BEFORE THE FRESHWATER COMMISSION

UNDER	the Resource Management Act 1991 (the **Act** or **RMA**)
IN THE MATTER	of an original submission on the Proposed Regional Policy Statement for Otago 2021 (**PRPS**)
BETWEEN	**OTAGO WATER RESOURCE USER GROUP** **Submitter FPI043** **FEDERATED FARMERS NZ INC** **Submitter FPI026 and FSFPI026** **DAIRY NZ** **Submitter FPI024 and FSFPI024**
AND	**OTAGO REGIONAL COUNCIL** **Local Authority**

EVIDENCE IN CHIEF OF SIMON FLEMING GLENNIE: ADDITIONAL EVIDENCE FOR FRESHWATER PARTS

GALLAWAY COOK ALLAN LAWYERS
Bridget Irving / Phil Page
bridget.irving@gallawaycookallan.co.nz
phil.page@gallawaycookallan.co.nz

P O Box 143
Dunedin 9054
Ph: (03) 477 7312
Fax: (03) 477 5564

EVIDENCE IN CHIEF OF SIMON FLEMING GLENNIE: ADDITIONAL EVIDENCE FOR FRESHWATER PARTS

1. This brief of evidence is the same as the brief filed in relation to the Otago Regional Policy Statement 2021 - non freshwater parts. New evidence not previously provided to the non-freshwater panel is added in text that is shaded grey for ease of identification.

2. I have been given a copy of the Environment Courts code of conduct for expert witnesses. I have reviewed that document and confirm that this evidence has been prepared in accordance with it and that all opinions that I offer in this evidence are within my expertise. I have not omitted to refer to any relevant document or evidence except as expressly stated. I agree to comply with the code and in particular to assist the Commissions in resolving matters that are within my expertise.

Introduction

3. My full name is Simon Fleming Glennie. I work as a sheep, beef and deer consultant for AbacusBio, based in Otago.

4. I spent my early years on an intensive mixed sheep beef and arable, family operation in West Otago. I then studied at Otago University and attained a BSc.

5. I have provided advice on fertilizer use on many farms throughout Otago and Southland. I have also consulted to farming businesses across Otago over past 20 years

6. I currently run a discussion group in Central and South Otago.

7. I have run B+LNZ monitor farms in South and West Otago. I have also run a Sustainable Farming Fund project on irrigation in North Otago rolling downlands. This project investigated the water use efficiency of K-Line, roto-rainers and centre pivots on rolling aspects.

8. I have been involved in projects to analyse of the economic impacts of changes to irrigation in the Manuherikia on sheep, beef and dairy operations.

Code of conduct for expert witnesses

9. I have read and agree to comply with the Code of Conduct for Expert Witnesses in the Environment Court Practice Note 2014. This evidence is within my area of expertise, except where I state that I am relying upon material produced by another person. I have not omitted to consider material facts known to me that might alter or detract from the opinions that I express.

Scope of evidence

10. I have been asked to look at the on-farm aspects of regulatory change from a range of angles. In particular, I have been asked to take a deeper look at the implications of particular changes on a farm and what this might mean for the farmers in terms of social, cultural and economic wellbeing.

11. The purpose of this evidence is to assist the Panel in understanding the process of transition that will be required by participants within the food and fibre sector of Otago. And the need to consider this when determining when new regulations and/or limits need to be achieved.

12. The diversity of farming operations in Otago is remarkable and brings an array of challenges when setting policy and rules. The first of the challenges to consider is the practical challenge of implementing an array of practices that could be considered as best practice or even good practice in terms of environmental management and freshwater outcomes. The physical challenges need to be considered along with the social and financial elements such as the age and stage of farmers and the labour to support any change to practice. Some actual examples are included for context.

13. Going beyond the practices that could reasonably be adopted within the current systems, requires significant system changes and even precipitates land use changes which have greater impact but also take

longer to implement. Where policy dictates that on farm change of this magnitude is required, there are generational impacts to consider.

WHAT IS A TYPICAL FARM IN OTAGO?

