Scientific Assessment on Livestock Predation in South Africa

CHAPTER 4

ETHICAL CONSIDERATIONS IN THE MANAGEMENT OF LIVESTOCK PREDATOR IMPACTS

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Introduction

What makes the predation of livestock an ethical issue? It might not seem obvious to all that the management of predators has anything to do with ethics. However, a key element of the livestock predation issue is that it entails conflicts of interest between various stakeholders; and wherever conflicts of interest exist there are ethical implications. Without guidelines or policies for resolving conflicts of interest, conflict of another, more harmful kind can easily develop between those with competing interests. The most obvious conflict of interest in this situation is that between livestock owners and predators. With losses of livestock due to predation in South Africa estimated to cost more than a billion rand annually (Kerley et al. 2017) livestock owners clearly have economic interests they would want to protect. Predators have an interest in feeding themselves and their young, in avoiding injury or disability and in their survival. Our ethical dilemma consists in deciding on what sort of policies we[1] need to apply in order to decide which (if any) of these interests carry more moral weight and deserve our protection, or, at least, how best we can try to ensure some fair balance between the competing interests.

The situation is further complicated by the fact that there are other stakeholders, who also have interests in and differing moral visions regarding the management of predators. Some of these are societal stakeholders. Local communities, who depend on livestock farming for the strength of their economies and their own livelihoods, may side with farmers; other citizens, deeply concerned about the preservation of nature and biodiversity, may choose the side of the predators; those with a stake in eco-tourism have different interests from those in the meat or wool industries. Furthermore, future generations of people may be said

[1] In this chapter 'we' and 'us' are mostly used to refer to humankind in general. In some cases, such as this use of 'we', the assumed agents might not be humankind as a whole, but rather a more circumscribed and specific group, such as those who are interested in formulating appropriate policy for livestock management. The context should be sufficient to assist the reader to understand how these words are used.

to have an interest in our actions in the present, especially in terms of the preservation of biodiversity and the environment, generally. Setting aside human interests, there are other species that must also be taken into consideration. For instance, the loss of mesopredators in an area can have an impact, negative or positive, on the well-being or survival of natural prey species, other smaller predators, other animals, as well as on vegetation. Thus, there are many different stakeholders, with a variety of interests, many of which are in competition with others, that need to be taken into account in trying to formulate policy on predator management. Policy makers need to weigh up competing interests and moral obligations in seeking the best overall outcomes for all stakeholders.

This is why this chapter on ethical considerations with respect to the management of livestock predator impacts is necessary. In situations such as these, where the interests of many stakeholders are relevant and in which our moral duties towards different stakeholders come into conflict with one another, it is important that we reflect very carefully on what our ethical priorities are. To do this, some engagement with various moral theoretical perspectives and notions is necessary, as these provide the conceptual tools that enable us to fully appreciate the nature of the competing interests and ethical obligations that are of relevance, as well as with some direction on how to balance interests and obligations. While it is clearly important that any interventions recommended by policy makers should ordinarily comply with existing legislation and regulations – unless they are themselves unethical – the law alone is not able to provide answers to all of the complex ethical issues that arise in situations such as these. This is where the discipline of applied ethics can come to our aid in providing intellectual resources that can help us make the best decisions.

As a starting point, any ethical analysis of a complex situation requires the identification of all relevant stakeholders as well as their interests. It also requires identifying all of our ethical obligations towards these various stakeholders, recognising that these will often come into conflict with one another. The problem here is that there is no consensus on which stakeholders should be taken into account and what kinds of moral obligations we have. Some, for instance, might claim that only human beings have interests, at least of the kind that matters. So, they might think that our work is done if we have found a way to balance the competing human interests in cases such as this. There is even less agreement on what kinds of moral obligations we might have. Most will likely acknowledge a moral obligation to protect the livelihoods of people, but some also think that we have moral obligations towards individual animals, and some even claim that we have duties towards species, ecosystems and even the biosphere as a whole. Some engagement with these and other relevant

overarching moral questions is necessary for our ethical appraisal to be thorough, comprehensive, robust and plausible.

Ultimately, though, our ethical analysis needs to go beyond merely weighing up competing interests and moral obligations in an abstract, theoretical sense. It needs to consider the various options that exist in terms of actions that can be taken to address the conflicts of interest. In the case of livestock predation this necessarily entails engaging in an ethical analysis of all of the possible options available for managing livestock predator impacts. The moral implications of these various methods need to be understood by policy makers. How effective is each strategy? What sorts of harmful consequences does each strategy result in and for which stakeholders? Which methods result in the least harm and take into account all important interests? Furthermore, it is important to provide policy makers with a set of guidelines or basic principles that can be applied to choose the most appropriate strategy in each specific situation. These guidelines ought to assist them in making the best ethically justifiable decisions possible.

The body of this chapter consists of four main sections. In section 1, attention is given to a theoretical consideration of our moral obligations to other humans. Social contract theory is introduced as a helpful approach to dealing with situations in which there are many competing interests and where policies need to be devised that can resolve conflicts. The question of moral obligations to future generations is also addressed. In section 2, the focus is on our moral obligations to other living entities and nature. First individualist approaches to our duties to non-humans are introduced. These include animal welfarism, the animal rights/liberationist school and biocentrism. Thereafter, the holist or eco-centrist approach is presented. The section ends with a discussion of the special value that holists often accord to predators. Section 3 focuses on a few pertinent ethics lessons to be learnt from the history of predator management in South Africa. In the fourth and final section, several principles for the ethical analysis of current methods of predator management are proposed, explained and applied.

Our moral obligations towards other humans

Few would likely question the claim that we have moral obligations towards one another as human beings. Thus, it is fairly uncontroversial that it is necessary for our society to find some way of settling the disputes that arise in the conflicts of interests between various

persons and groups of persons with respect to the livestock predation issue. Ultimately what is needed is a morally justifiable policy for management of competing interests and ideals. Where our focus is on the ethics of policies, laws, regulations or guidelines, what moral theoretical resources might be most useful to us? On what basis can we distinguish between laws or policies that are ethically sound and those that are not?

Social contract theory

One very valuable approach in this respect is grounded in what is known as 'social contract theory'. Thomas Hobbes (1588-1679) is one of the philosophers whose ideas most significantly influenced social contract theory. He sees morality (including the law) as a necessary solution to a practical problem. He thinks that it is a fundamental part of human nature for people to be essentially self-interested. Yet, if everyone were to pursue their self-interest at all times, without consideration of any others, our lives would be quite unbearable. In fact, we would live in a very dangerous world, always having to try to protect ourselves from others who would take our belongings and harm or even kill us, so long as it was in their self-interest. Furthermore, we would be completely unable to work co-operatively, which would make our life experiences considerably less rich and meaningful. He therefore argues that it is in our collective self-interest to have morality, laws, and some form of government to enforce the laws to ensure the best possible existence. Hobbes also believes that we are reasonable beings, and are thus able to recognize that it is rational and in our best interests overall to submit ourselves to morals and laws that will prevent us from constantly harming one another and that will enable us to reap the benefits of co-operation. So, he thinks it is rational for us to enter into an assumed social contract with one another in which we agree to certain limitations on our freedom to act selfishly and with impunity, because that is ultimately in our individual best interests (Friend n.d.). More modern proponents of social contract theory offer many more nuanced and sophisticated versions of this basic idea. What they have in common is the assertion that the moral rules (and laws) of our society should be those that rational agents would agree to. T.M. Scanlon famously expresses it as follows: 'It holds that an act is wrong if its performance under the circumstances would be disallowed by any set of principles for the general regulation of behaviour that no one could reasonably reject as a basis for informed, unforced general agreement' (Scanlon 1999). In other words, the principles we apply to regulate behaviour should be those reasonable people would agree to.

This brief account of social contract theory will suffice for our purposes here. It is valuable precisely because it provides reasonable grounds for deciding what sorts of regulation or restriction of human acts should be put in place. In the context of trying to deal with conflicts of interest related to livestock predation, we need to take into consideration all of the human stakeholders (individuals and groups) and ask what kind of policy they would reasonably agree to. In this case, the most significant conflict is likely to arise between those whose interests are best served by preventing predation altogether and those who have an interest in the protection of predators from harm or a hastened death. On one hand, there are farmers and members of their surrounding communities whose livelihood depends on the livestock industry, and on the other hand, there are animal welfarists, environmentalists, eco-tourists and possibly state environmental agencies tasked with the protection of biodiversity and wildlife. Based on social contract theory, policy makers would need to seek some kind of sufficient consensus, once all stakeholders' interests have been considered.

