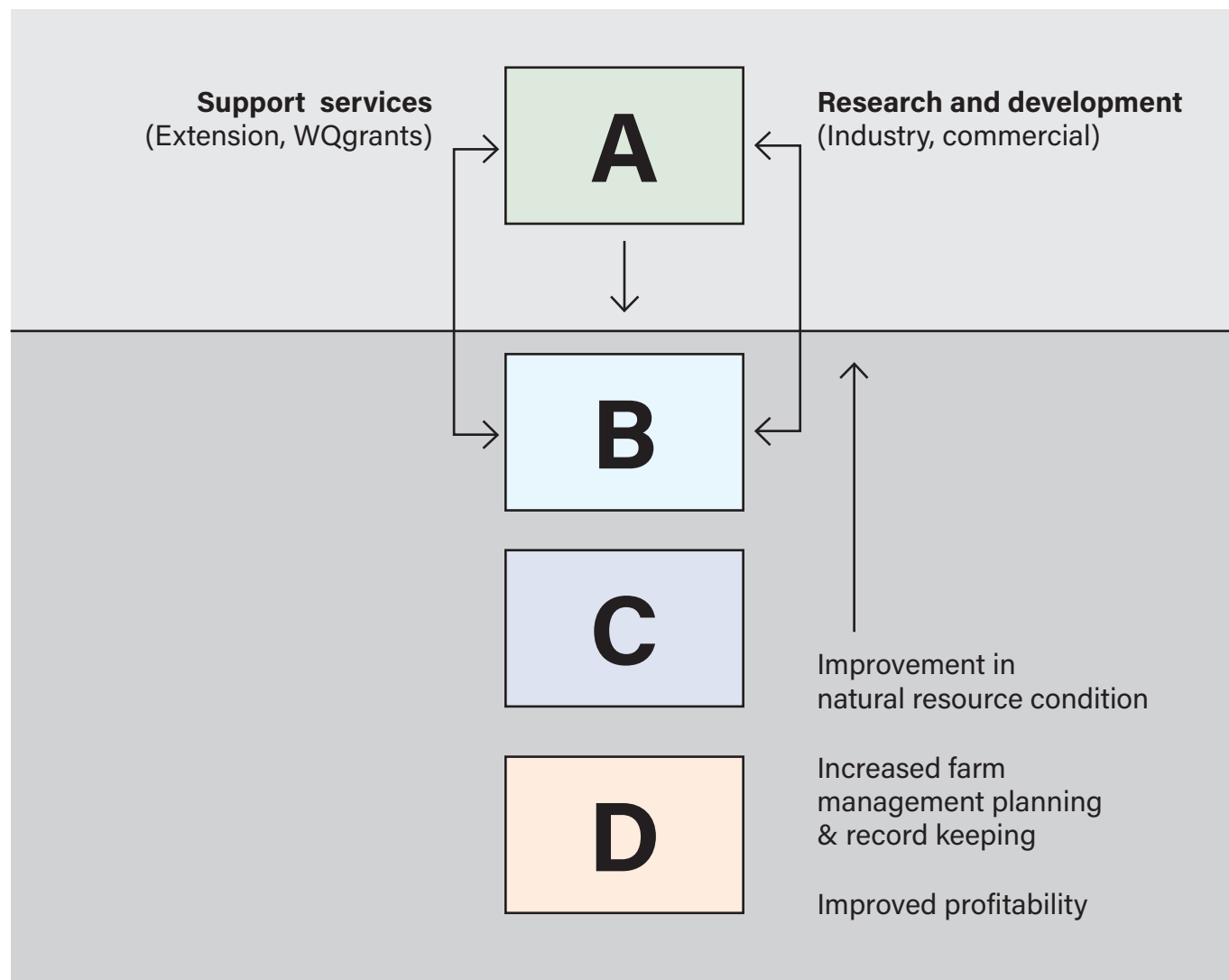


Figure 1: ABCD conceptual flow diagram

3. Developing the Mackay Whitsunday Isaac Framework

This document is the third update of the original 2010-11 Mackay Whitsunday Region Grazing Management Practices ABCD Management Frameworks. Contributors to the original document are listed in Appendix A, together with the contributors that assisted with the review and update of the current document. The MWI-RC Grazing Regional Working Group met in 2015, 2018 and again in 2021 & 2022 to provide input on the current update.

Focus of outcomes associated with practices outlined in this document are to optimise end-of-catchment water quality and marine ecosystem health. It is understood that practices identified have also been evaluated in terms of their economic and social benefits to the individual land managers and the broader community prior to being adopted as the most suitable grazing management practices.

The ABCD framework classification descriptions for grazing have been reviewed and updated to ensure:

- wording of classification descriptions matches current industry terminology
- resource condition indicators are defined (for appropriate parameters)
- links between resource condition indicators and level of practice are validated
- actions required to progress from one management level to another are further defined
- practices and classifications align with the Grazing BMP program.