14. The land area of Otago is 32000 Km2 or 3.2MHa . 1.8mHa of land is predominantly farmed with livestock which comes to 56% of the total area.

15. Dairy is included in this total with 453 farms listed on figure.nz as dairy farms. Using the more conservative 263,000 dairy animals, there would be 580 dairy animals on the average dairy farm.

16. Dairybase benchmarking group for Otago and Southland shows 582 cows milked at peak for sharemilkers and 600 for owner operators.

17. Stocking rate in the benchmark group is 2.8 cows per Ha which would scale up to 94,000Ha in Otago or 5% of the area assumed to be farmed by livestock. Additional area is required to support wintering of cows in the region.

18. The area of irrigated area in Otago that has a dairy use is 41,369Ha (figure.nz) which includes use as dairy support. This represents around 43% of the 94,000ha of irrigated area in Otago.

19. Dairy farms are typically located on the better land with irrigated areas in Central Otago and North Otago combining with areas of South and West Otago in more reliable rainfall zones, that don't tend rely on irrigation.

20. With 94,000Ha removed from the total of 1,813,168Ha, the remaining drystock including dairy support area will total in the order of 1,719,168Ha or close to 54% of Otago's total area

21. Taking the 2019 stats NZ numbers of drystock and using 5 su equivalent for beef, 2 su equivalent for deer and 1 su equivalent for sheep, the stocking rate for land categorized as sheep and beef, beef or deer is carrying 3.9su/Ha.

22. While the average stocking rate of the regions farms is around 4su/Ha, the range spans from high performing irrigated properties running more

than 12 su/Ha to very extensive areas where carrying capacities are restricted by altitude and lack of moisture to under 1su/ha

23. Of the 1.7M Ha of land assumed to be used in drystock systems, 913,392Ha is described as tussock -grazing or 53% of the area farmed by drystock. This extensive grazing country is what pulls the average stocking rate down as growth is limited.

24. Attached at Appendix 1 is an Agribase image that convey the range of stocking intensity across a broadly diverse, regional agricultural sector.

Land use in the region (figure.nz)

	Area (Ha)
Tussock Grazing	913,312
Grassland	824,463
Grain and fodder crop	75,313
Agricultural	1,813,168

Financial

25. A typical farm is difficult to describe due to the great variability across Otago. If we were to try, the answer would look something like the Beef + Lamb New Zealand (B + LNZ) class 6 model. This “typical farm” is a benchmark generated from an extensive survey of randomly selected farms representing a breeding and finishing type operation. It is used in industry for the benchmarking of income and expenditure.

26. The benchmark model farm of 509Ha runs 4326su at 8.5su/Ha. While the average stocking rate in Otago is lower than the benchmark, it is most representative of the typical system run in Otago. I use this benchmark model for discussion groups and have found it a good set of financial indicators for this region over time.

27. The 2020-21 provisional analysis shows a gross revenue of $609,400 and a cash expenditure of $441,100. Average depreciation for this class is $37,400 leaving a farm profit of $130,900.

28. The model is based on an owner operator situation where the owner draws from the farm profit and pays tax.

29. Debt servicing and rent in this model totals $87,800. As this estimation is an average of many farms, a portion of farmers service much higher debt than others. A higher level of debt servicing reduces the farm profit available.

30. In variable environments where effective rainfall fluctuates between years, the financial impacts also are felt as farmers pay for grazing or feed. In addition, a portion of the financial impact is felt in the year following the dry season as stock numbers are rebuilt. In the situation where pasture is damaged, the impacts can span multiple years.

31. Looking at 5-year averages, for the benchmark model, the farm profit before tax is $144,790. While the average is likely to be a fair representation, the variation that would occur at an individual farm level is smoothed by the pooling of farm results from different climatic zones. Even as a benchmark group, the standard deviation of farm profit over the 5-year period is $51,000. At an individual farm level, this variation is even greater. This variation requires a degree of respect and conservatism as farmers progress through the years. In the instance where poor years occur consecutively, the variation can be catastrophic. The inclusion of additional expenditure needs to be carefully considered in this light.