One way in which this might be achieved is suggested by the authors of a recent article entitled *International consensus principles for ethical wildlife control* (Dubois et al. 2017). They argue that social acceptability is an important principle that should be adhered to by policy makers in these contexts. They point out that, inevitably, human values play an important role. Significantly, different people and communities have very different values from one another. Some place a priority on the protection of property, others on human safety, and others on the protection of biodiversity and the prevention of harm to animals. These values often conflict and may be incompatible (Dubois et al. 2017). In the light of this, the authors recommend the following:

> This diversity of interests calls for an open process of community engagement informed by the relevant science, a transparent approach often overlooked by some government and academic research… An ethical review process with proper governance and resources, similar to that used by animal ethics committees when assessing the acceptability of scientific research involving animals and people, could be a way to include scientific and technical expertise while ensuring community values inform decisions… (Dubois et al. 2017).

What is clear is that policy makers need to engage in a broad process of consultation with all stakeholders in order to fulfil the social contract.

Our moral obligations to future generations

The human stakeholders who might not come readily to mind are the people of future generations. It is in the nature of many environmental issues that they have implications not just for the current generation, but also for posterity. Extinctions and the loss of ecosystems and wilderness are just some examples of such environmental ethical issues. Since these processes take time, our actions (and inactions) might not deprive those of us living now, but they could lead to a situation in which future generations live in a world far less biodiverse than our own. If, for instance, lethal control methods were to be applied on a wide scale against predators such as caracals and black-backed jackals, their numbers could be depleted to the point where their species become endangered. Any subsequent unforeseen serious threat, such as viral disease or persistent severe drought, could be enough to drive these species into extinction. Future generations might well blame the generation that chose to apply a policy of lethal management methods for causing the loss of these predators. But, would they have any right to stand in judgment of previous generations? Does it make any sense to claim that we can have moral obligations to future generations?

This is a question that has led to intense debate. There are theoretical problems with conceiving of moral duties to future people who do not yet exist, whose very existence is contingent, whom we cannot know and who cannot reciprocate any actions we might take in consideration of their interests. Much of the philosophical debate around this issue in the Western tradition has struggled to give an account of how we can have obligations to future people (Partridge 2003). Yet, there is a pervasive intuition that – at least with respect to the environment – we ought to take the interests of future generations into account, to the extent that this is possible. Kwasi Wiredu writes:

> Of all the duties owed to the ancestors[2] none is more imperious than that of husbanding the resources of the land so as to leave it in good shape for posterity. In this moral scheme the rights of the unborn play such a cardinal role that any traditional African would be nonplussed by the debate in Western philosophy as to the existence of such rights. In upshot there is a two-sided concept of stewardship in the management of the environment

[2] This reference to duties to ancestors might seem strange to non-Africans. There is a pervasive belief among African communities that the ancestors (the recent dead) continue to influence events in the world. They need to be treated with respect, lest they inflict some kind of hardship on the living. Wiredu claims that one of the most pressing obligations to the ancestors is the duty to preserve the environment for future generations. For a comprehensive account of this "two sided concept of stewardship", see Behrens (2012).

> involving obligations to both ancestors and descendants which motivates environmental carefulness, all things being equal (Wiredu 1994).

This view is supported by many other African theorists such as (Bujo 1998) (Murove 2004) (Nnamani 2005). John O'Neill is also critical of dominant Western accounts of inter-generational obligation, writing that a

> … temporal myopia… infects modern society. The question of obligations to future generations is posed in terms of abstract obligations to possible future people who are strangers to us. The argument is premised on the lack of a sense of continuity of the present with both the past and the future (O'Neill 1993).

He argues that it is important for us to conceive of ourselves as being part of communities that cross generations. Furthermore, the environment is a shared resource, and we share it not only with the current generation, but also with those to come. This imposes on us some obligation to leave the environment in a fit state for the future[3] (O'Neill 1993). These ideas resonate with our day to day intuitions that we ought to be considerate of the needs of those who will inherit the earth from us.

In the context of the livestock predation issue, what this implies is that future generations should also be considered as stakeholders. The interests of future people in still being able to encounter predators outside of captivity need to be taken into account, as do their interests in a generally healthy natural environment, still rich in biodiversity.

Our moral obligations towards other living entities and nature

Thus far in this chapter it has been assumed that predators, other animals and plants and the natural environment in general are the kinds of things whose 'interests' ought to count when we develop policies about the management of predator impacts on livestock. This assumption entails that non-human living things have at least some moral standing and that they should be valued in some way. This is obviously not an uncontroversial claim. In fact, historically, there has been a long tradition of believing that only humans have any kind of moral standing, and that, at best, other living beings are merely to be valued instrumentally, in terms of their usefulness to us as humans. This view is known as anthropocentrism, and

[3] Other Western theorists who support the claim that we have moral obligations to future generations include Callahan 1981, Weiss 1996, Partridge 2003.

has historically been a pervasive, dominant view, particularly in the West. Anthropocentrism holds that if we have any moral duties with respect to other animals or natural entities, they cannot be duties to these entities themselves, they must be indirect duties to other human beings. Thus, many of the earliest laws protecting animals protected them on the basis that they were the property of their owners. The enlightenment philosopher Immanuel Kant famously expressed the notion of indirect duties to animals as follows:

> If a man shoots his dog because the animal is no longer capable of service, he does not fail in his duty to the dog, for the dog cannot judge, but his act is inhuman and damages in himself that humanity which it is his duty to show towards mankind. If he is not to stifle his human feelings, he must practice kindness towards animals, for he who is cruel to animals becomes hard also in his dealings with men (Heath & Schneewind 1997).

It is very likely the case that many members of the public and policy makers continue to hold anthropocentric views of the moral value of non-humans. By contrast, few ethicists still hold such instrumentalist views today[4]. There are several different non-anthropocentric approaches to animals and nature. They fall into two broad categories: individualist and holist accounts of the moral value of non-human natural entities. These two kinds of accounts will now be discussed in turn.

Individualist accounts: Animal welfarism

If anthropocentrism were right, our only ethical concerns regarding the management of predators would revolve around the competing human interests. However, in more recent times, there has been a growing rejection of anthropocentrism by ethicists and even by members of the public. In the first instance this has been characterised by an increased concern about animal welfare. As we have gradually come to understand that animals are sentient beings that are capable of experiencing pain and pleasure, and prefer comfortable and pleasurable states over unpleasurable ones, more and more people hold the view that animals should not be hurt or harmed without good reason. Going back to the 17th century,

[4] In the discussion that follows in the rest of this section, several non-anthropocentric, non-instrumentalist accounts of the moral value of non-human natural entities are briefly described. The intention is to provide the reader with an overview of the alternatives to anthropocentrism that have been proposed by various theorists. It is acknowledged that a plurality of views exists among the stakeholders whose interests must be taken into account in developing policy regarding livestock-predator management. The discussion that follows should not be understood as advocating for non-anthropocentrism. In developing public policy a balance needs to be found between competing values and interests.

we see laws enacted that sought to prevent harm to animals for their own sake. These included laws against pulling wool off sheep and attaching ploughs to the tails of horses. By the 19th century, welfarist concerns started to be extended to animals and some of the first true anti-cruelty laws (protecting horses and cattle) were passed. The first society for the prevention of cruelty to animals was formed in Britain in 1824 (Favre & Tsang 1993). Since this time the challenge to anthropocentrism by animal welfarists has continued to strengthen.

Individualist accounts: Animals rights/liberation

Towards the end of the 20th century a movement making somewhat more radical claims about our moral obligations towards animals emerged. Known as the animal rights/liberation movement, it went further than the animal welfarists, whose only concern was to prevent cruelty to animals[5]. The historical legacy of the animal rightists has been very significant, and its challenge to our anthropocentrist assumptions remains relevant.

One of the prominent voices of the movement was that of Peter Singer. Appalled by seeing how animals at the time were routinely abused as a result of intensive farming techniques and in experimental research, Singer asserts that we are 'speciesist'. He sees our behaviour towards other animals as grounded in species chauvinism. He argues that it is clear that many animal species have the capacity to suffer, and that when their suffering is akin to ours, we should take their 'like suffering' equally into account as our own. Furthermore, he claims that sentient, self-conscious animals prefer to live than to die. For him this implies that not only should we avoid causing animals to suffer, we also should not ordinarily kill them. He therefore completely rejects meat eating and vivisection[6] (Singer 1975).