The Grazing BMP Program was a joint initiative between the Queensland Government, Agforce and the Fitzroy Basin Association. This program was a voluntary, industry led process to help graziers identify improved practices, which in turn can improve the long-term profitability of their enterprise. Though now complete, when identified 'best management' practices are included into farm management they will also allow the grazing industry to demonstrate good environmental and animal welfare management to the wider community.

Further information on best management practices for grazing can be found at:

Future Beef Australia -

- <https://futurebeef.com.au/projects/grazing-bmp/>

Meat and Livestock Australia -

- <https://www.mla.com.au/extension-training-and-tools/profitable-grazing-systems/>

Resource Consultancy Service (RCS) -

- <https://www.rcsaustralia.com.au/rcs-regenerative-grazing-principles/>
- <https://www.rcsaustralia.com.au/products/family-business/grazing-for-profit-2/>

4. Grazing Management Practices

The ABCD framework for the reef catchments of Mackay Whitsunday Isaac identifies standards of grazing management (as opposed to resource condition) within the grazing industry for different parameters that impact on water quality including:

1. Pasture Management
2. Pasture Recovery
3. Riparian Management
4. Gully Management
5. Nutrient Management
6. Pesticide Management
7. Planning and Record Keeping

The grazing management practices considered A, B, C or D class are presented in Sections 4.1 to 4.7.

4.1 Pasture Management

Pasture management practices for grazing are summarised below. Current practice within any one enterprise is likely to be a combination of all practices in the table and producers may need to alter the combination in response to seasonal fluctuations, input costs or market forces.

DATED	CONVENTIONAL
Pasture management practices that are superseded or unacceptable	Pasture management practices that meet minimum expectations
Stocking rate exceeds pasture availability Description: <ol style="list-style-type: none">1. No pasture monitoring.2. Ground cover targets exceeded for most grazing land types in most years.3. No spelling.4. Regular survival supplementary feeding.5. No weed control.6. Lack of infrastructure to deal with stocking rate.7. No stock management or animal husbandry.	No differentiation between grazing land types. Description: <ol style="list-style-type: none">1. Pasture management strategy based on the major grazing land type.2. Pasture monitoring only conducted for the major grazing land type.3. Stocking rates are based on seasonal visual assessment or set stocking rate (not recorded).4. Occasional survival feeding.
Resource Condition: <ol style="list-style-type: none">1. Badly degraded.2. Absence of perennial, palatable and productive (3P) grasses.3. Increasing areas of erodible bare ground.4. Increasing proportion of weeds.	Resource Condition: <ol style="list-style-type: none">1. Evident decline in frequency of (3P) grasses.2. Increase in less desirable pasture species.3. Susceptible to erosion.4. Some increase in areas of bare ground.5. Increased weed presence.

BEST PRACTICE	ASPIRATIONAL
Currently promoted Best Management Practices	Innovative pasture management practices that require further validation
<p>Independent management of less resilient grazing land types</p> <p>Description:</p> <ol style="list-style-type: none"> 1. Pasture management strategy based on all grazing land types. Pasture monitoring is conducted across multiple land types at critical times and results are used to make decisions on stocking rates and supplement programs to maintain an acceptable level of ground cover. 2. All grazing land types fenced where practical and appropriate. 3. Long-term carrying capacity is known for all grazing land types but stocking rates are adjusted seasonally to achieve ground cover targets (i.e., 90% of grazing land to maintain above 70% ground cover in the late dry season, with a high frequency of 3P grasses). 4. Soil testing of different land types and recommended fertiliser regimes are then followed where appropriate. 5. Water infrastructure is appropriate for paddock size and carrying capacity and minimises uneven grazing and sacrifice zones around water points. 6. New watering points are established when cattle are excluded from existing watering sources by fencing to land type. 7. Seasonal spelling. 8. Adoption of holistic resource management systems such as time-controlled grazing. 9. Monitoring grass:legume ratios to match time of year/season/stock requirements. E.g., 60:40. 10. Provide feed supplements to improve animal nutrition and utilise dry (lignified) standing feed. 11. Females managed in classified groups according to pregnancy status, cows, maiden heifers, first calf heifers and placed in specific paddocks according to nutritional requirements. 12. Bulls have access to females for a restricted time based on and optimal calving window 13. Shelter (for example timber belts, non-boggy terrain, and ridgelines) is available in adverse weather. 14. Joining, weaning and stock sales are planned around seasonal pasture production and strategies are in place to respond to seasonal conditions. 15. Fencing off vulnerable overgrazed areas to allow recovery of pastures (ie. electric fencing or opportunity to explore virtual fencing methods). 	<p>Property specific – independent management all grazing land types</p> <p>Description:</p> <ol style="list-style-type: none"> 1. All B Class practices implemented. 2. Stocking rates include consideration of longer-term climatic data for all grazing land types and are formally recorded within a live document. 3. Soil testing is georeferenced and monitoring sites established for each land type. 4. Nutrient deficiencies remedied based on soil tests and subsequent professional recommendations. 5. Stock requirements seldom exceed pasture availability. 6. Seasonally tailored supplement programs match results of soil tests, faecal NIRS sampling, pasture monitoring or blood samples. 7. Improved pastures are sown specifically for heifers and sale stock (steers and cull females). 8. Paddocks are subdivided into areas that optimise resource utilisation.

