Boffa Miskell Upper Rakaia Values Assessment for Game Animal Management A guide for future game animal management

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Prepared by:	Pete Caldwell Biosecurity Consultant Principal Boffa Miskell Limited	Maldull
Reviewed by:	Marcus Girvan Biosecurity Consultant Associate Partner Boffa Miskell Limited	IR.
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Executive Summary

The Upper Rakaia Values Assessment for Game Animal Management has been developed to guide the direction for game animal management in the upper Rakaia River catchment ('Upper Rakaia') and to provide learnings for game animal management across further landscapes within Aotearoa New Zealand. The preparation of this values assessment involved engagement meetings with a wide range of stakeholders and an electronic survey, which resulted in 262 responses. The conversations had during engagement and the survey responses have helped to shape desired outcomes relating to game animal management in the Upper Rakaia and understand future challenges and options for game animal management elsewhere.

The most frequently discussed and important values raised by stakeholders during engagement were focused predominantly on:

- Indigenous biodiversity (particularly indigenous flora) to be protected from adverse effects of high game animal densities
- Red deer (and to a lesser extent, chamois) being most important, and available for hunting recreationally and commercially to provide for wellbeing (through outdoor experiences), food and economic return
- **Game animals** considered as mahika kai and generally as having high cultural value, for both Māori (mana whenua) and non-Māori
- Agricultural values to be protected from adverse effects of high game animal densities

Stakeholders were each categorised into one of four value groups; Mana whenua, Ecological, Recreational or Commercial. There was significant variation between their values, not only in what was considered valuable, but also on whether one value should be protected at the expense of others or if a balance should be struck to include all stakeholders' values.

Numerous themes relating to game animal management were raised, and these are examined in more detail in the discussion section:

- The use of 'game animal' terminology was questioned, and some respondents considered 'pest' to be a more appropriate term. However, 'game animal' was selected because it is technically and legally the correct term to identify the species of focus.
- In the Upper Rakaia, red deer were considered the highest-value species for a number of reasons and should be managed with this in mind. Wild pigs were the lowest-value species and should be managed to low levels to protect biodiversity and agricultural values.
- Recreational hunters would like to be involved in management programmes, where
 practical, by being both involved and informed of what is happening within the Upper
 Rakaia. Furthermore, stakeholders supported the utilising of meat from management
 activities.
- Proactive management of all game animals was generally supported, with support for the designation of a Herd of Special Interest (HOSI) from recreational and commercial value groups, and mana whenua. Ecological value groups did not support the designation of a HOSI. There are differing views on what the designation of a HOSI would mean. This should be further clarified with all stakeholders to ensure a common understanding.

About the Author

Pete Caldwell works as a biosecurity consultant and project manager at Boffa Miskell. He is passionate about protecting New Zealand's landscapes to enable indigenous species to thrive, and for New Zealanders to be able to recreate in these wild places. He is a recreational hunter, a Certified Environmental Practitioner, has an interest in traditional culture and practices (e.g. mahika kai) and works across much of the Canterbury high country. Pete has worked for several years within the Upper Rakaia catchment and is in frequent contact with many stakeholders. These existing relationships have allowed open conversations about values present in this area, and the challenges and opportunities of future game animal management.

1.0 Introduction

The Research Project

Purpose

To assist the design of future management plans, in the Upper Rakaia and elsewhere, by developing a process for (i) understanding stakeholder values and (ii) considering how game animal management (or lack of) could impact those values.

Objectives

- 1. Identify and report on (i) indigenous and valued introduced biodiversity, (ii) land use, and (iii) active management programmes in the upper Rakaia River catchment.
- 2. Understand stakeholder values in the upper Rakaia River catchment.
- 3. Discuss the potential impact of various game animal management approaches on identified stakeholder values.

The preparation of this values assessment involved meeting with a wide range of stakeholders (over 20 groups and subgroups) and an online survey, which resulted in 262 responses. The feedback from this engagement and the survey responses have helped to shape the desired outcomes relating to game animal management in the Upper Rakaia and better understand how this may work across other landscapes.



A red stag in indigenous vegetation, Mathias River catchment.

The Upper Rakaia Values Assessment for Game Animal Management Report (henceforth, **Report**) seeks to provide information on the values in the upper Rakaia River catchment ('Upper Rakaia') that relate to the management of game animals. This Report also provides learnings on how game animal management can be effectively carried out across other catchments within New Zealand. The Report also discusses management options as outcomes from the engagement. This includes 'quick wins', where there is widespread support across stakeholders for a management decision, and 'future challenges', where important decisions must be made on issues that may divide the community or where significant effort is required long-term. This project was funded by the New Zealand Deerstalkers Association and Boffa Miskell internal research project funds, due to a common understanding that, compared to historic management, applied game animal management can be more effective at protecting all values.

The upper Rakaia River catchment was chosen due to its rich values across a range of categories including ecological, mana whenua, recreational and commercial values. This project has sought out and utilised the knowledge and views of a range of key stakeholders to bring together information that can help shape future game animal management strategies and, eventually, management plans and operations.

Te Mana o te Taiao – Aotearoa New Zealand Biodiversity Strategy 2020 (ANZBS) – outlines the goal of designing management plans by 2025 for valued introduced species, including game animals, to reduce impacts on biodiversity and to maintain the value these species provide to the community. The design of management plans to achieve the goals of the ANZBS is enabled through the adaptive framework, Te Ara ki Mua (TAKM). There is currently no process under TAKM for identifying stakeholder values or for considering how game animal management may impact those values when considering management plan design. This research project has been commissioned to better understand the process for identifying stakeholder values and considering the impact game animal management may have upon them.

New Zealand has effected further change in the game animal management space, with the recent establishment of the first Minister for Hunting and Fishing. This position is based on supporting rights of New Zealanders' to hunt and fish, while protecting and enhancing New Zealand's natural environment. This could further accelerate game animal management in New Zealand in its move from a largely reactionary state to proactive programmes that deliver quality outcomes to protect and promote ecological, mana whenua, recreational and commercial values within a game animal management context.

