

Towards a Duty of Care for Biodiversity

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ABSTRACT

The decline in biodiversity is a worldwide phenomenon, with current rates of species extinction more dramatic than any previously recorded. Habitat loss has been identified as the major cause of biodiversity decline. In this article we suggest that a statutory duty of care would complement the current mix of policy options for biodiversity conservation. Obstacles hindering the introduction of a statutory duty of care include linguistic ambiguity about the terms ‘duty of care’ and ‘stewardship’ and how they are applied in a natural resource management context, and the absence of a mechanism to guide its implementation. Drawing on international literature and key informant interviews we have articulated characteristics of duty of care to reduce linguistic ambiguity, and developed a framework for implementing a duty of care for biodiversity at the regional scale. The framework draws on key elements of the common law ‘duty of care’, the concepts of ‘taking reasonable care’ and ‘avoiding foreseeable harm’, into its logic. Core elements of the framework include desired outcomes for biodiversity, supported by current recommended practices. The focus on outcomes provides opportunities for the development of innovative management practices. The framework incorporates multiple pathways for the redress of non-compliance including tiered negative sanctions, and positive measures to encourage compliance. Importantly, the framework addresses the need for change and adaptation that is a necessary part of biodiversity management.

Keywords: duty of care; stewardship; biodiversity; policy instruments; Australia

INTRODUCTION

The decline in biodiversity is a worldwide phenomenon, with current rates of species extinction more dramatic than any previously recorded (Novacek and Cleland 2001). Ominously some commentators call this the ‘sixth mass extinction’ (eg. Myers and others 2000; Thomas and others 2004), this time induced primarily by human activities (Fischer and others 2007).

Recognised threats to biodiversity include clearing and fragmentation of habitat associated with agricultural, urban and coastal development, alteration of hydrological flows, inappropriate fire regimes, pest plants and animals, and climate change, but historically loss of habitat associated with agricultural development has been the principal driver (Burgman and others 2007; de la Crétaz and Barten 2007). In this article we focus on biodiversity in agricultural landscapes.

Agriculture, including cropping, intensive and extensive livestock grazing, is a dominant land use and globally occupies 30% of the earth’s landscape (Groom and others 2006). In the United Kingdom it accounts for approximately 70% of land use (DEFRA 2006), in Australia more than 60% (BRS 2006) and in the USA approximately 52% (Lubowski and others 2006). The urgency of addressing biodiversity loss in agricultural landscapes is common to all these countries (Cork and others 2006; Defenders of Wildlife 2000; Donald and others 2001), as is the reality that much farm land is privately owned or managed, and thus requires positive co-operation and active management by landholders to achieve effective conservation (Bowers 1999; Gunningham and Grabosky 1998).

The ultimate measure of success of policies aimed at conserving biodiversity will be a halt to its decline. Evidence from Australia (Cork and others 2006; SSCECA 2009), from the UK (EAC 2008), from the EU (McGlade 2009), and from the USA (Defenders of Wildlife 2006; The Heinz Center 2008) suggests that current approaches have not yet achieved this outcome, especially in agricultural landscapes where the predicament of biodiversity is most dire (Donald and others 2002; EAC 2008; VCMC 2007).

In this article we consider why a statutory duty of care for biodiversity is a potentially useful instrument, and identify a number of problems with the concept. We then address two of these problems, firstly articulating characteristics of duty of care to help reduce linguistic ambiguity, and then presenting a framework designed to assist with the development of a statutory duty of care for biodiversity suitable for implementation at a regional catchment/watershed scale.

BACKGROUND

What Policy Instruments have been Used to Address Biodiversity Loss?

A similar variety of policy approaches has been adopted in Australia, the United Kingdom and the USA to address biodiversity loss. These may be classified into five broad groups:

1. Direct action by governments and non-government organisations to acquire land for conservation reserves (Collins and Scoccimarro 2008);
2. Regulation, principally ‘command and control’ style, but also self-regulation and cross-compliance measures;
3. Voluntary approaches, supported by fixed grants and incentives, that engage landholders or community groups to undertake natural resource management activities, designed to effect behavioural change and enhance the likelihood of ongoing adoption of management practices compatible with biodiversity conservation;
4. Education and awareness programs that provide information and technical support, to build social and human capital in natural resource management; and
5. Economic approaches including property-based instruments such as leasehold agreements and covenants/easements that attach to title, revolving funds for land purchase and resale, tax rebates market-based instruments such as auctions, and offset schemes with tradeable rights (Gunningham and Grabosky 1998).