Resource Condition:

1. Stable or increasing frequency of 3P grasses.
2. Managed weed presence (woody or otherwise).
3. Maintain or improve soil condition.

Resource Condition:

1. High frequency of 3P grasses.
2. Proactive weed control program.
3. Minimal erosion, with management strategy in place.
4. Minimal woodland thickening, with management strategy in place.



Pasture in the Whitsunday Region

4.2 Pasture Recovery

Pasture spelling (i.e., recovery) practices for grazing are summarised below. Current practice is likely to be a mix of all practices in the table.

DATED	CONVENTIONAL
Pasture spelling practices that are superseded or unacceptable	Pasture spelling practices that meet minimum expectations
<p>Stocking rate exceeds pasture availability</p> <p>Description:</p> <ol style="list-style-type: none">1. Pasture spelling not used in the management of any grazing land types.2. Lack of internal fencing.	<p>No differentiation between grazing land types.</p> <p>Description:</p> <ol style="list-style-type: none">1. Spelling is opportunistic and is usually a one-off occurrence in the wet season with limited planning.2. Pasture monitoring to determine spelling regime is conducted periodically for the management of less resilient land types.3. Inadequate fencing and infrastructure.4. De-stocking because of above.
<p>Resource Condition:</p> <ol style="list-style-type: none">1. Badly degraded.2. Absence of perennial, palatable and productive (3P) grasses.3. Increasing areas of erodible bare ground. <p>Increasing proportion of weeds.</p>	<p>Resource Condition:</p> <ol style="list-style-type: none">1. Evident decline in frequency of (3P) grasses.2. Increase in less desirable pasture species.3. Susceptible to erosion.4. Some increase in areas of bare ground. <p>Increased weed presence.</p>

BEST PRACTICE	ASPIRATIONAL
Currently promoted Best Management Practices	Innovative pasture spelling practices that require further validation
<p>Pasture spelling for less resilient grazing land types. Description:</p> <ol style="list-style-type: none"> 1. Pasture allowed to re-seed at appropriate intervals. 2. During periods of pasture renovation, introduce new species to establish high diversity in pastures (i.e., predominantly perennials and include some annuals). 3. Pasture spelling (such as wet season spelling) is used periodically in the management of all grazing land types to maximise soil seed bank and to provide sufficient rest for the pasture. 4. Planned annual grazing strategy based on optimum utilisation of country. 5. Grazing rotations are based on seasonal conditions and pasture monitoring results. 6. Land types assessed and vulnerable types given more consideration. 7. Fodder for future dry season is produced on-farm or purchased cheaply during wet cycles. 8. Destocking strategy is in place for climatic extremes such as drought. 9. Opportunistic herd management strategy is in place to optimise resource use in favourable seasons. 10. Paddock and overall property stocking rates are calculated using standard stock units for different classes and spelling regimes determined accordingly. 	<p>Pasture spelling for all grazing land types. Description:</p> <ol style="list-style-type: none"> 1. All B Class practices implemented. 2. Appropriate planning is conducted for all land types. 3. Grazing strategies implemented during the growing season. 4. Stocking numbers per paddock are recorded electronically and compared across different seasons and various years. 5. Long-term weather forecasting tools are used to make decisions on stocking rates and buy and sell trigger points.
<p>Resource Condition:</p> <ol style="list-style-type: none"> 1. Stable or increasing frequency of 3P grasses. 2. Managed weed presence (woody or otherwise). <p>Maintain or improve soil condition.</p>	<p>Resource Condition:</p> <ol style="list-style-type: none"> 1. High frequency of 3P grasses. 2. Proactive weed control program. 3. Minimal erosion, with management strategy in place. <p>Minimal woodland thickening, with management strategy in place.</p>

4.3 Riparian Management

Riparian management practices for grazing are summarised below. Current practice is likely to be a mix of all practices in the table.