Singer's approach is basically utilitarian. Utilitarianism is moral theory that defines a right action as that which has consequences that maximise the aggregate welfare (utility) of all

[5] In this chapter we only consider the positions of Singer and Regan. Strictly speaking Singer does not use the language of rights about animals, making it somewhat inappropriate to label him as an animal rights theorist. He might, then, better be called an animal liberationist – even though his views lead to much the same conclusions as those of animal rightists. However, the label 'animal liberation' has become associated with radical animal activist groups whose practices are sometimes unlawful and even regarded as a kind of terrorism by some. Singer would likely distance himself from such agendas. For this reason, in the rest of this chapter the label 'animal rights' theories is used to refer to the kind of position taken by both Singer and Regan.

[6] This is essentially an account of the animal rights debate of the mid 1970s when these ideas were novel and first came to prominence. Singer's ideas have developed since then, and what is expressed here are his claims in the 1975 publication cited. It should also be noted that Singer would allow for the killing of an animal if it were the only way to survive.

affected by the action[7]. On Singer's account, any beings capable of suffering need to be considered when trying to choose the action with the best overall consequences. In other words, the welfare of all sentient beings must be considered in deciding which actions maximize welfare (Singer 1975).

Another prominent figure in the animal rights school is Tom Regan. He rejects Singer's utilitarian grounding for vegetarianism and anti-vivisectionist positions, but supports similar conclusions. Regan uses deontological, rights-based arguments to defend the basic claim that what is wrong with how we routinely abuse animals is not fundamentally that we cause them pain – what is wrong is that we regard animals as our resources; things we can treat as we like, including causing them suffering and killing them. He argues that the best way to conceive of our moral duties to other humans is in terms of respecting their fundamental rights, Similarly, the best way to understand our obligations to animals is to accord them the same kinds of rights. He argues that there is no justification for not according rights to certain animals. For Regan what counts morally is not the differences between humans and animals, but the similarities (Regan 1983). He writes that what we share with the kinds of animals we routinely hunt, eat, and use in experiments is that

> We are each of us an experiencing subject of a life; each of us a conscious creature having an individual welfare that has importance to us whatever our usefulness to others. We want and prefer certain things; believe and feel things; recall and expect things. And all these dimensions of our life, including our pleasure and pain, our enjoyment and suffering, our satisfaction and frustration, our continued existence and our untimely death – all make a difference to the quality of our life as lived, as experienced by us as individuals (Regan 1983).

For Regan, any being that can be described as an 'experiencing subject of a life' in this sense has an inherent value of its own that should be respected. Such beings ought to have basic rights, such as the right not to be deliberately made to suffer, as well as a right to life (Regan 1983).

The animal rights position has, of course, been challenged. R.G. Frey argues that animals cannot have interests, and only beings with interests can have rights (Frey 1980). Michael Leahy claims that self-consciousness is necessary for a being to have moral standing, and that self-consciousness requires the ability to use language (Leahy 1994). These objections

[7] It follows that the welfare of some affected by the act might be reduced because the purportedly right action is that which leads to the maximum total welfare.

are easily refuted, however. There are surely no grounds for claiming that animals do not have interests. They clearly prefer not to be too hot or too cold, to be fed rather than hungry, and they seek to defend their own lives when they are under threat. There is also no self-evident reason why we should be free to ignore the interests of beings that are not self-conscious or capable of advanced language. Besides, evidence suggests that at least some non-human species are self-conscious enough to be able to recognise their own reflection, and not all humans are capable of language.

A broad consensus against cruelty

The animal rights school has certainly not managed to convince society that animals have rights or that we should all be vegetarians and that all experiments involving animals should be prohibited. But, their challenge to anthropocentric assumptions has been far-reaching. Before the work of the animal rights school, there were theorists who might still have questioned whether there was really any moral wrong in causing animals to suffer. One would be hard pressed to find any serious moral philosopher today who would defend such a view. Interestingly even the theorists, mentioned in the previous paragraph and who argued against the animal rightists, concede that cruelty to animals is morally wrong. Frey, who denies animals have rights, nonetheless claims: 'I have allowed that the 'higher' animals can suffer unpleasant sensations and so, in respect of the distinction between harm and hurt, can be hurt; and wantonly hurting them, just as wantonly hurting human beings, demands justification, if it is not to be condemned' (Frey 1980). And Leahy, despite claiming that animals do not have moral standing, argues that 'All of this is perfectly compatible with our treating other creatures humanely and with respect and it is a sign of perverted human nature not to do so' (Leahy 1994). He goes on even to assert that 'This must not be seen as condoning the random killing of animals; far from it… our instinctive impulses to avoid cruelty will normally extend to their needlessly being killed' (Leahy 1994). In upshot, in the post-animal rights era there has been a significant shift towards a general consensus among moral philosophers that cruelty to animals is morally wrong and even that killing animals should not only be humane, but that it should be avoided unless there are good counter-weighing moral grounds for such killing. Furthermore, this consensus has found much popular acceptance in many parts of the world. Few would seriously try to defend any notion that animals are mere things that we can treat in any way we like.

What this suggests is that while the animal rights position has not gained that much traction in society at large, animal welfarism has been taken up much more broadly. It is therefore worth considering what an animal welfarist approach to livestock predation would entail. Central to such a view would be that the management of predators should avoid causing

suffering to individual animals, as far as possible. In contrast to the animals rightists, welfarists are not necessarily opposed to killing animals, as long as it is done as humanely as possible. This would therefore allow for the use of lethal methods of predator control, so long as they did not cause suffering. Indeed, a painless lethal method would be preferred over a non-lethal method that causes some suffering. Welfarists are also bound to considering the welfare not only of individual predators, but also of prey animals. Thus, there might be an obligation to manage predators in such a way as to minimize the amount of suffering predation causes to livestock. The animal welfarist must in some way seek to weigh up the suffering caused to prey animals against the suffering caused by methods of managing predators. This is clearly a difficult task, and it is likely that welfarists would come to different conclusions. However, it should be noted that a plausible welfarist position might hold that predators should be removed from farming areas, to prevent suffering to prey, and that any methods of management that do not cause suffering to predators – including lethal methods - can be used to achieve this goal.

Individualist accounts: Biocentrism

Both the animal welfarist and animal rights positions are individualist. That is, their focus in on the well-being, interests or 'rights' of individual living beings. Later in this chapter consideration is given to holist, rather than individualist conceptions about our moral obligations to nature. But, before turning to these positions, there is another kind of individualist approach that needs mentioning briefly. The individualist conceptions of our moral obligations towards non-human entities discussed so far only give an account of our moral obligations to sentient beings, mainly animals, birds and possibly some fish. A group of thinkers, often referred to as biocentrists, argue that all living entities ought to be objects of our moral consideration. Paul Taylor asserts that we ought to treat all of nature with respect, because every living organism has a 'telos' or purpose of its own, and thus has inherent worth (Taylor 1986). Robin Attfield describes his approach as biocentric consequentialism, which is similar to utilitarianism, defining what is morally right in terms of maximising what is good for all beings worthy of moral consideration. For him what counts is that all organisms are able to thrive (Attfield 2003). Thus, biocentrists expand the circle of our moral obligations to include non-sentient organisms, too. These positions clearly need some theoretical mechanism for weighing up the competing interests of different kinds of living entities, but it is enough for the purposes of this chapter to highlight that biocentrists do not limit moral considerablity to sentient animals only.

Holist accounts: Eco-centrism

This leads us neatly to the next broad position that needs consideration: holism. There are a number of different holist approaches. Some like Deep Ecology and the view based on the so-called 'Gaia hypothesis' make quite radical claims. The focus of this chapter will be on only the more mainstream holist positions, which are often also referred to as eco-centrist. Holists are distinguished from all of the individualist approaches discussed above, by virtue of their claim that our moral obligations extend not just to individual entities, but to groups or 'wholes' too. Thus, holists argue that species, as species (rather than only the individual members of a species) should have a moral standing. So too should ecosystems, natural habitats, and the like. Indeed, the biosphere as a whole is often conceived of as being of direct moral consideration. Grounded in the biological and ecological sciences, holism emphasises the interconnectedness of all organisms in nature, and the importance of recognising that a certain healthy balance is necessary in nature's systems for all things to thrive.

This leads holists to some very different conclusions to those reached by individualists. For instance, holists would give priority to members of highly endangered species, which is something individualist accounts find difficult to do, since they are concerned only with the individual well-being of entities. They would also defend the need to give special protection to species who make a very important contribution, ecosystemically. Thus, the preservation of honey bees is vital because of their role in the fertilisation of important plants, including food crops. Holists also support the humane culling of members of a species that is threatening the existence of some other more vulnerable species (Palmer 2003).