The extent to which individual instruments have been used varies between countries. For instance, in the USA emphasis has been on ‘command and control’ approaches through legislation such as

the *Endangered Species Act (1973)* (Illical and Harrison 2007), as well as voluntary and cross-compliance measures through the *Food, Conservation, and Energy Act (Farm Bill)* (Cocklin and others 2006) and incentive programs run by non-government agencies such as Defenders of Wildlife. UK policy currently focuses on voluntary programs and mandatory cross-compliance measures driven through the Common Agricultural Policy (CAP) (Davies and Hodge 2006).

In Australia ‘command and control’ regulation of biodiversity has focused on public land or threatened species conservation and until recently private land received relatively little attention (Gunningham and Grabosky 1998). The most significant regulation affecting biodiversity on private land has been the introduction of vegetation clearance controls, phasing out broad-scale clearing of vegetation, which commenced in the 1980s in South Australia. Strong criticisms, from the agricultural sector in particular, include the perceived infringement of property rights, an unfair cost burden on landholders, excessive bureaucracy and red tape, high enforcement costs, an adversarial nature, inflexibility and the stifling of innovation (Cocklin and others 2007; Industry Commission 1998; Productivity Commission 2004). Dissatisfaction with ‘command and control’ approaches prompted a shift to non-regulatory, voluntary approaches to biodiversity conservation, with emphasis on the use of economic instruments (Cocklin and others 2007).

In Australia it is acknowledged that the current scale of investment and voluntary participation in biodiversity management, although impressive, will not be sufficient to bring about the changes needed at a landscape scale (Curtis and others 2000; Pannell and others 2006). Indeed, after more than a decade of significant investment in conservation on private land, biodiversity continues to decline (Cork and others 2006; SSCECA 2009; VCMC 2007).

Legal responsibility for natural resource management in Australia rests largely with State and Territory Governments, but a shift to regional catchment/watershed governance has resulted in significant delegation of responsibility for deciding the priorities for public investment in biodiversity conservation on private land. The task of regional catchment management organisations (CMOs) is a difficult one, particularly with respect to biodiversity conservation on

private land. In part this is because significant shortcomings exist in current policy arrangements which have led to instrument failure.

Broadly speaking, instrument failure can be classified according to the underlying reasons. These include policy gaps, policy misalignment, and poor implementation (Gunningham and Grabosky 1998), as well as architectural problems (Donald and others 2002; Martin and others 2007), and low social acceptability (Davies and Hodge 2006; Stankey and Schindler 2006). For instance, problems identified with the Australian *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC) include poor design of objectives, lack of political will, lack of resourcing, and an absence of positive measures applicable to private land (Beynon and others 2004; Gunningham and Grabosky 1998; SSCECA 2009). Similar criticisms have been levelled at the *Victorian Flora and Fauna Guarantee Act (1988)* (VAGO 2009). Economic instruments, although reputedly more cost-effective and socially appealing than statutory regulation, are less dependable and have not been effective in all situations (Bowers 1999; Dobbs and Pretty 2008; Gunningham and Grabosky 1998).

World-wide it is accepted that no single policy instrument will bring about optimal outcomes for natural resource management, and the use of a mix of instruments, including well-designed statutory regulation (Driesen 2003; Harrison 2001), is recommended to overcome this problem (Doremus 2003; Gunningham and Grabosky 1998). While the intended use of multiple approaches is evident in many strategies addressing biodiversity conservation, Dovers (2005) considers this to be limited. A clear rationale explaining why particular instruments have been chosen is often missing.

In Australia many instruments for biodiversity conservation emphasise increasing the quantity of habitat. A major gap in the suite of instruments currently used for biodiversity conservation is a mechanism for encouraging ongoing responsible management activities that avoid or minimise harm to biodiversity (Stoneham and others 2000). Instruments that do address this need are voluntary, e.g. Land for Wildlife, conservation covenants, and though their outcomes are positive,

their application to date has been limited. A statutory duty of care for biodiversity has been suggested as a policy instrument that could meet this need. We have developed a possible framework to assist with implementation of a duty of care in a regional catchment setting. Before describing our framework, we will look at how duty of care has been applied in an environmental context.