DATED	CONVENTIONAL
Riparian management practices that are superseded or unacceptable	Riparian management practices that meet minimum expectations
<p>No independent management of riparian / frontage grazing land types.</p> <p>Description:</p> <ol style="list-style-type: none"> 1. Riparian grazing land types are not managed independently of other grazing land types. 2. Unrestricted access to riparian zones all year. 3. Extended periods of excessive stocking rates. 	<p>Some independent management of riparian / frontage grazing land types.</p> <p>Description:</p> <ol style="list-style-type: none"> 1. Riparian grazing land types are not fenced or only partly fenced. 2. Off stream watering points used to encourage stock away from riparian area.
<p>Resource Condition:</p> <ol style="list-style-type: none"> 1. Bank erosion and slumping, eroding cattle tracks, minimal grass, or vegetation cover, weed distribution and density is extensive. 	<p>Resource Condition:</p> <ol style="list-style-type: none"> 1. Bank erosion and slumping, eroding cattle tracks, acceptable grass, or vegetation cover, weed distribution and density is concerning.



Riparian management

BEST PRACTICE	ASPIRATIONAL
Currently promoted Best Management Practices	Innovative riparian management practices that require further validation
<p>Independent management of riparian / frontage grazing land types.</p> <p>Description:</p> <ol style="list-style-type: none"> 1. Riparian grazing land types are managed independently of other grazing land types where practical. 2. Where practical riparian areas fenced using permanent robust fencing that is a minimum of 20m from the top of the bank, where appropriate on defined watercourses to create a riparian paddock. 3. Pasture monitoring at critical times in riparian areas drives decisions on stocking rates. 4. Stocking rates adjusted independently of other grazing land types in response to pasture monitoring to maintain higher ground cover for riparian grazing land types. 5. Restrict access on vulnerable and easily dispersive sodic soils. Planting various groundcover species (i.e., predominantly grasses and shrubs) can assist in retaining the soil. Please refer to specific guides on sodic soils. 6. Grazing management is based on regular, short interval grazing period/s with wet season spelling to maintain ground cover and minimise stock losses. 7. Off-stream watering points provided. 	<p>Regeneration or revegetation of native vegetation within riparian / frontage grazing land types.</p> <p>Description:</p> <ol style="list-style-type: none"> 1. All B Class practices implemented. 2. Independent grazing management is applied to encourage natural regeneration (weed control) or revegetation of a native riparian vegetation buffer, which is recommended to be at least 10m wide from the top of the bank. 3. Stock is excluded while native riparian vegetation buffer is established up to 5m tall. The native riparian vegetation buffer consists of local native trees & shrubs consistent with the original regional ecosystem. 4. Seasonal grazing consistent with 'B' class practice can be implemented to manage pasture grass adjacent to the native riparian vegetation buffer, once established.
<p>Resource Condition:</p> <ol style="list-style-type: none"> 1. Reduced riparian bank slumpage with adequate grass and vegetation cover. 2. Pests and weeds monitored and managed/ eliminated where practical. 3. Pest and Weed management program in place and coordinated with local and regional stakeholders, i.e., feral pig bating programs. 	<p>Resource Condition:</p> <ol style="list-style-type: none"> 1. Stable riparian banks with well-established or regenerating native riparian vegetation buffer at least 10m wide from the top of the bank.

4.4 Gully Management

Gully management practices for grazing are summarised below. Current practice is likely to be a mix of all practices in the table.

DATED	CONVENTIONAL
Gully management practices that are superseded or unacceptable	Gully management practices that meet minimum expectations
<p>No gully management</p> <p>Description:</p> <ol style="list-style-type: none"> Gully management not used for any grazing land types. Gully used as a refuse site for ineffective materials and equipment from farm. 	<p>Gully management for identified risk areas</p> <p>Description:</p> <ol style="list-style-type: none"> Identification of risk areas with appropriate action taken. No rehabilitation of identified eroding gullies.
<p>Resource Condition:</p> <ol style="list-style-type: none"> Actively eroding gullies, with moving sediment. 	<p>Resource Condition:</p> <ol style="list-style-type: none"> Actively eroding gullies, with moving sediment.
BEST PRACTICE	ASPIRATIONAL
Currently promoted Best Management Practices	Innovative gully management practices that require further validation
<p>Description of gully management for vulnerable grazing land types:</p> <ol style="list-style-type: none"> All grazing land types in the active gully catchment are managed independently of other grazing land types where appropriate. Active stabilisation of gullies using restoration or mechanical intervention. Prevent establishment of new gullies and contain expansion of established gullies in susceptible or vulnerable grazing land types. Rehabilitated areas are fenced and managed independently during rehabilitation period. Planning for infrastructure aims to minimise the risk of gully erosion. Susceptible areas are monitored, and site-specific restoration activities (including mechanical intervention) are implemented when appropriate. Stocking rates adjusted independently of other grazing land types in response to pasture monitoring to maintain higher ground cover within the active gully catchment. Stocking rates based on pasture monitoring at critical times conducted for vulnerable grazing land types. 	<p>Description of gully management for all grazing land types:</p> <ol style="list-style-type: none"> All B Class practices implemented. Stocking rates are based on consideration of seasonal variability and monitoring in critical periods conducted for grazing land types in the active gully catchment. Annual or biannual wet season spelling, or complete exclusion is conducted for grazing land types within the active gully catchment during the rehabilitation period. Identify all at risk soil types via soil mapping. Professional advice informs appropriate mix of strategies to improve areas of gully erosion, which may include stock exclusion, mechanical reshaping of gully heads and sides and the installation of porous check dams. If budget allows, investigate methodologies of gully management, such as: <ol style="list-style-type: none"> Placement of debris or silt traps at bank toe to facilitate sediment and seed deposition to encourage tree/shrub regeneration. Engineered Stream Bank toe protection or bed protection using rock or timber structures and/or battering and revegetation. Construction of porous check dams with fallen timber is commenced by laying the metal mesh across the base of the Gully. Sheets are overlapped and joined with fencing wire