The Upper Rakaia Catchment - Values and Activities

The Upper Rakaia, from above the Rakaia Gorge to the headwaters (map appended), is a river system with a diverse ecological landscape spread across multiple land tenures. It encompasses Toitū Te Whenua / Land Information New Zealand (LINZ)-managed riverbed areas, public conservation land (PCL) administered by Te Papa Atawhai / the Department of Conservation (DOC), and high-country stations and various homesteads. Important habitats include some of the country's largest intact braided river systems, high-country lakes, extensive and largely intact wetland complexes, montane podocarp forests, beech forests, tussocklands, extensive grey scrub and shrublands, and productive pastures set against the backdrop of an impressive glacier-carved landscape.

The Upper Rakaia is also home to five game animal species, comprising red deer (*Cervus elaphus*), fallow deer (*Dama dama*), wild pigs (*Sus scrofa*), chamois (*Rupicapra rupicapra*) and Himalayan tahr (*Hemitragus jemlahicus*). The value of these animals in the Upper Rakaia varies significantly between species, geographic area and stakeholders, and is therefore difficult to

quantify. The value of game animals to a given stakeholder generally falls within one of four value categories; Ecological, Mana whenua, Recreational and Commercial. Recreationally, the opportunity to hunt game animals is valued for a range of reasons, including utilising meat from harvested animals, and the increased wellbeing involved in participating in recreational hunting activities in these remote landscapes. There is also crossover with guided hunts and Wild Animal Recovery Operations (WARO) which provide an economic return from having game animals present in the landscape. Depending on the context, game animals are also frequently called ungulates, valued introduced species, pests, trophy animals, and a myriad of other descriptors. For clarity and accuracy, in this Report the five species listed above are referenced as game animals, based on their inclusion in the Game Animal Council Act 2013.

There are numerous interests, activities and programmes that run in the Upper Rakaia, drawing in a diverse range of stakeholders who have interest in this catchment. The high-country farms are steeped in history, and many have been owned and managed by the same families for multiple generations. It can be a harsh environment, and some landholders have diversified to add more agritourism into their business, including managing or allowing guided hunting for game animals on their properties. There are also other programmes running in the Upper Rakaia aimed at protecting the ecological, agricultural, recreational and mana whenua values present. These include coordinated approaches between DOC, LINZ, Environment Canterbury (ECan) and landholders to manage mammalian predators around key habitat for braided river birds, including the globally unique and nationally threatened wrybill (Anarhynchus frontalis). These agencies also collaborate on comprehensive weed programmes, which aim to prevent weeds from establishing in the upper catchment to secure habitat for indigenous biodiversity while allowing recreational access to the upper reaches of the catchment. Recreational fishing, some guided, is a common activity in the Upper Rakaia, with tributaries being important for indigenous and introduced sports fish spawning, and is a beneficiary of the weed management programme.



Ecological, recreational, agricultural and mana whenua values all exist in the same spaces, Cameron-Heron catchment.

Conflicting Values

Game animals are herbivores (or omnivores, in the case of wild pigs), and consume both indigenous and exotic vegetation through browsing and grazing. The general conflict between game animals and other values is due to the effects game animals have on indigenous biodiversity and agricultural production. Lower game animal densities result in reduced impacts on these values. Game animals generally have highest value to recreational hunters and commercial activities relating to guided hunting and wild animal recovery operations (WARO). Specifically, the red deer herd in the Upper Rakaia area is renowned as a heritage herd due to its bloodlines. These genetics are the basis that give this herd its trophy potential, and is consequently of high value for many recreational and commercial hunters. The presence of game animals is generally valued the lowest within the ecological group, with the view that increasing game animal abundance generally has greater impacts on indigenous vegetation through browsing, grazing and soil disturbance from pig rooting. For mana whenua, game animals in the Upper Rakaia are high value for their role in mahika kai (food gathering), but can also be considered low value, due to negative impacts on indigenous flora and fauna and any other effects on taoka (treasures).

Continual Increasing Abundance

Game animal abundance in New Zealand generally increases over time due to the reproductive output of game animals and the lack of non-human predators. Since the introduction of game animals, herd abundance has fluctuated significantly due to various actions and activities, including government protection, followed by hunting, culling and WARO. Game animal management has been inconsistent and often not well coordinated throughout much of New Zealand's history, resulting in a 'boom and bust' approach, which has had severe implications for both indigenous biodiversity (when game animal abundance has been high) and game animal populations (when game animal populations have been reduced to very low levels). The lack of proactive management after deer were released in New Zealand in the late 1800s and early 1900s resulted in high deer densities for several decades and caused degradation of ecological values across many parts of the country. There has been no effective, overarching national strategy and associated plans to give effect to landscape-scale, multi-species management programmes, rather, ad hoc approaches often guided by government directives and budgets. Indeed, there are generally no consistent and long-term agreed visions for game animal management for most landscapes throughout New Zealand. This lack of a strategic, proactive approach, in addition to insufficient and inconsistent funding, has likely been the cause of variable game animal management over the decades. Since the 1990s, game animal abundance (particularly deer) appears to have increased across many areas of the country, but not all, and this is likely to continue where there are no management programmes to limit game animal population growth. High game animal densities would again likely bring about a reactive control programme to protect biodiversity and consequently return an area to a state of both poor ecological health and very low game animal abundance.

High game animal densities are not found across all landscapes. Recreational hunting and WARO are responsible for over 100,000 animals being removed from the New Zealand landscape each year (pers. com. NZDA 2023). Where there is good foot access, the recreational take is generally higher than areas that require helicopter transport or significant travel by 4WD or by foot. The Upper Rakaia is an example of an area at risk of increasing game animal densities due to the remoteness of many of the upper reaches. This is not entirely due to recreational hunting not having an impact on game animal abundance, rather that there is no clear direction for hunters entering the area on what level of control is required to protect the

values present. Therefore, the creation of a management plan would benefit the Upper Rakaia if it took into consideration the specifics of this catchment to ensure all values are considered and protected where practical.

