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"Adaptive co-management of wild horses in Kosciuszko National Park, Australia: Defining the policy problems"

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Abstract

In Australia, adaptive co-management is hailed as the new face of protected area management. Yet little empirical inquiry has been conducted into the translation of this novel concept into conservation practice. In particular, the application of adaptive co-management to value based conflicts surrounding the management of introduced animals in national parks remains largely untried. In Kosciuszko National Park (KNP), where the management of wild horses (*Equus ferus* f. caballus) has grown into a persistent socio-political problem, co-management initiatives have emerged in response to policy failure of classical conservation paradigms. These recent institutional changes require government agencies to broker agreements between multiple conflicting interest groups and base management decisions on a sound understanding of local cultural, ecological and historical conditions. Drawing on the analytic framework of the policy sciences, this thesis develops a comprehensive problem orientation towards the issue of wild horse management in KNP by identifying conditions in the policy process that constitute a persistent challenge to collaborative management efforts. Data was collected from interviews with key stakeholder groups, media analysis, technical reports and management documents. The case study illustrates the difficulties of setting up adaptive co-management arrangements in the context of deeply rooted power asymmetries and historical relations. Key barriers toward collaborative action demonstrated in the wild horse case include: contested ecological knowledge; competing problem definitions and epistemologies; consultation versus collaboration; and a lack of trust and respect in working relationships. The case study findings point to the conclusion that the re-allocation of decision-making power in adaptive co-management arrangements indirectly challenges the normative basis of classical conservation concepts and may lead to a critical reappraisal of prevailing assumptions surrounding the management of introduced animals.

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Acronyms

ACM	Adaptive Co-Management
ACT	Australian Capital Territory
HVBA	Hunter Valley Brumby Association
ICOMOS	International Council on Monuments and Sites
ITRG	Independent Technical Reference Group
IUCN	International Union for Conservation of Nature
KNP	Kosciuszko National Park
NPWS	National Parks and Wildlife Service
NRM	Natural Resource Management
NSW	New South Wales
OEH	Office of Environment and Heritage
PA	Protected Area
RSPCA	Royal Society for the Prevention of Cruelty to Animals
SMBSMG	Snowy Mountains Brumby Sustainability & Management Group
SMBUG	Snowy Mountains Bush Users Group
SMHRA	Snowy Mountains Horse Riding Association
UNESCO	United Nations Educational, Scientific and Cultural Organization

Preliminary Note

In Australia, there are numerous terms used to refer to free-roaming horses (*Equus ferus* f. caballus), including ‘feral horses’ and ‘brumbies’. Usage of these terms carries cultural associations beyond their literal definitions and is often highly politicized. In an effort to avoid categorizations and maintain balance between conflicting stakeholder groups, the terms ‘wild’ and ‘free-roaming’ are used interchangeably in this thesis to refer to horses that range freely in Kosciuszko National Park.

1. Introduction

1.1. Statement of the problem

In the face of the 6th mass extinction in the history of the planet (Barnosky et al. 2011; Ceballos et al. 2015), a new sense of urgency has changed the relationship between conservation biology and the social sciences. Through human activity, the richness of species on earth has been reduced to a critical point. In recognition of the accelerating rate of extinctions worldwide, many scholars have referred to this phenomenon as 'global biodiversity crisis' (Koh et al. 2004). The concept of biodiversity encompasses the entire array of biological variety of living organisms and of the systems of which they are a part (Johnson 1993). Born out of the biodiversity crisis, conservation biology is a mission driven discipline that seeks to protect, maintain and restore the variability of living organisms at genetic, species and ecosystem levels (Soulé 1985; Sandlund et al. 1992). Core disciplines that have traditionally supported conservation biology's endeavor to achieve this goal are ecology, biogeography, genetics and systematics (Soulé 1985).

According to classical conservation paradigms, environmental issues are best understood within narrow conceptions of conservation biology, thus leading to the erroneous assumption that only the natural sciences are required to solve them (Brewer & Clark 1994; Clark 2011). Indeed, a great number of conservation problems that exist today are merely technical and fall outside the bounds that conservation biology has established for itself (Clark 2011).

One such problem is the management of wild horses (*Equus ferus* f. caballus) in Australian national parks. Australia's colonial past is closely tied to the horse, which was first introduced by European settlers in 1788 and played a vital role in the country's development (CONTEXT 2015). In the course of time, domestic horses (*Equus ferus* f. caballus) were deliberately released or escaped, forming free-roaming populations and conquering vast parts of the continent. Today, Australia is home to the largest population of wild horses in the world, with an estimated 400,000, occurring mainly in northern and central Australia (Nimmo & Miller 2007).

Due to the continent's geographic isolation, Australia's biodiversity combines high levels of endemism with vulnerability, and has experienced an exceptionally high decline since European settlement, inter alia, in response to the introduction of ungulate

species (Woinarski et al. 2015). It is within this context of biodiversity loss that conservation biologists have relegated free-roaming horses to the status of exotic pests and urge to drastically reduce population numbers in order to preserve native biodiversity (e.g. Worboys & Pulsford 2013; The Guardian 2016). In the state of New South Wales (NSW), the National Parks & Wildlife Service (NPWS) holds jurisdiction over national parks and has a legislative duty to reduce the impact of introduced species such as horses. However, given the close association of humans and horses in the course of the nation's history, management efforts have been accompanied by deep controversy over management techniques and the perceived legitimacy of horses on the land (Chapple 2005).

When the NPWS undertook an aerial cull of 606 horses in Guy Fawkes National Park in October 2000, the problem of wild horse management "suddenly hit the public's radar screen" (Chapple 2005, p.233). The three-day cull provoked public outcry and received widespread media attention. Aerial shooting was subsequently banned as a means of managing horses in New South Wales (DEEC 2008). In Kosciuszko National Park (KNP), New South Wales' largest national park, it was decided to involve major stakeholders and the community in developing long term solutions in 2000. Since the adoption of the *2003 Horse Management Plan for the Alpine Area of Kosciuszko National Park* (NPWS 2003), the NPWS has conducted periodic reviews in order to better understand, monitor and respond to the complex socio-ecological dynamics of wild horse management. The *2016 Kosciuszko National Park Draft Wild Horse Management Plan* builds on these reviews and aims "to conserve the outstanding values of Kosciuszko National Park with the support of the community through active, adaptive and humane management of wild horses to minimize their adverse impacts on natural, cultural and visitor values, while acknowledging the cultural and social values of the Kosciuszko National Park wild horse population" (OEH 2016a, p.2).

As described by Chapple (2005), wild horse management in Australia falls into the 'wicked' category of natural resource based conflicts, because it is a value-based conflict that goes beyond the techno-rational dimension of problem solving. Since conservation biology itself cannot be separated from issues of values, the disciplinary postulates that are used to guide conventional conservation practice are likely to arrive at ill-conceived problem definitions and solutions if applied acontextually (Funtowicz & Ravetz 1990; Clark 2011). According to Sarkar (2005), conservation is fundamentally

an expression of human values. For the purpose of this study, the conceptualization put forward by Sarkar is useful, because it does not depend on single disciplinary views and allows for biodiversity conservation to be analyzed as a social construct that is open to contest and debate.

Different ways of valuing and relating to nature inform different management decisions (Maffi & Woofley 2010; Stolton & Dudley 2010). In the case of wild horse management, these contested concepts are set within a dynamic set of power relations. The interaction of people in their efforts to conserve what they value is the policy process (Clark 2011). The term policy, as used in this study and following Lasswell & McDougal (1992) and Clark (2011), refers to 'a social process of authoritative decision making by which members of a community clarify and secure their common interests' (Clark 2011, p. 6).

The multi-scale society-environment problem of wild horse management in Kosciuszko National Park reflects the complexity and uncertainty in biodiversity conservation. In Natural Resource Management (NRM), there is a growing consensus that complex socio-ecological systems are not amenable to conventional management strategies and require policy-oriented approaches (Holling & Meffe 1996; Gondo 2011; Zikos & Thiel 2013).

Adaptive co-management (ACM) is an emerging policy-oriented approach to address and resolve conditions of uncertainty and conflict. The concept merges the principles and practices of co-management and adaptive management (Armitage et al. 2009). Central to the approach is the recognition that complex socio-ecological systems require management strategies that encompass the flexibility to respond to environmental feedbacks (Olsson et. al 2004; Plummer & Armitage 2007). ACM provides a platform where institutional arrangements are tested and modified in a dynamic process of experimentation (Folke 2002). The integration of bottom-up structures facilitates the mitigation of conflicts and aims to enhance legitimacy (Olsson et al. 2004; Carlsson & Berkes 2005; Armitage et al. 2009).

By incorporating major stakeholders and the community into the decision-making process and undertaking periodic reviews, the NPWS goes beyond classical conservation professionalism and takes up on the approach of adaptive co-management. However, the application of adaptive co-management to pressing agendas of

biodiversity conservation in national parks is a largely untried domain (O'Riordan 2002; Chapple 2005; Robinson & Wallington 2012). In Kosciuszko National Park, alternative management strategies, such as passive trapping and re-homing or transport to abattoir, have thus far failed to meet NPWS conservation agendas (OEH 2016b). The conflicts surrounding the management of wild horses remain largely unresolved and have grown into a persistent socio-political problem, raising questions about the regimes ability to bridge the gap between multiple competing conservation perspectives and values.

1.2. Research aim and objectives

Against this background, the overall aim of this thesis is to develop a comprehensive problem orientation towards the issue of wild horse management in KNP by identifying conditions in the policy process that constitute a persistent challenge to current management efforts. However, the contexts that condition conservation problems matter enormously. This study places the wild horse controversy in the context of the wider debate on conservation paradigms and management approaches in order to gain a more meaningful picture. Further, past management regimes and the socio-ecological context of wild horses and biodiversity conservation in Kosciuszko National Park will be examined to facilitate a critical understanding of underlying management issues. The policy sciences offer an integrative framework, which can be used as a practical guide for defining and analyzing policy problems in a structured way. This analytic framework will be applied to conduct empirical research into policy problems of wild horse management by mapping their underlying social and decision processes. Chapter 3 (Research Methodology) contains information on both the policy sciences framework and the techniques used to collect empirical data.

Specifically, the following objectives have been identified in helping to achieve the aforementioned aim:

I. *Review critically* conservation paradigms and management approaches relevant to the situation of wild horse management in KNP.
II. *Describe* the historical and socio-ecological context of biodiversity conservation and wild horse management in KNP.
III. *Identify* policy problems by mapping the social process of wild horse management in KNP and by exploring participants' views of various functions of the recent decision process (2013-2016)

IV. *Formulate* recommendations to address the policy problems identified

The interrelatedness of the research objectives is critical to the logic and value of this study and aims at providing a contextual understanding of the case studied. Before describing the research methods, the first objective will be initially addressed in the next chapter, in the form of a literature review. This objective seeks to link the problem of wild horse management to broader issues surrounding biodiversity conservation and examines the ethical reasoning that has traditionally informed conservation paradigms and management approaches. It also provides information on adaptive co-management as an emerging pragmatist approach in biodiversity conservation and justifies the need for empirical data in this field of study. The second objective orients to the specific situation of adaptive co-management of wild horses in KNP by describing the changing circumstances of horse management and land use in Kosciuszko National Park. Although the major focus of the empirical data collection will be placed on the recent decision-making process, data will also be gathered on the broader context of wild horses and conservation in KNP and –amongst secondary sources of information- be used to cover the second objective. Based on the theoretical and site-specific background information provided by the first two objectives, objective III sets out to explore the core aspect of this study – the collection and problem-oriented analysis of data on the wild horse policy process. Data will be obtained from in-depth interviews with participants involved in the recent decision-making process and secondary analysis of related public submissions, press releases and governmental reports. Finally, objective IV is derived as a result of the research findings and draws recommendations from this study.

1.3. Significance of the study

Adaptive co-management represents an innovative approach to conservation in terms of emphasis placed on interdisciplinary inquiry and policy-orientation. This may seem a subtle shift, but it is an important one. The move away from the classical conservation paradigm to a more policy-oriented model impacts on the leading role of conservation biology in biodiversity governance and thus makes the study of adaptive co-management regimes in national parks an area worth of studying. According to Plummer and Armitage “adaptive co-management is a relatively new concept around which an idealized narrative has formed with relatively little empirical evidence and even less evaluative experience” (Plummer & Armitage 2007, p. 71). As has been

suggested, a need lies in further investigating the practical application of ACM strategies in biodiversity conservation. Picking up on this agenda, the general contribution of this study is to help understand the status quo of adaptive co-management in biodiversity conservation based on the particular context of wild horse management in Kosciuszko National Park.

In Australia, very few studies have been carried out for investigating the policy process of wild horse management (Symanski 1994; Chapple 2005; Robinson & Wallington 2012). More specifically, this thesis seeks to address this gap of knowledge by opening a window through which participants involved in decision-making can perceive the internal and external conditions of wild horse management currently practiced in Kosciuszko National Park. Strategies, which can be derived from the policy problems identified, may offer practical value and contribute to social-ecological feedback learning.

2. Literature Review

2.1. Introduction

This chapter addresses the complex ethical and value dimensions of biological conservation, as well as practical concerns relating to socio-political challenges of protected area management that have sparked recent discussions about the adoption of environmental pragmatism as a workable solution to policy problems. The theoretical and sociopolitical forces pushing conservation biology to engage with other disciplines will be examined. Finally, adaptive co-management is introduced as a pragmatist approach to converge different conservation values towards a common policy goal and transform conservation conflicts, such as the wild horse controversy, into a more collaborative debate. The value of reviewing the aforementioned literature areas will be to situate the case study of wild horse management in Kosciuszko National Park in the broader context of contemporary discussions on protected area management and the normative ends of conservation.

2.2. Biodiversity conservation and protected areas: Ethical foundations, management approaches and contemporary debates

Biodiversity conservation is a human endeavor and multiple socio-political and moral values are found at its core (Longino 1990; Barry & Oelschlaeger 1996). Historically, conservation efforts have been rooted in philosophical arguments about both intrinsic and utilitarian values of nature (DesJardins 2013). In response to industrialization and environmental degradation, the first protected areas (PA) were set aside by governments in the 19th century (Ghimire & Pimbert 1997). Today, there are more than 217.000 protected areas worldwide (UNEP-WCMC & IUCN 2016) and the purpose of their creation is very broad. Per definition, the term ‘protected area’ refers to “a clearly defined geographical space, recognized, dedicated and managed, through legal or other effective means, to achieve the long-term conservation of nature with associated ecosystem services and cultural values” (Dudley 2008, p.8). Wilderness areas and national parks fall into the most strictly protected categories of PAs (Category I and II) and are considered the cornerstone of global biodiversity conservation (UNEP-WCMC & IUCN 2016). Yet the spread of introduced species into protected areas is threatening to simplify and transform recipient native ecosystems into new species assemblages and thus poses a major challenge to global conservation work (GISP 2007).

For millennia, humans have transported species widely beyond their biogeographical home ranges (DiCastri 1989). More recently, globalization processes have facilitated both intentional and accidental species introductions at an unpreceded pace, with an estimated 400.000 introduced species of animals, plants and microorganisms worldwide (IUCN 1997; Macdonald et al. 2007). Amongst other factors such as habitat loss and anthropogenic climate change, the rise of species introductions correlates with global biodiversity loss, which is currently running at 100-1000 times the 'normal' background rate of species extinction (Lamkin & Miller 2016). In Australia, the combined effects of land use change, discontinuation of Indigenous fire management regimes and species introductions have been particularly devastating. While conservation biologists worry about the ever-increasing rate of human assisted 'ecological globalization', the study of biogeography indicates that the arrival of species in a new location in itself is neither unnatural (e.g. via seed dispersal or migration) nor is it uncommon that complex ecosystem perturbations are induced when species extend their home range (Meyerson & Mooney 2007; Macdonald et al. 2007).

As defined above, the term introduced species will be used in this study to refer to human assisted introductions and implies no judgement of value. The pivotal question of how the presence of an introduced species is judged is case-specific and remains ultimately a cultural matter. While protected areas comprise natural phenomena and biodiversity at the biophysical level, they are socially conceived and managed. In fact, they are fundamentally a social space and every conservation policy inevitably symbolizes the values and ideologies that its authors attribute to nonhuman nature (Ghimire & Pimbert 1997).

2.2.1. "Fortress conservation" and the wilderness ideal

Throughout the twentieth century, the romantic idea of 'wilderness' as the last remaining area of pristine and unspoiled nature was the most influential conservation concept. It has been argued that the wilderness ideal is embodied with the protected area system and the exclusionary management approach of classical conservationism (Brockington 2002). Indeed, management approaches drawn from the 'wilderness ideal' have often recommended the exclusion of people in protected areas. Classical approaches focus on environmental solutions (rather than social solutions) to perceived environmental problems (Blaikie & Jeanrenaud 1997) and are based on the assumption that 'wilderness' conditions are required for the conservation or restoration of

ecosystems and wildlife (Brockington 2002). Conservation biology is inexorably wedded to classical conservationism and embraces the intrinsic value of 'wild' biodiversity. Protected areas –traditionally understood as places with minimal human induced changes and interferences- are frequently hold by conservation biologists to be the most effective means to protect 'wild' biodiversity (Adams et al. 2004). Human activity is widely regarded as a threat to biodiversity conservation, and Miller et al. (2011) note that "it is within this context of the crisis of biodiversity loss that PAs are defended as beachheads in the global war against extinction" (p. 949).

Critics of the wilderness ideal and its associated management approaches charge that "the received view of the wilderness is factually and scientifically unsound, that it is ethically suspect, and that it is likely to have unacceptable political and practical implications" (DesJardins 2013, p.159). The tendency to describe the wilderness with an image of the land as it existed at a certain point in time (e.g. before the arrival of European settlers in America or Australia) is problematic. DesJardins notes that by systemically ignoring the fact that many of the 'wilderness areas' were of course inhabited and much used by native people, the wilderness ideal is an ethnocentric concept that "exhibits more than a small amount of cultural bias, if not outright racism" (DesJardins 2013, p. 159). The wilderness ideal may encourage 'pre-Darwinian' thinking, a view that sees humans separate from nature, as opposed to the Darwinian understanding that people are much a part of nature (Callicott 1995).

Exclusionary protected area management and the wilderness ideal have not only been challenged ethically (Guha 1989; Nelson & Callicott 2008; Sarkar & Montoya 2011), but also on more pragmatic grounds, because the long-term viability of conservation projects depends on the political support from local communities (Brechin et al. 2002; Naughton-Treves et al. 2005). Protected area management that isolates areas of interest from local communities has in many cases become a source of permanent socio-political tension and earned the derogatory name 'fortress conservation' (Brockington 2002). Local people are frequently excluded from decision processes because they are perceived to lack the 'big picture' (Miller et al. 2011). Where local communities have been expelled from their lands or restricted in their use of common property without adequate compensation for the creation of a protected area, the imposition of conservation ideologies based on idealized 'wilderness' concepts is often rejected and creates a difficult socio-political environment for the protected area to function within.

Rebuilding the relationship between conservation agencies, government authorities and local communities after a history of exclusion and marginalization is recognized to be a difficult process (Colchester 1997; Naughton-Treves et al. 2005).

Finally, the wilderness ideal and associated management approaches are inclined to view ecosystems as an 'unspoiled' and static place. Yet, few areas on earth –if any (Sanderson et al. 2002; Hapern et al. 2008), are untouched by human activity. In the face of species introductions and global climate change, the wilderness ideal is hardly compatible with the dynamic reality of ecological processes. Controversially, active human intervention (such as wild horse management in KNP) is required to maintain the sense of wilderness that some people wish to preserve (Kareiva & Marvier 2012). Difficult ethical questions arise about what conservation values should guide protected area management. Should conservation policies be aimed at restoring ecosystems to a certain point in history? By what process should conservation decisions be made and who gets to decide? What are legitimate values in conservation? Should the preservation of 'wild' biodiversity take precedence over other legitimate conservation values?

The natural sciences alone cannot provide answers to these questions. A gap in logic exists between what is and what ought to be. The fallacious conclusion to derive judgements of value from facts described by natural scientists has been rejected by many philosophers and identified as 'naturalistic fallacy' (Daston 2014). Thus, the discipline of conservation biology is distinctive from the natural sciences in that it carries an implicit political and moral commitment, namely, the protection of 'wild' biodiversity (Soulé 1985). With special attention paid to the situation in Australia, the next section examines how this normative mandate is translated into protected area management at the practical level and addresses ethical and scientific disputes that have recently emerged in the context of introduced animal control.

2.2.2. Ecological restoration and the "native vs. introduced fauna" debate

As the wilderness debate illustrates well, different societal relationships to nature and conceptions of what constitutes 'wild' and 'valuable' nature have profound significance for the management of introduced species in protected areas.