Social

32. While there is a wide array of farm types in Otago, there is also a great deal of diversity in terms of the circumstances under which each farm is operated. The age of the average NZ beef farmer in the 2013 census is 56 yrs and 51yrs overall and the trend over 2006 -2013 was that the average age lifted 1 year every 2.7yrs. There is a very different mindset involved where farmers are at the end of their career. While debt levels are typically lower, the desire to spend on long term farm projects are certainly reduced as this generation prepares to exit the industry. If succession is possible, it is usually achieved by working to reduce the burden on the incoming generation. In family farms, this desire is still strong and influences the capital expenditure available to put into projects that are viewed as not having a positive return on investment.

33. Young entrants are faced with the situation where they are learning the ropes with immediate pressure to perform and service debt. While the enthusiasm to make a difference is stronger than the retiring generation, the financial constraints are considerable. Changes are prioritised carefully with requirements to meet new regulations necessarily wedged in among the initiatives that allow the financial impositions to be met. While the will to improve farm parameters with respect to environment is often strong, the ability to carry out the work is by no means equal across the region.

34. An example is a Central Otago family farm where the incoming generation take on a considerable burden of debt to bank and family. In this case, the incoming generation are aware and grateful of the opportunity that is only possible through the will of a determined family. The operation is partly border dyke irrigated and through tough years, there has been minimal input. The borders are no longer operating efficiently and the opportunity to switch to pivots is explored. As the scheme is a combination of rostered take and on demand, some storage is required to run the pivots. The scheme is designed and priced with a second array of costs estimated to make the farm functional including fencing, stock water and sowing new pastures. The additional debt taken on needs to be serviced by improved production, so the current farm system is modelled in software and then altered based on expected change to pasture and feed available. Different systems are tried in software to evaluate fit and potential profitability. The farmer considers the skills and resources required to undertake both the development and also running the altered operation. The bank is eventually approached with a proposal along with cashflow budgets through the transition period and forward until a new status quo is reached. Much deliberation has taken place and cost incurred before this point and during that time the pricing for the pivots has increased. Deposits are required to secure the materials and timelines are stretched to undertake all of the work required before the irrigation season begins. The bank has to agree to the proposal and be comfortable with the level of risk undertaken. The farmers also need to

be comfortable that the undertaking doesn't cost them an inter - generational farm if they are unable to make it work.

35. From an environmental perspective, the change is modelled in Overseer to significantly reduce losses of Nitrogen and Phosphorus. However the Greenhouse gas emissions increase through higher stock numbers as irrigation efficiency is improved boosting pasture growth. While the benefit to water quality is significant, the cost of the additional CO2 emissions is difficult to mitigate as forestry options are limited.

36. The stock system being run is destined to change to maximise the benefit of the new irrigation. Breeding stock are reduced and trading stock increased but this will not be able to be undertaken in full until the pivots and associated new fencing are in place and pastures are renewed, which will be a three to five year lag.

37. Due to the scale of the development, not all pastures are able to be upgraded in the first instance and some will go through a crop phase to ensure a better outcome in new pasture. The resident pasture on the dryland area that will receive pivot irrigation are not suited to high performance and will all be renewed. Because the spend on infrastructure is incurred up front, the pressure to address soil fertility and regrassing is high in order to get to the required level of production to service the increased debt. Stock numbers are not settled until this phase is complete and during this time, the new system is learned and adapted requiring high skill levels and new skill sets as the irrigation is managed. Cashflow is not expected to reflect the new system until the third season as improved young grass areas are fully in place and systems are refined.

38. While the financials need to stack up to undertake the venture there are many assumptions that underly the expected performance. For many farmers, the risks involved are simply too great to bear and the status quo remains. Where the reasons for the change are driven or partly driven by compliance, the risk of failure is likely to climb.

39. The above example is when the farmer needs to upgrade an older irrigation system. The financial merits of upgrading a more modern irrigation system, for instance, hard hose irrigation to pivot irrigation is incredibly difficult to justify. This is because the stock unit increase may be from 12 stock units increasing to 15 stock units under pivot irrigation. However, if it is a new irrigated area, it would usually see an increase from 3 – 5 stock units to 15 stock units, which the Banks are more likely to support.