Guiding Documents and Management Decisions

The legislation underpinning the management of game animals in New Zealand is varied, and game animal management decision-makers would benefit from having a full understanding of these, while considering the learnings from New Zealand's history of managing game animals. The most relevant documents guiding future management include the Wild Animal Control Act 1977, Conservation Act 1987, the Game Animal Council Act 2013, the Te Mana o te Taiao Aotearoa New Zealand Biodiversity Strategy 2020 and the recent Te Ara ki Mua framework released by the Department of Conservation in 2022. The Te Ara ki Mua framework is a non-statutory document aimed at guiding more effective management of wild animals (game animals and goats) through adaptive management and balancing the range of values held about both the animals and the environment. The outputs and key findings within this Report can be used to inform regional/local strategies and plans, specifically for the Upper Rakaia catchment, but also more generally across New Zealand's landscapes. Within the process outlined in Te Ara ki Mua Framework for adaptive management' and may play an important role in informing 'regional collaborative plans'.

Numerous people are involved in the management of game animals, from high-level decisionmakers, including the Minister of Conservation and the newly established Minister for Hunting and Fishing, through to on-the-ground practitioners who carry out management activities. It is possible that government ministers will play an increasingly important role in guiding the vision for game animal management across both Crown land and the wider landscapes.



Figure 1: Direction from the NZBS flows through to site-based adaptive management and monitoring

2.0 Methods

A number of key stakeholder groups considered relevant to values affected by game animal management (including the game animals themselves) were chosen to provide feedback through engagement meetings and an electronic survey. The stakeholders (Table 1) varied in their knowledge of the Upper Rakaia and the game animals present. Most survey respondents (80%) were from recreational hunting groups. Some stakeholders responded to the survey with very few submissions to represent that group. Conversely, numerous individuals from within recreational hunting groups provided individual submissions.

Information from engagement meetings was used to shape the survey. It was expected that the most meaningful information would be teased out within engagement meetings, and the survey data would support these findings. This was generally true. Additional comments were added by a few individuals who responded via email or phone to question specifics from the survey or the direction it had taken. These comments were highly valuable and are further explored in the discussion section.

The Upper Rakaia catchment was split into six sub-catchments to enable an appropriate level of data. Values vary throughout different areas of the Upper Rakaia, and this landscape scale was deemed appropriate to provide enough information while not providing so much data that it became impractical to report on. The map of the Upper Rakaia shows the various land tenures, including Crown Pastoral Lease (CPL, LINZ-administered), Public Conservation Land (PCL, DOC-administered), Hydro Parcels (LINZ-administered) and freehold. However, water-catchment areas were used as boundaries for management areas rather than land tenure.

Stakeholders were selected during the scoping of this project, and some additional stakeholders were added following initial conversations and engagement meetings. For example, engaging with the Canterbury Botanical Society was recommended by Forest and Bird, and were consequently engaged with. The Game Animal Council (GAC) did engage to provide context on legislation, game animals and their value to the New Zealand hunting fraternity. However, GAC chose not to participate in the electronic survey due to their remit of listening to and representing the hunting industry, rather than providing individual views. Te Rūnaka o Arowhenua were the only rūnaka who agreed to be involved in this project.

Key stakeholders have been grouped into four value categories (Table 1). Some stakeholders may fall within multiple value categories but have been placed in the category considered most relevant within this context. All stakeholders listed were engaged with in-person or via phone/video conference, except for Facebook hunting groups, who only provided feedback through the survey.

Value Category	Organisations/Associations		
Mana Whenua	Te Rūnaka o Arowhenua (through Aoraki Environmental Consultancy Ltd (AEC))		
	Department of Conservation (DOC)		
	Environment Canterbury (ECan)		
Foological	Land Information New Zealand (LINZ)		
Ecological	Forest and Bird (F&B)		
	Canterbury Botanical Society		
	OSPRI		
Decreational	New Zealand Deerstalkers Association (NZDA)		
Recreational	New Zealand Game Animal Council (GAC)		

Table 1. Stakeholders grouped by value categories

	Heritage Red Deer Foundation (HRDF)
	North Canterbury Fish and Game (F&G)
	Canterbury Mountaineering Club (CMC)
	 Facebook Hunting Groups (Survey only) Canterbury Hunting and Fishing Info Tahr and Chamois Hunting New Zealand Venison Hunters New Zealand
	Landholders
	Federated Farmers
Commercial	New Zealand Professional Hunting Guides Association (NZPHGA)
	Aerial Operators (WARO, Aerially-Assisted Trophy Hunting (AATH))

Engagement Meetings

There was no set list of questions for engagement meetings. The questions were based on three main themes, but diverged to include more specific questions relevant to each specific stakeholder. The themes were based on understanding each stakeholder's, 1) Purpose, 2) General values and activities, 3) Values within the Upper Rakaia catchment. This approach resulted in key information and views that would not have been forthcoming under a set list of questions.

Where possible, engagement meetings were made in-person. The remaining were via Microsoft Teams video calls, with the exception of landholders and some aerial operators who were predominantly engaged with via phone.

Electronic Survey

An electronic survey was created in SurveyMonkey, with input from Boffa Miskell's engagement specialists and Geoff Kerr (Lincoln University) who have experience in creating and analysing surveys. Survey questions were added/amended throughout the engagement meetings, as new information and views became clear. Most survey questions had multichoice answers, rather than free text, to enable quantifiable data to be gained. The questions were predominantly based around understanding which game animal species and sub-catchments held value, and how much value. Latter questions attempted to determine preferred densities of game animal species and future management options, including if the designation of Herds of Special Interest (HOSI) was desired within the Upper Rakaia. The survey was sent out to key stakeholders after the last engagement meeting had taken place.

3.0 Results

1. A. P.

The results from the engagement meetings and survey confirm the range of values held by the community in relation to game animals and their management. The results show significant overlap and agreement in some areas, while clearly confirming the variability of stakeholder views in other areas.