4.5 Soil Nutrient Management

Soil nutrient management practices are summarised below. As nutrient management progresses to B and A class there is increasing precision in management of nutrient inputs to optimise the supply of nutrients to the pasture. The use of equipment as defined in this table can be owned individually, share-owned or contracted.

DATED	CONVENTIONAL
Nutrient management practices that are superseded or unacceptable	Nutrient management practices that meet minimum expectations
<p>No Nutrient Management</p> <p>Description:</p> <ol style="list-style-type: none">1. No nutrient program or opportunistic (price-based) unregulated application.2. No soil sampling undertaken.3. Applying fertiliser based on visual assessment, and historic application.	<p>All land types managed the same for nutrient applications</p> <p>Description:</p> <ol style="list-style-type: none">1. Legumes introduced for increased pasture protein and nitrogen soil levels.2. Limited soil testing.3. Uneven application of fertiliser with limited calibration of application equipment.4. One rate application to all land types/property.
<p>Machinery:</p> <ol style="list-style-type: none">1. Broadcast applicator.	<p>Machinery:</p> <ol style="list-style-type: none">1. Broadcast applicator.



Healthy root systems and vibrant soil at Bob Harris' property, Glencoe

BEST PRACTICE	ASPIRATIONAL
Currently promoted Best Management Practices	Innovative nutrient management practices that require further validation
<p>Land types managed independently for nutrient application</p> <p>Description:</p> <ol style="list-style-type: none"> 1. Combined program of soil testing, faecal NIRS sampling, pasture quality monitoring or animal blood samples are used to determine required inputs. 2. Conduct soil tests per representative soil type/ land type and appropriate fertilizer application related to soil test results/pasture composition/ land type. 3. Timing nutrient applications with respect to seasonal conditions, rainfall probabilities and appropriate ground cover density (nitrogen-end of wet season / phosphorous-pre wet season where practical). 4. Seasonally timed strategic pasture renovation to reduce compaction issues. 5. Even application of fertiliser and regular calibration. 6. Strategic high nitrogen paddocks (grazing or fodder). 7. GPS guidance (light bar or auto steer) in fertiliser application. 	<p>Variable rate nutrient application within land types.</p> <p>Description:</p> <ol style="list-style-type: none"> 1. All B Class practices implemented. 2. Soil testing is georeferenced and monitoring sites established for each land type. 3. Nutrient deficiencies remedied based on soil tests and subsequent professional recommendations. 4. Apply variable fertiliser rates between paddocks based on representative soil type. 5. Soil ameliorants are used to achieve desirable pH. 6. Planned pasture renovation based on analysis of soil compaction measurements then treatments are appropriately timed 7. Even application of fertiliser is achieved through regular calibration. 8. If appropriate soils are available, a finishing system of high input pasture or fodder crop paddocks are used to finish sale stock to genetic potential 9. Use of recycled organics to build soil and substitute synthetic fertilisers. 10. Use of new legume and grass cultivars matched to soil fertility and used to improve soil properties. 11. Managing use of soil ameliorants to match soil health requirements, whether they be biofertilizers or synthetic with a focus on quality control of product used. 12. Making use of drones to support targeted management of plant health, weeds, and soil health.
<p>Machinery:</p> <ol style="list-style-type: none"> 1. Application of granular or liquid fertiliser with GPS guidance. 	<p>Machinery:</p> <ol style="list-style-type: none"> 1. Ability to adjust rate for granular or liquid applicators with GPS guidance. 2. Making use of drones to support targeted management of plant health, weeds, and soil health.

4.6 Pesticide Management

Pesticide management practices are summarised below. The term pesticide is used in this section and is a general classification for chemicals including herbicides, fungicides, rodenticides, and insecticides for which similar management principles apply. The equipment as defined in this table does not have to be owned individually (e.g., can be share-owned, contracted or other).