40. Land use change is often associated with irrigation development in order to fund the additional debt serviced. However, with restrictions on land use intensification, the opportunities are limited. Banks who fund the developments are risk adverse and factors such as reduced use options and short consent periods are affecting the "bankability" of these projects. The financial viability of the development turns on the availability of water to irrigate the land which will then increase farm production. With shorter consent periods the bank no longer has certainty that the farmer will have water to irrigate, which means that there is no certainty that a farm's productivity will increase to pay for the debt incurred to build the irrigation.

41. Irrigation upgrades are considerable undertakings and require skill and a viable financial pathway to be successful. Constraints such as stage of career, inter-generational goals, access to finance, land use options, and skill/ability all suggest longer timeframes may be required to achieve successful outcomes.

Good Management Practice

42. In light of the legislative changes in play and the desire by farmers to reduce environmental footprint, there are a range of management practices that, when put in place can reduce impact on the receiving environment. We can describe these interventions as 'good management practices'. This suite of possible changes typically represents management adjustments and small tweaks to farm systems. The changes are relatively minor in that they don't impact heavily on the system and allow the production and requirements for labour and services to continue largely unchanged.

43. Given the extensive nature of the farmed land in Otago, the systems developed are generally simple low input systems. Beef cow numbers have held up in the face of land use change for a reason. There are limited options for grazing feed that is grown during a short growing season and has low energy density and is often unfertilized. Beef cows fit this role well and are a lower input stock class requiring less labour input relative to other classes. Compared to sheep, they are able to maintain themselves on feed of lower energy density and as such, require less supplementary feeds to be carried and fed.

44. The range of stocking rate is very significant where rules-based controls are put in place where costs shift relative to area. A good example is fencing where per Ha costs don't shift relative to stock unit.

45. With a low stocking rate on this class of land, the infrastructure is also less dense with fewer fences and greater distances covered if water is to be reticulated or streams fenced off. The cost to comply with what is a simple, low cost mitigation on flat, highly profitable land is much more challenging on extensive hill country.

46. Where deer are concerned, the cost of fencing is much greater due to the type of fence required to exclude this stock class. Some farm businesses are reducing hind numbers because of the challenges ahead. However, this too has implications for the farmer as infrastructure and farm system has to be changed.

47. The 2016 MPI stock exclusion costs report looked into the cost to supply materials and erect different types of fencing on different contours. 2 wire electric fencing suitable to exclude cattle from flat land was worth $1.80/m for materials and $2.40/m to erect in Otago at that time. A total cost of $4.20/m. At that same time, a deer fence erected on steep country in Otago was reported to cost $9.80 in materials and a further $14.80/m in labour to erect for a total of $24.60/m. In effect, the cost to exclude deer is 6 times greater than cattle in some instances. Steeper country is also run at lower stocking rates. I have deer clients in Otago who run less than 1 deer per Ha on dry hill country. The efficiency of breeding hinds on this country is very good being a low input system.

The carrying capacity of this land is well below the Otago average of 4su (sheep, beef and deer). On a per stock unit basis, at 2su/ha the cost to exclude deer climbs to over 30 times that of excluding cattle from productive land at 10su/Ha.

Winter Crop

48. Brassica crop such as Kale and Swedes are typically sown in the summer during a period of feed surplus with the intention of feeding that crop to livestock in winter when pasture growth is below what is required to meet the need of livestock.

49. It is not a simple case of not sowing winter crops as the alternatives have ongoing impacts on the farm system and productivity.

50. If livestock numbers were reduced to allow wintering with no winter crops there are consequences that go beyond simply reduced revenue through reduced stock. Because there are fewer animals on hand in spring a greater portion of the grass grown in spring is ungrazed and as a result, loses quality. Stock performance is based on the quality of feed and as pastures age the quality declines rapidly impacting growth rates and lowering reproductive rates. The quality of feed on hand in winter has improved over time and this has been necessary to allow the increase in lambing performance that has occurred. For 2018-2019, B+LNZ reported a lambing % of 140.9% for the land class 6 model most reflective of Otago drystock systems. To achieve this level of performance on Otago farms requires a feed platform capable of delivering sufficient feed quality to support a high level of multiple lamb bearing ewes. Winter crops have the advantage of effectively shifting feed from a time of surplus in late spring and delivering high quality feed at relatively low cost in winter when feed is in short supply.