Conservation biology traditionally embraces the intrinsic value of 'wild' biodiversity and represents a relatively new application of science to environmental ethics. In 1985, Michael Soulé famously announced that the ethical basis of conservation biology was

made up of a number of normative postulates: Diversity of organisms is good, ecological complexity is good, evolution is good, and biotic diversity has intrinsic value (Soulé 1985, p. 730-731). In addition, Soulé laid out working propositions to guide efforts to preserve the long-term viability and evolutionary potential of 'natural communities'. Soulé's concept of 'natural communities' comprises "species whose genetic makeups have been mutually affected by their coexistence" and distinguishes 'natural' from 'unnatural' systems on the basis of these co-evolutionary structures (Soulé 1985, p. 729). While this dichotomy is not solely derived from the romantic wilderness ideal, it clearly implicates that human induced changes and species introductions create artificial environments. Peretti notes that "(…) the association of native species with what is natural has fuelled conservationists' interest in biological invasion. The task of identifying, protecting, and restoring native species, and the corollary task of identifying and eliminating alien species, has become a major branch of conservation biology." (Peretti 1998, p. 184).

According to this line of argument, introduced animals do not form part of the valuable 'wild' biological diversity, may threaten 'natural communities', and thus require interventionist practices such as culling and eradication in protected areas (Katz 1983; Soulé 1985). In particular, domesticated animals and their feral descendants are viewed to be living human artefacts, genetically debased and inferior to members of the 'natural community' (Callicott 1980; Katz 1983). Metaphorical conceptualizations of introduced (and feral) animals in terms of 'pest animals' (OEH 2015) and "outside invaders, that infiltrate 'closed', 'co-evolved', and 'interdependent' ecosystems" (Peretti 1998, p. 187) are frequently attributed to this assumption (O'Brien 2006; Macdonald et al. 2007). Indeed, these preconceived categorizations are so common that even the usage of the term 'feral' causes ambiguity because it connotes that animals lack legitimacy and cause environmental harm (Bhattacharyya et al. 2011).

Conservation biology's preference for nativism in biodiversity conservation raises troubling ethical, political and scientific questions. Peretti asserts that the study of introduced species rests on an infirm scientific foundation: "It is unclear how long a species needs to be established in a location before it is considered native. Is a species 'naturalized' in 100 years, 1,000 years, or 10,000 years? The distinctions are arbitrary and unscientific. (…) Anthropogenic changes to natural areas further complicate the determination of what is natural and native. (…) Humans have existed with nature for

tens of thousands of years. If ‘real nature’ is human-free, it becomes questionable if ‘real nature’ even exists.” (Peretti 1998, p. 185). Indeed, discussions related to introduced animals in protected areas emphasize the importance of understanding the cultural ideas that are driving ecological restoration work (Keulartz 2016). For example, James (2016) found “European restorationists typically aim to restore pre-industrial but post-settlement states of affairs, while many of their New World counterparts seek to restore how things were before the arrival of the Europeans” (p. 381; see also Zeller et al. 2017). In Kosciuszko National Park, the policy implications of the latter view are reflected in NPWS’s legislative duty to maintain ‘natural landscapes’ and control introduced animals that were not established in New South Wales before European settlement (*National Parks and Wildlife Act 1974 No 80*; *Threatened Species Conservation Act 1995 No 101*).

However, cross-cultural analysis of perceptions towards feral animals in protected areas show that the categorization of ‘native’ and ‘introduced’ is a false dichotomy, particularly in local contexts and Indigenous worldviews. By contrast, the presence of species is not simply evaluated according to a pre-existing reference state but rather appraised on the basis of the contextualized values that members of the community assign to different animals (Rose 1995; Rose 2000; Chapple 2005; Robinson et al. 2005; Rikoon 2006; Bhattacharyya et al. 2011; Robinson & Wallington 2012; Notzke 2013).

A nuanced understanding and appreciation of human relationships to nature is particularly important in co-management arrangements. In Australia’s Kakadu National Park, for example, the integration of Indigenous knowledge systems and values into feral animal management decisions has created a situation of persistent environmental conflict. Jawoyn people, who traditionally own and co-manage the park, categorize buffalos (*Bubalus arnee* f. bubalis), horses (*Equus ferus* f. caballus) and pigs (*Sus scrofa* f. domestica) into “bush tucker, bush pets, and push threats” (Robinson et al. 2005, p. 1385). Contrary to international conservation agendas that seek to eradicate these introduced animal species and turn back the biogeographical clocks, Jawoyn employ an environmental ethic that is open to cultural adaptation and environmental change. The wasteful nature of large-scale aerial culling programs as well as unforeseeable cascade effects, such as the observed explosion of pig populations following an extensive shoot-to-waste buffalo control program, has made Jawoyn people wary of extreme restoration practices. The beliefs are that mechanical views of nature and attempts to manipulate

the environment in order to achieve some idealized pre-European state are neither practical nor morally acceptable (Robinson et al. 2005).

In particular, free roaming horses present major management challenges. Similar to people in many locations around the world (Chapple 2005; Bhattacharyya et al. 2011; Notzke 2013), Jawoyn highly value wild horses and have culturally and spiritually integrated these animals into the landscape: "(…) elders are emotionally attached to individual horses and herds (…) and many past and present horses are affectionately known by individual names. (…) Jawoyn considered horses living in the park to be the ancestors of the horses that carried their parents' generations, which is consistent with Aboriginal concepts of cyclical generations (…). There was also concern that not only is widespread culling of horses disrespectful but also stories associated with these animals could be lost as a result." (Robinson et al. 2005, p. 1388-1389). Although Jawoyn have agreed to control horses in some areas, elders insisted that horses (and Jawoyn) should be treated with respect, because they belong to country and were present long before the park was created (Robinson et al. 2005). Robinson and Whitehead (2003) thus suggest that co-management regimes in protected areas require a reconciliatory shift in the prevailing management paradigm that "includes notions that introduced animals can, through their association with humans who regard themselves as inseparable from the land, come to belong to a landscape" (p. 456).

Another challenge of interventionist conservation practices is the scientific uncertainty that accompanies decision-making in a rapidly changing world. Ramp et al. (2013) provide several case studies from Australia that underpin the criticism that governments and conservation agencies often lack sufficient understanding of the environment and fail to recognize the complexity of altered ecosystems when undertaking ecological restoration work. Debates about the perceived environmental harm caused by species introductions often obscures the fact that introduced species can simultaneously make contributions to ecosystem services (Macdonald et al. 2007; Davis et al. 2011; Mascaro et al 2012; Kull et al. 2013). For example, Robinson and Whitehead (2003) note that although the introduction of water buffalo to Northern Australia had detrimental effects on native wetland communities, it was recognized that their grazing and browsing behavior had likely provided barriers against uncontrolled bush fires. Attempts to precisely quantify and attribute the factors of environmental damage to introduced species have in many cases proven to be difficult. There is much argument as to whether

the presence of some introduced animal species is the primary cause of environmental change or the symptom of human induced ecosystem simplification (Fisher et al. 2003; Ramp et al 2013). Macdonald et al. (2007) caution to single out introduced species as scapegoats and misdirect attention from more fundamental drivers of species extinction. Complete removal of well-established populations is rarely feasible and may have unwanted side-effects (Zavaleta 2001; Rayner et al. 2007; Brodier et al. 2011; Bergstrom et al. 2009; Martínez-Abraín & Oro 2013). Martínez-Abraín and Oro (2013) thus call to prevent dogmatic approaches in conservation biology. In fact, much of the current debate about introduced species now revolves around the recognition and potential of novel ecosystems (Kareiva & Marvier 2012; Ramp et al. 2013; Morse et al. 2014; Kasari et al. 2016; Quiroga & Rivas 2017).

2.2.3. Holistic and individualistic approaches to environmental ethics and biodiversity conservation

Perhaps the most concurrent interpretation of environmental ethics amongst conservation biologists is the moral consideration of the 'natural community' as the primary object of concern. From the perspective of holistic environmental ethics, the well-being of individuals may be sacrificed in the name of the greater 'communal good' (Katz 1983). This point is reinforced in Soulé's oft-quoted work '*What is Conservation Biology?'*. Soulé argues that "biologists recognize that conservation is engaged in the protection of the integrity and continuity of natural processes, not the welfare of individuals. At the population level, the important processes are ultimately genetic and evolutionary because these maintain the potential for continued existence. (…) Therefore, the ethical imperative to conserve species diversity is distinct from any societal norms about the value or welfare of individual animals or plants. (…) Conservation and animal welfare (…) are conceptually distinct, and should remain politically separate." (Soulé 1985, p. 731).

Although conservation biology's commitment to reduce biodiversity loss introduces a valid concern into the basis of environmental policy, its attempts to categorize and control introduced species have not only been criticized in local and cultural contexts, but are also a hotly debated subject within the field of environmental ethics. Over the past decades, several environmental philosophers have challenged the discipline's holistic approach to biodiversity conservation. Tom Regan labelled ethical holism as "environmental fascism" since it anticipates "the clear prospect that the individual may

be sacrificed for the greater biotic good". (Regan 1992, quoted in Palmer 1994). Individualistic and animal rights-based approaches widely view the prioritizing of the communal whole over the individual as ethically unacceptable, in particular when the communal whole exclusively refers to conservation biology's concept of 'natural communities' (Palmer 1994). This criticism is related to cases, where introduced animals have been subjected to large-scale control programs because they threaten conservation biology's quest for 'natural' purity. Environmental ethicist Peter Singer (2003) laments that "the authorities who conduct these campaigns give no consideration to the suffering they inflict on these "pests", and invariably use the method of slaughter they believe to be cheapest and most effective." (p. 59).

The difficulty of reconciling conservation biology's holistic view of 'natural communities' with the individualistic nature of animal rights is a largely unresolved area of environmental ethics and remains a persistent conflict at the public policy level (DesJardins 2013).

In recent years, attempts have been made from within the disciplinary field of conservation biology to overcome the ongoing dilemma by promoting a precautionary approach to interventionist conservation practices that affect animal well-being. The explicit extension of moral standing from ecosystems and populations to individual animals (both native and introduced) in conservation decision-making lies at the heart of what has been termed 'Compassionate Conservation'. Compassionate Conservation openly recognizes that difficult ethical trade-offs are unavoidable in real-life situations, yet carefully reappraises the premise that conservation biology's concern for the greater good of 'natural communities' automatically trumps the welfare of introduced animals (Bekoff 2013). It is perhaps unsurprising, that the first research Centre for Compassionate Conservation was founded in Australia – a country that is not only confronted with unique challenges of species introductions, but also internationally renowned for its large-scale applications of lethal management in conservation practice (UTS 2015; Ramp et al. 2013).

2.3. Ethical pluralism and environmental pragmatism

One of the clearest messages emerging from the above study of contemporary ambivalences around protected area management is the notion that there are diverse moral positions regarding human relationships to nature. Classical conservation

paradigms have traditionally favored conservation biology's monistic approach to environmental ethics, often at the at the expense of democratic discourse in decision making (Minteer & Manning 1999). Robertson and Hull (2001) point out that conservation biology's fairly narrow empirical focus and desire for nativism in ecological restoration practice has a tendency to downplay other environmental values that are equally important in deciding upon which image of nature to recreate in protected area management. Indeed, the preference of 'native' species in protected areas is not a natural law, but a cultural idea, and provokes challenging ethical questions regarding the management of introduced animals (Humair et al. 2014). These questions cannot be answered by conservation biology alone. They relate to an array of complex social, political and cultural issues and are fundamentally at the heart of human care for nature. As classical conservation paradigms face increasing socio-political pressure, environmental policy makers become more aware of conservation's inherent interdisciplinarity and the importance of exploring alternative ethical sentiments. Yet understanding the diversity of human values in environmental policies requires a shift away from single moral truths to a plurality of explanations (Spash 2009).

In search for a workable and context-sensitive accommodation of ethical pluralism, a growing number of environmental philosophers and policy-oriented professionals have turned their attention to environmental pragmatism as a philosophical foundation for decision-making in conservation (Minteer & Manning 1999, Clark 2011, DesJardins 2013). The roots of pragmatism date back to the work of Charles S. Peirce in the 1870s, yet applications of pragmatist approaches to environmental problems were later developed in the 20th century. Environmental pragmatists reject ethical monism and acknowledge that there are multiple legitimate normative ends to conservation. Rather than being committed to seek out a single 'true' principle, pragmatists hold that knowledge "results from inquiry, that inquiry is always a response to a "perplexity" that has disrupted a social process, and that all inquiry is directed by some end or purpose – a value goal." (Clark 2011, p. 122). John Dewey proposed to accommodate diverse value goals by adopting participatory democracy as a mode for social learning and context-sensitive problem solving. Writing in a similar vein, Minteer and Manning (2003) maintain that environmental pragmatism transcends the undemocratic strain of monistic moral claims in conservation and holds the potential to generate democratically authentic environmental policies: "A pluralistic accounting of environmental ethics dovetails with democratic culture, which thrives on such diversity

in moral thinking and experience. Democracy as a "way of life" entails the genuine conversation about new meanings and values, a discussion which challenges participants to both clearly articulate their own positions as well as to understand those of others. Indeed, this kind of public political "talk" is at the center of a strong participatory mode of democracy, and the legitimacy it bestows upon public values, including those relating to the environment, is of central importance." (p. 321).

In recognition of the practical limitations of classical conservationism, governments around the world are seeking to regain legitimacy by adopting pragmatist approaches in protected area management. In such a context, conservation biology finds itself in close interaction with other knowledge systems and environmental ethics. Debates over how introduced animals are valued may challenge conservation biology's normative postulates and profoundly influence protected area management. Yet integrating different forms of knowledge and competing moral claims is recognized to be a difficult process (Robinson & Whitehead 2012). Adaptive co-management is an emerging pragmatist concept of participatory action that is specifically dedicated to address this kind of socio-ecological complexity and will be further explored in the next section.

2.4. Adaptive co-management in biodiversity conservation: a pragmatist approach

Classical top-down approaches are ill-suited to accommodate ethical pluralism and address complex conflicts in dynamic socio-ecological settings. In response, adaptive co-management (ACM) arrangements have been put forward as a concept of dealing with these issues of complexity and uncertainty in socio-ecological systems (Schultz et al. 2011). Adaptive co-management seems in step with the principles of pragmatist ideals and is uniquely suited to integrate multiple types of knowledge with differing ethical commitments and values. Ruitenbeek and Cartier (2001) define adaptive co-management as "a long-term management structure that permits stakeholders to share management responsibility within a specific system of natural resources, and to learn from their actions" (p. 8).

Many of the ideas that are shaping the theory and practice of adaptive co-management have emerged in the fields of common property and co-management (Ostrom 1990; Ostrom et al. 2002; Plummer & Fitzgibbon 2004; Armitage et. al 2007), and adaptive management (Holling 1978; Walters 1986; Lee 1993). Key features include power

sharing among local, regional, and national levels, and the iterative learning dimension of adaptive management (see Table 1). Adaptive co-management supports democratic values such as respect for diverse worldviews and the commitment to enabling transparent and open decision-making processes. Doing so in a way that reflects true partnerships and fosters the reworking of stakeholder relationships seems to be both good ethics and a good strategy to build resilient socio-ecological systems (Armitage et al. 2007; Minteer 2013).

Table 1: Origins and synthesis of adaptive co-management

Characteristic	Co-management	Adaptive management	Adaptive co-management
Focus on establishing linkages	Establishing vertical institutional linkages	Learning-by-doing in a scientific and deliberate way	Establishing horizontal and vertical linkages to carry out joint learning-by-doing
Temporal scale	Short- to medium-term: tends to produce snapshots	Medium- to long-term: multiple cycles of learning and adaptation	Medium- to long-term: multiple cycles of learning and adaptation
Spatial scope	Bridging between local level and government level(s)	Focus on managers' needs and relationships	Multi-scale, across all levels, with attention to needs and relationships of all partners
Focus on capacity building	Focus on resource users and communities	Focus on resource managers and decision makers	Focus on all actors

(Source: adapted from Berkes et al. 2007)

One of the most defining element of adaptive co-management is the explicit focus on transformative learning. While most learning in natural resource management is solely directed at improving technical aspects of management actions (also referred to as "single-loop learning), transformative learning challenges the beliefs upon which those actions are based (Armitage et al. 2007). Rooted in John Dewey's pragmatist theory of social learning (Paquet 1999), "(…) "double-loop" or transformative learning involves resolving fundamental conflict over values and norms, and promoting change in the face of significant uncertainty, and is identified as a particularly important component of adaptive co-management. The effort to foster double-loop learning requires a commitment to valuing different knowledge sources and epistemologies, however. Double-loop learning is also linked to social capital or the social norms, networks of

reciprocity and exchange, and relationships of trust that enable people to act collectively." (Armitage et al. 2007, p. 9). Figure 1 provides a summary of the conceptual elements of adaptive co-management.

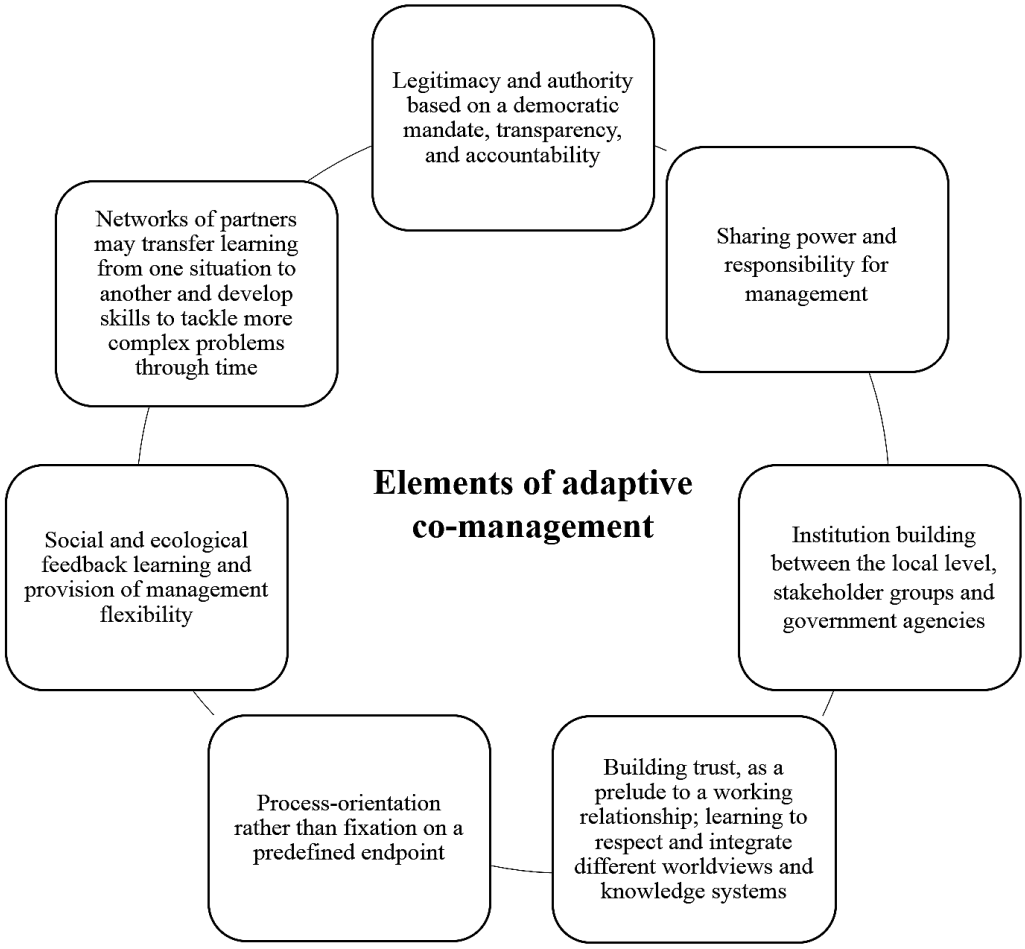

Fig. 1: Elements of adaptive co-management
(Source: adapted from Berkes 2007)

While several studies suggest that adaptive co-management has the positive effects mentioned above and improves society's ability to respond to complex environmental crises (Lebel et al. 2006; Schultz et al. 2011), other attempts to realize ACM in natural resource management have faced various problems. The challenges identified when shaping the conditions of practical action through ACM include the risk that divergent values and problem definitions slow down decision-making processes and participatory action initiatives may be dominated by actors that have more resources or time to participate than others (Brody 2003; Platteau & Abraham 2002).

Previously unaddressed power imbalances may arise and the (historical) role of government bureaucracies has been recognized to play a particularly important role in the reworking process of stakeholder relationships (Pinkerton 2007; Berkes et al. 2007). Berkes et al. (2007) note that embedded historical relations "dictate that issues of equity manifested in management are fundamentally political issues and must be addressed as such" (p. 315). Ecological knowledge is often contested and the impact of scientific knowledge on management decisions might be limited (Plummer 2009; Colfer 2011; du Toit et al. 2004). However, Sarewitz (2004) cautions to "scientize" environmental conflicts and masquerade unacknowledged value and philosophical divisions as empirical disagreement.

Given the plurality of human values and the importance of contextual factors in conservation decision making (see sections 2.1.2 and 2.1.3), performance evaluation of ACM based on predefined success metrics has proven to be difficult. Instead, Berkes et al. (2007) identified a set of criteria to help distinguish the maturity stage of an adaptive co-management arrangement (see Table 2).