The survey returned 262 results, with approximately 80% being recreational hunters or linked to recreational hunting groups. Below are the key findings from engagement meetings, the electronic survey and further communications with stakeholders.

The most discussed and important values raised by stakeholders during engagement were focused predominantly on:

- Indigenous biodiversity (particularly indigenous flora) to be protected from adverse effects of high game animal densities
- Red deer (and to a lesser extent, chamois) being most important, and available for hunting recreationally and commercially to provide for wellbeing (through outdoor experiences), food and economic return
- **Game animals** considered as mahika kai and generally as having high cultural value, for both Māori (mana whenua) and non-Māori
- Agricultural values to be protected from adverse effects of high game animal densities

The general conversation and common conflicts surrounding game animals in the Upper Rakaia can generally be broken down into two questions:

- Should there be game animals present in this landscape, and if so, how many?
- If game animals are present, what sort of management should be in place?

These two questions can be further broken down into key points and questions which will help to understand and address the concerns and potential conflicts between stakeholders. The first question involves all key stakeholders. The second question is more refined and is generally more relevant for those groups involved in hunting recreationally, culturally, or commercially.

• Should there be game animals present in this landscape, and if so, how many?

- There is some conflict between those who want game animals in the upper Rakaia and those who do not.
 - Those only interested in ecological values generally want very low abundance or no game animals at all
 - Landholders generally want some, but not all species and do not want high abundances
 - Recreational hunters and commercial operators generally want game animals (except pigs) in low to moderate numbers
 - To mana whenua, game animals play a role in providing mahika kai, but also threaten indigenous biodiversity at high densities
- If there are game animals present, what sort of management should be in place?
 - Who hunts game animals on public conservation land?
 - Which animals are being taken?
 - How many are being taken?

- When are they taken?
- How are they taken?

To answer the above questions accurately, there must be comprehensive data and further engagement with key stakeholders. This data capture and management falls outside of this project scope. However, the survey results below go some way to understanding what stakeholders value and how to best approach game animal management long-term.

Survey Results

General information and values

- 60% of respondents were from Canterbury, 40% were from other regions
- Number of respondents in four value categories:
 - o 222 recreational respondents (including hunting and other recreational uses)
 - o 22 ecological respondents
 - o 18 commercial respondents
 - o Mana whenua response was only through engagement meetings
- Respondents most commonly accessed the upper Rakaia once every few months
- 45% valued upper Rakaia catchment in top three most valued catchments
 - o 44% placed upper Rakaia within 4-10 most valued catchment
- The Wilberforce, Top Rakaia and Mathias were consistently rated as highest-value areas of the catchment
 - o This was true across all value categories
- Most respondents considered native/indigenous species in the Upper Rakaia as being Extremely or Very Important
 - o 49% of recreational groups
 - o 82% of ecological groups
 - o 83% of commercial groups

Hunting and game animal management

- Game animals were often (average 57% across groups) rated as extremely or highly valuable in the Upper Rakaia
 - 91% of recreational groups
 - 18% of ecological groups
 - 61% of commercial groups
- Game animals were seldom (average 29% across groups) rated as having zero or low value in the Upper Rakaia, except by ecological groups
 - o 5% of recreational groups
 - o 59% of ecological groups

- 22% of commercial groups
- 91% of hunters who live outside Canterbury consider game animals to be extremely or very valuable in this catchment
- Over 80% of respondents hunt recreationally in the upper Rakaia
 - This included 36% of Ecological Value respondents
- Most respondents rated all of the following reasons as their motivation for hunting in the Upper Rakaia. They are ranked in order from highest to lowest scoring:
 - o Experience
 - o Trophy
 - o Herd Management
 - o Sustenance/Food
 - o Conservation of native species
- Over 75% of respondents considered it extremely or very important to use meat from game animals killed as part of management programmes, where it is practical to do so
- Recreational hunters consider it extremely important to be included in management programmes, where it is practical to do so
- The preferred densities were
 - For all respondents merged:
 - Red deer and chamois: moderate (7-10km²), followed by lowmoderate (4-6/km²) for all sub-catchments
 - Fallow deer: Very low/absent (<1/km²) for the Harper-Avoca, Wilberforce, Mathias and Top Rakaia catchments, but Moderate (7-10km²) for Cameron-Heron and North Ashburton
 - Tahr: Very low/absent (<1/km²) for the Harper-Avoca, Wilberforce and Mathias but Moderate (7-10km²) for Top Rakaia, Cameron-Heron and North Ashburton.
 - Wild pigs: Very low/absent (<1/km²) across all sub-catchments
 - Averaged across all catchments and species, the most common preferred densities were:
 - Recreational From very low or absent, through to moderate
 - Ecological Very low or absent
 - Commercial From very low or absent, through to moderate
 - Less than 10% of respondents wanted high density for any species in any subcatchments
- Designating game animals in the upper Rakaia as a Herd of Special Interest (HOSI) was supported by some groups:
 - o Recreational group
 - 86% support for red deer
 - 58% chamois, 56% tahr, and only 3% pigs

- o Ecological groups
 - 18% support for red deer, fallow, tahr and chamois
 - None supporting HOSI for pigs
- o Commercial groups
 - 67% support for red deer
 - 56% for chamois
 - None supporting HOSI for pigs
- o Mana whenua
 - Red deer and chamois may be considered for HOSI by Arowhenua
- Most comments from respondents supported HOSI for red deer, including:
 - o Historical trophy significance
 - o Herds needing to be managed better
 - o Retaining hunting culture and promoting next generation of hunting
- Strong support for limiting game animals (all species) to their current range
 - o 76% of recreational
 - o 82% of ecological
 - o 72% of commercial
- Proactive management of game animals was supported by all groups
 - o 50% support or above for all sub-catchments
 - o Over 65% support for Wilberforce, Mathias and Top Rakaia
- There was clear support for active management programmes of other species, including:
 - o Cats (Over 93% considered it extremely or very important to control cats)
 - o Significant support for programmes targeting wallabies, possums, mustelids
 - Goats, geese, rabbits and hares were supported for active management programmes, but not to the extent of the species above

Table 2 displays the information that has come from engagement and the survey for each of the five game animal species. This approach is an easy way to view and compare the current situation against planned management goals and activities and can easily be updated throughout the life of a management programme with changing priorities or as updated information is obtained. Although the information in this table does display the outcomes from the engagement/survey, it does not necessarily reflect the best management option for each area and species, as these decisions consider more than just a snapshot of stakeholders' views (e.g. available budget). The table may be used as an example and a guide to understand key information on game animals in a landscape. Abundance categories were: Very low or absent (<1/km²), Low (1-3/km²), Low-moderate (4-6/km²), Moderate (7-10/km²) and High (>10/km²).