The holist position is perhaps best expressed in the words of Aldo Leopold: 'A thing is right when it tends to preserve the integrity, stability and beauty of the biotic community. It is wrong when it tends otherwise' (Leopold 1949). Leopold proposes what he calls a 'Land ethic', arguing that the land (by which he means the environment) is a community which needs to be loved and preserved. His ideas have been taken up and theoretically developed into a more robust environmental ethic by J. Baird Callicott (Callicott 1986).

Importantly, some of these holist notions find much support in the work of African theorists. While anthropocentric views are no less evident in Africa than in the West, on many African accounts, all beings in nature are regarded as essentially inter-related. Furthermore, humans are not understood as standing apart from nature, but are seen as being integrally part of it. Munyaradzi Felix Murove emphasises the need for '…an ethical outlook that suggests that

human well-being is indispensable from our dependence on and interdependence with all that exists, and particularly with the immediate environment on which all humanity depends' (Murove 2004). Benezet Bujo claims that 'The African is convinced that all things in the cosmos are interconnected. All natural forces depend on each other, so that human beings can live in harmony only *in* and *with* the whole of nature' (Bujo 1998). And Godfrey Tangwa claims that 'The pre-colonial traditional African metaphysical outlook… impl[ies] recognition and acceptance of interdependence and peaceful coexistence between earth, plants, animals and humans' (Tangwa 2004).

Holists have been accused by individualists of supporting an ethic that is cruelly indifferent to the suffering of individual beings for the sake of the integrity of the whole environment. Some have even called their approach misanthropic: After all, on their view it could be argued that it would be morally justified to cull some humans for the sake of the biotic community. That is not necessarily the case, however, as holists do not disregard the moral requirement to prevent cruelty and suffering of sentient beings. They argue, instead, that we also need to take into consideration the importance of maintaining nature's balances.

The special value of predators on holist accounts

Some holists, such as Callicott and Holmes Rolston III (Rolston 1992), have some particularly interesting things to say about predators. Predation, for them, is simply part of nature, and not something inherently bad. Callicott accuses individualist approaches of being fundamentally life-denying (Callicott 1980), because the simple reality of the food chain (a fundamental basis of life on earth) requires predation for those species that have evolved to be on the higher end of the chain. All living things require nutrition to survive, and some animals survive by consuming others. Both Rolston and Callicott reject the claim, expressed by some individualist animal welfarists (Singer 1975)(Sapontzis 1987), that we ought to protect prey species from predators and that an ideal world would be one in which predation did not occur. In a sense, to reject predation as an evil is to reject the very evolutionary advances that have made complex life forms (such as humans and other predators) possible. Rolston writes: 'A world without blood would be poor, but a world without bloodshed would be poorer too. Among other things, it would be a world without humans – not that humans now cannot be vegetarians but that the evolution of humans would never have taken place' (Rolston 1992). Elsewhere he claims:

> …an Earth with only herbivores and no omnivores or carnivores would be impoverished. The animal skills demanded would be only a fraction of those that

> have resulted in actual zoology – no horns, no fleet-footed predators or prey, no fine-tuned eyesight and hearing, no quick neural capacity, no advanced brains (Rolston 1992).

Summarising Rolston's view, Ned Hettinger writes:

> Evolutionary history is (as Rolston says of animal suffering) "a sad good"… and predation, perhaps especially carnivorous predation, mirrors and drives it. Although dissected and viewed myopically from the perspective of the prey who loses, predation does appear evil, it should be understood holistically as the process of advancement and flourishing of life. For Rolston, the most important goal of an environmental ethic is to defend the creative, fertile, and sacrificial process of natural history itself. As a result, Rolston must value predation; it is simply natural history write small (Hettinger 1994).

For holists, cats, raptors, canidae – the predator species in general – are in some sense special precisely because of the complex evolutionary processes – that have taken many millions of years to unfold – that have made it possible for them to exist at all. This grants them a particular kind of moral status, such that it would be a significant moral wrong for human actions to cause them to become extinct. Rolston asserts that species are akin to blueprints of lifeforms, which we ought to value intrinsically because of their long historical development. Natural history reveals an evolutionary tendency towards the emergence of more complex species whose lives are of higher quality and richness. For Rolston, members of species that are higher on the evolutionary ladder are capable of experiencing far more value richness and are a greater 'achievement' in an evolutionary sense. Thus, predator species have (some) more intrinsic value to Rolston than species below them on the evolutionary ladder (Hettinger 1994). In addition to this, he argues that there is something about our aesthetic appreciation of these remarkable creatures that adds even more to their moral status. He describes the wolf as 'one of the most handsome creatures on Earth' (Rolston 1992). He goes on to point out how many people would like wolves reintroduced in areas like the Yellowstone National Park[8], how visitors to Africa mostly want to see the big cat species and how the panther became the state animal of Florida because children chose this beautiful creature (Rolston 1992). He concludes: 'We admire the muscle and power, the sentience and skills that could only have evolved in predation. Such aesthetic experience is

[8] Rolston wrote this just prior to the time that wolves were successfully reintroduced into Yellowstone National Park.

in the eye of the beholder, but the biological achievements are objective in cat and wolf' (Rolston 1992).

Another claim about the special value of predators made by holists relates to their crucial role in ecosystems. The loss of predators can lead to overpopulation of their typical prey species, which can in turn have serious consequences for other species of animals and plants. Furthermore, Leopold points out that while we should not overstate these claims, predators have a positive impact in terms of improving the health of prey species by weeding out weaker individuals and by controlling rodents, to the benefit of farmers (Leopold 1949). Rolston argues that even though the individuals who lose their lives to predators experience the ultimate loss

> the species may gain as the population is regulated, as selection for better skills at avoiding predation takes place, and the prey not less than the predator will gain in sentience, mobility, cognitive and perceptual powers. Being eaten is not always a bad thing, even from the perspective of the prey species (Rolston 1992).

The holist challenge is particularly pertinent when it comes to developing policies for the management of predators, as it highlights the importance of taking ecosystems into account, and explains why species are of value as species. It also grants predators special moral status because of their exceptional evolutionary history and their ecosystemic value.

Hyrbrid and pragmatic accounts

The accounts of our moral obligation to non-human nature addressed in this chapter thus far are all characterised by taking one particular position and rejecting all of the alternatives. Indeed much of the academic debate in environmental ethics has taken the form of contestation along binary lines: anthropocentrism vs non-anthropocentrism, holism vs individualism, etc. (Light 2002). While this kind of approach clearly has a place in the academic discourse, it is less helpful with respect to pragmatic decision-making and policy-making in a context of competing stakeholder interests and values. Some environmental ethicists have therefore opted to defend hybrid positions that combine the strengths of erstwhile competing approaches. These hybrid position are characterised by a concern to find theoretical approaches that are pragmatically useful. Weak anthropocentrists such as Eugene Hargrove (2003) and Bryan Norton (1991) argue that there is no need to reject anthropocentric reasons for ecological protection. They claim that a weak form of anthropocentrism that gives some priority to human interests without denying the moral

value of non-humans is a sound enough basis for an effective ethic of the environment – provided that a long-term view is taken, including the interests of future generations. So-called environmental pragmatists have taken the view that it is counter-productive for environmental ethics to become bogged down in too much theoretical debate, and that it should focus on influencing practice and policy in favour of environmental protection (Light . Such theorists often embrace theoretical pluralism, affirming what is helpful in all of the possible approaches to value in nature. This pluralist, pragmatic approach is helpful in the context of policy making, as it allows for a variety of views to be recognised and considered. One prominent hybrid approach proposed by Minteer and Collins, is particularly relevant to environmental policy makers. They describe it as follows

> There is a need to bring ethicists, scientists, and biodiversity managers together in a collaborative effort to study and inform the methods of ethical analysis and problem solving in ecological research and biodiversity management. We present a series of cases that illustrate the kinds of ethical questions faced by researchers and biodiversity managers in practice. We argue for the creation of an extensive case database and a pluralistic and integrated ethical framework, one that draws from the theoretical (normative), research, animal, and environmental ethics traditions. These tools form the foundations of a new area of inquiry and practical ethical problem solving, that we call "ecological ethics."