Table 2: Three stages in the maturity of an adaptive co-management arrangement

Criterion	Early stage	Middle stage	Mature stage
Reason for being	Initiated by top-down intervention or self-organized in response to crisis	Successful self-organization to respond to management challenges	Adaptive co-management to address a series of challenges, including those not originally in the mandate
Degree of power sharing	Little or none, or only as formally mandated	Moving from two-way information exchange to decision-making partnership	Partnership of equals in formulating the management problem and solution options
Worldview and sense making	Reacting to past events and resource crisis	Making sense of new realities and beginning to look forward and to develop a consensus	Shaping reality by looking forward, planning, and developing a shared vision of the future
Rules and norms	Tend to be externally imposed, often with a disconnect between formal and informal rules	Beginning to develop own rules and norms, both formal and informal	Rules and norms tested and developed as needed; complementary relationship between formal and informal rules

Criterion	Early stage	Middle stage	Mature stage
Trust and respect	Relationships relying on formal arrangements rather than on mutual trust and respect	Learning to exercise mutual trust and respect, typically through high and low points in the relationship	Well-developed working relationships with trust and respect, involving multiple individuals and agencies
Horizontal links and networks	Few links and informal networks	Increasing number of links and information sharing	Many links with partners with diverse functions; extensive sharing of knowledge through networks
Vertical links	Only as formally mandated	Sorting out of roles and functions of other levels; realization that information can flow upward as well as downward	Robust and redundant links with other levels of management authority, with two-way information flow
Use of knowledge	Uncritically using available technical and scientific data *or* local information	More attention to different kinds of knowledge and how to use them together	Valuing local and traditional knowledge; combining different kinds of knowledge and co-producing knowledge
Capacity to experiment	Instrumental learning	Willingness to experiment; developing capacity to plan, carry out, and learn from experiment	Experimentation leading to adaptation and innovation through several cycles
Learning	Instrumental learning	Building on the experience of instrumental learning; developing flexibility; recognizing uncertainty	"Double loop" or transformative learning

(Source: Berkes et al. 2007)

Ultimately, making decisions about biodiversity conservation is recognized to be part of a larger societal process and successful participation has been found to rest "on the relationships among human actors which are supposedly nurtured by the formal institutions and informal arrangements which makes these relationships possible" (Pinkerton 1989, p. 29). In other words, government agencies, stakeholder groups and local communities who commit to an adaptive co-management arrangement face the challenging task of understanding and integrating all aspects of a policy dynamic to guide practical action - the values people attribute to nature, their perspectives, and their

interactions and relationships across multiple levels. In concert, these aspects reflect the same patterns of human behavior that can be observed in other policy arenas (Clark 2011). The policy sciences offer a methodological framework that is specifically designed to conduct empirical inquiry into public conflicts and associated social and decision processes, and will be employed to identify policy problems in the wild horse policy process (see chapter 3).

2.5. Conclusion and implications for research

Classical conservationism and associated top-down approaches to protected area management are at a crossroads. The rise and ascendance of conservation biology within environmentalism and protected area management, as well as insensitive impositions of associated social constructs of 'natural' environments, lack contextuality and face practical limitations (Rikoon 2006; Bhattacharyya et al. 2011; Robinson & Wallington 2012; Notzke 2013). Scientific uncertainty accompanies decision-making in a world marked by rapid ecological transformation, the ethical rationale that underlies conservation biology is in dispute, and participation of local communities and stakeholder groups is increasingly being demanded. In recent years, adaptive co-management has emerged as an innovative policy-oriented approach to resolve situations of social-ecological complexity. As this review showed, there has been increasing interest in the application of adaptive co-management in biodiversity conservation, and in the reworking of multi-level partnerships in protected area governance. Less explored have been the ways in which this novel concept is translated into practice. Specifically, the implications of applying adaptive co-management to value-based conflicts over introduced animals in national parks and its influence on power dynamics in ethical visions of conservation has received scant attention. Rather than approaching adaptive co-management as a blueprint approach, the goal of this case study is to contribute to the literature on multi-level governance (see section 2.3) by identifying conditions in the policy process of wild horse management in KNP that hinder the development of joint protected area management arrangements. The following chapter describes the methods used for data collection, lays out a methodological framework for analyzing the results of the case study, and provides a critical reflection on the research strategies employed.

3. Methodology

3.1. Introduction

This chapter describes and justifies the research philosophy (pragmatism) and research strategy (abductive case study research), as well as data collection techniques (document analysis and semi-structured interviews) that were adopted in the conduct of this study. Details on sample selection and the analytical framework of the policy-sciences are provided. In addition, methodological limitations and issues of validity are discussed.

3.2. Research philosophy

Different models of scientific inquiry are informed by different epistemologies, and greatly affect how conservation conflicts are conceived and addressed (Clark 2011). This study seeks to investigate the policy problems of wild horse management in Kosciuszko National Park by considering the intricate ways in which human relationships, values, and beliefs are implicit in both formulating and resolving environmental problems. Conservation is both a product and a process of social interaction. Indeed, Daly (1999) defined conservation as "a policy in the service of a purpose" (p. 694). Yet chapter 2 revealed a multitude of conservation purposes, value goals and moral positions on human relationships to nature. Rather than avoiding complexity and assuming a single objective reality (positivist epistemology), this study adopts the pragmatist epistemology outlined in section 2.2. Pragmatism, the philosophy that underlies the policy sciences (and elements of adaptive co-management theory), recognizes the centrality of human values in constituting knowledge without committing to ideological stances or disciplinary views. As the wilderness debate illustrates (see section 2.1.1), protected areas are inexorably linked with human value systems and mirror socially constructed images of nature. This does by no means imply that a biophysical reality does not exist apart from social constructions of nature. Unlike extreme relativist approaches to the 'construction of nature', a pragmatist position acknowledges both a biophysical reality as well as multiple social constructions of how people perceive that reality (Clark 2011). For example, in order to understand the wild horse controversy, scientific knowledge of the ecology of wild horses in the Australian Alps was taken into account as well as peoples' perceptions of wild horse interactions with the environment. Unless differences in value outlooks and worldviews were

recognized, local ecological knowledge and conservation biology seemed to be irreconcilable.

3.3. Research strategy

Given the purpose of this study – an in-depth analysis of the policy process of wild horse management in KNP- a case study format was chosen. This strategy of empirical inquiry "investigates a contemporary phenomenon within its real-life context, especially when the boundaries between phenomena and context are not clearly evident" (Yin 2014, p.16). The scope of case study research thus fits well with the purpose of this study, because it is uniquely suited to capture the complex socio-ecological interactions and contextual conditions at play in protected area decision making (Clark 2011).

Through an abductive approach, case study results were partly deduced from theory and partly induced from empirical data (Samuels 2000). Rather than approaching case study research as a linear process, this form of inference highlights the complexity of real-life events and systemically combines induction and deduction "to arrive at an appropriate matching between reality and theoretical constructs" (Dubois & Gadde 2002, p. 559). Indeed, this kind of systemic combining was continuously applied throughout the entire research process. While the preparation of fieldwork was guided by studies of government reports, press releases and adaptive co-management theory, new empirical data from stakeholder interviews continuously challenged and reshaped initial research questions, and the theoretical and analytical framework of this study. In this way, literature review, empirical research and data analysis overlapped and were interwoven tasks. For example, during fieldwork it became evident that stakeholders assign different meanings to the concept of protected areas and 'wilderness'. To better understand conflicting narratives and politics of scale (e.g. what image of nature is sought to be protected for whom and why?), environmental ethics were taken into account to facilitate a pluralistic reading of conservation values and human relationships to nature (see chapter 2). Once the context of wild horse management in KNP was more clearly understood by means of empirical findings and theoretical insights, policy problems were identified and analyzed using the interdisciplinary framework of the policy-sciences, which emerged as a useful methodological tool at a later stage of the research process (see section 3.5).

3.4. Data collection

Data were gathered from interviews with key participants and document review of scientific and gray publications on the socio-ecological context of conservation and wild horse management in Kosciuszko National Park. Other sources of information included related press releases, social media platforms, public submissions to the *2016 Kosciuszko National Park Wild Horse Management Draft Plan* and opinion pieces of horse advocacy groups and environmental nonprofit organizations. This review facilitated the identification of key informants, including NPWS agency officials, technical experts, scientists, and representatives of interest groups. Additional informants were identified using a 'snowball' sampling method, through which interviewees recommended and recruited other stakeholders that were actively involved in the policy process. As interviews progressed, similar emerging themes and perspectives were noted within stakeholder groups, which gave further confidence that the interviewee sample was representative of the stakeholder arena.

Interviews were semi-structured and open-ended, and covered the questionnaire in Appendix 1. Respondents were encouraged to discuss their perspectives freely so that interviews followed a dialogue form rather than a pre-established order of questions. Fieldwork was conducted in New South Wales from the end of August 2016 to the end of September 2016, and included first-hand observation of wild horses in Kosciuszko National Park, as well as participant observation and interviews with seventeen key informants. All interviews were in person and lasted between 60-240 minutes. The respondents comprised of one NPWS agency officials (project officer of the 2016 Wild Horse Management Plan review); one member of the Southern Ranges Regional Advisory Committee; two members of the Kosciuszko Wild Horse Management Plan Independent Technical Reference Group (ITRG); one representative of the Colong Foundation for Wilderness (an environmental nonprofit organization); one bushwalker affiliated with the Brindabella Bushwalking Club and the National Parks Association of the ACT; two representatives of the Hunter Valley Brumby Association (HVBA) (a nonprofit animal rescue organization); one scientist affiliated with the Centre for Compassionate Conservation at the University of Technology Sydney; six local residents from three regional horse advocacy groups (two representatives of the Snowy Mountain Brumby Sustainability & Management Group (SMBSMG), one representative of the Snowy Mountain Bush User Group (SMBUG), one representative of the Snowy Mountains Horse Riders Association (SMHRA), and two residents

affiliated with both SMBUG and SMHRA); and two representatives of Straight Talk (an independent organization contracted by NPWS to design and facilitate community and stakeholder engagement during the 2016 Wild Horse Management Plan review) (see Appendix 2).

Care was taken to obtain respondents' written consent to participate in research and secure confidentiality (see Appendix 3). All interviews were audio recorded and respondents are indicated with individual codes (e.g. IN01, IN02). MAXQDA, a software program for qualitative data analysis, was used to manually transcribe audio files, categorize unstructured interview data, and facilitate the search for interview passages. Names are only given when relevant in understanding the context, or if participation was undertaken as a representative of an organization.

3.5. Data analysis

This thesis applies the analytical framework of the policy sciences (Lasswell 1971; Clark 2011) to the conflict surrounding current management efforts of wild horses in Kosciuszko National Park. The policy sciences, a sub-field of the social sciences, provide a useful structure for the analysis of conservation conflicts by facilitating the integration of natural and social sciences, and employing theoretical knowledge of the policy process. The policy process "is the never-ending, value-laden efforts of people to organize themselves effectively to solve important collective problems and find meaning for themselves" (Clark 2011, p. 6). Values are the basic medium of exchange in all policy processes, and key factors in understanding social behavior and interaction. Lasswell (1971) identified eight base values that can be used to classify the great diversity of human values: enlightenment (accumulation of knowledge), power (influence in decision making), wealth (control of resources, creation and distribution of wealth), affection (loyalty, love, and warm relations), skill (acquisition and exercise of talents and expertise), well-being (health, safety, and comfort), respect (equality, recognition, and freedom of choice), and rectitude (ethical conduct, participation in forming norms). Protected area management that fails to promote common interest outcomes and equitable access to these values through inclusive decision processes also often fails in the long-term achievement of conservation goals (see section 2.1.1; Clark et al. 2008). The policy sciences framework recognizes the centrality of human values and rests on the assumption that people use institutions in pursuit of these values. Ultimate authority in decision-making thus lies "in the perspectives of living members

of the community -their identifications, demands, and expectations -which, like other factors in social process, are amenable to empirical inquiry" (Brunner 1996, p. 46).

In addition to human values and perspectives, a great variety of contextual and technical variables are at play in conservation decision-making. The analytical framework of the policy sciences (see Figure 2) guides empirical inquiry into natural resource policy processes by grouping these variables into three principal dimensions:

(1) *Social process mapping*, which comprises participants (individuals, groups and organizations) and their perspectives (identities, expectations, value demands, myths), situations (value-inclusive or exclusive, organized or not, crisis or intercrisis), base values (positive and negative assets reckoned by wealth, power, enlightenment, well-being, affection, skill, rectitude, and respect), strategies (collaborative, persuasive, coercive), outcomes (proximate choices, indulgence or deprivation of base values), and effects (long-term distribution of base values); in adaptive co-management arrangements, social processes are sought to be collaborative, value inclusive and closely linked with decision processes;

(2) *Decision process mapping*, which differentiates seven functions of decision-making – intelligence (obtaining, processing, and disseminating information), promotion (mobilizing support for specific demands), prescription (articulating basic goals, values or norms, enacting guidelines for action), invocation (initial effort to implement a prescription, e.g. setting up administrational arrangements), application (final characterization of required actions, e.g. resolving disputing claims over the implementation of a prescription), appraisal (assessing decision processes and the success of particular prescriptions in reaching their goals), termination (repealing or largely adjusting a policy prescription); decision processes are carried out to allocate and use resources, and affect the ways in which societies shape and share values; adaptive co-management decision processes are characterized by a cyclic learning-by-doing approach and use appraisal to test and revise ecological knowledge and institutional arrangements for planning (intelligence);

(3) *Problem orientation*, which involves five analytical tasks – clarifying goals, describing trends, analyzing conditions, projecting developments, and inventing, evaluating, and selecting alternatives (Lasswell 1971; Clark 2011).

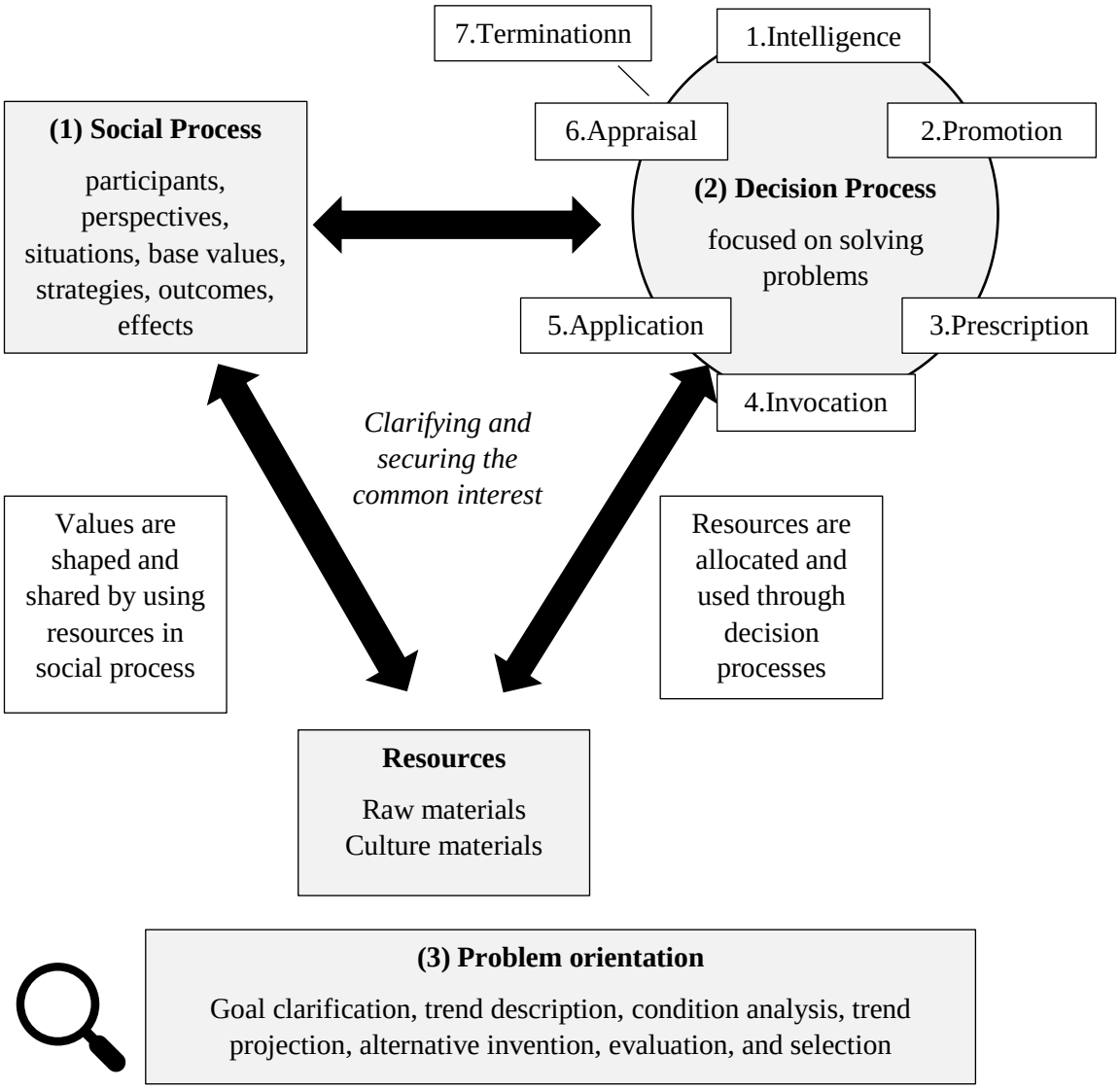

Fig. 2: A generalized view of the natural resource policy process and the three principal dimensions of the analytical framework of the policy sciences

(Source: adapted from Clark 2011, p. 15)

Data from diverse sources (see section 3.4) were contrasted and categorized based on elements of the analytical framework of the policy sciences. In this case study, policy analysis was conducted to gain insight into the evolving problems of adaptive co-management of wild horses in KNP. Problem orientation in the policy sciences is an analytical exercise (see. Figure 2) which should be informed by social and decisional contexts, and carried out interactively. Conservation problems are "discrepancies between goals and actual or anticipated states of affairs" and "are socially constructed, based on the perspectives and values of participants" (Clark 2011, p. 100). Because people hold different problem definitions, objectives for analysis were to identify

competing perspectives (and components of their associated myths), analyze participants' views on various functions of the 2013-2016 decision process (both content-oriented and procedural), and examine how the adoption of adaptive co-management structures affected the long-term distribution of base values.

3.6. Limitations

Thoroughly examining all elements of the current decision process, together with its multifaceted political dimension, is beyond the scope of this study. And while the specifics of institutional interplay are centrally important, the focus here is to analyze the simultaneous societal struggle over ethical visions, power structures, and legitimization in protected area decision making, specifically through the lens of adaptive co-management theory. As a product of a pragmatist approach, it is also not within the scope of this study to provide an indication of the optimal substantive content of decisions (Lasswell & McDougal 1992; Clark 2011), but rather to arrive at a functional understanding of policy problems prevalent in the case of wild horse management in Kosciuszko National Park. Issues of reliability, validity and the fair representation of different perspectives are key challenges in qualitative research, even more so in the reconstruction and analysis of sensitive and longstanding conservation conflicts. This study provides a problem definition that aims to be plausible, accurate and comprehensive, yet unavoidably reflects a personal understanding of a complex and still evolving situation. Inevitable interview biases (e.g. respondents answer questions in a way that they believe is socially desirable or presents themselves in the best possible light) are not uncommon and may have influenced results. However, a number of case study tactics were employed throughout the research process to reduce such biases and improve the quality of the methodological research design (Yin 2014). Care was taken to develop a reliable and well-documented database, and ensure that the interview sample was representative of the stakeholder arena (see section 3.4). Data triangulation further facilitated validation of results through cross-checking of multiple sources. Finally, a draft was given to all interview partners to ensure that the use and interpretation of interview quotes is context-sensitive and not extrapolated.

4. Case Study Results: Description, Analysis and Synthesis

4.1. Introduction

This chapter reports on the findings from the case study of adaptive co-management of wild horses in Kosciuszko National Park. First, a description of the study system and the contextual history of wild horse management is provided, with special attention being drawn to underlying socio-political dynamics, power structures and struggles over cultural concepts of nature. Drawing on a problem oriented analysis of relevant social and decision processes, this chapter further identifies conditions in the aggregate policy process that constitute a persistent challenge to collaborative management efforts. From the outset, the aim of this thesis has been to link the empirical findings of the wild horse case to adaptive co-management theory. This chapter concludes with a synthesis of research findings and provides ground for discussing the role of participatory approaches in redefining the ethical visions of conservation.

4.2. Situating the study area

Kosciuszko National Park is located in the southeastern corner of mainland Australia and forms part of the Australian Alps bioregion (Figure 3). The park borders Namadgi National Park in the Australian Capital Territory to the north east, and the Alpine National Park in Victoria to the south. At 6,900 square kilometers, it is the largest national park in New South Wales and one of the largest protected areas in Australia (ISC 2004). Nestled in the Snowy Mountains, the park straddles the Great Dividing Range and contains Australia's highest summit, the eponymous Mount Kosciuszko (2228 m). The Snowy Mountains range includes a patch of the only alpine climate zone of the Australian mainland and seasonally experiences natural snowfall events, with extended snow cover in the subalpine (1,400–1,850m) and alpine areas (above 1850m). Within the park, temperatures greatly vary by climatic and altitudinal range (225-2,228m) and show high inter-annual variability (Costin et al. 2000). Annual precipitation is exceptionally high compared to the rest of the country, with more than 2700 mm along the Main Range from Mount Kosciuszko to Mount Jagungal (Hope et al. 2012; Doherty et al. 2015). The headwaters of the Tumut, Swampy Plains, Snowy, Murray and Murrumbidgee rivers all lie within the park and around 80% of the stream flows in the area are captured and diverted by the Snowy Mountains Hydro Electric Scheme, the largest and most prestigious engineering project ever undertaken in

Australia. The contribution of the waters from these snow-fed rivers to the value of irrigated agriculture, urban water supply and power generation is nationally significant (ISC 2004; Wagner et al. 2008).