Table 2: Game animal information and actions based on stakeholder responses

<u>Game</u> <u>animal</u> <u>species</u>	Current Distribution	Desired Distribution	Desired Abundance	Active Management Required?	Current proactive management programmes	<u>Considered for Herd of</u> <u>Special Interest (HOSI)</u> <u>status in the Upper</u> <u>Rakaia</u>	Hunters to be used in management programmes?	Additional information
Red deer	Throughout entire catchment	Consistent with current distribution	Moderate, low- moderate	Yes	None within PCL. Management occurs on private/leasehold property	Yes - highest support at 86%, 18% and 67% support from recreational groups, ecological groups and commercial groups, respectively	Yes	Consistently scored as the most valued species of game animal in the Upper Rakaia
Wild pigs	Throughout most of catchment, generally lower elevations	Removed from areas of high ecological value	Removed or reduced to low abundance where funding permits	Yes	Infrequent management in PCL, low levels of funding are not sufficient	No – Lowest support at 3%, 0% and 0% from recreational groups, ecological groups and commercial groups, respectively	Where practical, along with targeted specialist control	Consistently scored as the least valued species of game animal in the Upper Rakaia
Fallow deer	Present in lower to mid riverbeds, including Wilberforce, Mathias and Rakaia Rivers. Not yet known to be present in Lake Stream	To current distribution. All management programmes to target fallow to limit distribution to lower sub- catchments	Responses split between moderate and very low/absent	Yes	None within PCL. Management occurs on private/leasehold property	No – Low support at 32%, 18% and 0% from recreational groups, ecological groups and commercial groups, respectively	Yes	Further detailed information required on distribution. Ideal abundance between moderate and very low or absent within North Ashburton Management Area, although this area is also outside desired distribution
Chamois	Present in low densities throughout the catchment, mid to high elevations	Consistent with current distribution	Most support for moderate and low-moderate abundance.	No	No programmes aimed at reducing abundance	Yes – Second highest support at 58%, 18% and 56% from recreational groups, ecological groups and commercial groups, respectively	Yes, if management is required	The density estimates for these categories (e.g. 7-10/km ²) may be least accurate for chamois
Tahr	Throughout catchment at high elevations. Low densities within Northern Exclusion Zone (NEZ)	Distribution limited to exclude from NEZ	Moderate within Management Unit 1 (MU1), very low/absent within NEZ	Yes	DOC control programme within NEZ. MU1 transitioning to hunter-led management	Yes, third highest support at 56%, 18% and 44% from recreational groups, ecological groups and commercial groups, respectively. Likely to be considered for HOSI status only south of NEZ	Yes	Tahr Management Programme has more detailed information

4.0 Discussion and Management Options

Discussion part 1: Determining which management approach and goals are most valuable within the Upper Rakaia catchment

Understanding the responses for Rakaia Game Animals

Many of the conversations and responses from engagement meetings and the survey were as expected. There were also some statements and insights that did come as a surprise.

As expected, there still exists a difference in the premises held by different groups or individuals. For game animals in the Upper Rakaia, this is most commonly one of two views, either 1) game animals threaten indigenous biodiversity and therefore game animals should have no value placed on them, or 2) game animals threaten indigenous biodiversity, but have a range of other values, and therefore trade-offs are required to balance different values. The most logical way to approach this question is by running a cost-benefit analysis, but this becomes difficult from the outset when there is no agreed criteria for quantifying the value of biodiversity, wellbeing, mana whenua values or recreational experiences.

Most respondents, including most hunters, did not want high densities of any game animals in the Upper Rakaia. The preferred densities for most species were either in the low-moderate or moderate ranges.

Moving from an old to a new approach to game animal management

Stakeholder feedback commonly stated that game animal management needs to improve to better manage game animals. Many respondents are aware of the history of deer in New Zealand during the 1900s and the damage they could again do if not managed adequately. The following points were frequently cited as being important to consider in managing game animals in the Upper Rakaia:

- Proactive management and monitoring is needed to protect biodiversity
- Funding is needed to enable proactive management and monitoring
- Not all game animal species are equal in value
 - o Red deer (stags) are highest value here and should be managed as such
 - Wild pigs are lower value here and should receive more consistent and concerted population suppression
- An approach similar to Fiordland Wapiti Foundation's programme would enhance this area for Red Deer trophies
- The Rakaia Red Deer herd should be considered as a HOSI

Herds of Special Interest

A Herd of Special Interest (as outlined in the Game Animal Council Act 2013) is the statutory designation of a herd/population of a species of game animal in a defined location. The purpose of a HOSI is to be managed for hunting, providing they do not compromise other uses or values.

The requirements for a HOSI to be established are clear but complex and require engagement (regard to the advice of) with a range of stakeholders, including several conservation organisations such as the Department of Conservation and the New Zealand Conservation Authority. Clear communication with these stakeholders about what a HOSI will achieve for ecological values as well as game animals will be paramount to getting general agreement.

The view from some (particularly ecological value groups) is that a HOSI designation will result in adverse effects on biodiversity. This view assumes that HOSI status will result in a high or increased abundance of that species.

Many respondents from the recreational hunting group consider that a HOSI will decrease game animal abundance. This is based off discussions with hunters and was not adequately captured in the survey.

There is also some concern from landholders that HOSI may impact on how landholders manage game animals on their own properties. It should be made clear to all stakeholders that, under the GAC Act 2013, a HOSI can only be designated and managed on Public Conservation Land.