Moral lessons from the history of predator management in South Africa

The history of the use of various kinds of tactics or methods aimed at reducing predation of livestock in South Africa goes back many centuries. Kraaling was used as a means of protecting livestock from predators by the Nguni peoples from soon after they first inhabited territories parts of what is now South Africa (Bergman et al. 2013). The administration of the Dutch colony at the Cape introduced a bounty system aimed at reducing predation from as early as 1656 (Bergman et al. 2013). Early European settlers had to deal with a variety of predators including lions, hyenas, leopards, African wild dogs, black-backed jackals and caracal. Indigenous communities would likely have experienced much the same in earlier times. However, after a few centuries of increasing human encroachment, intensive hunting and the use of lethal methods to reduce predator numbers, large predators in South Africa became confined to protected areas, specialised wildlife farms and national parks. As a

result, since the 19th century it has mainly been black-backed jackals and caracals that have been responsible for predation in farming areas. While other smaller predators might also opportunistically take livestock as prey, the general consensus among scientists and livestock farmers is that it is black-backed jackals and caracals that are the main concern (Bergman et al. 2013)(Du Plessis 2013). Furthermore, evidence suggests that as a consequence of the confinement of large predators, the lack of competition has increased both the number and the range of black-backed jackals and caracals. This has had an impact on predation on livestock farms and wildlife ranches (Du Plessis 2013).

Through much of the 19th century, management of predators was mainly focussed on extermination of species regarded as a problem in local areas. Lethal methods such as hunting, trapping and poisoning were used. Poisoning clubs were formed, with government support. Kraaling was also used to keep livestock protected. However, over time it became evident that kraaling had negative impacts in terms of increased levels of disease in livestock as well as soil erosion and grazing damage. This led to a shift towards erecting jackal-proof fences, and state subsidies were redirected to this and away from sponsored bounties. Ultimately, fencing proved to have its own disadvantages, especially in terms of limiting the range of smaller wildlife species and threatening biodiversity. Sponsored hunting clubs proliferated in the 20th century (Du Plessis 2013). More sophisticated traps and more effective poisons began to be employed in the 1960s. These combined efforts created a situation in which the government believed that the predation problem was largely under control by 1967 (Bergman et al. 2013). Nonetheless, a variety of methods, lethal and non-lethal continued to be employed. This included the introduction of the use of protection collars in the last decade of the century (Du Plessis 2013). Management during much of this period was characterised by government support in terms of subsidies, incentives and encouragement of management efforts. The use of lethal methods was widespread, and there was little questioning of the ethical appropriateness of such methods (Bergman et al. 2013).

A major shift began to take place from the 1980s. Animal welfarists and animals rights groups became more vociferous and influential. Environmentalism was also a rapidly growing movement across the globe. In South Africa, this had an influence on the political climate, and together with financial constraints, led to government agencies phasing out subsidies for predator management. By the early 1990s government had all but completely ceased to be involved in management programmes (Bergman et al. 2013). After the first democratic elections in South Africa in 1994, priorities changed, and the new Constitution included in its Bill of Rights the right to environmental protection through measures that,

among others things, promote conservation and the policy of sustainable development. The concerns of environmentalists now had some support in the constitution. From the perspective of livestock owners, they were in a sense left to manage predators on their own, and without any official co-ordinated strategy or integrated policy to guide them (Bergman et al. 2013). This is clearly an undesirable situation, as it is mainly left to individual livestock owners to manage predation for themselves, with no guarantee that they will take environmental impacts seriously, or not simply fall back on what they know best, the use of lethal methods.

Human responsibility for the conflict

From an ethics perspective there is much that we can learn from this history. In the first place, it is obvious that we, as human beings, bear the responsibility for having created and exacerbated the conflict that exists between us and jackals and caracals, as well other related threats to the environment. We eliminated the competition from larger predators; we vastly reduced the populations of the natural prey species of mesopredators; we introduced new species of animals in our own interests for meat and wool production; we encroached on the natural habitats of other species and transformed the land to suit our purposes; we erected the jackal-proof fences that threaten biodiversity; we set the traps and snares and poisoned baits that indiscriminately (and often painfully) killed not only the predators we sought to eradicate, but collaterally, other creatures, too. Ethically, we human actors cannot simply assume that only our interests are relevant in decisions about how to manage the predation problem. We certainly need to give attention to the plight of farmers whose business interests are threatened by predation. But, many would argue that it would be unacceptably anthropocentric for us not to acknowledge a moral responsibility towards predators, to ensure that they are not caused to suffer or die without good cause. Furthermore, we need to consider the effects of our actions on the environment, holistically.

Unintended consequences

Another lesson to be learnt is that actions can have unintended consequences. The complete removal of larger predators from farming areas had the unforeseen effect of increasing the numbers of black-backed jackals and caracals, and consequentially, the predation problem. This in turn, had negative outcomes on biodiversity. Similarly, kraaling might have appeared to be a promising non-lethal method for protecting livestock, but it too had unintended consequences for the health of livestock and the environment. These two

examples are enough to demonstrate that it is important to take into account all of the possible consequences of our actions, for them to be ethically justifiable. Furthermore, it is essential that we are cognisant of the concerns of holist environmental ethicists that it is important to consider these problems holistically, taking into account the implications of our actions for natural systems.

The importance of shifts in public opinion

The history of predator management in South Africa also teaches us the importance of being aware of changes in public awareness and the social acceptability of our actions. There was a fairly rapid and dramatic change in public attitudes to animal welfare and environmental issues in the final decades of the 20th century. Prior to that time, few would have objected to the use of methods of management that could cause suffering or death. Fewer still would even have been aware of the environmental impact of predator management methods. That has all changed. It is no longer possible ignore these kinds of concerns. Another pertinent aspect of this shift in public sensibilities is that there is now a new, and often vocal, group of stakeholders whose interests need to be taken into account. Animal welfarists, animal rights advocates, environmentalists, eco-tourists and the many NGOs and advocacy groups they belong to must now be included in any consultative processes regarding the management of predators. On the grounds of social contract theory, any proposed policies that are devised without the participation of these stakeholders would be ethically unsound. In the South African context, this is supported by law because of the right to a healthy environment that is included in the Constitution.

The role of the state

The history of predator management has another important ethics lesson to teach us: namely, that government has a role to play in assisting the various stakeholders to come to some kind of sufficient consensus on the principles that should guide policy. Leaving the problem entirely in the hands of livestock owners is not going to lead to solutions that have wide-spread buy-in from all stakeholder groups. It is part of the state's mandate to mediate between conflicting interests and devise policies that will reduce conflicts through participatory processes. Furthermore, while it can be argued that the costs of predator management should be borne by livestock owners and passed on to consumers, there is a case to be made that if the state is to insist on environmental protection and taking public sentiment into account, then the state ought to consider subsidising some of these efforts.

Principles for the ethical analysis of current methods of predator management

Du Plessis provides a comprehensive review of management methods currently used in South Africa. He lists the following methods used to manage black-backed jackal and caracal:

Lethal methods

- Shooting
- Foothold traps
- Snares
- Coyote getters
- Poisoned baits
- Poison collars
- Denning
- Hunting Dogs

Non-Lethal methods:

- Guarding animals
- Fencing
- Box traps
- Translocation
- Frightening devices
- Aversions
- Reproductive interference
- Supplemental feeding
- Husbandry
- Protective collars and cellular technology
- Financial incentives
- Adaptive rangeland and herd management (Du Plessis 2013).

An ethical analysis of the various possible methods could take a number of forms, including a brief discussion of each method in turn. However, since a major aim of this chapter is to provide policy makers with a set of principles that can be used to inform their decision-making, the ethical analysis is structured around some basic principles.

A recent article published in *Conservation Practice and Policy* represents the outcome of a workshop by a panel of 20 international experts who sought to develop a set of principles for ethical and evidenced-based management of human-wildlife conflicts (Dubois et al. 2017).

Since these principles reflect some international consensus, they are informative and should be regarded as having some authoritative weight. The principles identified in the article are expressed under the following headings:

- Managing human practices
- Justification for control
- Clear and achievable outcome-based objectives
- Animal welfare
- Social acceptability
- Systematic planning
- Decision-making by specifics rather than labels

While the discussion below does not follow the same structure or headings, it draws on the article frequently.

Acknowledging human responsibility for human-predator conflicts

As claimed earlier, the primary responsibility for the conflicts that arise in human-predator conflicts lies with ourselves. Ethically, this imposes a duty on us to find the best ways to reduce these conflicts. Given our culpability as humans, Dubois et. al. assert that the conflicts 'should be prevented and mitigated by altering human practices wherever possible and by developing a culture of coexistence' (Dubois et al. 2017). Essentially they make two recommendations: a change in human practices and a change in culture or attitude.