51. A secondary benefit for the farmer is that the pastures on the farm are upgraded during the process allowing the damage caused by insect, weed incursion and drought to be remedied and new species drilled in. A typical crop area would be 5-7% of a farm which equates to new grass sown every 14-20 years. Perennial pastures are often under pressure

from regenerating native and weed species and the brassica allows a break in the cycle and better establishment of new species.

52. Farmers are aware that grazing these crops come with increased risks, particularly during wet weather and saturated soil conditions. There has been a lot of progress in adapting techniques to reduce risk with a lot of thought to protect critical source areas.

53. Alternative systems are being trialled and refined to fit as best as possible but there are issues. There still remains a need to push a reasonable yield into those winter months where growth in Otago is low. If a yield is too high on any crop, the pressure of grazing can be too intense to allow the plants intended to remain alive to survive the treading damage. An example of this would be a turnip and grass mix where the turnip is eaten once and will not recover but the grass, if not too damaged, will recover in spring. However, this depends primarily on the weather which is variable at best. Simply moving the animals off can form part of the plan but is reserved for extreme events, and there are animal welfare considerations when changing feed type at short notice. Allowing more waste and shifting animals earlier is also possible but the consequences of over feeding and then running short while stock are heavily pregnant is to be avoided. By targeting a lower yield, a greater area of crop is required to meet the feed shortfall. While this fixes the shortfall in winter, more area of summer and autumn feed is removed as well. The system must be adapted to allow for this outcome. A greater area of drilling and seed is required, and time and feed implications need to be accounted for.

54. The mixed crop example where species are included that are intended to remain and grow post grazing will often have variable results depending on the season. If grass is included, it grows early and can significantly affect the brassica yield if dry conditions prevail. In different conditions, the brassica can dominate and shade the species included with the intention of surviving the grazing. In this situation, high yield of brassica and poor companion establishment can risk a large area of ground in spring without a growing plant in the ground. If this situation

occurs there can be reduced capacity to carry stock through the crucial spring period. The outcomes of this system are not as reliable and consistent making management difficult.

55. In some situations, silage can be grown, harvested and fed out to meet the need of livestock. However this requires specialized machinery and can be dangerous to feed on rolling country.

56. All grass wintering was a strategy heavily promoted in the 1970's. Farmers now refer to the system that existed as "controlled starvation" or "skinny sheep farming". Effectively the supply of feed didn't meet the nutritional needs of the livestock causing them to lose condition. Holding body condition on ewes during winter is important to allow the best possible survival outcomes for lambs. Ewes with lower body condition and lambs with lower birth weights have poorer survival outcomes. While there is a degree of environmental pressure on farm systems there is also a growing requirement to maintain a social license through good animal welfare practices. Some of the short-term welfare concerns regarding crop grazing don't reflect the improved overall nutrition of livestock and the positive influence on survival outcomes in Spring.

57. At a more granular level, the management of critical source areas is changing. At its simplest, the swales and dips on flat to easy contour are identified and easily excluded from spraying or cultivation and are grazed last if at all. However the situation on our more rolling contour is more challenging with multiple critical source areas that are non-uniform on larger blocks with increased distances to fence and provide water across. Continuously cropping the easiest contour is also not an option as diseases such as club root require long break periods between re cropping to break the cycle. Effective management of critical source areas on steeper paddocks will be a time consuming and challenging operation. In some instances, the need to provide shelter and protect immediate welfare of stock will be in conflict with environmental outcomes. A pragmatic approach is implored in this respect, particularly where weather events are concerned.

58. Where rules are in place and time bound, there is concern that change is not as simple in each situation. Circumstances also change for different and legitimate reasons meaning plans must change also.