DATED	CONVENTIONAL
Pesticide management practices that are superseded or unacceptable	Pesticide management practices that meet minimum expectations
<p>Unplanned pesticide management</p> <p>Description:</p> <ol style="list-style-type: none"> 1. Inappropriate and reactive application and use of chemicals. 2. One herbicide strategy for the whole farm based on historic application rates or rules of thumb. 3. Often the maximum label rate of residual and knockdown products used irrespective of weed pressure. 4. No drift control. 5. No calibration knowledge. 6. Poorly maintained machinery. 7. Inappropriate nozzles used. 8. Chemical accreditation training not completed or out of date. 	<p>Basic pesticide management</p> <p>Description:</p> <ol style="list-style-type: none"> 1. Basic weed strategy based on chemicals. 2. Reactive preventative weed control. 3. Alternate strategies not considered. 4. Infrequent calibration of spray equipment conducted and limited nozzle maintenance. 5. Limited chemical selection based on one or two strategies 6. Limited knowledge of appropriate chemicals and application rates. 7. Minimal Personal Protection Equipment (PPE). 8. Meet legislative requirements for chemical storage, application, and disposal. 9. Drift control measures in place.
<p>Machinery:</p> <ol style="list-style-type: none"> 1. Standard spray rig, with conventional nozzles. 	<p>Machinery:</p> <ol style="list-style-type: none"> 1. Standard spray rig, with a suitable range of nozzles for various application tasks.

BEST PRACTICE	ASPIRATIONAL
Currently promoted Best Management Practices	Innovative pesticide management practices that require further validation
<p>Strategic pesticide management Description:</p> <ol style="list-style-type: none"> 1. Implementation of new application technology for, improved placement, timing, and drift reduction. 2. Choice of herbicides and application rates based on weed spectrum and growth stage. 3. Knockdown herbicides replace residual herbicides where practical (residual herbicides only used where weed species and pressure demands it). 4. Timing chemical applications with respect to weed stage, irrigation, and rainfall probabilities. 5. Integrated weed control approach to weed management including chemical, mechanical biological and nutrition. 6. The impact of chemicals on beneficial legumes considered. 7. Completed accreditation and competency requirements for chemical usage. 8. Frequent calibration of spray equipment including appropriate nozzle maintenance. 9. Methods in place to prevent weed seed spread and property hygiene. 10. Animal health activities are rotated. 11. Targeted herbicide strategies within paddocks. 12. GPS guidance (light bar or auto steer) in chemical application. 	<p>Strategic, spatial, and innovative pesticide management Description:</p> <ol style="list-style-type: none"> 1. All B Class practices implemented. 2. NIR detection and control of weeds. 3. Low rates of nitrogen are used to fertilise pastures so they can outcompete low-level weed infestations. 4. Use of drones to map problem weeds and to spray inaccessible places. 5. Spatial recording of the control of major weed species with GPS. 6. Understanding the form and function of plants, including weeds (i.e., recognising that weeds are pioneer plants and understanding what their sequence (dominant order and distribution) is indicating about the condition of the soil at a specific site. 7. Use of drones to identify weed infestations, plant health issues, and to mitigate these with a precise and targeted use of pesticides, herbicides, soil ameliorants
<p>Machinery:</p> <ol style="list-style-type: none"> 1. Boom jets, low drift nozzles (matched to job), splatter guns, wick wipers with manual rate control. 2. Pressure sprayers, knapsack sprayers, stem injection/cut stump and slashers. 3. GPS. 	<p>Machinery:</p> <ol style="list-style-type: none"> 1. Boom jets, low drift nozzles (matched to job), splatter guns, wick wipers with manual rate control. 2. NIR detectors. 3. GPS guidance. 4. Low impact machinery. 5. Making use of drones to support targeted management of plant health, weeds, and soil health.

4.7 Planning and Record Keeping

It is recognised that planning and record keeping practices are inherent to good management and are needed for efficient implementation of all other management practices (i.e., pasture management, pesticide management etc.). As shown in Figure 1, good planning and record keeping drives improvement from lower classes (D or C) to higher classes (B or A).

DATED	CONVENTIONAL
Planning and record keeping practices that are superseded or unacceptable	Planning and record keeping practices that meet minimum expectations
<p>No record keeping or planning on natural resource management.</p> <p>Description:</p> <ol style="list-style-type: none"> 1. No current practice review completed. 2. No formal records kept. 3. Records kept in head. 4. No forward planning for property improvement or increased sustainability. 5. No farm map. 6. No financial planning. 	<p>Basic record keeping and some forward planning on natural resource management.</p> <p>Description:</p> <ol style="list-style-type: none"> 1. No current practice review completed. 2. Basic record keeping. 3. Basic records kept in pocket notebook or similar highlighting major events. 4. Some forward planning into business. 5. Industry accreditation kept up to date 6. No or outdated farm map. 7. Financial planning for current year. 8. Maintain records of chemicals and related products in line with legislative requirements.