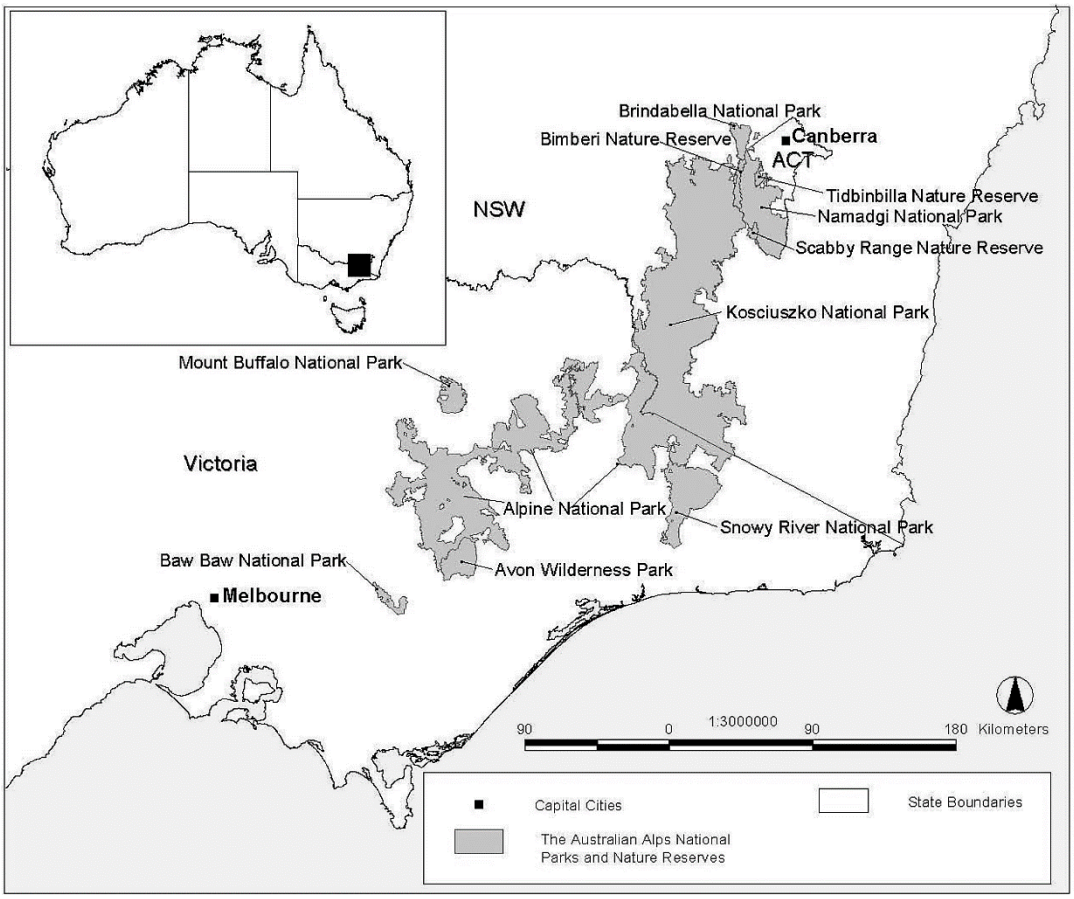

Fig. 3: Location of Kosciuszko National Park
(Source: ISC 2004)

The extreme altitudinal and climatic gradient is reflected by a diverse array of landforms, soils, and vegetation communities. During the Pleistocene, the area around Mount Kosciuszko was the only region of the mainland to be affected by glaciation. At the onset of more temperate conditions 15,000 years ago, the periglacial and glacial landforms of the highlands provided an ideal location for the formation of peatlands. Today, bogs and fens are common in the alpine and treeless areas of the Snowy Mountains and cover up to 2,5% of the higher altitudes of Kosciuszko National Park. Peatlands are acknowledged to be of major environmental significance as regulator of water quality and water flow (Hope et al. 2012). Other vegetation communities of this zone include herbfields, grasslands, feldmark and heathlands. In the surrounding areas, vegetation communities range from cool temperate rainforest, subalpine snow gum and

shrublands to extensive tracts of dry woodland and montane forest communities (Doherty et al. 2015). While alpine and treeless areas represent less than 14 % of the park, they provide critical habitat for alpine specialists and species endemic to KNP. Thirty faunal species with populations in the park are listed as rare, vulnerable or threatened by the IUCN, including Kosciuszko's critically endangered flagship species, the Southern corroboree frog (*Pseudophryne corroboree*) and the Mountain Pygmy-possum (*Burramys parvus*) (ISC 2004). Located in the most densely populated part of the country, Kosciuszko National Park lies in a 500km radius of three major cities (Melbourne, Sydney, and Canberra) and attracts approximately three million visitors annually. Recreational activities include cycling, bushwalking, motorized sightseeing, canoeing, horse riding, fishing, and skiing at the various winter sports resorts located within the park. Kosciuszko National park contains nine designated wilderness areas and is listed as an 'International Biosphere Reserve' under the UNESCO Man in the Biosphere program (ISC 2004).

4.3. Historical context of wild horse management and biodiversity conservation in Kosciuszko National Park

The landscapes in Kosciuszko National Park and the culture of people living in the area have been mutually forming for thousands of years, starting with Aboriginal occupation approximately 21,000 years ago. The arrival of European settlers in the early 1800s gradually supplanted Aboriginal peoples and lifestyles, and profoundly altered the landscape through the introduction of pastoral activities, changing fire regimes, species introductions, developments, logging and mining (ISC 2004). Horses were indispensable for travel and utility work, and soon became an essential part of the transhumant grazing culture that developed in the Australian Alps (e.g. the seasonal movement of livestock to higher pastures). In the course of time, domestic horses of diverse origin (e.g. Thoroughbreds, Timor ponies, Draught horses, Arabians and Capers from South Africa) escaped or were deliberately released during drought or to genetically augment wild mobs. These free-roaming populations, also known as mountain horses and 'brumbies', adjusted to the harsh conditions in the High Country and soon expanded their ranges. In 1861, explorers sighted "immense herds of wild horses, which would be impossible to break in" and it is believed that wild horse populations were well established in the Snowy Mountains by that time (Age, 7th January 1861, cited in CONTEXT 2015, p.12). Some stockmen considered wild mobs

to be pests and barriers to pastoral development, and routinely reduced numbers via shooting; others appraised the mountain horses for their hardiness and agility, and valued them as a resource for local use, for trade, or to be killed for their meat and hides. 'Brumby-runners', as they were known, mustered wild horses on horseback into yards or caught them via roping. Horses were also recruited from the Snowy Mountains as remounts for cavalry use in the Boer War (1899-1902) and World War I (1914-1918) (CONTEXT 2015; IN01).

The continuous controversy over the legitimacy of free-roaming horses in the Australian Alps dates back nearly 180 years and is rooted in two competing historic narratives. The first prevailing view associates wild horses in the High Country with a distinct 'bush' culture, which is celebrated in a large body of Australian folklore and literature (see Appendix 4). A.B. Paterson's famous poem of 1890, 'The Man from Snowy River', powerfully shaped the Australian legend of wild horses and drew on a heroic representation of horsemen and horses in the Snowy Mountains:

> *"To make any sort of a job of it I had to create a character, to imagine a man would ride better than anybody else. And where would he come from except from the Snowy? And what sort of a horse would he ride except a half-thoroughbred mountain pony?"* (Paterson, Sydney Mail, 21 December 1938, cited in CONTEXT 2015, p.14)

Within this narrative, Kosciuszko's wild horses became symbolic of Australia's colonial frontier and significantly contributed to the shaping of a national consciousness. Along this line of argument, some scholars have attributed a deeper socio-political function to the legend of 'The Man from Snowy River':

> *"(…) colonial newcomers were confronted by a strange and difficult country. (…) Placing 'wild horses' in the 'natural' landscape imposed the culture of the newcomers deep into this landscape; this was a twofold imposition – first, naturalizing the wild horses as being an intrinsic part of the natural environment and hence, in effect, enabling the foreign (invading) culture to take cultural possession of the new country; and second, demonstrating white man's superiority and heroism in occupying and conquering a hostile environment through his ability to capture the wild horses."* (CONTEXT, 2015, p. 33)

Other writings, such as Elyne Mitchells bestselling children's book 'Silver Brumby' (1958), reinforce this close alignment of free-roaming horses with a sense of 'wildness' despite horses being an introduced species. Today, the imagery of wild horses and stockmen in the High Country still appeal to the wider Australian community. Perhaps

the most powerful reinvigoration of the 'Man from Snowy River' legend occurred during the Opening Ceremony of the 2000 Sydney Olympics, when a 'Snowy River' cavalry segment was chosen to present a quintessence of Australian national identity to the world. Excerpts of Paterson's poetry and images of Kosciuszko's wild horses also appear on the front of the Australian 10-dollar note and contemporary interpretations of the Snowy Mountains mythologies continue to feature in popular culture (e.g. music, art, movies, sequels, festivals) (CONTEXT 2015; see Appendix 4**).**

Running parallel to the nationalist celebration of brumbies in the High Country, was a historic narrative which resonates with the romantic wilderness ideal outlined in section 2.1.1. This narrative developed in the late 19th century and portrayed the Snowy Mountains as a pristine, untamed landscape worthy of protection. Free-roaming horses were not regarded as an intrinsic element of this alpine wilderness. Quite to the contrary, horses, and in particular cattle, were considered damaging to the environment. In the early 20th century, this view was broadly adopted by bushwalkers. With increasing popularity of recreational activities in the mountains, bushwalking organizations were able to provide a base for early environmental activism (CONTEXT 2015). Criticism of overgrazing in the alpine areas of the High Country gained strength in the 1930s', when soil drift and erosion resulted in substantial ecological degradation and economic loss. In 1944, active lobbying from bushwalking organizations and members of the growing soil conservation movement led to the creation of Kosciuszko State Park and initiated the cessation of livestock grazing in the high alpine areas (Robin 1998).

However, the political campaign to successively withdraw all pastoral leases in the park was primarily motivated by utilitarian conservation purposes related to the construction of the Snowy Mountains Hydro-electric Scheme (see 4.1). In the 1950s', ecological research in the alpine area almost exclusively focused on soil and vegetation management in relation to water yield and the needs of the Snowy Mountains Authority, a large government agency that was established to oversee hydrological works. The strong links between the science of ecology and natural resource agencies soon translated into a justification for professional resource management bureaucracies, which were common in classical conservation approaches throughout the Western world (see section 2.1). The conflation of conservation and ecology was common in public

discourse and secured a special place for scientific expertise in conservation decision making (Robin 1998).

To local pastoralists, hydroelectric developments and the removal of stock from Kosciuszko State Park came at great economic and social costs. During the construction of reservoirs, the old townships Adaminaby and Jindabyne were flooded and many people suffered from forced relocation. The cessation of transhumant grazing resulted not only in a loss of livelihoods, but also brought an end to cherished traditions and a distinctive way of life that is still felt deeply by those who continue to hold strong emotional ties to the land. It is within this context of events, that Kosciuszko's wild horses became a source of local identity and cultural pride:

> *"When over 120 years of mountain grazing ended, the mountain people's world changed dramatically. The brumbies became sacred as they were the last link to the heritage that they treasured."* (SMHRA 2016, p. 2)

The practice of brumby running and roping was carried on by local horsemen and women as a recreational activity. Wild horses were also sourced for domestication and local events (e.g. Jindabyne and Cooma rodeos), and in 1970, a licensed system of brumby running was formally introduced as a means of controlling horse numbers in the park (NPWS 2003). Meanwhile, the creation of the NPWS in 1965 and the declaration of Kosciuszko National Park in 1967 shifted management priorities from a more utilitarian conservation approach to one firmly embedded in nature preservation. Conservation organizations played an integral role in defining environmental discourse around protected area management in the political space and secured their endeavors through state control. The concept of 'wilderness' - an idealized nature associated with a pre-European past (see 2.1.1), soon became firmly established as a baseline for restoration practices and conservation decision making in New South Wales. However, attempts to conceptualize nature as an object to be 'wildernized' and managed apart from human influences revealed a substantial mismatch between preservationists' wilderness ethics and locally specific ways of relating to land and animals. In 1982, the declaration of large wilderness areas under the Kosciuszko National Park Plan of Management disallowed recreational horseback riding and effectively put an end to traditional horse management practices across the park. Long-term residents perceived the restrictions as an attack on their heritage, and as an attempt of elitist groups to project their own nature concepts onto the land. The local antagonism towards outside

impositions of wilderness areas and associated preservationist ideologies stresses the inherently socio-political dimension of the relationship between governmental agencies, conservation organizations and local communities:

> *"(...) since the late 1960s' and 70s' when it became a national park, they [NPWS] have tried to exclude und wipe through the preceding history in our view. (...) The original legislation that was laid down for Kosciuszko National Park in 1944 by the premier then (...), one of his statements enshrined the fact that the people should have free access to the national park, obviously people have to be managed, (...) but in the late 80s' and 90s' we saw the extreme greens and their ideology lock up vast tracks of land and called them wilderness areas. They are no more wilderness areas than that car park!"* (IN04)

> *"(...) experts arrived from universities adopting the American antisocial environmentalist view where humans can do nothing for the environment but visit, pay gate fees, the motel, the eatery, and take photos in this ecological artifact wilderness they have created from myth-information."* (Franklin 2014)

> *"The entrenchment of the environmentalists has been the issue all along (...) and people in this area, and this becomes a political statement I suppose, feel as if they were invaded in terms of their lifestyle and their culture. And this started some years ago, with the Snowy Mountains Hydro Electric Scheme. (...) towns were swamped with lakes and things like that, so they had this persecution complex going on going back 70, 80 years or longer. (...) So, you have got a situation where people still believe that authority, government and others are infringing on their cultural lifestyle and they go 'feral'. With good reason (*laughing). And that is part of the emotional state of the whole region, particularly the older families. And there might be lower tolerance levels in the cities for that sort of emotion -it does exist, and it is a legitimate concern, because these people are 'native', (...) there is 7-8 generations of them now. And they developed a culture in the area which they are proud of and they want to protect it."* (IN01)

Intentionally or not, the declaration of wilderness areas aggravated the struggle of local communities to maintain a cultural connection to the park. The non-transparent way in which decisions were carried out led to feelings of disrespect and added to the history of disempowerment at the hands of external authorities:

> *"(...) in 1982 without any public consultation whatsoever, the plan [1981 Draft Plan of Management for Kosciuszko National Park] was changed and then gazetted, and the Snowy Mountain people had been devastatingly abolished overnight from riding (and hence managing brumbies) in these areas where our ancestors were born, lived, worked and died. This contradicted everything that was in the publicly exhibited plan regarding riding and the brumbies, and the community was in shock. Our heritage had been highjacked and the Snowy River Riders were now deemed illegal in their own country. At that same time, NPWS*

> *told us that brumbies are 'insignificant and do not warrant any management'."* (SMHRA 2016, p. 2)

It turned out to be a significant oversight of the Park Service to downplay local concerns and leave wild horse populations unchecked. In a rather ironic twist, the NPWS's ethical imperative to ban traditional horse management practices in wilderness areas allowed horse numbers to build up over a period of two decades:

> *"There was no formal management in that period of time [1982 – 2003], because horses were in low number. It was a blow for management back then in not recognizing that this was going to be a problem. (...) But I suppose it is like laying the blame for any management in a former manager's feet in not recognizing the big truck that was coming over the hill that was going to bury you in terms of management, you don't always see how it is going to turn out."* (IN15)

By the early 1990's, conservation biologists started to express concerns over increasingly visible ecological impacts of wild horses in wetland areas, and in 2003, NPWS initiated formal management (NPWS 2003).

4.4. Socio-ecological conditions and trends of wild horse management

In Australia, wild horse management often attracts considerable public attention (Symanski 1993; Chapple 2005; Robinson et al. 2005; Nimmo & Miller 2007). In 2000, public condemnation of an aerial cull of 606 horses in Guy Fawkes National Park had wide ramifications for wild horse management in New South Wales. The three-day cull received widespread media coverage and aerial shooting was subsequently banned as a means of managing horses across the state. The incident profoundly destabilized NPWS's centralized management system and acted as a catalyst for a rebuild of conservation governance structures (Chapple 2005). In Kosciuszko National Park, it was decided to involve major stakeholders and local communities in developing long term solutions. In response to concerns over a growing horse population in the park (see section 4.3) and following extensive stakeholder consultation, NPWS prepared a *Horse Management Plan for the Alpine Area of Kosciuszko National Park* in 2003. The plan noted the legal duty of NPWS to minimize the environmental impact of horses on the landscape and set out the management goal to exclude horses from the alpine area of the park. Three control methods were recommended for trial, including passive trapping, roping and mustering. Due to welfare concerns, high insurance costs and associated risks to personnel, roping and leading passively trapped horses onto transport was soon

discounted as a management technique. Passive trapping (luring horses into portable yards using molasses or mineral blocks) and loading captured animals directly onto transport (see Figure 4) has been the control method implemented in KNP since then (OEH 2016b). Within the revised framework of the 2008 *Kosciuszko National Park Horse Management Plan*, management efforts were extended from the alpine area to the entire horse distribution zone in the park (DECC 2008).

Fig. 4: Wild horses inside a trap yard
(Source: Cohen 2011)

Between 2003 and 2016, NPWS staff removed 3183 horses from the park at an average cost of $ 1116 per horse. Only 583 (18%) of these horses were re-homed and the rest were sent to an abattoir or a knackery for processing. While recent incoming statistics indicate a growing public interest in the re-homing program, much concern remains as to the welfare implications of the multi-stage trapping and transportation system, in particular when the final fate of the horse is slaughter. In fact, an assessment of the overall welfare impact of different control methods ranked the cumulative stress associated with long journeys to abattoirs as having the most severe impact on wild horse welfare (ITRG 2015).

Despite ongoing management efforts, a review in 2016 concluded that key objectives of the 2008 wild horse management program had not been achieved. Wild horses were not excluded from areas specified under the plan and appear to have extended their historic range. The latest population count for horses in the Australian Alps estimates 6000

(95% CI 4000-8000) horses in KNP (Cairns 2014; OEH 2016b). Wild horses have a patchy distribution and currently occupy 48% of the park (see Figure 5).

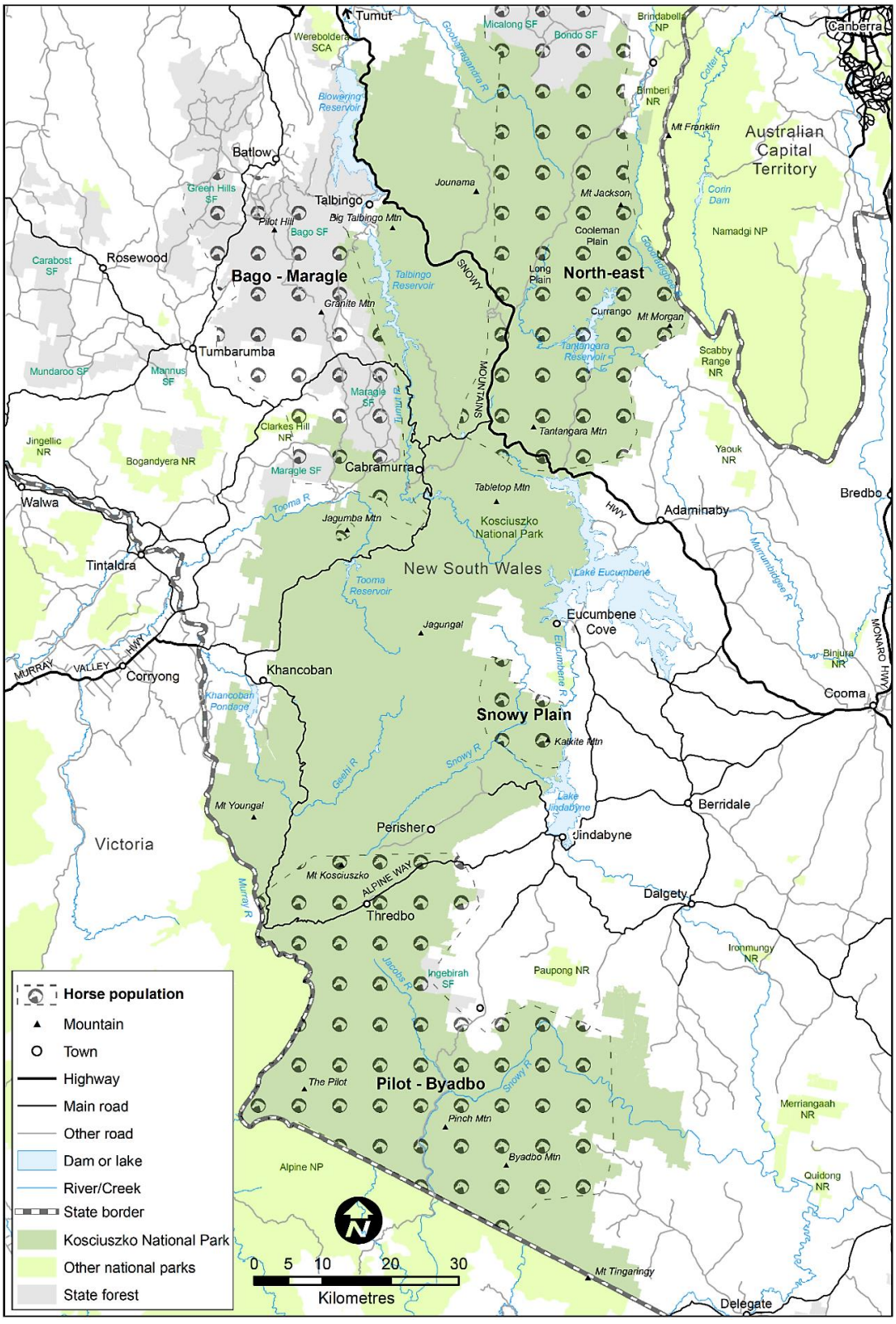

Fig. 5: Wild horse distribution in KNP

(Source: OEH 2016a, p.10)

Throughout the 20th century, horse populations have fluctuated primarily in response to human intervention, but also as a result of natural events. In 2003, wildfires burnt large parts of Kosciusko National Park and reduced the estimated population size by approximately 50% (Walter 2003). While studies in other regions report that free-roaming horse populations can increase up to 20% per annum if left unchecked (NAS 2013), local observations suggest that environmental factors (e.g. droughts, geographical barriers, winter conditions, available forage) place major limitations on population growth in some areas of the park (Dawson & Hone 2011). Aerial surveys have been used by NPWS over the past two decades to assess the population dynamics of wild horses (Walter 2002; Walter 2003; Dawson 2009; Cairns 2014). However, inconsistencies in count methodologies and survey areas have thwarted attempts to compare horse numbers and densities over time (ITRG 2015). Surprisingly little is known about the impact of current management levels on wild horse demographics (eg. re-invasion rates, compensatory reproduction and movement behavior in response to population control) (ITRG 2015). Disagreements between stakeholder groups over horse numbers in the park (i.e. how many are there, and how many should be there) and the horses' relative role in causing environmental harm characterize much of the current debate (see section 4.5). Scientific reports of horse impacts have been most focused on alpine and subalpine areas in the park where wild horses were shown to affect streams, peatlands and drainage lines (see Figures 6-10).