Regarding the first recommendation, the kind of change in human behaviour envisaged here is a change in actions that create the conflicts in the first place, rather than changes in how we try to manage the conflicts. In the specific case of the kind of predator-human conflict at issue in this scientific assessment, it seems unlikely that there are any changes in human behaviour of the kind that remove the fundamental causes of conflict that would be practicable and achievable at this time. Strong animal rights proponents might well argue that if we all stopped eating meat and phased out commercial animal agriculture completely, there would no longer be any conflict to manage. While this is true, it is clearly not likely that the majority of people would be prepared to accept such a drastic change in their behaviour. Society's view on this would also be supported by many holist environmental ethicists, who deny that predation is necessarily a bad thing, including human predation of animals. That said, some holists might argue that a significant reduction in the amount of meat humans consume would be good for the environment, and might greatly reduce human-predator conflict. Again, however, it is unlikely that there would be sufficient support for such drastic

changes in human behaviour to make such an approach viable. Thus, the recommendation that changes in human practice should be considered as a first option is not obviously applicable to the predation problem in South Africa.

The second recommendation by Dubois et. al. is more promising in terms of its practicability. They suggest that in handling human-predator conflicts it is necessary to develop 'a culture of co-existence' (Dubois et al. 2017). While it seems that they are concerned with inter-species co-existence, it should be stated that a similar attitude with regards to the relationships between human stakeholders should also be encouraged. Regarding inter-species co-existence, Dubois et. al. write: 'A long-term education-based process, based on preventive action and increased tolerance, is also necessary to move toward a culture of greater coexistence with wildlife' (Dubois et al. 2017).

Livestock owners are understandably likely to see predators as a threat to their livelihood. From their perspective the interests of predators and of the environment may not generally be given much consideration. Sometimes the threat posed by predators can cause a hardening in attitudes towards them. Farmers can easily begin to see predators as an enemy, and even become vengeful and retaliatory in their behaviour (McManus et al. 2014) . The historical use of labels such as 'vermin' or 'pests' to describe these creatures betrays an attitude that lays the blame for predation with the predators, without acknowledging our role in creating the problems in the first place. It is this sort of attitude that easily leads to decisions to use lethal methods as a first preference in predator management, without giving due consideration to other possible approaches. One of the responsibilities of the State in this situation may well be to set up programmes to conscientise livestock owners more aware of in an attempt encourage a 'culture of co-existence'. Such a change in attitudes might go some way towards finding solutions that satisfy a large number of stakeholder groups, and avoiding knee-jerk reactions that underlie the desire to eradicate predators rather than co-exist with them.

Effectiveness

One might well ask why the effectiveness of methods of managing predation is presented as an ethical issue. It is obvious why scientists, policy makers and livestock owners would want to know how effective different methods are for pragmatic reasons. Ethicists are no less interested, however, for the simple reason that many management methods have harmful consequences (to predators, other species, the environment, humans and to the bottom line of farmers and possibly even the state). Whenever our actions cause harm to others, we

have related ethical obligations. Often it is incumbent upon us to weigh up competing harms, so as to be able to justify our actions. This is based on consequentialist thinking about morality, and is intuitively quite plausible in situations such as this. Thus it might be possible to justify some very minor harms to predators – say, in terms of using methods that might sometimes cause them to suffer a little – if the methods used were exceptionally successful in reducing predation. On the other hand, we could not justify serious harms to predators if using a particular method has little or no effect on preventing predation.

While shooting problem species remains a popular management choice in South Africa, it is not at all clear how effective it is in reducing predator numbers over the long term. It may fail to remove problem individuals; when individuals are removed from an area, others may simply take their place; and there is some evidence that younger individuals are more likely to be shot than older, habituated individuals (Du Plessis 2013). Since the harmful consequences of shooting are obviously not trivial, it would not be ethical to resort to shooting as a first-line approach to predator management without evidence that it is very effective.

Similar concerns arise with regard to most of the lethal methods of management that can be used. In each case, the amount of harm done needs to be weighed up against the benefit. If levels of effectiveness are low, it may well be that the harms cannot be morally justified. Denning – the practice of removing or killing young from their dens – is harmful not just to the young – its ecological impact is uncertain. The practice is also likely to be deeply offensive to animal welfarists. Foothold traps, snares, coyote getters, poisoned baits, poison collars and hunting with dogs all have potentially harmful consequences. In the first place, they can cause suffering and death to targeted predators. Furthermore, while some of these methods are more selective than others, they can all potentially cause the same kinds of harm to other species – potentially even humans. They may also have other harmful effects on the environment (Du Plessis 2013). Again, these are serious harms, and these methods would not be morally justifiable unless they were effective.

Some non-lethal methods are potentially harmful in a number of ways. Using dogs as guarding animals has shown some potential in effectively reducing predation (McManus et al. 2014). However, some studies done in local conditions suggest that the method may not always be as non-lethal as it seems, as some individual dogs have been shown to kill target predator species, other species and even some livestock. Furthermore, where they don't kill other animals they might cause injury and trauma. While there may be ways, such as better selection of dogs and better training, that could reduce these harms (Potgieter et al. 2015),

the potential for such harm cannot be ignored. Again, some relatively small harms might be justifiable, but only if the method is, in fact, effective. Fencing has potentially harmful environmental impacts, but might yet be shown to be a fairly effective method. It is an expensive option, in terms of initial outlay, and as such may be harmful to the business interests of farmers.

Another non-lethal management method that might cause harm is the use of conditioning taste aversion. It entails treating baits (usually carcasses of livestock) with chemicals, so that when predators eat the bait they become nauseous. It is not known what other harms the chemicals used may cause to the targeted species or other creatures that might scavenge on the bait. Many studies have found the method to be largely ineffective, which would make it hard to justify ethically (Du Plessis 2013). Husbandry practices such as kraaling livestock during lambing season or at night may lead to potential harms in terms of increased incidence of disease and to poor grazing conditioning. The effectiveness of these methods is very important ethically. Should they be shown to be extremely effective, some minimal harms might be justifiable. But causing harm for no benefit is not. Furthermore, it is not fair to expect farmers to bear the costs of these interventions if they are not likely to be successful.

The need for evidence

In trying to decide what is the most morally right action out a number of possibilities, we need to have information that enables us to understand causes and effects, impacts, costs, threats, responsibilities, and the like. For instance, it is difficult to predict the possible effectiveness of a predator management method without knowing about the feeding behaviours of the specific predators. If it is true that caracals are more likely to target livestock when they are nursing young, then denning combined with translocation might be an effective and humane method. What is important is that there is not only a scientific obligation for conclusions to be evidence-based, there is also an ethical obligation to ensure that our decisions are based on as much sound evidence as possible (Dubois et al. 2017).

This is why a scientific assessment of this nature is ethically so important. Bringing together the best evidence from as many sources as possible, taking into account the many different kinds of data that are available, goes a long way to increasing confidence in any conclusions that are drawn. Where there is sufficient evidence, it may also be possible to convince certain stakeholders to reconsider entrenched views, making consensus on some items more likely.

Unfortunately, it is often the case that there is a paucity of appropriate evidence-based studies. The literature on the conflict between predators and livestock in South Africa is characterised by repeated claims that no or little research has been done, in local conditions, to answer critically important questions (Du Plessis 2013) (Bergman et al. 2013). Clearly, it is not possible for research to be undertaken that will fill all of the gaps in our knowledge. However, a comprehensive assessment such as this might at least identify the most critical and urgent research that should be undertaken. For instance, in his comprehensive account of management methods employed in South Africa, Du Plessis notes, as he discusses each method in turn, that there are either no or very few local studies on the effectiveness of almost all of these methods. That does not entail that we ought to engage in research on all of these methods, however. For instance, he points out that a majority of international studies on conditioning taste aversion (CTA) find it to be ineffective (Du Plessis 2013). It is possible that since the South African predators concerned and conditions are different from those in the international studies, it might turn out that CTA is effective here. But, the evidence we do have suggests that there might be other more promising methods that are worth investigating first. There might also be methods, the effectiveness of which is largely unknown, but that can be ruled out because it is known that the costs involved are completely prohibitive. If resources are to expended on research, this needs to morally justified on the basis that such research is promising and likely to produce results. Wastefulness and engaging in research that is unlikely to provide useful results is ethically unjustifiable.

Certain kinds of studies investigating gaps in our knowledge might also be identified as unnecessary or undesirable by virtue of their social unacceptability. For instance, if there is widespread disapproval of methods such as traps and snares, because they are seen as cruel and non-selective, it might not make sense to study their effectiveness or investigate their relative cost-effectiveness. After all, some would be opposed to the studies themselves, on ethical grounds. And there is not much point in obtaining more knowledge about methods that we already know are unlikely ever to be implementable.