Cattle grazing at Blair Plains

BEST PRACTICE	ASPIRATIONAL
Currently promoted Best Management Practices	Innovative planning and record keeping practices that require further validation
<p>Record keeping and forward planning for optimum resource management is part of the annual business cycle.</p> <p>Description:</p> <ol style="list-style-type: none"> 1. Current practice review completed. 2. Engagement in professional development activities focused on grazing best management practise / regenerative farming / sustainable farming methodologies. 3. Review and update of Property Biosecurity Plan. 4. Formal record keeping process established. 5. Records kept in a paddock journal or diary. 6. Develop and implement a grazing land management plan, including a plan for water infrastructure. 7. Utilise software tools and similar technologies to interpret land and develop property management plan (i.e., QGlobe, WALI, Vegmachine, Long Paddock website). 8. Identify grazing land types and pasture types for each paddock using farm maps. 9. Record pasture condition and stocking rates. 10. Pasture assessments conducted on a regular basis to formulated accurate pasture budgeting using tools such as "Stocktake GLM" app. 11. Farm map in electronic or paper format. 12. Paper or electronic photo records kept. 13. Financial planning is conducted for both the current and future years. 14. Pregnancy testing. Female management is planned and dependant on pregnancy status and feed requirements. 15. Planning for extreme climatic conditions – drought, heavy wet seasons, flooding. 16. Development of a Business Plan enabling access to participation in grazing initiatives, training programs and professional development activities which is maintained as a live document and shared (wholly or in part) with business contributors – landholders, managers, employees, contractors. 	<p>Electronic record keeping and forward planning using GIS and emerging technologies.</p> <p>Description:</p> <ol style="list-style-type: none"> 1. All B Class practices implemented. 2. High quality formal electronic records kept. 3. Develop and implement a grazing land management plan, which is updated regularly, including a plan for water infrastructure. 4. Identify grazing land types, pasture types, weed pressure and variability within each paddock using GPS and mapping technology. 5. Electronic farm map. 6. Records kept in computer database. 7. Business regularly benchmarked using tools such as 'Profit Probe.' 8. GPS tracking of livestock (i.e., virtual fencing).

5. Implementation of the ABCD Framework

This framework identifies and supports the validation of grazing management practices that can improve both freshwater and marine water quality and ecosystem health as identified in the Water Quality Improvement Plan (WQIP), (Folkers, A., Rohde, K., Delaney, K., Flett, I., 2014).

The ABCD framework is designed to highlight and facilitate communication about the different levels or standards of management practice (as opposed to resource condition) within the grazing industry for different water quality parameters (i.e., sediment, nutrients, and pesticides). The classifications provide a definition and a scale of improvement from Dated to current Best Practice through to future Aspirational or 'cutting edge' practices.

If implemented, the A and B class grazing management practices that have been identified in this document will improve water quality and increase enterprise viability through long-term improvements in land condition. This aligns with the Water Quality Improvement Plan and associated State and Federal funding programs.

6. Review of the ABCD Framework

Over time, changes in knowledge, technology, costs, and market conditions may validate cutting-edge, 'A' class (Aspirational), practices so they eventually become B class (Best Management) practices. If these practices are widely adopted and become the new industry standard, they may become Conventional practices within an ABCD framework.

The Mackay Whitsunday Isaac Grazing Regional Working Group (see Appendix A) will therefore review the framework periodically to monitor emerging Aspirational practices and to determine those practices that need to be re-considered as Best Practice. Considerable effort was made to consult with grazing industry partners to develop the original ABCD framework in 2010 and this will be repeated over time to ensure there is continued relevance to the industry in the Mackay Whitsunday Isaac region.

7. Bibliography

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- Fitzroy Basin Association (December 2008). Ground Cover Standards for Central Queensland Grazing Lands.
- Folkers, A., Rohde, K., Delaney, K., Flett, I. (2014). 2014-2021 Reef Catchments Water Quality Improvement Plan. Reef Catchments (Mackay Whitsunday Isaac) Limited.
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- Reef Catchments Limited. Mackay Whitsunday Region, Sustainable Grazing Guide.
- The State of Queensland - Department of Employment, Economic Development and Innovation (2011). Grazing for Healthy Coastal wetlands; Guidelines for managing coastal wetlands in grazing systems.