DUTY OF CARE

Broadly speaking a duty is ‘an act or a course of action that is required of one by position, occupation, social custom, law or religion’ (Editors of the American Heritage Dictionaries 2006). ‘Duty of care’ is most widely recognised as a legal concept associated with common law in countries that have adopted the English legal system, such as Australia, New Zealand, USA, and Canada (University of Ottawa 2007).

‘Duty of care’ is defined variously as:

- The legal obligation to take reasonable care to avoid causing damage (Martin and Law 2006);
- The obligation owed to anyone whom it is reasonably foreseeable would be injured by that lack of care of that person (Nygh and Butt 1997); or
- A duty to use due care toward others in order to protect them from unnecessary risk of harm (Merriam-Webster's Dictionary of Law 1996).

‘Duty of care’ has evolved over time to its current form in common law. As early as the fourteenth century, the concept of a person owing a duty towards another or their property was reported in the British legal literature (Luntz and Hambly 1995), but only as an adjunct to other types of legal action (Baker 1990). It was not until the case of *Donoghue v Stevenson* (1932) that ‘duty of care’ achieved formal recognition in its modern form (Luntz and Hambly 1995). In general for a person to be liable for negligence in common law, a number of criteria must be satisfied:

1. It must be established that a person owes a duty of care to another person (or their property). A duty holder will typically have a relationship that entails some position of power over another

person. This relationship is clearly bounded; for instance, an individual doctor's duty is limited to the patients under his/her care, but does not include all people in need of medical attention.

2. A reasonable standard of care must be employed in carrying out or omitting to carry out a particular action. A 'reasonable standard of care' in this sense refers to the actions that a reasonable person would do or not do, in adhering to community standards (Nygh and Butt 1997). While 'reasonableness' is seen as an objective test in law (Bates 2001), it is nevertheless a concept that is sensitive to context, including the degree of hazard associated with the actions (Bates 2001), the personal characteristics of the parties involved, and their relationship to each other (Nygh and Butt 1997). In that sense what is reasonable for one person, may be unreasonable for another.
3. The damage caused was reasonably foreseeable as result of the actions or omissions. Foreseeable harm or damage is the type of harm that, based on the best available science and knowledge, is likely to occur as a result of the activities in question. Accidental harm is excluded from the concept (Bates 2006).
4. The harm or damage that occurred was not too remote from the breach of the duty (Bates, 2001, 2006; Kerr, 2002). This criterion recognises the proximity or neighbourhood principle articulated in *Donoghue v Stevenson* (1932), allowing for indirect, as well as direct causation of harm.

In common law the interpretation of these four criteria is still subject to debate, and dissenting views are not uncommon. As knowledge, technology, and society's expectations and standards change over time, it is to be expected that the common law understanding about duties and responsibilities will continue to change to reflect these broader shifts (Kerr 2002).

Problems with a Duty of Care

A number of Australian states have introduced a general duty of care to the environment through statutory legislation. Examples include the *Soil Conservation and Landcare Act 1989*, the *Pastoral*

Land Management and Conservation Act 1989 and the *Natural Resources Management Act 2004* in South Australia, the *Catchment and Land Protection Act 1994* in Victoria, the *Environmental Protection Act 1994* and the *Land Protection (Pest and Stock Route Management) Act 2002* in Queensland.

While each of these acts has included biodiversity within its terms of reference for the duty of care, none has effectively addressed the biodiversity issue, for a variety of reasons. In Victoria the *Catchment and Land Protection (CaLP) Act 1994* reformed and updated the *Soil Conservation and Land Utilisation Act 1959* and the *Vermin and Noxious Weeds Control Act 1959*, but was largely confined to the contexts of the preceding legislation. ‘Biodiversity’ was not a commonly used term, even in 1994, and although the definition of ‘land’ included native flora and fauna, they were in many ways ‘lost’ within the broader concept. In the *CaLP Act*, landholders must take reasonable steps to avoid harming their neighbour’s biodiversity, but have no requirement to avoid harming biodiversity occurring on their own property. In most cases there is an absence of supporting guidelines or codes articulating how the duty of care should be enacted, or in the case of the Queensland *Environmental Protection Act 1994*, codes of practice are framed around land use rather than ecological processes, in effect limiting the application of the duty to instances where no major imposition on agricultural practices is implied.