It will be beneficial for DOC, GAC, NZDA, the Heritage Red Deer Foundation, the NZ Tahr Foundation, and any others involved in game animal management, to have an agreed statement on what a HOSI will look like, and to communicate this to stakeholders and the wider public. This may clear up some misunderstanding with non-hunting groups and would form a useful starting point for further discussions with all stakeholders.

Two key concerns from stakeholders, relating to the designation of a HOSI, are the potential effects on indigenous biodiversity and restrictions to hunting in the Upper Rakaia.

Understanding effects on indigenous biodiversity

The Upper Rakaia is home to a variety of indigenous flora and fauna, with parts of the catchment being relatively unmodified habitat, particularly nearer the main divide. The upper catchment is home to numerous indigenous plant species including some of the best cedar and Hall's totara in the region. The intact, uncommon ecosystems present include braided rivers and ephemeral wetlands, which support a diverse range of indigenous animal species, including a number of braided river bird species.

Effects of game animals on indigenous biodiversity becomes clearer with increasing densities, but it can be difficult to quantify these effects when there are other browsing mammals in the area. Most notably, wild pig damage can be obvious with the uprooting of many species, including speargrasses. Especially palatable and vulnerable species, such as alpine buttercups, may only remain in inaccessible areas (e.g. rock crevices) when game animal pressure becomes too great.

It is widely accepted that game animals do adversely affect indigenous flora to some degree, and these effects are more significant when game animal densities are high. The lack of consistent game animal management and monitoring means that these effects are 1) very difficult to quantify, and 2) difficult to attribute solely to game animals. Well-planned management and monitoring, as would be required through the designation and management of a HOSI, would allow for a longer-term study that would provide valuable data on game animal densities and indigenous biodiversity. These data would undoubtedly inform and enable better management of game animals throughout the Upper Rakaia and other landscapes.

Restrictions to hunting

There were numerous comments on the costs and benefits of hunting restrictions, particularly from the engagement meetings. These restrictions could apply to a HOSI. Some of the costs and benefits listed below are only realistic with extreme restrictions, but should be considered before any restrictions are put in place.

Costs

- Hunters are restricted on what and when they can hunt
 - o Likely only at certain times of the year
- · Fewer hunters may result in fewer game animals shot
 - This would likely only apply to accessible areas
 - Possibly offset by enabling hunters to access remote areas more easily
- WARO may be limited to certain animals and more remote areas

Benefits

- Added safety by limiting number of those hunting during peak times
- Enhanced hunting experience by having fewer other hunters around
 - o But fewer hunters having this experience at peak hunting times
- More high-value animals (e.g. trophy stags) for recreational and commercial guided hunting, through restricted WARO operations
- Higher-quality and more trophies through a well-managed herd
- Healthy habitat if herds are managed and monitored well, preventing high densities of game animals from establishing
- Additional funding can be leveraged if a successful and responsible programme is demonstrated

Increasing safety at peak hunting times is a clear benefit of having fewer hunters in an area. Hunting-related incidents due to high hunter density are infrequent, but have high consequences. Having greater harvest restrictions for WARO is a clear cost to aerial operators. WARO are seen as both an asset and a risk when it comes to managing game animals. This is due to these operations limiting population growth at no cost (asset), while also removing stags from open country that recreational and commercial guided hunting would otherwise be able to harvest (risk).

Management options

Key management actions are listed below and split into:

- Quick Wins, where there is considerable agreement between stakeholders and actions can be quickly implemented
- Future Challenges, where stakeholder values or desired outcomes are more varied and where actions will take longer to implement

The actions listed below can help game animal managers make decisions on how best to create and implement a game animal management plan/strategy in the upper Rakaia River catchment. The extensive feedback from stakeholders clearly showed the importance of protecting indigenous biodiversity. Most stakeholders wanted to see game animals present in the Upper Rakaia, provided that other values are also protected.

Critical actions for the Upper Rakaia Catchment

Quick Wins

- Create a vision and goals for the management of red deer and chamois in the Upper Rakaia
- Begin proactive management on game animal species with lower value in the Upper Rakaia
 - Target wild pigs (and goats/wallabies if present) in all management programmes in the Upper Rakaia
 - These species are considered low value here and have significant adverse impacts on this environment
 - o Utilise recreational hunters as first option for management activities
- Create a mapping system that displays which species should be targeted in each sub-catchment
 - Recreational and commercial hunters can view and understand what they should focus on and the associated goals
 - Over time, other groups can provide feedback on the effectiveness of the management through observing trends in indigenous vegetation health
- Set up a process for utilising game animal meat from management programmes where it is practical to do so
 - Explore the costs of utilising game animal meat and produce decision-making criteria to determine if it is feasible at a given location
- GAC to communicate with all key stakeholders what a HOSI would mean in terms of game animal abundance
 - There is a current difference between what ecologically-focused groups and recreational/commercial hunting groups understand a HOSI to be
- Scope and quantify budgets needed for effective game animal management in the Upper Rakaia

Critical actions for the Upper Rakaia Catchment

Future Challenges

- Establish or appoint a management team to work with GAC, NZDA, WARO, NZPHGA and recreational hunting groups to create an agreement on how red deer and chamois are managed
 - Management team appointed should have a strong commitment to the area and species
- Begin capturing harvest data, including number, species and location
- Restrict fallow deer to their current geographic range, or reduce range further (see Table 2)
 - Further work is required to determine precise geographic range as it continues to increase
- Monitor game animal abundance (via counts and/or harvest data) against condition of biodiversity to refine understanding of sustainable abundance and sustainable harvest
- Secure funding to enable a management programme which can properly implement the management activities required
 - o Use the budget figure determined from the Quick Wins section, above
 - Use the game animal meat programme to leverage funding, citing the win-win for peoples' health, wellbeing and protecting biodiversity

Discussion part 2: Establishing the best approach to developing landscape-scale game animal management plans in Aotearoa New Zealand

General Approach to Understanding Values

There were considerable learnings throughout this project and there is no standard or accepted approach to determine the number, type and weighting of differing values. Stakeholders were largely very supportive of this project, and there was wide acknowledgement that management to date has not been effective at protecting known values. The key learnings are listed below, and should be considered before embarking on future management strategies/plans for game animals in landscapes across New Zealand.