Organisations and Industry Bodies:

- Reef Catchments (Mackay Whitsunday Isaac) Limited - <http://reefcatchments.com.au/>
- National Landcare Programme - <http://www.nrm.gov.au/>
- Resource Consulting Services - <http://www.rcsaustralia.com.au/>
- Meat and Livestock Australia - <https://www.mla.com.au/>
- AgForce Queensland - <https://agforceqld.org.au/>
- Department of Agriculture and Fisheries - <https://www.daf.qld.gov.au/>
- Alluvium Consulting - <http://www.alluvium.com.au/>
- MAPS
- Farmacist
- GBRMPA

Specific Resources:

- RCL's Sustainable Grazing Guide - <http://reefcatchments.com.au/land/sustainable-grazing-guide/>
- Bull Selection – Buying Better Bulls, Queensland Government, DPI, John Bertram - <https://futurebeef.com.au/wp-content/uploads/Bull-selection.pdf>
- Grazing Best Management Practices - <https://www.longpaddock.qld.gov.au/dcap/grazing-industry>
- Farm Biosecurity Toolkit - <http://www.farmbiosecurity.com.au/toolkit/>
- FutureBeef Knowledge Centre and Document Library - <https://futurebeef.com.au/document-library/>
- Meat & Livestock Australia – Cattle Assessment Manual - https://www.mla.com.au/globalassets/mla-corporate/prices--markets/documents/minlrs-information-brochures-etc/mla_cattle-assessment-manual_jan-2017.pdf
- PASTURES: Mackay Whitsunday Region: <https://futurebeef.com.au/document-library/pastures-mackay-whitsunday-region-a-guide-for-developing-productive-and-sustainable-pasture-fed-grazing-systems/#:~:text=The%20aim%20of%20Pastures%3A%20Mackay,region's%20graziers%20and%20land%20managers.>
- Queensland Globe Interactive Mapping Tool: <https://qldglobe.information.qld.gov.au/>
- RCS: Free online Drought Preparedness training modules. <https://www.rcsgloballelearning.com/courses/rcs-drought-preparedness>
- Reef 2050 Water Quality Improvement Plan 2017=2022: https://www.reefplan.qld.gov.au/__data/assets/pdf_file/0017/46115/reef-2050-water-quality-improvement-plan-2017-22.pdf
- Stocktake Plus Pasture Monitoring Package User's Manual: <https://stocktakeglm.com.au/about.html>
- Weed Management in Sugarcane Manual (contains application, mixing and product selection information relevant to weed control in Grazing) - <https://sugarresearch.com.au/new-sra-manual-helps-sugarcane-industry-tackle-a-70-million-problem/>

Appendix A

Grazing Industry Working Group (as at 2010-11)

- Reg Andison (DEEDI)
- Bob Bennett (AgForce/Land Manager)
- Harry Bishop (Local Regional Expert)
- Jean Borg (Land Manager)
- Krista Cavallaro (DEEDI)
- Neil Cliffe (DEEDI)
- Ross Dodt (DEEDI)
- Ron Earle (AgForce/Land Manager)
- Miriam East (DEEDI)
- David George (Land Manager)
- Dr. Jon Graftdyk (Reef Catchments)
- Jim Fletcher (DEEDI)
- Raylene Hansen (DEEDI)
- Will Higham (Reef Catchments)
- Carrie Mayne (AgForce)
- Rod McFadzen (Land Manager) - Chair
- Brigid Nelson (DEEDI)
- Graham Townsend (Industry/Land Manager)
- Marie Vitelli (AgForce)

ABCD Framework Technical Working Group (2010-11)

- Bob Bennett (AgForce/Land Manager)
- Harry Bishop (Local Regional Expert)
- Bill Davies (AgForce/Land Manager)
- Ross Dodt (DEEDI)
- Miriam East (DEEDI)
- Jim Fletcher (DEEDI)
- Dr. Jon Graftdyk (Reef Catchments)
- Raylene Hansen (DEEDI)
- John Hughes (DEEDI)
- Carrie Mayne (AgForce)
- Rod McFadzen (Land Manager) - Chair

Grazing Working Group (2015 Update)

- Robyn Bell (Reef Catchments)
- Bob Bennett (Grazier)
- Michael Boland (Reef Catchments)
- Bill Davies (Agforce/Grazier)
- Rob Eccles (Catchment Solutions)
- Jodie Ferdinand (Grazier)
- Bob Harris (Grazier)
- Claire Mahony (Catchment Solutions)
- Phil Trendell (DAF)
- Scott Underdown (Reef Catchments)

Grazing Working Group (2018 Update)

- Bob Harris (Grazier)
- Mandy Jeppesen (Reef Catchments)
- Julianne Kasiske (Reef Catchments)
- Tegan McBride (Reef Catchments)
- Roxanne Morgan (Grazier)
- Phil Trendell (DAFF)

Grazing Regional Working Group (2021-22 Update)

- Gillian Barbat (Reef Catchments) – Coord.
- Stacey Corrie (Reef Catchments)
- Jim Fletcher (DAF)
- Bob Harris (Grazier)
- Roxanne Morgan (Grazier / DAF)
- Rodney & Paula Wright (Graziers)



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