Animal welfare

The importance of giving consideration to animal welfare has already been addressed substantially in this chapter. However, there are a few other important ethical principles to be considered when assessing the relative moral justifiability of various management methods.

The first is that the more harmful a practice is to welfare of animals the more of a burden there is on us to provide good reasons that can justify the practice. While it is a matter of some debate whether death is the most serious harm that can befall conscious beings, there is no doubt that for such beings it is a non-trivial harm. It may be argued that causing the loss of animal lives can be morally justified on the grounds that this results in significant benefits for humans (indeed a lot of research using animals is justified in this way). But, no serious ethicist would defend the morality of killing animals without good reason. With this in mind, from an ethical perspective, non-lethal methods of management are normally going to be more easily justified than lethal methods.

Methods that cause suffering and distress are also problematic, ethically. Again, they place an enormous burden on us to show that they are necessary, and that other methods cannot achieve the same or similar results. While killing a predator with a clean shot from a hunting rifle might not cause it much suffering, a botched shot could. Animals that are poisoned or caught in foothold traps or snares may experience prolonged suffering. Such methods will require a great deal more justification than many of the other options available.

Dubois et. al. sum up the consensus view on animal welfare of their international group of experts as follows: 'Control methods should predictably and effectively cause the least animal welfare harms to the least number of animals' (Dubois et al. 2017).

Selectivity

Management methods (and particularly lethal methods) differ significantly in terms of how species-selective they are. Traps, snares, coyote getters and the use of poisoned baits are generally non-selective, and many kinds of non-target species may be killed or injured by these devices. Guard dogs might also sometimes kill or injure other species. CTA is also not very species-selective, and could cause harm to animals others than the species targeted (Du Plessis 2013) (Potgieter et al. 2015).

The more non-species-selective a method that causes harm is, the more difficult it is to justify ethically. While it may be possible to argue that the harms caused to some predators can be justified because they are outweighed by benefits to the livestock industry, this argument is not as sound when used to justify the suffering and death of species that are not responsible for the predation problem.

Environmental impacts

We cannot claim that any method of managing predators is ethically justified without giving due consideration to the possible environmental impact of such a method. This has already been argued for earlier in the chapter and will only be dealt with briefly here. This principle applies to both lethal and non-lethal methods. There are some methods, the environmental impact of which may be of such significance that it should be a key factor that needs consideration. These include: traps, snare, poisons, denning, fencing, translocation, aversion techniques, sterilization and kraaling.

Social acceptability

It has become more and more obvious over the last few decades that policy makers have to give due consideration to the social acceptability of initiatives. Furthermore, public opinions and mores can change quite rapidly at times, which also needs to be considered. Dubois et al write:

> Decisions to control wildlife should be informed by the range of community values alongside scientific, technical, and practical information. Decisions on whether and how to control wildlife usually involve balancing benefits and harms. Scientific and technical information can inform decision making…. Nonetheless, decisions regarding wildlife control inevitably involve human values which differ from person to person and across communities (Dubois et al. 2017).

It has already been pointed out that in terms of social contract theory, we have a moral obligation to formulate policies that most rational agents would agree to. What this entails for issues such as livestock-predator conflict is that it is important that all stakeholders are included in consultative processes and feel that they have been heard. This approach has been adopted as a basic principle for how this scientific assessment has been conducted.

In terms of predator management methods, public opinion has swung in favour of preferring non-lethal and humane methods. The authors of one review article write: 'Ethical decisions should consider the value of society at large and the intrinsic value of all of the individual animals involved… For instance, two large scale studies in the US suggested lower public acceptance of lethal methods than of non-lethal methods and that humaneness was important to the public' (Treves et al. 2015a) Similarly, in a study on the use of guarding dogs in Namibia, Potgieter et al write: 'Large-scale lethal control using indiscriminate

methods such as poisoning, snaring and hunting can be environmentally damaging and are increasingly socially unacceptable' (Potgieter et al. 2015). This general trend with respect to public opinion is one that policy makers need to give appropriate attention to.

Cost-effectiveness

The cost-effectiveness of each method of management is clearly of pragmatic importance. As long as livestock farmers in South Africa continue to have to the shoulder the financial burden of management themselves, cost-effectiveness will understandably be an especially weighty consideration for them. Ethically, since livestock owners are key stakeholders, their interests must carry significant weight. They also play an important role in food production and contribute to the economy through providing employment and in other ways. Furthermore, the consumers of their meat products also have an interest in the affordability of these products. The methods that are best for animal welfare, most socially acceptable and environmentally sound might turn out to be relatively expensive. This would lead to a conflict of interests between animal welfarist and environmentalist groups on the one hand and farmers, their employees and consumers on the other. In such an eventuality, it may be that the state would need to consider ways of subsidising management again, as an incentive to get farmers to adopt non-lethal, more humane, and ecologically sound management methods. This would entail that taxpayers would become a much more interested stakeholder group, whose concerns would need to be considered. Creative approaches to raising funds for subsidies (for instance, a tax on eco-tourists) might be more palatable to taxpayers than simply adding a further strain on the fiscus.

Responsibility of the State

This brings us back to the responsibility of the state in managing the conflict between livestock owners and predators. The current situation in South Africa, where the responsibility for managing predators largely falls on the shoulders of individual livestock owners, and in which there is no co-ordinated approach and a lack of clarity on policy, needs to be addressed. It is the responsibility of government to mediate between competing interests and to facilitate the formulation of clear, workable policy and even legislative reform, where necessary. In a constitutional state, there is an obligation to ensure that all stakeholders' interests are considered and that solutions are found that are fundamentally fair. The methods of predator management that are most suitable in terms of the social

contract may not be practicable without the participation and intervention of the state and the use of some state resources.

Conclusion

The conflict between predators and livestock owners gives rise to many ethical issues. It is a very complex situation in which there are many different stakeholders who have competing interests. Finding a way to accommodate and balance the interests of all parties is hardly simple. This chapter has tried to give an account of the many ethical issues that need to be considered, as well as to introduce some of theoretical tools that applied ethics can provide to assist in navigating through complex ethical questions. It has also proposed, explained and applied a number of principles for the ethical analysis of current methods of predator management that ought to inform the process of policy making.

BOX

Against the use of lethal predator control

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In this section, I shall examine the kinds of considerations that need to be brought to bear on the ethics of lethal methods of predator control in reducing livestock predation. I'll examine by way of a cost-benefit type of analysis whether lethal methods of predator control are ethically justifiable. For the sake of this paper I shall assume that animals have moral status which do not necessarily amount to moral rights. Debates in animal ethics are often artificially positioned as disagreements between those who do and those who do not hold the view that animals are the bearers of moral rights. This usually results in a stalemate, as neither side can find common agreement. However, the claim that animals have moral *status* is a necessary condition if discussions on the ethics of lethal methods of predator control are to have any traction, since ethical issues arise only if one can talk meaningfully of a being's moral interests. The cruel nature of some lethal methods, such as gin traps for example are taken -- even by proponents of their use - as relevant considerations to their continued use. Such considerations make sense only in the context of animal welfare, which presupposes that animals have interests. Such interests, I argue, lie at the heart of the claim that animals have moral status. I thus take it for granted for the sake of this discussion that animals have moral status, but I do not claim that this status necessarily amounts to the possession of moral rights. Were non-human animals to be accorded moral *rights*, lethal and harmful methods of predator control would be impermissible, except perhaps in extreme circumstances. Given the context in which discussions of predator management occur, and given the current moral status of animals in society, I am assuming for the sake of the argument that animals do not have moral rights. However, I argue that their possession of moral status nevertheless places severe constraints on how they may be treated. This position is also consistent with the ways in which ethical decisions involving animals' interests are deliberated -- namely, via appeal to a utilitarian "cost-benefit" analysis, which is standardly employed in animal research and elsewhere. Animal ethics committees, for example, decide whether a research protocol involving the use of animals is morally justifiable by weighing up the harms done to the animals against the purported benefits of the experiment. Such a utilitarian calculation thus assumes that animals have moral status. I would like to adopt a similar sort of strategy in the discussion that follows by asking whether - and if so under what conditions - lethal methods of predator management are ethically justifiable. An obvious objection to this strategy would be that medical research is an objective human good while livestock farming is not. Indeed, given the large negative

environmental impact[9] of livestock farming, or the negative effects on human health of excessive meat eating, one might argue that the harms to humans and the environment caused by animal agriculture outweigh the benefits, and humans should rather focus our energies on replacing livestock farming with other methods of food production. However, putting these larger concerns aside, I shall restrict my analysis to the question regarding whether - and if so, under what conditions - the lethal management of predator control is morally justifiable given the *status quo*. The broader ethical issues regarding animal agriculture are being set aside for the sake of the argument, but they would nevertheless be relevant in a more global holistic appraisal.