Fig. 6: Exclosure plots on the NSW-Victorian border

(Source: Morrell 2014a)

Fig. 7: Horse impacts tend to be concentrated in riparian areas

(Source: Morrell 2014b)

Fig. 8: Wild horses crossing Nungar Creek

(Source: Edwards 2015)

Fig. 9: Pug marks

(Source: Cohen 2011b)

Fig. 10: Wild horse cutting paths through *Spaghnum* mounds

(Source: Hope 2011)

Long-term monitoring of horse exclosure plots have alerted conservation biologists to the ecological conditions at these sites and seem to support the hypothesis that wild horses cause substantial ecological degradation (see Figure 6). Repeated horse crossings led to hydrological changes (e.g. stream bank disturbance, siltation and peatland drainage) and loss of vegetation cover. A recent report of the Independent Technical Reference Group (ITRG 2015) concluded that 'impacts on bogs and waterways are probably the greatest concern, particularly because they are important habitats for a range of Commonwealth and state threatened species' (ITRG 2015, p. 11).

The report further lists an array of conservation threats associated with wild horses in the Australian Alps, including weed dispersal, soil erosion, and changes to vegetative species compositions. However, attempts to precisely quantify and attribute the factors

of environmental damage to wild horses have proven difficult. Horse impacts tend to be concentrated in certain habitats and observations at these sites may not support extrapolation to other areas in the park. Interpretations of the effects of wild horse activity on the land are further complicated by the fact that many sites are relics of historic grazing, fires, and construction work, and may be cumulatively impacted by other, more recently established, introduced animals (eg. deer, pigs). In the absence of targeted scientific research, there is much argument as to whether wild horses can simultaneously provide ecosystem services, for example, by reducing fuel levels and promoting cool fire conditions (see section 4.5.1; ITRG 2015).

Likewise problematic is the appraisal of the horse's role in causing environmental change, because the meanings that people assign to the horses and the park vary significantly. The next section examines the main perspectives advanced to date by stakeholder groups and individuals involved in wild horse management.

4.5. Social process mapping: participants and their perspectives

This section analyzes the social process for the controversy surrounding wild horse management in Kosciuszko National Park. Specifically, it analyzes the narratives of local horse advocates, nature preservationists and animal protection groups in order to understand how competing social constructions of wild horses influence different perceptions towards the management problem. The values that participants attribute to the horses and the park reflect their social identities (i.e. what they value or identify with), and provide insight into their expectations (i.e. expected outcomes) and demands (i.e. value demands) in relation to wild horse management.

4.5.1. The local horse-advocacy perspective

Kosciuszko's wild horses are intimately connected to the self-identities of local groups and the controversy surrounding their management cannot be understood or addressed outside its historic context. Beginning with the creation of Kosciuszko State Park in 1944, peoples in the Snowy Mountains have witnessed a loss of local control and a series of powerful interventions in the name of conservation (see section 4.3). As a result of this history, local narratives of wild horses are closely linked to the cessation of

grazing and wilderness declarations, and contain many references to the struggle of resident people to regain political and cultural recognition (see Table 3).

Table 3: Local horse advocates' definition of the management problem -1-

Element of problem definition	Evidence
Recognition of cultural heritage value	*I think that is the major concern for me, is the loss of history and the loss of culture. And the respect that we owe to the pioneers of this area and the horses were their transport. (...) they lost the battle trying to get the cattle in, they lost the battle with the access and now they are really concerned they are losing the battle with the horses. The horses that - a lot of them they rode to school on for crying out loud, their first horses were brumbies out of the bush! (...) and that is that passion that drives us behind it! It's the last link! And that petrifies me.* (IN03)
	Here in the Snowy Mountains the brumbies (...) are not just an integral part of the High Country natural environment. They reflect our history, our ancestors and our culture. That's a heritage that gives us our own identity and a sense of belonging, I guess. (...) Our heritage may be only 200 years, but it's all we have, and it is important to us. (Leisa Caldwell, December 12th, 2014, 21st century town hall meeting, OEH 2014)
	(...) I have a very strong nationalistic connection with the whole image of the brumby and the spiritual connection between the people of the High Country and the brumby. (IN01)

Disputes over the removal of wild horses from Kosciuszko National Park are also underlain by different conservation policy goals. Local concepts of nature and 'wilderness' are often shaped by cross-generational associations with the High Country cultural landscape, and are not exclusive to the presence of horses or humans. As a consequence, local residents wish to preserve the continuous existence of Kosciuszko's wild horses as an integral part of the parks value as a living cultural landscape. Interestingly, the values that High Country communities attach to the horses are also reflected in language choices, e.g. many community members refuse to categorize wild horses as 'feral' even when known (Straight Talk 2015). Although the special place that wild horses hold in local value systems does not extend to other introduced animals in the park, attempts to eradicate non-native species and restore nature to some pristine state are considered neither achievable nor desirable (see Table 4).

Table 4: Local horse advocates' definition of the management problem -2-

Element of problem definition	Evidence
Ecological restoration scenario	*The truth? National Parks they just don't want anyone in there and they only want what's native and that's it. (…) I don't think you can bring in animals and introduce them now. Back then, when all this first started it was ok, because that's the way it was (…) And so, it has become a part of a culture there in the environment. I am sure the environment has got a culture just as we do, you know, they do their certain things and we do our certain things [*laughing]. (…) I think we have to look at it and go 'ok, what have we made it -let's keep it how it is now, so we can remember it like that'.* (IN10)
	There are some people that are trying to keep that nexus between humans and the land and the animals, but there are also those people who would see it as a tourism destination or a come-and-see Kosciuszko National Park and have a look at the wilderness -which is wrong! (…) In those areas where the horses exist by tradition there is a pastoral history and it does equate with the values of the park. And that is something that we have a lot of trouble getting National Parks to acknowledge. (IN04)
	(...) Nature vs. nurture. How much do you want to influence? Do you really want to grab hold of the reins of Mother Nature and go 'yes, we are going to control this for the benefit of the native creatures!' or do you just allow mother nature to do her thing? It is wilderness area, but it was declared wilderness while the horses were still there! (…) It is a very fine line there to what I would see wilderness, I see it as virgin bushland, and I see that yes, certainly there is fragile areas, (…) and we want to look after it. (IN03)
	(…) there is no way they are ever going to restore the Kosciuszko National Park or any part of it back to its 'natural state', because it has had 200 years of white man's occupation. (…) It is a wild dream that people have, and it won't happen. (…) [Wild horse management] must be respective of the cultural heritage of the animal and the people. It has to be in line with management practices of the National Park and their responsibilities to the environment and at the same time it needs to be recognized in legislation that the Snowy Mountain brumby has a place in the environment because of that cultural connection. (IN01)
Link to other introduced animals	*As to the difference between horses and other feral animals – our grandfathers did not ride pigs into battle at Beersheba. It was not pigs, deer or cats that transported humans throughout the world for over 8,000 years and partnered humans in the field for survival. (…) So, horses should be viewed very differently. And yes, it is emotional!* (Leisa Caldwell, December 12th, 2014, 21st century town hall meeting, OEH 2014)

Local stakeholders strongly believe that the environmental impact of horses is of minor importance in comparison to other disturbance factors (e.g. fire events, floods, human developments, other introduced animals such as pigs, deer and foxes) and reject

attempts to rationalize management decisions based on empirical evidence concerning ecological conditions. Scientific information published by NPWS is not deemed credible, as it is believed to be collected on the basis of an ideologically biased drive to eradicate horses from the park (see Table 5).

Table 5: Local horse advocates' definition of the management problem -3-

Element of problem definition	Evidence
Ecological impact	*The horse has been there for 150 to 200 years. If you look at the impact on the region and compare that with the impact of humans and compare that with the Snowy Mountains Hydro Electric Scheme, feral animals, roads, ski fields - the impact of the horse is minimal. And if you accept the fact that the horse numbers need to be controlled, which I do, I think if the only damage they can find is paddles here and there and fence lines etc. then there is a good argument for the sustainability in conjunction with the environmental standards that they have set themselves.* (IN01)
	(...) [ecological impacts] are made up to a certain point. They [NPWS] will only pick certain places where they will take a photo at where the horses maybe do cross and drink. (IN02)
	Can the horses coexist in the park? We don't use the term impact, we use the term evidence of existence, because that's what it is. Nobody yet has identified what is an acceptable level of evidence of existence. (IN04)
	(...) we also can see that horses should not be up in the high alpine areas. We agree that the high alpine areas above the tree line and other areas that they are not historically found should be kept horse-free. (Leisa Caldwell, December 12th, 2014, 21st century town hall meeting, OEH 2014)
	There has not been any independent formal or peer reviewed scientific studies conclusively stating that brumbies in the Snowy are the cause of damage to wilderness areas to warrant the brumbies (or the riders) being targeted over any other animal or park development or activity. These manufactured claims of the extremist green groups use the "precautionary principle" to give credence to their greed and resentment of our heritage. (SMHRA 2016)
	They are only ever looking at a small window of time and a small picture in a very big area. (...) it's evolving. (...) Why is that impact different to whole roads that are gouged out? That's ok? Weeds that were brought in by National Parks? That's ok? What's the difference? (...) what was done back in the Snowies when they built all the dams. (...) The impacts that the ski resorts and the tourists have are million times more than what horses will ever be! (...) Such a hypocrisy! (IN11)
	(...) they talk about the horses impacting on numerous animals, well, it is not going to matter with this next fire. There is not going to be any creature left and that is not because of the bloody horses it is going to be because of the mismanagement of the park in general. (...) That is the whole thing that

> *they need to look at! (…) We are not ever debating that there are areas where they shouldn't be in. (…) We are conservationists ourselves.* (IN03)

A repeated point made during interviews was that grazing by wild horses reduces fuel loads and lessens the severity of major fire events. Local observations of the relationship between large-scale fires, structural habitat changes and wild horse population dynamics are contextualized through cross-generational environmental understandings and comparisons with past natural states. Confident in their knowledge of wild horses and fire ecology in the Snowy Mountains, local horse advocacy groups challenge prevailing scientific understandings of the environment and the privileged place of institutionalized ecological knowledge in conservation decision making (see Table 6).

Table 6: Local horse advocates' definition of the management problem -4-

Element of problem definition	Evidence
Link to fire management	*In the large fires which we had in 2003, the area that wasn't burnt is the area with the greatest population of the brumbies. So, the brumbies have kept the field levels down and therefore reduced the intensity of the fire. So, I see them as being an asset in that perspective (…).* (IN01)
	(…) despite of what our opponents say, it has been proven that grazing and bringing down the levels of vegetation can contribute to a lessening of the impact of fire. (IN04)
Population estimates	*Because of the fires the regrowth is that dense in some areas where the horses used to live – they don't live there anymore (…). Yes, more horses are being seen [since 2009], but that is not because there is more horses but because they are in areas where they never used to be because of the bushfires which brings us back to the mismanagement of the National Parks. (…) It's the way they manipulate the areas and they manipulate the numbers to make it sound like 'oh there are too many!'. Between 3800 and 8000 horses is not precise. (…) They are playing games*. (IN11)
	(…) their methodology and their understanding of the horses is inadequate to establish accurate numbers. Firstly, because the methodology of counting is wrong. And the second thing is their understanding of the mortality rate is wrong. And you only get that from generations understanding, it doesn't come through a book! (....) And they underestimate the intelligence of the people who are making comments on these things. (IN01)
Recognition of local knowledge	*(…) bureaucratic reports should not be weighted any more credible than several generations of personal and intimate experience and eye witness accounts of the life cycle of the mountains.* (SMHRA 2016)

> *It's education on both sides that we really fight about. Because we have got our opinion and they have got their opinion. And their science backs their opinion and we have got what -folklore? (*laughing) So, we are getting ignored a little bit. We are not naive people and we are certainly all for it being acknowledged (…) I am a bushrat! That is the hard part! There is these professional people in their field making these decisions influencing it.* (IN03)

A key objective of local conservation efforts is to formalize the relationship between local communities, the horses and the land through legislation. By defining Kosciuszko's horses as a core element of local identity, demands to nationally recognize wild horses in the park ultimately extend to the political recognition of local people themselves. At the practical level, such demands are expressed through people's desire to regain access rights and be actively involved in the management of wild horses, using traditional practices of horse capture and removal. Many local knowledge holders contend that horses were appropriately managed prior to the ban on traditional management techniques. While wild horses are highly valued, there is general agreement that populations need to be controlled, which may even require that some horses be killed if suitable homes cannot be found (see Table 7).

It should be noted though that local horse advocacy groups do not speak with a unified voice and support levels for different management techniques vary among groups and group members. In the absence of legislation that identifies and protects a 'sustainable' number of horses in the park, however, there is much opposition to large-scale culling programs on grounds that such actions are considered an attempt to eradicate horses from the park. In particular, the issue of aerial culling has been a central point of contention over management practices due to the method's wasteful nature, perceived cruelty and potential efficacy in quickly reducing horse numbers in the park. While the local horse advocacy perspective is derived from interviews with politically active opposition leaders, public appeals to state legislators (e.g. demonstrations) and the collection of 10135 (mostly local) signatures on a petition against aerial culling of wild horses in KNP reflect resonance with a significant proportion of the community (Monaro Post 2016).

Table 7: Local horse advocates' definition of the management problem -5-

Element of problem definition	Evidence
Wilderness Act	*(…) when the Wilderness Act was introduced, thereby denying horses and riders access into those areas, so all the traditional methods of capturing the horses were from then on prohibited. (…) And with it went some of the skills. (...) So, the problem that exists at the moment was largely caused by the NPWS back then.* (IN01)
traditional wild horse management practices and access rights	*We can supplement in those areas removing them or moving them from the sensible areas like bogs and fens (…), where they are needed. Mother Nature can look after the rest as she always has. (…) They should allow us to go in there again. They should be using the local people for so many more things (…) But we are not getting any younger and if we are not allowed to go in there now, and show our kids how to do it we will be the end of the line. And there won't be anybody else who could be doing it*. (IN11)
	As horse lovers with several decades of wild horse experience we believe that we must continue to play a significant role in their management using our traditional methods and humane methods which should be a win-win for all. It's part of who we are and it's what has been handed down for generations. If anybody in Australia knows how and what to do for wild horses – it's us! (Leisa Caldwell, December 12th, 2014, 21st century town hall meeting, OEH 2014)
	Managed to a point where... years ago, if you wanted a brumby you would go up and catch one and they were riding horses and they are the best horses to have, like, they are the best stock horses, they are the best horses on their feet. They handle the cold climate, but the National Parks stopped anyone doing that. (…) They are rugged, they are not stupid, they are very sweet animals. (…) If you can get a brumby its perfect for kids ponies or anyone, and yeah, fair enough, some might need to go for slaughter (…) (IN02)
	Our heritage seems to be important enough and is nationally recognized and celebrated when it is deemed suitable to exploit for entertainment purposes such as the Opening of the Sydney Olympics and Snowy River Spectaculars, Festivals and the several films. (…) We want to pass on the skills, knowledge and love of our heritage, the brumbies and the mountains to our children and grandchildren, just as our ancestors did. (SMHRA 2016)
Legislation	*I think the first thing that has to happen for the population to agree on a number, which is a sustainable number, is for government to legislate that they keep the presence of that horse in the Kosciuszko National Park, because we are very suspicious of government. Everybody! With good reason. (...) And that is not only my generation. Everybody is saying the same thing and we don't trust government, (...) because there is that element within the environmental group that want them totally eliminated.* (IN01)

Local stakeholders repeatedly asserted a lack of trust in governmental agencies and NPWS management actions. Given the strong utilitarian context of nature preservation

and the history of classical conservation approaches in Kosciuszko National Park (see section 4.3), many long-term residents are suspicious of the economic and political influences behind protected area decision-making. Reports of illegally shot horses in the park (some of which were officially confirmed by NPWS as an act of poaching) and rumors about hidden economic interests and political deals behind wild horse management have fueled such doubts and suspicions (see Table 8).

Table 8: Local horse advocates' definition of the management problem -6-

Element of problem definition	Evidence
Illegal shooting of horses	*(…) we actually got word that they are actually shooting them in the parks and in the pens and they are dumping them in pits and burying them and not telling the public, which is really disgraceful if that's a truth (…) And so we actually went on horseback and went looking. We did find a horses' tail and up into the mountains there were crows, we don't know what was up there.* (IN02)
	We had some people going into the bush yesterday looking for the horses that were shot. We know they were shot, we cannot find where. We believe that the government agency had its fingers in the pie, but we cannot prove until we can find the horses (...). (IN04)
Link to water catchment values	*Here we say the shadow of water (…). And there are all sorts of conspiracy theories with respect to water and the sale of water. (…). If you look at the possibility of the sale-off, this is only a wild card, if you look at the possibility of the sale of something like Snowy Hydro, it channels a lot of that water, would a prudent buyer say 'I am not going to buy it if there is a possibility that feral animals may introduce some pugging? I don't know.* (IN04)
	They want the mountains all dead. Send our Brumbies to slaughter for their cheap city water. (Franklin 2015)

Local community members, basing their conclusions on such rumors, link conservation and wild horse management to hidden agendas and illicit government activities. Indeed, issues of trust and respect run through many elements of local problem definitions and are represented by community groups as a major hurdle for collaborative management.

4.5.2. The nature preservationist perspective

The nature preservationist perspective is grounded in conservation biology's disciplinary understanding of nature and characterizes Kosciuszko's horses as accidental to formalized ecological restoration goals. As described in chapter 2, the science of conservation biology is socio-culturally embedded in the wilderness ideal, and has

traditionally informed the culture of environmental governance institutions. Adherents of this perspective include environmental professionals who work within the NPWS and the Office of Environment and Heritage (OEH), environmental nonprofit organizations, members of bushwalking associations and others who place a high value on the ecological integrity of 'natural areas'. Within the scientific knowledge system of conservation biology, the preference for nativism is treated as self-evident, and it is assumed that 'natural' ecosystems can be scientifically determined and managed. Indeed, preservationist narratives reveal a tendency to define management problems of wild horses in scientific terms and demarcate science from culture (see Table 9).

Table 9: Nature preservationists' definition of the management problem -1-

Element of problem definition	Evidence
Legal requirements and scientific management principles	*(...) the problem is that the horses, pigs, foxes are all introduced species and so, as a scientist, completely taking aside the cultural stuff, those things are completely alien animals to this environment. (...) The goal ideally would be a park system that had no non-native species in it, but that will never be possible, although it would be the ideal from a scientific point of view and a legal point of view.* (IN07)
	Because they're hard-hooved animals - the vegetation evolved free of hard-hooved animals - so there's no sustainable population that people talk about often. 'What's the sustainable population of wild horses, brumbies, call them what you will, in the park?' (...) There's no ecological reason to have any horses in the park. So, there's a requirement to actually remove them, legally remove them. (Roger Good, February 22nd 2015, Landline)

Although the preservationist ideology is based on assumptions and values that are inherently cultural, many consider the battle over Kosciuszko's horses to be one of 'nature versus culture'. In contrast to local residents who characterize wild horses as an intrinsic part of the High Country natural environment, nature preservationists disassociate the horses with what is 'natural' and 'truly wild'. Free-roaming horses in the park are typically termed 'feral', a designation that stresses their recent, human-assisted establishment and lack of legitimacy in a 'natural' area (see chapter 2). Adherents of this perspective treat local narratives with skepticism, and rarely recognize the cultural and socio-political significance of Kosciuszko's horses to local groups. As a result, cultural heritage claims are not seen as important information that should be taken into consideration for conservation decision-making (see Table 10).