In the UK, the requirements of the mandatory Good Agricultural and Environmental Condition (GAEC) and Statutory Management Requirements (SMR) standards in cross-compliance policies (DEFRA 2007) show hallmarks of an environmental duty of care, although the term is not used explicitly. In a recent amendment to the English *Natural Environment and Rural Communities Act 2006*, Section 40(1) places a duty on all public authorities to conserve biodiversity. Early signs are that the Biodiversity Duty is too weak in its wording and attention to enforcement, to realistically be an effective mechanism for improving biodiversity conservation (EAC 2008). Despite the obligation placed on public agencies to incorporate the duty into their strategic planning it appears that not all have done so (EAC 2008).

The UK focus on public agencies as duty-holders stands in contrast to much of the Australian discussion which has typically portrayed land owners and managers as duty-holders. Our work maintains a focus on landholder duty of care, as we believe it offers greater potential for effecting changes in biodiversity conservation in agricultural landscapes. In this sense, a duty of care would apply to managers of both public and private land.

We believe that a duty of care, framed specifically around biodiversity, will ensure that the needs of this important element of our environment are properly considered, while also providing a precursor for a broader duty of care to the environment. Intermittent discussion about an environmental duty of care in the Australian literature has highlighted a number of other difficulties with the concept of duty of care (e.g. Binning and Young 1997; Industry Commission 1998; Productivity Commission 2004; Young and others 2003). These include linguistic ambiguity (Carey and Burgman 2008) in the way ‘duty of care’ is understood in a natural resource management context, and in particular how it differs from ‘stewardship’, a concept with which it is often confused in public discourse (e.g. HRSCEH 2001; Productivity Commission 2004). Implementation of a statutory duty of care in a way that is socially acceptable, as well as economically and environmentally effective, is also a challenge where a range of important and powerful stakeholders are involved. Our research begins to address these challenges.

RESEARCH METHODS

We used a qualitative research approach that included extensive document review and key informant interviews. Following a broad survey of predominantly Australian literature addressing duty of care and related topics, a subset of documents was selected to identify linguistic characteristics. Document review is a widely used tool for analysing linguistic and thematic content, in both published and unpublished material (Seale 2003). Document review involves systematic categorisation of information into either predetermined or emergent themes (Silverman 2006). In this case documents were selected because they supplied either a definition or description of what was meant by the terms ‘duty of care’ or ‘stewardship’, or they provided

examples of how the terms were used in relation to natural resource management issues. In total 51 documents were reviewed, including dictionaries, refereed journal papers, conference papers, media and electronic sources, books, and ‘grey’ literature such as government reports and policy documents, public inquiry reports and submissions (Table 1).

INSERT TABLE 1 ABOUT HERE

Face-to-face semi-structured interviews were then undertaken with 14 Australian-based individuals purposefully chosen because of their leadership in the disciplines, which the document review suggested, underpinned the concepts of ‘duty of care’ and ‘stewardship’, including philosophy, ethics, theology, environmental law and economics (Table 2). Participants were asked to explain their understanding of the terms ‘duty of care’ and ‘stewardship’ in relation to natural resource management, and to reflect on how a duty of care could operate in practice. Transcriptions of these audio-taped interviews, together with the reviewed documents, provided data for thematic content analysis.

INSERT TABLE 2 ABOUT HERE

Qualitative thematic content analysis involves categorisation of words or sections of text into codes (Dey 1993). The interview transcripts were categorised using codes established during the document review. Categories were added as new ideas emerged from the interviews. The information within each category was combined with the data from the document review to suggest how to reduce ambiguity around the term ‘duty of care’.

A framework, representing decision paths for a duty of care, was devised principally from the Industry Commission (1998) report. Under this proposal a single statute in each State or Territory jurisdiction would articulate an environmental duty of care incorporating voluntary environmental standards, supported by recognised codes of practice. Standards are intended to be measurable, outcome-based, and tailored to suit local situations. Mandatory standards are also proposed, but only for use as a last resort, with this model relying extensively on self-regulation.