59. The farm systems employed and the reasons they exist are many and varied. Ability to incorporate change is also different between farms and for each of the possible mitigations that can or must be implemented. To this point, the array of mitigations is best described as good management practice.

Constructed Wetlands

60. In terms of the mitigations available and the impact able to be made, each farm is unique. Whether the farm is on heavy or light soils, free draining or impeded, flat or steep or some combination dictates the mitigations available and the cost of implementing.

61. Community catchment schemes have allowed an injection of both capital and knowledge to advance the creation of wetland habitats on farm where the opportunity exists.

62. In areas such as West Otago, on pallic soils, there has been significant historical expenditure on drainage and often farms have extensive tile drainage networks. As a result of the drainage, the improved pastures grow early, and the land supports high stocking rates. Land use options are plentiful, and the land has a high value as a result. Where there is little fall on offer, the tile drainage network is often connected directly to waterways. Introduction of wetlands to the equation has the potential to reduce land use options and land value through reduced drainage efficacy.

63. While at a simple level, the inclusion of wetlands is a part of good management practice, there are situations where the value of land and the land use potential is impacted which pushes us beyond best practice and into an area of changing land use and value.

BEYOND GOOD PRACTICE

64. When changes are considered to be required that go beyond good management, the implications for farmers are much more profound. Changing the farm system from its current state to address legislative

requirements is more complex and can fundamentally affect wider communities, particularly where land use changes are included.

Shift in land use

65. New Zealand has seen a significant shift in land use in relatively recent history. Below is a table demonstrating the changes that occurred from 1990-2019 through the 'dairy boom'.

Table 1: Change in Stock numbers in New Zealand 1990-2019 (stats.govt.nz/indicators/livestock-numbers

	1990	**2019**
Dairy Cows	43,775	352,639
Beef	235,617	325,432
Sheep	8,309,622	4,888,402
Deer	59,802	121,391

B+LNZ economic service numbers are different for June 2020

B+LNZ	2020
Dairy Cows	263,000
Beef	276,000
Sheep	4,374,000
Deer	112,000

66. Another consequence of a land use change at scale and at a similar time period is the disruption to trading markets. The significant increase in dairy numbers from the 1990 number 43,775 to the 2019 number 352,639 corresponds with a reduction in the Otago sheep population of 3.42 million head. During the peak of the land use change, the ewe market prices dropped to near the works price. We are beginning to see a similar trend as a result of land converting to forestry. Ewe numbers are again on the decline. The market needs time to absorb numbers as change occurs.

67. The dairy expansion since 1990 has continued to evolve as wintering barns have started to become a part of the landscape. Once again, the

capital cost to construct the sheds and the skills required to operate them are considerable. While some have been able to incorporate wintering barns into their operations, the option is not valid for many given debt constraints and location.

68. Production forestry has increased on drystock properties as farmers take the opportunity to capture Carbon and shift land use to trees. In instances where trees are planted into low producing gullies, there is little change to the farm system. However, the situation in play currently has seen whole farms sold and those farms being planted in their entirety into pine trees.

69. Where regular or even seasonal farm work or services are replaced by the less regular silviculture and management of plantation forestry, communities outside the farm gate suffer.

70. The longer-term effects on communities will be more profound as the number of residents decline. This factor is in contrast to the change to dairy where more labour was required than the existing use at that time.

71. The land use changes to date have been driven by economics of the individual farm business. In usual circumstances, this results in capital appreciation in land value over time. Where land use change is forced as a result of regulation, the impact on capital value is likely to be negative. The cost of compliance falls on the shoulders of few and this can be seen where irrigation reliability is reduced.

Irrigation and Water Storage

72. Winter stored water or water stored in dams during periods of excess and used to supplement irrigation during dry periods makes sense to most people. Community projects are present in Otago and have provided irrigation water over many decades. However, getting agreement to reinvest or alter these schemes is very difficult with conflicting interests and differing opinions on funding.

73. Many farmers have invested in on farm water storage in order to better secure reliability in dry periods. The dams themselves are a considerable undertaking requiring an array of consents and

engineering. The large capital cost is divided through decades to gain approval from the bank. Below I discuss a real example of one of these on farm projects.