Lethal methods of predator control clearly inflict enormous harms on individual animals, which suffer from being hunted, trapped, or killed by other means. Many lethal methods such as gin traps are not only extremely cruel but trap and kill indiscriminately. The negative impact of killing predators on biodiversity is enormous: most large carnivores are in decline globally and 'conflict with local people, particularly over depredation on livestock, is a major cause of this decline' (Ogada et al. 2003). In North America, wolves 'were deliberately exterminated in the lower 48 United States, except in northeastern Minnesota, primarily because of depredations on livestock' (Bangs & Shivik 2001, p. 2). In South Africa, the Oranjejag hunting club in the Free State between 1959 and 1991 killed 24 589 jackals and 3 377 caracal, as well as other non-predation species including over 65 000 Cape foxes (Bothma 2012). Lethal controls have also led to the extinction of several species, such as the marsupial wolf and the Falkland Island wolf[10]. Furthermore, eradication of a target species may have unpredictable knock-on effects: 'Reducing the density of top predators may cascade through ecosystems with meso-predators increasing in density, which can have unpredictable consequences for prey populations, conflict rates and the services ecosystems provide to humans.' (Treves et al. 2015b, p.91) Thus from both an animal welfare and a conservation perspective, finding ways to replace lethal with non-lethal methods of livestock protection is a moral imperative. This is especially so since there is evidence to suggest that predators - at least in certain instances - are not the major cause of livestock losses. For instance, Bangs and Shivik claim that natural mortality was the leading cause of calf death in the Northwestern US; wolf predation 'was the second leading cause of death' (Bangs & Shivik 2001, p.2) at 29% of calf loss. They also argue that, even where wolves live near livestock, 'conflicts were uncommon considering the potential for

[9] See, for example, the report *Livestock's Long Shadow* by the Food and Agriculture Organization of the United Nations (Food and Agricultural Organization of the United Nations 2006).

[10] See (Woodroffe et al. 2005).

depredations' (p.3). Research by D. H. Roberts concludes that domestic dogs and not predators were the major cause of sheep killings on farms in KwaZulu Natal in the early 1980s: 'Of 395 sheep carcasses examined, predation was attributed to black-backed jackal in 50 instances, caracals in 9, and domestic dogs in 350' (Roberts 1986, p. 150). In his 2012 report, Bothma notes that 'in a sheep production region in KwaZulu-Natal black-backed jackals have been estimated to be responsible for the loss of 0.05% of the sheep population' (Bothma 2012, p.6). If predation does not count as the main or even a major cause of at least some livestock losses, then blaming wildlife is aiming at the wrong target.

In addition to the ethical concerns regarding the harms caused by killing predators, in terms both of animal welfare and loss of biodiversity, there are also scientific concerns - short of total eradication (which would obviously be completely unjustifiable) - that lethal methods are ineffective. Bothma notes that 'to date all attempts at the control of black-backed jackal populations have failed' (Bothma 2012, p.7); he further notes that 'the black-backed jackal and caracal are the products of a long period of development and co-existence with humans and are adapted to it. It is impossible to control their population sizes except through regional or national extermination' (Bothma 2012, p.14). The scientific arguments against lethal methods are also referred to by Nattrass and Conradie, who claim that 'the science of predator ecology' shows that 'predator numbers can increase as a result of persecution' (Nattrass et al. 2017). If so, then killing predators would be unjustifiable given the paucity of benefits that would accrue to farmers when weighed against the enormous resultant harms.

Thus the ethical arguments against the use of lethal methods seems strong: the harms caused by predators outweighed by disproportional killing or culling, especially when the methods used are indiscriminate and affect either non-target species or members of target species that are not responsible for livestock predation. In addition, the science seems to indicate that lethal methods are not effective. Thus the replacement of lethal with non-lethal methods of either predator control or livestock protection seems both logical and ethically mandated. Indeed, even if the science were wrong and lethal methods were effective in limiting predation, this would not remove the moral imperative to find non-lethal methods. This is so because a cost-benefit analysis must look not only at the *actual* harms or benefits that result from a particular practice, but it must also take into account whether reasonable alternatives would result in *lesser* harms[11].

[11] This is the case where animals are used for medical research: even if a protocol would be morally justifiable on the grounds that its outcomes would result in greater good than harm caused, it may still be rejected by an ethics committee if reasonable non-animal alternatives were available.

If they would, then such alternatives should be implemented instead, providing of course that non-lethal methods do not cause other serious harms to predators. McManus et al argue that tools for protecting livestock from predation 'should benefit both farmers and wildlife conservation' and should include the following: 'persistent efficacy, minimal unintended environmental consequences, selectivity towards problematic individuals, lower cost than that of the depredation prevented, and social acceptability' (McManus et al. 2014). Non-lethal methods seem to tick most, if not all, these boxes. Non-lethal methods should also not result in the suffering of targeted individuals, even if such suffering does not result in death. McManus et al also argue that in addition non-lethal methods are not only more efficacious than lethal methods but are also cost-effective to the farmer. Their research into the relative advantages of non-lethal vs lethal methods was conducted over a three year period on 11 commercial livestock farms in the Eastern Cape. Farmers used a variety of non-lethal methods, which included alpacas, dogs and collars. During the 1st year of research, the costs per head of non-lethal control resulted in an increase in savings to the farmer when compared with lethal control use. There was also a mean decline in depredation.

> Our findings suggest that non-lethal mitigation can effectively reduce depredation and the economic costs of carnivores in the vicinity of livestock farming. Farmers saved 55.1% and 74.6% during the first and second years of non-lethal control, respectively, compared to expected losses during lethal control. Even where lethal controls were cheaper to implement than non-lethal methods, the lower-than-expected depredation resulted in savings in both years when non-lethal controls were used. There was a mean saving of USD 13.79 per head of stock in the first year of non-lethal control and USD 17.41 per head in the second, compared to what would be expected when using lethal control only. Overall, farmers saved a mean of USD 20,000 during the first year of switching to non-lethal measures, which was equivalent to the value of 138 livestock. Initiating and operating non-lethal control during the first year was cheaper than continuing lethal control on the majority of study farms, and depredation rates were invariably lower. In short, non-lethal measures were cheaper than lethal control on 91% of the farms in the first year of implementation (McManus et al. 2014, p.6).

Another study by Potgieter et al found that the use of Anatolian shepherd dogs resulted in fewer losses to predation, which resulted in fewer killings of cheetahs by farmers. However, Potgieter et al also discovered that the sheepdogs themselves were responsible for killing livestock, and argue that 'corrective training for dogs that chase or kill non-target species

should be implemented' (Potgieter et al. 2015, p. 514) in order to prevent this. It should be noted that there are many methods of non-lethal predator control, and it may be that some methods work better than others, depending on the region, the nature of the livestock farming and the kinds of predators involved. Shivik outlines a variety of non-lethal methods and notes that 'many methods that are applicable in small pasture situations … may have little or no applicability in large, open-range situations' and stresses the need 'to categorize and understand the plethora of methods that are being advertised by both scientists and charlatans' (Shivik 2004, p. 64). However, given the obvious need to develop effective non-lethal methods, the 'field and body of knowledge on non-lethal techniques is growing' (Shivik 2004).

Given the obvious advantage of non-lethal over lethal methods from a variety of perspectives - animal ethics, conservation, livestock protection, financial costs and social acceptability - the case for non-lethal methods seems strong. Certainly the *moral* argument is extremely strong. If this is the case, then the converse - namely that lethal methods are morally acceptable - is unsupported. If this is so, then, at the very least, conservation authorities should be extremely reluctant to permit lethal methods, especially given the evidence that lethal methods implemented by farmers have not succeeded in lowering predation. Further research into different kinds of non-lethal methods is also required to find the best methods for different farming situations. However, the clear harms of lethal methods of predator control provide a *prima facie* argument against their use, certainly as a default method, and the burden of proof should thus fall on those who wish to defend their continued use rather than on those who oppose them. For this reason, authorities should, as far as possible, mandate against their use while simultaneously provide incentives for the use and development of non-lethal methods. Pragmatically, farmers will be persuaded to give up traditional methods only if alternative methods are available, effective and cost-effective.

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