Table 10: Nature preservationists' definition of the management problem -2-

Element of problem definition	Evidence
Cultural heritage value	*(…) I don't accept that a National park should be managed for feral herbivores, feral mammalian herbivores have no role in a National Park. There is zillions of them everywhere, they don't belong in the environment and I don't accept the 'Man from Snowy River' ideology. So, I don't think that I want to see the things in my parks, in NSW. I have seen the damage that they cause to the park. It breaks my heart.* (IN14)
	I don't think that the cultural argument is a strong one. (...) from what I have seen it is a self-interested interest, it is not genuine cultural interest. (…) It might have been a genuine one a fifty years ago, but I don't think that those stories are speaking to modern Australians... given that the population has much changed in this country. (IN06)
	This is a resentment of those previous generations that lost that lifestyle and that access to the mountains. This is their way of getting back, it is kind of 'pay back', they found a way to maintain their cultural connection and it is almost like a weapon against the park. (...) They just do feel it from their hearts, of course there is this tremendous social connection. (IN07)
	(…). I think where there is a conflict between the natural values of a park and the cultural values, like, some people claim that these feral horses have cultural value, then I think that natural values must be supreme, they must be paramount." (Rob Pallin, December 12th 2014, 21st century town hall meeting, OEH 2014)
	Is there anything special about the horses? Well, we think the only special thing about horses here, is that we have half a million feral horses in Australia. We have the largest feral horse population in the world! (IN13)

The primary conservation policy goal of the nature preservationists is the safe-guarding of 'wild' biodiversity. This goal, they believe, requires the 're-naturalization' of Kosciusko National Park to a pre-European state. As mentioned earlier (see chapter 2), this position is reflected in NPWS's legislative duty to maintain 'natural areas' and eradicate introduced animals that were not established in NSW before European settlement in 1788. Nature preservationists hold that alternative visions of ecological restoration (e.g. the maintenance and protection of wild horses in the park) are inherently incompatible with these land management goals and pose a fundamental threat to the values and ethical rationales that have traditionally guided conservation (see Table 11).

Table 11: Nature preservationists' definition of the management problem -3-

Element of problem definition	Evidence
Ecological restoration scenario	*And to me, you have got to get even more nationalistic to sort of say 'I want Australian things in reserves that are for Australian things whose primary role is to maintain that'. And when you put another, whether it's an object or a plant or an animal, that detracts from preserving the Australian flora and fauna and habitats and geology, in something that it was set aside primarily for that reason, then I think you have got a big problem. (…) And I think this is probably a new era for park managers or environmental managers to change the mindset, because all over the world (...) we are losing the natural world.* (IN05)
	On a philosophical and moral issue, I don't think it is appropriate to have feral horses in a National Park to do the heritage management of feral horses (…) there is also the question of wilderness and feral horses. And core areas of Kosciuszko National Park are preserved as wilderness (…). These are very important large and intact natural areas and should be managed for nature. (IN14)
	To me, you know, the question is 'is a national park a zoo'? Or is it a place where natural ecosystems function'? (...) It is a fundamental threat to the whole concept of what a national park is. To me, that's a farm -they should go and buy a farm! (...) That is the problem, that there is a complete disconnect between those two concepts. (…) The park is not a farm. The problem here is that people perceive these animals as being now a part of the Australian landscape that legally should be protected. They are not protected under any legislation as a purpose for which a National Park was created. The IUCN, the international system of parks, is for the preservation of the natural ecosystem. (IN07)

In contrast to local horse advocacy groups, nature preservationists identify wild horses as a high priority threat to native biodiversity and urge to drastically reduce horse numbers in order to protect critically endangered endemic plant and animal species. Many believe that public resistance to horse eradication plans stems from a lack of ecological education and communication, in particular regarding the horses' impact on the park's wetland ecosystems and the proper normative ends of conservation (see Table 12). Key arguments for the removal of horses from the park are also grounded in utilitarian conservation values (e.g. water catchment values) that were a decisive factor in the creation of Kosciuszko National Park and continue to influence environmental policy (see section 4.3).

Table 12: Nature preservationists' definition of the management problem -4-

Element of problem definition	Evidence
Ecological impact of wild horses	*The problem is that you can take a person out there and they see the world differently if they have got a mindset that they believe that right before they start, if the horses are a completely acceptable thing to have in the landscape. And they go 'I don't understand what is the problem with that?' -that is the problem. (…) they are used to living on farms (...)When you are used to living in a landscape that is simplified like that, you think, this ecosystem here, this grassy thing that looks perfectly nice. But that is not a natural ecosystem (…) This is the huge communication problem.* (IN07)
	Horses are stock animals recently introduced and are not characteristic of this area, but threaten ecosystem processes, ecosystems and species that are characteristic. (Don Driscoll, August 19th 2016, The Guardian 2016)
	(…) the endangered species (...), it's little things, not the megafauna which we all love, none of them are sexy, the broad-toothed rat looks cute. Well, it's quite fat and hairy. But it's also mosses and the karst landscapes. It cannot compete with emotional impact with the horse. (…) you can see a dead horse when it's culled. What you don't see is the native animals that are not born because the horses destroyed their habitat and that is what you can't demonstrate. It is very hard to have a conversation about that. (IN06)
	There has been a tremendous amount of documentation of the ecological impacts of the grazing era. (…) So, horses are now replacing hard hooved animals that caused all that damage. In fact, the population just gets bigger and bigger and bigger. You are simply going to have a repeat of the catastrophic impacts on the ecosystems that occurred during that period. (IN07)
	You can see the kind of damage that occurs where they cross over a drainage line. And whilst that mightn't look huge to a lot of people, on a landscape scale, this kind of crossings everywhere on every drainage line soon start to add up. (Rob Gibbs, August 6th, 2016, Landline 2016)
Link to water catchment values	*The Park was established to protect the catchments so that they could provide this water supply. (…) Those catchments that are having horses currently trampling on them are drying out, becoming more and more hard, they won't have the capacity to yield water. So, they are not realizing that investment in ecological infrastructure that sustains all of us and it doesn't come for free. (…) You can't maintain a National Park any more easily than you can maintain a farm. If you have a farm, then you have to control it, and the yield of this landscape is water.* (IN07)

Based on the empirical claim, that horses are incompatible with the primary conservation purposes of Kosciuszko National Park (see Table 13), adherents of the preservationist perspective support eradication of horses from the park. Large-scale aerial shooting programs are believed to be the only practical, cost-effective and

humane option for achieving this goal. Advocates of this method are mindful of the ongoing costs of managing a large number of horses and argue that a rapid reduction of horses in the park will result in fewer animals being killed over the years (provided that the majority of passively trapped horses is sent to slaughter). According to data collected by Straight Talk (2015), nature preservationists rated effectiveness as the most important consideration in wild horse management and, to a lesser degree, animal welfare. This position is not surprising given that conservation biology's disciplinary approach to environmental ethics is ecosystem-centered rather than concerned with the well-being of individual animals (see section 2.1.3).

Table 13: Nature preservationists' definition of the management problem -5-

Element of problem definition	Evidence
wild horse management practices	*It's a bigger picture than just to say 'we want to kill these horses', there is a reason behind it too and if there is some pain involved it is sort of collateral damage almost for the greater good. That's on one hand, but on the other hand I think we have got the techniques now that there should be minimal pain happening. (...) The current approach is not particularly good. (...) That is where aerial shooting can be so much faster, because you can probably go through and do 200 in a day. You might even do more. And you are not eyeballing them either. (...) Still, there will be ground people, I hope, to see and check if they are dead.* (IN05)
	(…) the people who are advocating for the poor, poor horse are actually leading to a policy that leads to more horse suffering of more horses. And that is the greatest irony of this policy. Because it's got nothing to do with the damn horses! (…) And they don't realize that their (...) sympathy is actually harming the horses. So, it's all about education. (...) it's information, it's all about communication, it's all about engaging the public debate, it's all about leaping into it, but it's also about being consistent. It's about saying, 'humane culling of feral horses by trained marksmen in helicopters is the best and most humane and effective way to control feral horses that we know'. I wish it wasn't, but it is. (IN14)
	The repair takes a very long time and it costs a lot of money and it's crazy to leave the problem there longer rather than a shorter period of time. It's smart to remove the horses more quickly. And if that needs the biggest muster in the Southern Hemisphere, let that be. If that needs the biggest injection of staff and resources to deal with this problem quickly, then let that be. (Graeme Worboys, August 6th, 2016, Landline 2016)
Link to other introduced animals in the park	*(…) the people who are pro-horse they are like 'what about the pigs, what about the goats?' -yeah, but you can get up on a helicopter and shoot them en masse if they are a big population und drop the population of pigs and goats down. You can do things to pigs which is not very humane but effectively to control them. No one seems to mind.* (IN14)

In essence, nature preservationists' conceptual understanding of the horses and the land is not embedded in the local historical and cultural context, but rather related to national and international conservation agendas of the protected area system (see chapter 2). It is these legal and ideological frameworks through which advocates of the preservationist perspective perceive and appraise the presence of wild horses in Kosciusko National Park.

4.5.3. The animal protection perspective

Perspectives among animal protection groups are, to a varying degree, oriented toward the expectation that wild horses deserve direct moral consideration in conservation decision making. Adherents of this perspective include animal welfare organizations, wild horse rescue groups, researchers affiliated with the Center for Compassionate Conservation and others who identify with the policy goal of firmly integrating the welfare of introduced animals in conservation practice. Animal protectionists explicitly include the well-being of individual animals in the definition of environmental harm. Many believe that Australia's legislative framework fails to adequately regard the welfare of feral animals in conservation practice and thus object to horses being labeled 'feral', as it tends to justify a differential treatment compared with their domestic counterparts (see Table 14).

Table 14: Animal protectionists' definition of the management problem -1-

Element of problem definition	Evidence
Horse welfare	*(...) when you confront harm, and I think that most people would associate a desire to protect nature as protecting it from harm, that harm can be many things. One form of harm is extinction. Another form of harm is an impact on welfare and wellbeing and the kind of life that an animal is living. (...) there is value in endangered species - in conserving them. But we have to think really carefully about that these are conscious, sentient animals and we can't disregard life like that. (...) Every individual matters.* (IN17)
	The reason we don't like the term 'feral' is that when people hear that term, unfortunately, they think they can treat the animal differently. (...) When people see the term 'feral fox' or 'feral rabbit', they think it doesn't matter, that a fox is poisoned with 1080 and that it suffers terribly when it dies after it takes that poison. They don't think that when they go 'bunny-bashing' that that matters because it is feral. And it does matter. (...) To us, the most important thing is humaneness and it is the first thing that we should look at. (Madison Young, December 12th 2014, 21st century town hall meeting, OEH 2016)

> *(...) our government has spent hundreds of thousands of dollars on this consultation process, because it is a horse. Nobody cares about the pigs, nobody cares about the wild dogs or goats, deer (..) And that's what the environmental guys say as well 'it's just because it is a horse, that that's why we have to have this conversation, if it wasn't a horse then we could just do what we want. So, let's just do what we want anyway and ignore the social aspects' -but you can't.* (IN08)

Despite differing ethical orientations (i.e. animal welfare positions are primarily concerned with the alleviation of human inflicted horse suffering during management operations, while animal rights based positions argue that horses have rights because they possess certain cognitive abilities), animal protectionists share basic convictions of individualistic approaches to conservation (see section 2.1.3) and are generally opposed to conservation practices that require large-scale lethal control of wild horses on grounds that such actions violate the obligation to account for the interests of individual animals. Importantly, this position has normative implications for ecological restoration goals in Kosciuszko National Park (see Table 15).

Table 15: Animal protectionists' definition of the management problem -2-

Element of problem definition	Evidence
Ecological restoration scenario	*(...) NPWS they are just trying to do their job, I get that. They want to conserve the environment, they care about the environment. But I also care about the environment. I just don't want to see animals suffer to protect a certain type of environment. (...) And I think that's why it can become so difficult with the horses, because people love them so much and because they are big and you can see them, it makes people question 'what are we actually doing?'.* (IN09)
	*Animal rights people or animal welfare people often get dismissed as being emotive. (...) But the reality is, I think, that we are being less emotive than they are. That idea of protecting Australia from being a farm is an emotive argument. [*laughing] (...) I am not saying 'hands off'. (...) However, we need to rethink the way in which we conceptualize what is alien and we only need to look at people to understand that we all come from all over the place.* (IN17)

It should be noted though, that dogmatic adherence to animal rights ideology does not accurately capture the positions of many horse protection groups and there is general agreement that horse management is a legitimate conservation aim in KNP. In commenting on different control techniques, interviewees showed a preference for non-lethal management options and advised a mixed method approach, including fertility

control of horse populations that are readily approachable, fencing off sensitive areas, low stress (aerial) mustering, passive trapping and re-homing. Study participants expressed grave concerns over transporting wild horses to abattoirs and preferred on-site euthanasia of trapped horses that cannot be collected by re-homers. Similar to local horse advocates, stakeholders in this grouping object to shooting uncontained horses due to the risk of wounding (see section 4.5.1). Aerial shooting, in particular, was considered an inherently imprecise technique with a potentially disastrous welfare outcome in Kosciuszko's treed and rugged terrain. Some groups also vehemently opposed the reintroduction of traditional horse management (brumby running and roping) due to potentially negative welfare impacts on horses (see Table 16; Straight Talk 2015).

Table 16: Animal protectionists' definition of the management problem -3-

Element of problem definition	Evidence
wild horse management practices	*(...) it would be really good to be in a situation where we could trust that NPWS will go in, trap horses and then say 'ok, all of you rehomers, I have 20 horses in the yard -can you take them?'. People could take what they could take and then the remaining horses that were there could be shot on site, not have to go through all of that stress. If there is a non-lethal option like fertility control, we should at least trial that option.* (IN09)
	[Aerial culling is] not something that you could apply in most of the park (...) [and] if you applied it in a place where it is feasible to carry it out -well, you would probably be talking about 10, 20 horses a year. (...) And you know, people just don't get that! (IN16)
	It's not like 'leave them all, you can't do anything with them'. We are sensible, but it has to be humane and there are so many ways that even the current trapping program could be so much more humane. (...) We never said that horses shouldn't be out of very sensitive areas, if they have recognized areas in Kosciuszko NP or any National Park as being very sensitive (...) Put up some fences! It's not that hard! (IN08)

Problem definitions also focused on the lack of a firm data basis on which to base future management decisions. For any wild horse management program to be justified, animal protectionists demanded that interventions be based on a thorough understanding of population dynamics and the impact of different forms of management on horse numbers. Rather than defining the presence of wild horses as a problem per se and promoting a 'quick-fix' solution (see section 4.5.2), those interviewed relaxed

adherence to nativism in ecological restoration and accepted horses as well-established part of the parks novel ecosystem. Study participants, some of which had visited the park with NPWS staff, did not believe that moderate numbers of horses caused unacceptable damage and cautioned that drastic actions may backfire with unintended consequences (see Table 17).

Table 17: Animal protectionists' definition of the management problem -4-

Element of problem definition	Evidence
Ecological impact of wild horses	*The rhetoric around the impact is great and yet if you look for the evidence it's incredibly poor. (…) you will have scientists say 'oh, the horses' impact on the alpine ecosystem is by damaging the peat' and they will show you a picture of a horse print. That's really a misunderstanding of how ecosystems work. Disturbance is important, yes, too much is not good, but there are ways of solving that very localized impacts. So, from a conservation point of view we would (...) not buy the argument that just because they were introduced they should be got rid of.* (IN17)
	What we are seeing in Kosciuszko is lots of healthy horses and lots of healthy environments. The brumbies we're getting out look like they've come off studs. So, they're doing well and everywhere where we see brumbies that look that good, the environment looks as good. (Colleen O'Brien, August 6th, 2016, Landline 2016)
	(…) we just keep messing with things, humans trying to manage something, and we are not particularly good at that. (...) So before we kill 6000 animals let's just check (…) 'is it actually horses that cause this trampling? Or is it deer? (…) Now, that they are taking horses out is there a space that is being created for deer to then come into the park?' So, you are might be just creating a self-perpetuating cycle of new animals coming in that are going to do different things. So, it is really complex. (IN09)
	(…) even when you look at different parts of the park, which we have done on ourselves and with park rangers. They will take you to a water stream and say 'do you see the damage?' -and it will be one hoof mark. And there is plenty of grass, you will see all of the native species are thriving and the horses are just taking care of the pasture. (IN08)

In common with local horse advocates, some interviewees suggested that wild horses may positively contribute to novel ecosystems (e.g. by improving nutrient cycling, reducing fire risks, and enhancing biodiversity) and encouraged an open-minded consideration of the ecological role that horses now play in KNP.

4.6. Decision process mapping

This section describes the review process of the 2008 Kosciuszko National Park Wild Horse Management Plan (2013-2016) and the contents of the subsequent 2016 Kosciuszko National Park Draft Wild Horse Management Plan. The decision process is "a means of reconciling (or at least managing) conflict through politics in order to find a working specification of a community's common interests" (Clark 2011, p.57). This section conducts empirical inquiry into policy problems by analyzing participants comments on various functions of the recent wild horse decision process. Specifically, it examines how participants describe trends in decision making (both procedural and content-oriented) and how the adoption of participatory management structures affects base value dynamics.

4.6.1. The 2008 Horse Management Plan Review and the 2016 Draft Wild Horse Management Plan

The 2016 Kosciuszko National Park Draft Wild Horse Management Plan is the third iteration of a formal wild horse management plan for KNP and was released for public comment on 1st of May 2016, following an extensive review of the 2008 Horse Plan. The review process, which extended over a period of three years (2013-2016), concluded that key objectives of wild horse management had not been achieved (see section 4.4). For the purpose of the public engagement process and in recognition of the politicized use of terms to describe the horses (see section 4.5), NPWS refrained from referring to horses as 'feral' and used the term 'wild horse instead "to maintain balance between environmental and horse advocacy stakeholder groups that regard the term 'brumby' or 'feral' as either romanticizing or being derogatory, depending on the viewpoint." (OEH 2016b, p.4).

The planning phase (*intelligence*) consisted of several activities to inform future management, including extensive community and stakeholder consultation, assessment of the cultural heritage significance of wild horses in KNP, and technical advice from an Independent Technical Reference Group (ITRG) and NPWS staff. To facilitate public participation and assist with understanding community views, Straight Talk, an independent organization specializing in community engagement, was commissioned by NPWS to design and implement a comprehensive engagement process. The participation strategy titled 'Protecting the Snowies' encompassed a variety of

contemporary engagement methods (online surveys and discussion forums, kitchen table discussions, 21st century town hall meetings, focal group meetings, stakeholder meetings and field inspection trips) to capture community values in relation to wild horse management. Rather than indicating an overall management preference and making direct recommendations, the engagement process revealed a wide spectrum of views. Participants had polarized opinions on many aspects of wild horse management and no control method was universally supported or opposed.

Apart from inviting public participation, 'Protecting the Snowies' was also used as a promotional strategy to provide information on the challenges surrounding wild horse management and mobilize support for NPWS position (*promotion*). However, some of the information provided by NPWS was contested by horse advocates (i.e. horse numbers in the park, ecological impacts, promotion of aerial culling as a humane management technique). Despite the ban on aerial culling still being in place, NPWS announced that it would reconsider all available wild horse control options (including aerial culling) as part of the review. Resistance by local-horse advocacy groups and animal protectionists took the form of petitions, protests, news releases, formation of new horse protection groups, and legal efforts to permanently protect the horses from aerial culling. Tensions between stakeholder groups and NPWS staff escalated to the point that some individuals engaged in inappropriate behavior. A Straight Talk (2015) report notes “the sale of bumper stickers that read “Aerial cull a 'greenie', save a Snowy brumby” can be viewed as intimidatory to both environmental advocates but also NPWS staff, given the claim made by horse advocates that NPWS are 'greenies' and NPWS is aligned with environmental stakeholder organizations.” (p.3). The report further notes that despite attempts to provide a safe environment for discussions to take place, some environmental advocates felt threatened and were reluctant to speak up publicly. Given the heightened media attention and potential political fallout, the State Minister for the Environment made a commitment (*prescription*) in the middle of the review to rule out aerial culling and brumby running as a means of managing wild horses in KNP.

In response to claims that Kosciuszko’s wild horse populations have cultural heritage value (see section 4.5.1), NPWS also commissioned a cultural heritage assessment to support the review. The study used National Heritage List criteria to frame the assessment and concluded that “the wild horse population in the park is an attribute

associated with the cultural heritage significance of the park in relation to five of the nine criteria" (CONTEXT 2015, p.13).