1. Terminology

The term 'game animal' has been selected to identify the five ungulate species that this project has focused on. It has been selected because it is, technically and legally, the correct term. The

use of this term within the survey resulted in numerous comments about preferred alternative labels for these species. Some of these comments were technically incorrect and/or based on personal preference. The use of 'game animal' does appear to effect an emotive response from some individuals/groups who disagree that this term should be used to describe introduced ungulate species. However, using the correct term is important for clarity, as it ensures the correct species are included, and all other species are excluded, from this conversation.

'Game animal,' within the Game Animal Council Act 2013, refers to tahr, chamois, pigs and deer within New Zealand. This accurately covers the species that are considered within this project.

'Ungulate' could also be used and is correct within a biological context. However, this also includes goats and other feral and domestic ungulates that may be present in areas of the Rakaia (and elsewhere), and, therefore, this term may be misleading.

'Wild animals,' within the Wild Animal Control Act 1977 (WAC Act 1977) include game animals, but also includes feral/wild goats. If the 'wild animals' label was used, it would require frequent and consistent clarification on how this differs from the WAC Act 1977 definition.

'Pest' is a term often used informally to describe a species that is unwanted in a place. Within New Zealand, 'pest' is also a legal term which refers to a species which has been designated as such within a Regional Pest Management Plan (RPMP). Species designated as pests within an RPMP often have associated rules which restrict the communication (i.e. release or spread) and/or require land managers to control said species within certain parameters. These rules are generally enforceable through legislation such as the Biosecurity Act 1993. Although a game animal can be classified as a pest within an RPMP this is not common throughout most regions, and are not considered as such within Canterbury (Rakaia catchment region). However, red deer, fallow deer and feral pigs are included as Organisms of Interest within the Canterbury RPMP, due to the knowledge that they have adverse ecological effects in some places.

Based on the available terms, described above, it is clear that 'game animal' is the correct term for referring to the species of focus in this Report. 'Game animals' should therefore be used consistently across strategies, plans and reports that refer to tahr, chamois, pigs and any/all of the deer species present in New Zealand. It should be reiterated that these species can also fall into other categories, but that this is dependent on a variety of factors, including time and place.

2. Timeframe

When embarking on a similar values assessment for a catchment, at least one year should be scheduled to have appropriate conversations with stakeholders to identify values and understand how they can be better protected or managed. This timeframe could be adjusted down if both the stakeholders and the party conducting the assessment has the appropriate level of capacity to invest in the process.

3. Engagement and survey

Stakeholders should be selected and engaged with prior to surveys being created and distributed. For the Upper Rakaia, engagement meetings (and follow up conversations/comments) were crucial in understanding values and issues that would not have been considered for the survey. Surveys do provide data to quantify the number who do, or do not, support a concept or management approach, but surveys often do not shed light on stakeholders understanding of said concept or management approach. One key example of this

was determining the support for a HOSI in the Upper Rakaia. The electronic survey shows how many responded in support (or otherwise), but this did not capture the different understandings of what a HOSI would mean for game animals and indigenous biodiversity in New Zealand.

Another limitation specific to the survey was trying to link numerical and descriptive game animal density estimates. Asking a question with these criteria will always create both confusion and disagreement. No obvious improvement to this question has come to light during conversations both prior to and after the survey was carried out.

4. Understanding others' values

All stakeholder groups shared an interest in protecting the values of the Rakaia catchment. However, the prioritisation of these values differed between stakeholders based on their distinct goals and general outlook.

There was significant variation between stakeholder groups' views on whether all values should be considered and a balanced approach taken. For example, hunting groups generally understood the need to also protect indigenous biodiversity, even though this requires limiting the abundance of game animals on the landscape. This resulted in open discussions of what a balanced approach could look like. Conversely, ecological values groups often stated that game animals have no value and should therefore be controlled to as low abundance as possible to protect indigenous biodiversity. This elucidates the need to approach various stakeholder groups slightly differently, as they generally approach this conversation from a different premise, that is, either that a) a value must be protected completely at the complete expense of another, or b) that trade-offs are possible (or preferable) to create outcomes that consider all stakeholder values.

Further engagement themes

The following discussion points are based on common themes and questions raised during the engagement meetings. These notes are crucial in understanding the issue and can guide management decisions or guide further stakeholder engagement, if required.

New Zealand is different to rest of the world

It is clear to stakeholders that improvements can be made to New Zealand's management of game animals. More proactive management, coupled with appropriate funding, will undoubtedly lead to such improvements. Exactly what this management would look like is still unclear, but will certainly require adaptive management that will be unique from one catchment to the next.

Many other countries (e.g. countries within North America and Europe) have a long history of indigenous game animal management, and often have robust practices to maintain the protection of values. In these areas, harvest may be restricted to ensure game animal populations are not overharvested. Exotic ungulate species (whether considered game animals, or not) can easily be added into such frameworks, which may, or may not, include restrictions on harvest. In many areas within New Zealand, hunters and farmers/land managers must be encouraged to shoot more game animals when they are at, or close to, desired abundance. There are learnings to be taken from international management practices, but this cannot all be transferred to New Zealand game animal management programmes. Even with the current absence of any limits on when and how many game animals can be taken, densities still appear

to be increasing in many areas across New Zealand. The lack of proper game animal abundance monitoring makes it difficult to track changes in abundance, and, consequently, difficult to trigger management activities to reduce abundance and potential damage to biodiversity/habitat.

More proactive, structured and coordinated game animal management would help to understand and achieve ideal outcomes. This would require greater funding than what is currently allocated to game animal programmes. In the absence of adequate additional funding, volunteer involvement would likely help to maintain target game animal abundance at a reduced cost. For this to work effectively, it would still require clear targets and monitoring of management activities and progress. It must be noted that volunteer-based programmes still require significant effort to manage, and having a well-resourced and committed management team would be beneficial.