74. At the time of construction, the previous estimated cost to build was exceeded two-fold leading to a great deal of on farm stress and a very long payback period.

75. The main dam constructed 15 years ago inexplicably failed after 13.5 years of faultless service.

76. Through fortunate timing there was an empty secondary dam immediately below the main dam which fully contained the flood. Had this not been the case, the implication for the receiving environment would have been akin to a very localized, high rainfall event, largely mitigated within the farm boundary.

77. The breach was unpredictable and the damage to the dam wall was assessed by engineers with the ultimate goal to reinstate the dam.

78. Engineering advice and consenting application fees have totalled over $120K to date and no consent has been issued. The farm business has shouldered the costs to date and are no closer to a consent being granted than when they started.

79. A difference in opinion between engineers over the requirement for full or partial lining of the dam sees the process at stalemate.

80. Due in part to the war in Ukraine and impacts on petroleum-based products, the cost of the dam liner required to meet the new consent was due to increase by over $100K. The farmer made the difficult choice to purchase the liner prior to the granting of consent in order to hold the price. Fuel required to complete the excavation work has also climbed considerably in price. On many farms, the interest rate on their debt has tripled over the past 2 years.

81. The position is difficult for the farmer as sunk costs associated with engineers time, existing infrastructure and inflation already equate closely to the original build cost, effectively doubling the price. To stop

now is not really an option but equally there is no clear pathway to reinstate the structure.

82. In the meantime, the farm system is vulnerable to dry and much less reliable. Additional infrastructure to apply the water has also been invested in overtime based on the availability of reliable water which is no longer being utilized.

83. The stress of the predicament and uncertainty of the process just to reinstate an existing piece of infrastructure has been considerable.

84. Farmers won't dispute that storage is a solution allowing a balance of outcomes between the environment and farm. However, the regulatory environment is already difficult to negotiate and there are risks and potential for unforeseen outcomes which fall back on farmers.

85. In the instance where consent periods are short, the uncertainty associated with large capital projects effectively makes them unbankable due to the possible risk of water loss. In this case, there is a delay in infrastructure spend that would have a positive environmental effect if instigated.

86. Hand in hand with the water storage debate, is the impact of reduced reliability where takes are affected in order to meet environmental outcomes. Where farmers are not able to or are not prepared to risk the development of on farm storage, the land value is impacted. Where reliability of irrigation water is reduced, the way in which land is farmed changes. Farm profit is lowered and as a result, the value of the land is also reduced.

87. While there is no doubt that in stream values need consideration, so too does the impact on the individuals and families most affected.

Summary

88. Farmers are aware that change is required but seek to ensure that consideration is given to timeframes and relative benefits of implementing best management practice. In doing this, the variation in physical, social and financial circumstances can be given due consideration. I have identified the following items for consideration:

(a) **Social**: There are significant hurdles for a farming family to take on the debt to support irrigation development and may turn on social factors such as the stage of the farm's succession, inter-generational goals, access to finance, land use options, and skill/ability of the particular farmer.

(b) **Good management practice**: Each farm in Otago will have a stocking policy to suit the environment and the farm's limitations. Significant change in management practice is often impossible or financially imprudent.