Based on the findings of the review process, the vision statement of the 2016 Draft Wild Horse Management Plan (*prescription*) sets a precedent in acknowledging the cultural heritage value of Kosciuszko's wild horses. The draft plan proposes to address cultural heritage values by retaining an overall population of between 400-800 horses in designated areas of the park (see Figure 11) and outlines three objectives: "(1) To reduce the impacts of wild horses on the natural and cultural heritage values of Kosciuszko National Park by reducing the overall population of wild horses using a range of cost-effective and humane control measures. (2) To reduce and mitigate the risk of adverse wild horse interactions or incidents with park visitors and the public more generally. (3) To involve the community in ongoing management of wild horses in Kosciuszko National Park through active participation in research, monitoring and control programs where possible. Key strategies to achieve these objectives are to reduce the wild horse population from 6000 to less than 3000 horses in five to 10 years; and to reduce the population to 600 (400-800) horses within 20 years." (OEH 2016a, p.3). Proposed control methods include: trapping (and then rehoming, shooting at the trap site, or transport to knackery or abattoir), aerial and ground mustering (and then rehoming, shooting at the trap site or transport to knackery or abattoir), ground shooting, fertility control (in the longer term when populations are reduced), and fencing (OEH 2016a).

Although the objective of the public engagement process was to explore community and stakeholder values in relation to wild horse management, participants were not involved in the writing of the plan and decision making remained centralized with NPWS. The 2016 Draft Wild Horse Management Plan was on public exhibition for 16 weeks until August 19th 2016 and NPWS announced that it may modify elements of the plan in response to public submissions. The next chapter presents and analyzes a representative set of comments illustrating stakeholder views of the decision-making process and the 2016 Draft Wild Horse Management Plan.

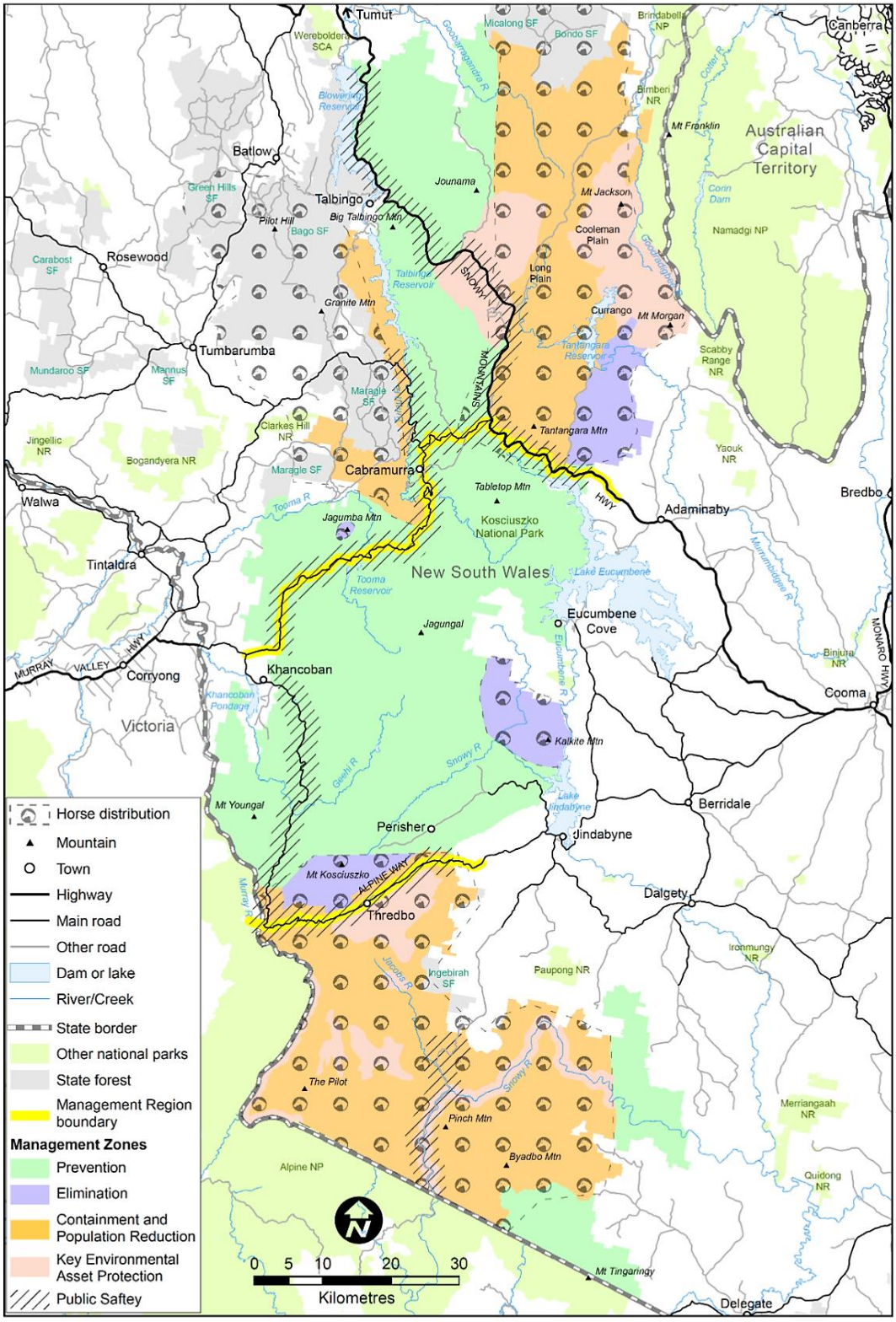

Fig. 11: Management zones proposal under the 2016 Draft Wild Horse Management Plan

(Source: OEH 2016a, p. 38)

4.6.2. Participants comments on various functions of the decision-making process

This section employs elements of the policy sciences framework (see section 3.5) to guide analysis into policy problems of recent wild horse decision making. Table 18 features participants comments on the formative stages of the decision process: *intelligence* (gathering, processing, and disseminating information), *promotion* (mobilizing support for specific demands), and *prescription* (articulating basic goals, values or norms, enacting guidelines for action). An interpretation of base values (positive and negative assets reckoned by the eight value categories *power*, *enlightenment*, *wealth*, *well-being*, *skill*, *affection*, *respect* and *rectitude;* see section 3.5) prevalent in the wild horse case reveals insights into relevant social process dynamics among stakeholder groups. Opinions (No. 1-21) come from nature preservationists ('NP'), local horse advocacy groups ('LG'), NPWS agency staff ('NPWS'), and animal protectionists ('AP') and are marked accordingly.

Apparently, the status quo of the wild horse decision process is not meeting the expectations of many participants. Disagreements over the policy prescriptions of the 2016 Draft Wild Horse Management Plan are rooted in competing perspectives and reflect the problem definitions outlined in section 4.5. In particular, the Draft Plan's management objective to greatly reduce horse numbers over the next 20 years and retain a managed population of 600 horses (400-800) in the park draws criticism on all fronts (see Table 18, No. 7). Nature preservationists motivated by a desire to return KNP into a 'pre-invasion' state question the legitimacy of purposely keeping horses in the park and remain skeptical as to whether significant population reductions can be achieved without the use of aerial culling (see Table 17, No. 20). On the other hand, (local) horse-advocacy groups take firm opposition to the draft proposal, arguing that an overall target herd size of 600 horses may be wiped out in a single natural event (e.g. bushfire) and is too low to sustain genetically viable populations in the park. Concerns expressed also include the absence of legislation that protects the continued existence of horses in KNP and the welfare implications of proposed management practices (e.g. long-distance transportation, shooting of uncontained horses) (see Table 18, No. 9,12,14,15). Rather than reconciling participants diverse value demands, the release of the draft plan has sparked outrage particularly in segments of local communities (see Figures 12-13). As reflected in the tag lines of newspaper releases (e.g. “Our heritage – the fight to stop a

brumby massacre", Hadgraft 2016), public discourse remains politically charged and local politicians use the horses as a symbol of local identity and power to rally voters.

Fig. 12: Protesters at the 'Save Our Brumbies' Rally, Sydney

(Source: Gallagher 2016)

Fig. 13: Horse advocacy groups and animal rights activists gather behind NSW Parliament House, Sydney

(Source: Gallagher 2016)

Despite the difficulty of finding common ground in managerial terms, community residents expressed support (see Table 18, No. 4,11,13) for the draft plan's vision statement ("To conserve the outstanding values of Kosciuszko National Park with the support of the community through active, adaptive and humane management of wild horses to minimize their adverse impacts on natural, cultural and visitor values, while acknowledging the cultural and social values of the Kosciuszko National Park wild horse population." OEH 2016a, p.2).

The vision statement can be clearly seen as an attempt to provide a value-inclusive goal clarification and introduce fundamental institutional change (see Table 18, No. 21). Yet the assembled evidence suggests that this shift toward a more inclusionary protected area management is not wholly welcomed by nature preservationists who fear a loss of influence in protected area decision making *(power)*. According to Clark (2011 p. 40), "power is an especially important base value that may be used for the acquisition of more power or as a means for acquiring each of the other seven values". Interestingly, data collected by Straight Talk (2015) revealed that stakeholder groups at either end of the management spectrum believed that "other stakeholders hold the political power and have an undue ability to influence the outcome of the review." (p.5). The operational and managerial understanding of nature conservation in KNP has historically been rooted in conservation biology's concept of 'natural ecosystems' (see section 4.2). Thus, a loss of power in decision making affects nature preservationists capabilities of

applying conventional norms of conservation (*rectitude*) to the wild horse issue (see Table 18, No. 3,16).

Table 18: Participants comments on the formative stages of the decision process

No.	Perspective and Source	Decision function	Base values invoked
1	*There is a whole lot of baggage that comes to the table about past management (…) I can sit there in a meeting and make a statement on whatever and - 'why would I trust you, because you wear the label badge on your shoulder and who you represent, I just don't trust'. And so that's a big one. But it's something that we as an organization and the local staff, that deal with this issue recognize, that that's a major hurdle that you need to get past. For us in the plan we propose to try and move past that by building a partnership (…) How successful remains to be seen in terms of doing that, but we still got a long way to get past some of those trust issues.* (NPWS IN15)	intelligence prescription	respect
2	*The opportunity is there [co-management], but I don't know if that will solve the issue. (…) And the reason for that is that the toxicity that exists in some elements of the brumby advocate groups is so toxic that the National Parks would not want to do anything with them. And I don't blame them. Some of the brumby advocate groups are feral! (…) And they get abusive and rude to people. There needs to be a greater level of tolerance on both sides.* (LG IN01)	intelligence promotion	respect
3	*Co-management? What do you mean? Allowing the pro-horse people to run the park? That is guaranteed not to work. It hasn't worked. They have bullied the park service into doing management that doesn't work. (…) You don't go weak at the knees on nature. It's a National Park! And they don't want to portray it as 'command- and-control', but there are management plans. (...) So it shouldn't be upside down. Horses are feral things in National Parks, do a tick for horses, do a cross for pigs. (…) It's just not real. But that's where we are at.* (NP IN14)	intelligence	power rectitude
4	*It's got the ball rolling. You can't just ask for the end results straight away (...) It's like saying "I want this brumby ridden and do rollbacks straight away". It's just not going to happen. I share the vision. And (…) just improve it as it goes. They [NPWS] do a good job. (…) We change some of our thoughts and they change some of their thoughts. We are going to slowly start working together and hopefully get to one goal (…).* (LG IN10)	intelligence prescription	rectitude respect
5	*(…) it has been whipped up into something that is green against brumby, and it is this battle of you must choose between the two and if you care about the environment that*	intelligence promotion	respect rectitude

No.	Perspective and Source	Decision function	Base values invoked
	means, you want all the horses out of there. And it just made it really nasty. (…) And that divisive way of not listening to us saying 'we care about the environment' and consistently insisting on splitting it that way, it has made it really difficult. (...)And that's where we have to come to some understanding and I think the best way to help improve that relationship is to get more research out there and for us to keep working together. Stakeholders are now starting to get involved, so that's good, we don't have situations like Guy Fawkes where they just went out and culled. (AP IN09)		enlightenment
6	*The ITRG does not have the practical experience or knowledge of brumby running to pass judgement and it is a method that needs serious consideration to supplement trapping. Each one of our individual members has more experience dealing with brumbies than the combined experience of any other stakeholder groups and should be afforded that recognition by NPWS and by ITRG as well as government.* (SMHRA Submission to 2016 Draft Wild Horse Management Plan)	intelligence	skill enlightenment respect
7	*(...) there is a challenge straight up, because everyone has got a different view about why the park is there. Then you take the next layer in terms of horses on top of that and another range of complexities yet again! In terms of -are they a feral species? Are they a species that has heritage value? (...) once you established that, well 'how many are there?', (…) we cannot even get agreement on what is actually there at the moment. Then the next thing to fly from there, well 'how many should be there?' (...) And then beyond that (…) how do we get to that number and what control methods or management methods are actually put in place to achieve that number? So, every step of the process is contested and debated!* (NPWS IN15)	intelligence promotion prescription	rectitude enlightenment
8	*I guess there is a movement in the way the process is being done. And that is a positive outcome! It has to be a step into the right direction where ultimately all the stakeholders have a genuine input into the outcome and not just tokenism or being seemed to be consulted. (...)It has to be that paradigm shift where national parks opened up the management decisions. At the moment, through our eyes, the decision-making process is very much a -there is consultation -here is the outcome.* (LG IN04)	intelligence prescription	power
9	*We are certainly grateful and there is no single one of us saying we are not grateful for being involved in the process, but the thing to remember is that the local people here have been burnt by National Parks before with agreements (…). We have been to open discussions, Straight Talk (…) where*	Intelligence prescription	affection rectitude respect power

No.	Perspective and Source	Decision function	Base values invoked
	they involved the stakeholders and stuff, which is awesome but at the same time it is still the NPWS branch doing their job and they have got a bloody tough job, none of us is denying that. (…) But we are saying that we need to work with you to get to the common goal. And at the moment, we haven't got that common goal other than they want to eradicate the vast majority of the population. (…) I just worry about the brumbies, and I worry about the old boys and the old families and the younger generations. (...) (LG IN03)		
10	*(…) there is also a great disrespect for education and expert opinion – "I don't believe in the science – it's all a conspiracy".* (NP IN13)	intelligence	respect skill enlightenment
11	*(…) the plan acknowledges the cultural significance of the horse! Unbelievable! And we acknowledge that straight away! (...)But in order to get the brumby issue resolved, they have to get this legislation through parliament. (…) they will get a greater level of cooperation from the people, and trust, as they do that because the fear of them being exterminated is the reason that they are not cooperative.* (LG IN01)	prescription invocation	respect rectitude
12	*My view from an animal welfare perspective is that it is not the right answer for these horses to put them through that, that transport is just not a good outcome. It has been highlighted as one of the least humane methods. What is in the ITRG report does not reflect what is in the draft plan.* (AP IN16)	prescription	enlightenment rectitude
13	*It's so hard to trust them [NPWS] again. (…) I am certainly not educated and I am the one that is doing a lot of this on behalf of our people. They are mostly farmers and shearers and aren't all that well educated. So, they haven't actually got the opportunity to stand up and to be heard over all these years (…) and a lot of them have given up on fighting for their rights and for the horses. It's a step in the right direction that they have finally recognized the cultural heritage whereas they have never done that before.* (LG IN11)	prescription	respect rectitude power affection
14	*It's folly to think they can put snipers up there and shoot horses without some of them escaping wounded. It's an outrageous proposition. There is nobody on the brumby advocacy side which would support any form of culling under the current proposal.* (LG Peter Cochran, August 6th, 2016, Landline 2016)	prescription	enlightenment rectitude
15	*If we get the brumbies down to 600, they may as well take them all because there'll be nothing left. Genetically not viable to survive at that number. There is no way we can accept the draft management plan. It's -you know, it's very*	prescription	enlightenment rectitude

No.	Perspective and Source	Decision function	Base values invoked
	biased (…) and we're asking for more investigation before they slap us with something so drastic. (AP Lyn Sutton, August 6th, 2016, Landline 2016)		
16	*But by saying we will deliberately keep horses in there, I think they have lost control to an extent (...). I found the vision problematic, because I don't see how you can conserve the natural values of the park whilst maintaining any sort of [introduced] animals, including horses, purposely there.* (NP IN05)	prescription	power rectitude
17	*They have taken out aerial culling which we are over the moon about which was our greatest concern initially, but to combat that they also took out brumby running which is how the horses were traditionally managed. So, we have lost a part of our culture there. The bush lore, having horses in the bush and learning the bush is absolutely beneficial in this area.* (LG IN03)	prescription	skill enlightenment
18	*There has never been in the history of conservation management in this country probably, as much effort and clarity and information provided to the stakeholders as in this issue. (...) And government is now far more sensitive than it used to be. (...) clearly command-and-control is what happened in the past, but it is clearly not possible in this particular social context. (…) I don't think there is public acceptance now. (...) What I fear is that people will get hurt.* (NP IN07)	intelligence prescription	respect enlightenment
19	*That [vision statement and objective to leave 400-800 horses in the park] is only tokenism, that is a political gesture that was never part of the initial mix of the draft plan of management. They, being the government agency NPWS, only inserted that into their draft plan of management after our group started circulating a petition calling on the government to recognize the cultural heritage and history of the horse. So, then our view is that National Parks identified a shortcoming in their own process, slid that in. (…) There is every indicator there (...) that there is no commitment so far by the government, what they have done is hid behind a process that they had to make public.* (LG IN04)	intelligence promotion prescription	respect rectitude
20	*(…) there is [a] political play effort, that feral horses are heritage and that is part of a narrative of this plan which is extremely negative and basically crap (...) until you have the whole thing managed as an equestrian centre! (…) We are not going down that road the way that that vision is a very distorted vision of what managing large intact natural areas should be.* (NP IN14)	prescription	rectitude

No.	Perspective and Source	Decision function	Base values invoked
21	*There has probably been a cultural shift within the agency itself to move from a point where in the 2008 plan (…) the reference to them were as being feral horses, they were pest species, where the objective was to completely eradicate a pest species. (…) what has been presented in the draft plan is a complete cultural shift from that in terms of saying 'we recognize that these animals have a cultural value and a social value particularly to the local community, but also more broadly to the Australian community.* (NPWS IN15)	prescription	rectitude respect

Meanwhile, long-term community residents still recall the loss of local power at the hands of NPWS and believe that local groups still face challenges in entering into equitable co-management negotiations (see Table 18, No. 8,13,19). This sentiment is particularly evident in comments on the intelligence phase of the decision process. As evidenced in section 4.5.1 and Table 18, local community members hold that intelligence did not sufficiently take into account local ecological knowledge (*enlightenment*) and traditional horse management skills (*skill*) (see Table 18, No. 6,17). In the process of negotiation, local ecological knowledge and conservation biology are promoted as reliable knowledge systems, yet to date no policy prescriptions have been established that combine both bodies of knowledge (although stakeholder suggestions for further research were submitted as part of the consultative process and may be used to co-produce knowledge in the future). Apart from conflicts over the legitimacy of different knowledge sources, issues of *respect* (12 instances) and *rectitude* (14 instances) are widely seen as being central to the wild horse management issue.

Indeed, perhaps the single most telling indicator of a polarizing social process is that participants from all stakeholder groups spoke of a fundamental lack of trust and respect in working relationships (see Table 18, No. 1,2,5,9,10,11,13,18). Historical relationships between NPWS, conservation organizations and local communities have been fraught with conflict (see section 4.2) and it appears that current efforts of establishing partnerships are still hampered by past interactions. Unfortunately, such a confrontational situation diminishes participants willingness to collaborate and amplifies the challenge of sharing knowledge (*enlightenment*) and ethical visions (*rectitude*) between stakeholder groups.

4.7. Interpretation of case study results and synthesis

This section uses the insights gained from the wild horse case study to highlight conditions in the policy process that constitute a persistent challenge to collaborative management efforts. Policy problems identified are contrasted with adaptive co-management theory and placed in the context of the broader debate on participatory approaches in protected area management (see chapter 2).

As the case study findings show, the management of wild horses in the Snowy Mountains is characterized by a conflict-laden policy process. According to Rikoon (2006), "environmental conflicts are at their heart issues about power to decide everything from the definition of nature to access to natural resources and, as a consequence, to reap whatever tangible and intangible spoils go with such victories." (p. 201). In Kosciuszko National Park, the conflict reveals underlying socio-political problems and power struggles that are, at least in part, played out through the wild horse issue. The NPWS's approach has long been a manifestation of classical conservationism and traditionally secured the imposition of conservation ideologies based on the "wilderness" concept through the power of the state (see section 4.3).

In relation to the management of wild horses, the pursuit of conservation through exclusionary management failed in a twofold way: First, it alienated neighboring communities by systematically ignoring cultural ties and locally specific ways of valuing nature; and second, it backfired with unintended consequences in managerial terms, with horse numbers ironically growing after local communities were stripped of their rights to access. In response to social discontent and policy failure, NPWS is attempting to regain legitimacy by adopting a participatory approach and setting conservation on a new path. As the study results suggest, however, this is a goal that is still being worked toward. The conditions that constitute a persistent challenge to collaborative action and problem-solving are summarized below.