Hunting groups wanting more input into game animal management programmes

The Fiordland Wapiti Foundation (FWF) is seen as a successful programme to many recreational hunters for a number of reasons, including due to its use of volunteers. The FWF programme utilises hunter presence in the backcountry to determine numbers of deer shot and indigenous birds observed during key hunting periods. Hunters desire the opportunity to be involved in management in more areas, and for meat from game animals harvested during management activities to be utilised and given to those who need it. This is already occurring at times, in programmes such as wapiti and sika management programmes. Many stakeholders consider this to be important to add into all management programmes, where practical. Furthermore, hunters consider themselves frequent recreational users of many backcountry areas, and therefore could be a useful resource in monitoring progress towards goals. This is more simply done when the data being captured is quantifiable, which reduces biases within monitoring.

There is no single group which represents all hunters

It is impossible to contact all hunters and understand the differences between them. The NZDA is the single largest and most well-coordinated group representing hunters in New Zealand, with a base of approximately 11,000 members. However, NZDA members are likely to be those who want to be involved in hunting conversations and may be more concerned with how game animals are being managed than the average hunter. Hunters not belonging to any hunting group are more difficult to contact, as there is no accessible list of all those who hunt. Data is collected on those who are granted a permit to hunt on Public Conservation Land, but this data is not available for use. Therefore, results from engagement and surveys will commonly be biased towards understanding the views of those that connect themselves to a hunting group.

Hunting groups on Facebook were contacted to participate in the survey, including Canterbury, tahr, chamois and deer focused groups. No hunting group based around pig hunting was contacted, which was an oversight and would likely have increased the number of responses where wild pigs were valued. However, given the extreme low value placed on feral pigs by all other groups surveyed, this would likely have had little effect on the outcomes and recommended management approach.

It would be beneficial to have a hunter registry, where hunters can voluntarily add their name and contact details for receiving key information. This would never include all hunters, but would be more comprehensive than attempting to find numerous hunting groups and contact them separately.

Habitat is already deteriorating in some areas of New Zealand

Reports on poor and deteriorating sika deer habitat (North Island) have been frequent in recent years and the Sika Foundation continues to provide updates that work is underway to mitigate these impacts. It is common to see reports in other landscapes showing degraded habitat as a result of other game animal species. Although it is difficult to prove that high densities of game animals are the cause of this, it is likely that they are at least a contributing factor. Deteriorating habitat quality can often be observed through decreasing condition of resident game animals, due to their reliance on indigenous and exotic vegetation for survival, growth and reproduction. Photos and descriptions were sent in from respondents who have witnessed this decline in habitat in other areas, including as shown in Figure 2.



Figure 2: Example of beech forest with little to no regeneration, in Broken River area, Canterbury. Photo: Survey respondent.

Iwi input early in planning process

One of the many highlights of the numerous engagement meetings was gaining an understanding of Te Ao Māori as it relates to the Upper Rakaia catchment. This engagement meeting with Te Rūnaka o Arowhenua (through AEC) gave a comprehensive background of the values to takata whenua within this catchment. Te Rūnaka o Arowhenua are a rūnaka based in Temuka with a rohe that extends from the Rakaia River in the north to the Waitaki River in the south. The most notable themes to come from this engagement (and subsequent engagement

meetings) were mahika kai sources and having access and freedom to roam in search of mahika kai.

The upper Rakaia River catchment has special significance to mana whenua due to it being a pathway to the West Coast for Maori prior to European settlement and the establishment of roads. Furthermore, there were numerous mahika kai sites within the upper Rakaia catchment. These sites were often named after the species that were harvested in that area, including kākāpō, weka and kākā. Indigenous plants were also important for mahika kai in this landscape. including kauru (tī kouka/cabbage tree root) and aruhe (bracken root). These species are removed from much of the landscape, with many of the sites now being intensified, freehold land. Te Runaka o Arowhenua are no longer able to roam, forage and hunt freely, where they could historically do so. These two themes, intensification/modification of the landscape, and losing access to whenua and species, are important to note, as they provide a better understanding for why kaitiakitaka and mahika kai are so important in this area. Te Rūnaka o Arowhenua have a clear understanding of the damage that game animals can do at high densities, but this was contrasted with the loss of much of the traditional mahika kai species. Game animals have, to some degree, replaced that mahika kai resource for whanau to be able to utilise. This view aligns with many recreational hunters' views and has the added importance of being a place where ancestors travelled through and collected mahika kai in pre-European times.

Use of the word 'cultural' in determining the value of a species or herd

In a New Zealand context, 'cultural' commonly refers to matters linked to Māori. Although this is a correct usage, it is often (mis)understood that it should not be used when relating something to non-Māori history and practices in New Zealand. 'Cultural' was often cited by respondents within engagement meetings and survey comments when explaining why hunting (in the Rakaia) is valued so highly. It is clear that a New Zealand hunting culture has evolved, borne from generations of pursuing game animals for meat, pay, trophy or experience. Further engagement was had with Te Rūnaka o Arowhenua on the use of 'cultural,' and there was acceptance that it was also correctly used for non-Māori practices and behaviours stemming from a history of hunting in New Zealand. It is important that Te Ao Māori has a separate section to better understand pre-European times, and how values are transferred through to modern day. However, New Zealand hunters also have a culture shaped by recent history and this should be considered within the cultural narrative.

There is still time to protect values through proactive management

The repeated message from numerous stakeholders is that game animal abundance has increased over the last few decades and proactive management would help to protect the values in these places.

Proactive, long-term management requires a committed management team, adequate funding, and coordination and collaboration between key stakeholder groups, including regular communications and understanding the values of other stakeholder groups. If these requirements can be met, meaningful management can begin to both protect the values within the Upper Rakaia and inform management across other landscapes of Aotearoa New Zealand.

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Project Manager: pete.caldwell@boffamiskell.co.nz | Drawn: BMc | Checked: PCa

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