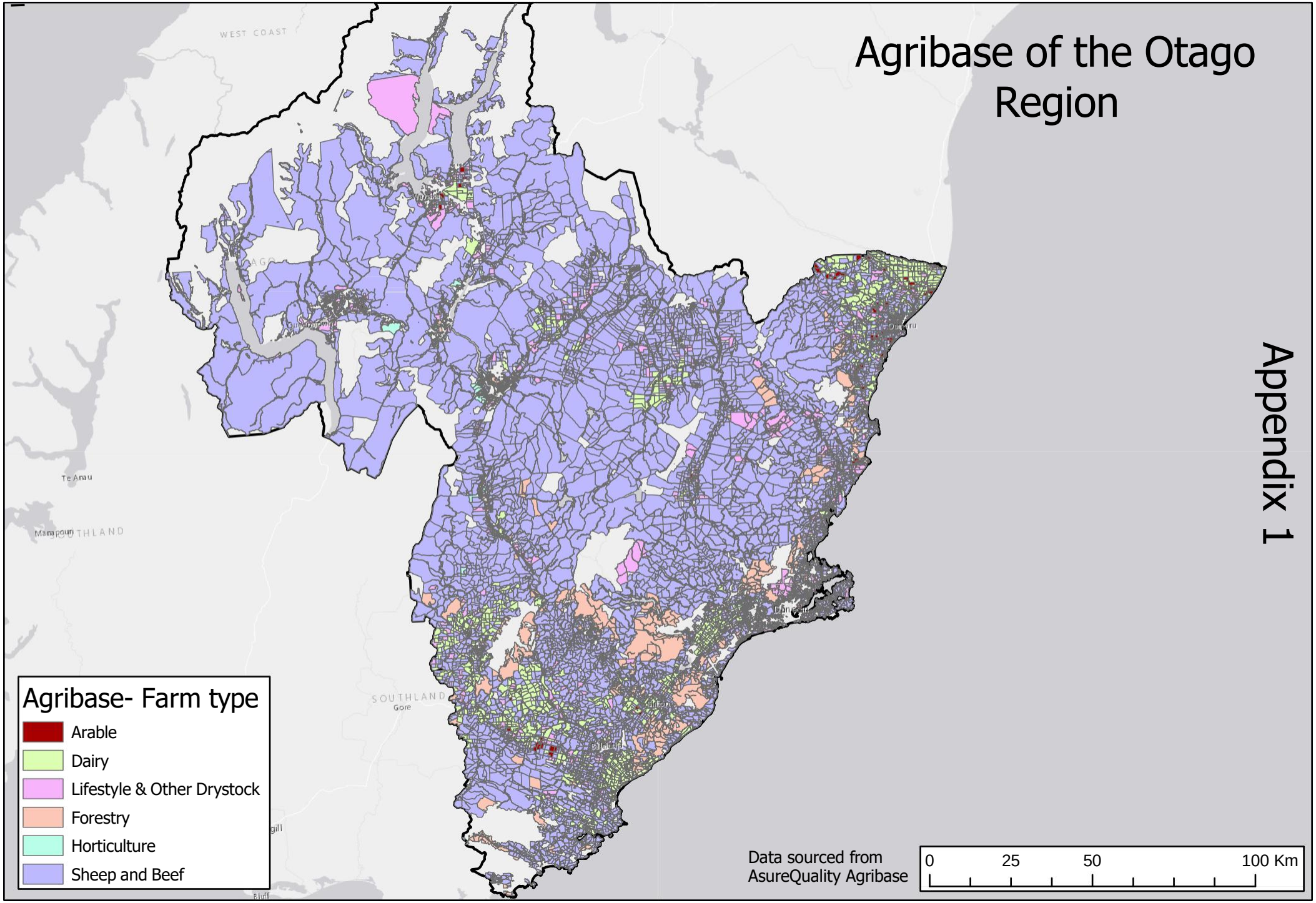
(c) **Winter Crop**: Winter crops are critical to farm productivity in Otago as well as animal welfare.

(d) **Constructed Wetlands**: Whether a wetland should be constructed requires consideration to the impact on the farming system. Where actions beyond best management practice are required a much wider and deeper consideration is due. Change of this magnitude requires more thought as to the ramifications for land value and the impacts on farmers making significant system changes, many of which will have detrimental financial outcomes.

89. Consideration is also required in light of the practical constraints associated with implementing these significant changes. As I describe in this evidence, these large changes take time, even once they have been committed to and funding is available.

S Glennie

28 June 2023


Agribase of the Otago Region
Appendix 1
WEST COAST
Te Anau
Manapouri
SOUTHLAND
Gore
Bluff
Agribase- Farm type
Arable
Dairy
Lifestyle & Other Drystock
Forestry
Horticulture
Sheep and Beef
Data sourced from AsureQuality Agribase
0
25
50
100 Km