Contested Ecological Knowledge:

The integration and use of knowledge systems with differing values and logics is challenging. In the wild horse case, conservation biology and local ecological knowledge are both selectively used in support of different perspectives. In particular, the appraisal of the horse's role in causing environmental harm is a much-contested part of the public debate surrounding wild horse management. As can be observed in many

conflicts over introduced animals in protected areas (see section 2.2.2), human values rather than scientific facts determine whether the overall presence of a species is considered damaging or not. This is particularly the case in Kosciuszko National Park, given that local restoration objectives differ markedly from those prescribed under NPWS's legislative requirements. Rather than harnessing the strengths of disparate sources of information, tensions arise over what constitutes reliable knowledge and exacerbate non-productive conflict.

Competing problem definitions and epistemologies:

Analysis of the contested cultural constructions of the horses revealed how local horse advocacy groups, nature preservationists and animal protectionists each frame 'the problem' (see section 4.5). As outlined in section 4.6, the conflict surrounding wild horse management is fundamentally oriented toward rectitude and it appears that some participants were unaware how different ethical convictions and ways of valuing nature contributed to competing problem definitions. The strong emotional affiliation that many people in the High Country feel toward the horses is embedded in the wider historical and socio-political context of the area. Wild horses are central to local assertions of rights to access and cultural practices, and are conceived of as an intrinsic element of the 'vernacular wild'. In contrast, the nature preservationist narrative disassociates the horses from 'wild' nature and typically refers to them as 'feral' – a categorization that stresses their lack of legitimacy in a 'natural' ecosystem. A strong division also remains between the holistic eco-system centered approach of the nature preservationists and the individualistic rights-based approach of the animal protectionist positions.

Consultation versus collaboration

The devolution of decision-making power and the development of collaborative relations across multiple levels of governance (both vertical and horizontal) are key factors for successful co-management (Pomeroy 2007; see also section 2.3). In Kosciuszko National Park, where the use of participatory management structures is still a relatively new approach, co-management initiatives have remained consultative rather than collaborative. And while NPWS has bound itself to recognize cultural heritage values and community goals under the 2016 Draft Plan, it remains unclear whether this outcome has been the result of collaborative management efforts or the consequence of high level political intervention. Indeed, it should be noted that decision-making

authority has been forced to higher governmental levels rather than being delegated to stakeholder groups, whose function has remained strictly advisory. Pinkerton (2007) cautions that in cases where "conflicts are resolved for political reasons at higher levels, regional decision makers in the agency lose power, and decisions will be more informed by politics than by program objectives." (p. 160). This manner of addressing conflict unfortunately reduces the likelihood of joint problem-solving and building cooperative relationships at the project level.

Lack of trust and respect in working relationships

A key challenge to collaborative management efforts in KNP is the ongoing struggle to overcome a history of conflict and repair damaged relationships. Attempts of NPWS to broker agreements among conflicting stakeholder groups are constrained by a fundamental lack of trust and respect, and it appears that existing consultative structures do not sufficiently foster the establishment of partnerships. The wild horse case supports other studies on co-management that highlight the need to build trust as a prelude to solve conservation conflicts in a collaborative manner: "Trust is an essential part of the social capital that needs to develop among a group of people trying to solve a problem; trust lubricates collaboration" (Berkes 2007, p. 26). Closely related to trust building is developing respect for diverse epistemological backgrounds and values. Trust and respect are widely regarded as critical factors for the successful facilitation of communication, transformative learning and knowledge exchange (see section 2.3).

The policy problems highlighted in the wild horse case closely parallel the conditions of adaptive co-management failure summarized in section 2.3. Taken together, the assembled data on the wild horse policy process paint a picture of an early stage adaptive co-management arrangement. Indeed, when rated against the set of criteria laid down by Berkes et al. (2007; see section 2.3), the case study results tend to fall into early and middle maturity stages. Figure 14 summarizes the key findings and displays in schematic form where the wild horse case study fits within the conceptual framework of adaptive co-management in protected area governance. Despite the serious challenges that currently characterize the wild horse policy process, institutional changes are underway. The 2016 Draft Plan vision statement reflects a pragmatist accounting of diverse conservation interests. Visioning processes are important for directing environmental policy and provide a common focus among stakeholder and interest groups (Olsson 2007).

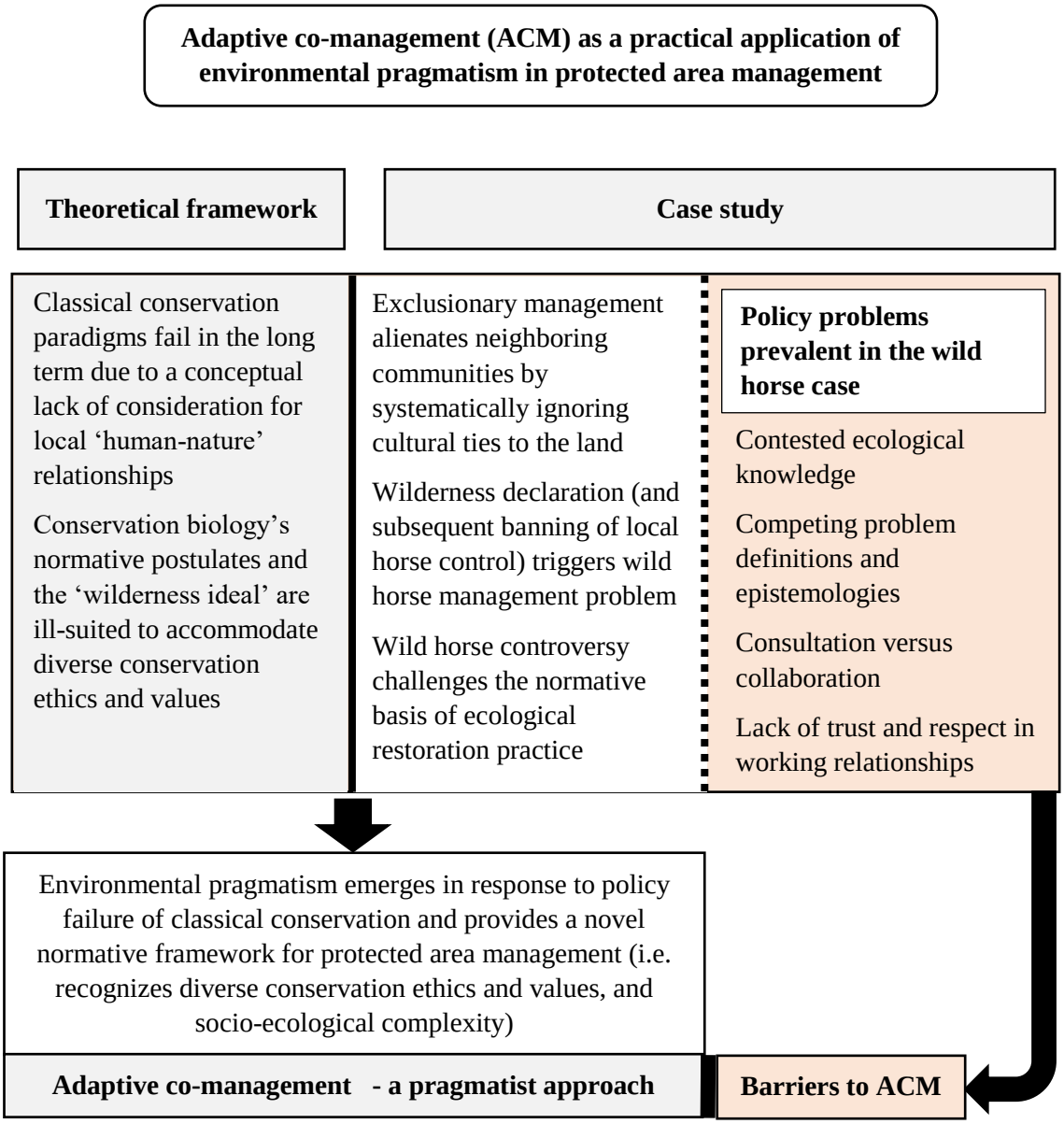

Fig. 14: Schematic overview of case study findings

In the past, the lack of attention to local contexts in conservation decision-making has created a situation of persistent conflict and substantial social disconnect between local communities and the park (see section 4.3). Sentiments of "anti-environmentalism" remain powerful in Kosciuszko's neighboring communities. As the research shows, however, it is not conservation per se that local people contest, but the imposition of wilderness ideals and ecological restoration concepts that are fundamentally different to their own (see sections 4.3 and 4.5.1).

The acknowledgment of the cultural heritage significance of the horses provides an opportunity to give serious consideration to some of these problems and raises questions

about the possibilities for local forms of nature conservation. How can local conservation efforts and concerns be meaningfully integrated with national and international conservation agendas? By what processes should conflicting conservation goals be negotiated across multiple levels of governance and who should be the final decision maker?

It is worthy of note that institutions exist that are relevant to these questions and could be effectively built upon. Kosciuszko National Park is not only an IUCN Category II Protected Area with an obligation to protect 'natural biodiversity'. It is also a designated World Biosphere Reserve under the *UNESCO Man and the Biosphere program* (see section 4.2). The biosphere program is an Intergovernmental Scientific Program that seeks to "harmonize conservation of biological and cultural diversity" by building theme-specific networks and inter-regional relationships (UNESCO 2017). The *Australia ICOMOS Burra Charta* and the associated *Code on the Ethics of Co-existence in Conserving Significant Places* provide a best practice standard for managing the co-existence of conflicting conservation values (ICOMOS 2017) and could give further guidance in the wild horse issue. Although not regarded as effective and humane by some stakeholder groups (Straight Talk 2015), some scholars have suggested that traditional skills and methods of capturing wild horses "might be considered an appropriate conservation action under the Burra Charter" (CONTEXT 2015, p.113).

Implementation of NPWS obligations toward these principles would replace eco-centric management practices with more holistic forms of protected area management. This new paradigm would also shift prevailing assumptions surrounding the management of introduced species in protected areas from eradication attempts toward the recognition of novel species assemblages. Indeed, as the wild horse case suggests, the application of participatory approaches to protected area management has important implications for the normative basis of biodiversity conservation. This, of course, is a challenging prospect, particularly for some of the more doctrinaire adherents of the nature preservationist perspective, who typically prefer a 'top-down' approach focused on preserving 'natural ecosystems'. While the pragmatist search for common ground in the wild horse case may appear less appealing than conventional conservation approaches, the case study results show that the latter are ultimately self-defeating. In contrast, decision processes that are value-inclusive and open to all interest groups are likely to result in greater legitimacy, transparency and capacity for collaborative problem solving

in the long-term. Indeed, “by not defining certain stakeholders or positions in advance as lacking a “true” conservation ethic, or as acting on improper or misguided motives, the pragmatist approach reflects a deeper faith in the possibility of building coalitions around specific conservation (…) problems.” (Minteer 2013, p. 90)

Even with such efforts, a balanced policy response to the wild horse controversy will require a number of concessions from all parties and ongoing attention to the policy problems outlined above. The final chapter summarizes the main findings and conclusions, and offers recommendations to constructively address the conditions of persistent stakeholder conflict.

5. Conclusion

The overall aim of this thesis was to provide a problem oriented analysis of the still unfolding situation of adaptive co-management of wild horses in Kosciuszko National Park. Wild horse management has become a focal point of debate over broader conservation decisions and the controversy may be best understood as a case within a wider social critique of classical protected area management and environmental ideology. Indeed, conflicts over ecological restoration practices and the protection of the horses are not isolated struggles, but reveal a deeper ethical and social division.

For local communities, wild horses constitute a source of regional identity, power and cultural pride, and demands to nationally recognize the horses as living cultural heritage in the park ultimately extend to the political recognition of local people themselves. The devolution of decision-making power in recent years has brought about the need for Park Service to engage with these claims of culture and base management decisions on a sound understanding of local socio-ecological conditions. As the research shows, however, setting up co-management arrangements that are legitimate and responsive to socio-ecological feedback is challenging in the context of historical marginalization, deeply rooted power asymmetries and high levels of uncertainty associated with ecological knowledge and management responses.

The case study illustrates an adaptive co-management arrangement in an early maturity stage and there are several barriers that need to be addressed in order to move governance in the direction of a more mature stage. Key barriers toward collaborative action identified in the wild horse policy analysis are: 1) contested ecological knowledge; 2) competing problem definitions and epistemologies; 3) consultation versus collaboration; 4) a lack of trust and respect in working relationships. Three of these conditions (1-3) are commonly seen in early-stage adaptive co-management arrangements and not inherently problematic, but when combined with social processes that are characterized by disrespect and a fundamental lack of trust, the outcomes may exacerbate conflicts rather than help participants find common ground.

In conclusion, three recommendations may be offered to address the policy problems identified and shift the management regime toward greater socio-ecological resilience:

(1) *Co-production of knowledge:* Draw on local ecological knowledge and skills as well as institutionalized science. Enable interest groups to set joint research agendas

and form purpose-built knowledge partnerships to share, apply, test, and integrate their knowledge with other forms of knowledge (e.g. joint field trips, collaboratively created maps and impact assessments; see Robinson & Wallington 2012).

(2) *Rework damaged relationships:* Prevent further polarization and address feelings of disrespect by creating venues for interest groups to understand diverse problem definitions, standpoints and ways of valuing nature (e.g. differing conceptual understandings of "wilderness" and national parks). Workshop-based approaches (Richie et al. 2014) and exercises such as the Q-Method (Mattson et al. 2006) have been successfully applied to complex conservation challenges and may help participants identify areas of common interest.

(3) *Sharing of power and responsibility:* Proactively address historic power asymmetries and foster local stewardship ethics and connections to the land and the horses, e.g. by involving local groups in on-ground monitoring and management activities. In the longer term, when participants have developed a common basis for management, devolve more decision-making power and management responsibility to local communities.

The case study findings point to the conclusion that the application of participatory approaches to protected area management has wider implications for power structures and the normative basis of biodiversity conservation. Nature preservation in Kosciuszko National Park has long been considered an exemplar of classical conservationism. Trends toward participatory management structures in KNP, as observed in many other conservation contexts around the world, can be seen as an outcome of the historic limitations of centralized bureaucracies and the privileging of conservation biology over other knowledge systems and ethical frameworks. At its core, the wild horse conflict is a political power struggle over what constitutes 'wild' and 'valuable' nature. By reallocating decision-making power and acknowledging a plurality of valid ends to nature conservation, adaptive co-management offers an opportunity to overcome the undemocratic strain of exclusionary protected area management. It also provides ground for revisiting the concept of native and introduced animals in a way which takes into account animal welfare considerations and locally specific ways of relating to land and animals. Ultimately, it marks a radical departure from conventional ideological stances

in conservation and may initiate a critical reappraisal of the values and ethical baselines that have traditionally guided protected area management.

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Appendix

Appendix 1: Questionnaire

Activity	Comments/Questions
Introduction	Introduction. Brief the participant. Explain goals of the interview. Review interview method, use of data, confidentiality etc.
Topics	1: - What is your professional background? - How were you involved in the process of developing a management plan for Kosciuszko´s wild horses? 2: - How would you define successful wild horse management? - NPWS envisions "to conserve the outstanding values of KNP with the support of the community through active, adaptive and humane management of wild horses to minimize their adverse impacts on natural, cultural and visitor values, while also acknowledging the cultural and social values of the KNP´s wild horse population". ▪ Do you share this vision? 3: - Do you think that the participatory approach to wild horse management provides an advantage over other management forms (e.g. "command-and-control" policies)? - Do you think ACM enhances the legitimacy of management practices? - What have been key success areas of wild horse management in KNP over the past 16 years? - What do you think are/were factors enabling successful management? 4: - What are characteristics of co-managing wild horses in KNP that place the project at a disadvantage relative to other management forms? - What is not done properly under the current management plan/ what are (internal) obstacles to successful management? - How responsive is wild horse management to feedback? - How effectively are science and other forms of knowledge integrated? 5: - How do you perceive the media coverage? - Can you think of elements in the socio-political environment that could pose barriers to collaborative management structures/ what should be done to minimize these threats? 6: - Do you think that the current approach enables policies in the common interest?

Appendix 2: List of Respondents

Code	Name	Position	Date
IN01	X	X	18/09/2016
IN02	X	X	17/09/2016
IN03	X	X	16/09/2016
IN04	X	X	19/09/2016
IN05	X	X	11/09/2016
IN06	X	X	02/09/2016
IN07	X	X	10/09/2016
IN08	X	X	08/09/2016
IN09	X	X	08/09/2016
IN10	X	X	17/09/2016
IN11	X	X	16/09/2016
IN12	X	X	12/09/2016
IN13	X	X	02/09/2016
IN14	X	X	05/09/2016
IN15	X	X	15/09/2016
IN16	X	X	20/09/2016
IN17	X	X	22/09/2016

Appendix 3: Consent to Participate in Research

HUMBOLDT-UNIVERSITÄT ZU BERLIN

Consent to Participate in Research

Title of study:
"Challenges and chances of adaptive co-management in biodiversity conversation: A case study of feral horse management in Kosciuszko National Park"

Introduction and Purpose

My name is Isabelle Riebow. I am a Master student at the Humboldt-University of Berlin, Germany, at the Faculty of Life Sciences. I would like to invite you to take part in my research study, which concerns the politics of feral horse management in Kosciuszko National Park, NSW.

Procedures

If you agree to participate in my research, I will conduct an interview with you, that will involve questions about feral horse management in Kosciuszko National Park. It should last about one hour. With your permission, I will audiotape and take notes during the interview. The recording is to accurately record the information you provide, and will be used for transcription purposes only. If you choose not to be audiotaped, I will take notes instead. If you agree to being audiotaped but feel uncomfortable at any time during the interview, I can turn off the recorder at your request. Or if you don't wish to continue, you can stop the interview at any time.

Confidentiality

Your study data will be handled as confidentially as possible. If results of this study are published or presented, individual names and other personally identifiable information will not be used unless you give explicit permission for this below. I will destroy the tapes when the research is completed.

Rights

Participation in research is completely voluntary. You are free to decline to take part in the project. You can decline to answer any questions and are free to stop taking part in the project at any time.

Questions

If you have any questions about this research, please feel free to contact me (e-mail: riebowis@hu-berlin.de).

****

CONSENT

You will be given a copy of this consent form to keep for your own records.

If you wish to participate in this study, please sign and date below.

_____
Participant's Name

_____ _____
Participant's Signature Date

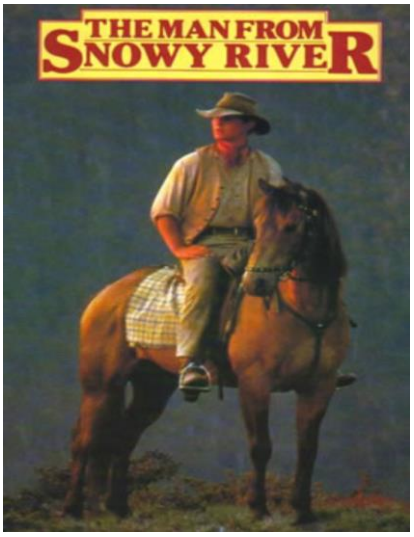
If you agree to allow your name or other identifying information to be included in all final reports, publications, and/or presentations resulting from this research, please sign and date below.

_____ _____
Participant's Signature Date

Appendix 4: Imagery of Kosciuszko's Wild Horses in Australian Folklore and Contemporary Culture

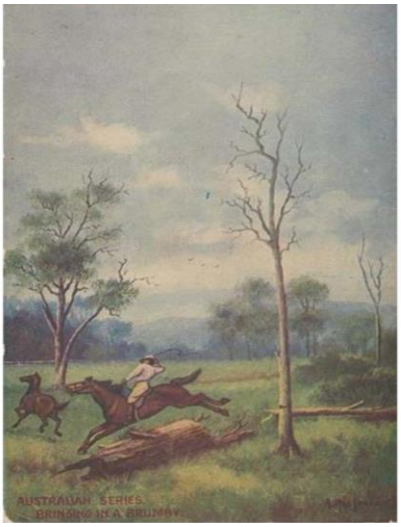
Ten Dollar Note, 1993

(Source: RBA 2017)



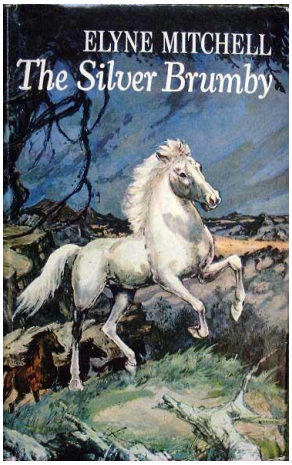
'The Man from Snowy River' film publicity, 1982

(Source: CONTEXT 2015, p.)



Postcard, Bringing in a Brumby, c.1910

(Source: NMA 2017)



Cover of the 1st edition of 'The Silver Brumby', 1958

(Source: CONTEXT 2015, p.29)

The Sydney Olympics opens with a 'Man from Snowy River' segment, 2000

(Source: Squire 2016)

Declaration

I hereby declare that the present thesis has not been submitted as a part of any other examination procedure and has been independently written. All passages, including those from the internet, which were used directly or in modified form, especially those sources using text, graphs, charts or pictures, are indicated as such. I realize that an infringement of these principles which would amount to either an attempt of deception or deceit will lead to the institution of proceedings against myself.

Berlin, November 17th, 2017 Isabelle Riebow