Our framework is modified from the Industry Commission (1998) in a number of ways. It addresses a duty of care for biodiversity at a regional scale, and a number of other variations have been made, and are discussed. This framework also drew inspiration from policy, legal, economic and philosophical literature, as well as the key informant interviews.

FINDINGS

Understanding Duty of Care and Stewardship

Shared understanding of language is of fundamental importance with interdisciplinary studies (Bracken and Oughton 2006) including those which involve environmental decision-making (Burgman 2005; Wallace 2007). Linguistic ambiguity (Carey and Burgman 2008) has been raised as one of the constraints impeding adoption of a duty of care for biodiversity, especially the conflation of the terms ‘duty of care’ and ‘stewardship’.

The word ‘steward’ originally described a person with responsibility for managing the household and staff of a nobleman or a king, although duties were sometimes extended to include management of financial affairs (Lerner 1993; Oxford English Dictionary Online 2007). In that sense ‘stewardship’ referred then to the position or actions of a steward. In its contemporary usage, ‘stewardship’ is defined as ‘the careful and responsible management of something entrusted to one’s care’ (Merriam-Webster Online 2006). In its modern context stewardship has changed so that it now encompasses Christian religion, philosophy, business, land management, natural resource management and governance (ABC 2007; Carr 2002; Lerner 1993; Macnamara 2004; Roberts 1992) and it has shifted from being a localised concept to one that is more worldly and holistic (Zeller 1999). The binding concept in all of these applications, past and present, is that stewardship is about ‘*looking after something not for oneself, but for another or others*’ (Bryden and Hart 2000). In its current form environmental stewardship is also very concerned with responsibility, respect for biodiversity, health of the environment and the principle of inter-generational equity, (Carr 2001; Lerner 1993; Zeller 1999).

This description of the derivation of stewardship can be contrasted with the definitions of duty of care provided earlier. Table 3 provides a summary of this comparison.

INSERT TABLE 3 ABOUT HERE

How are Terms Used by Experts?

Amongst the fourteen informants interviewed, understanding of ‘duty of care’ and ‘stewardship’ was expressed in terms consistent with many of the semantic characteristics described in Table 3, as demonstrated in the following verbatim quotes from the interviews. ‘Duty of care’ was generally recognised as a legal concept, with defined boundaries, reflecting a responsibility imposed by society. For example

“...a duty of care means very much what it says - a responsibility which is assigned socially, and by legislation, in order to maintain aspects of resources broadly conceived, for present and future generations.” (Key informant #6, Economic historian)

In contrast ‘stewardship’ was recognised as an ethical concept, less bounded and often associated with Christianity. For example

“The thing with stewardship is we tend to think of it in terms of just caring, not duty of care. A steward cares. You care for it because God’s given you care for your kids, ... give[n] you the Earth in common, it’s yours, you know, to look after.” (Key informant #9, Philosopher)

How are the Terms Used in Public Discourse?

A word or term may be used by experts in different disciplines with a range of meanings, or the meaning of a word or term in a particular discipline may be different to its everyday meaning; these are known as dialects (Bracken and Oughton 2006). When applied in a contemporary environmental context, the term ‘duty of care’ appears to take on other meanings in addition to its common law connotation (Hatfield Dodds 2004), with several different dialects of ‘duty of care’ apparent in the natural resource management literature. For example, Bates (2001) and the Industry Commission (1998) use it to mean a mechanism contained in statutory legislation, designed to promote a standard of outcome, while Binning and Young (1997) treat it as a financial

threshold below which costs associated with environmental management should be borne by landholders, and above which public funds for assistance to landholders should be available. The NECMA (2005) describes duty of care as a system of ethics.

Similarly the term ‘stewardship’ may be used to convey a variety of concepts including a land ethic (e.g. Carr 2001), a way of managing land which also incorporates improvements in productivity (Andrew and others 2007), a way of managing land above the duty of care to produce public good outcomes (VCMC/DSE 2003), and even an institutional program which facilitates partnerships between government and private landholders to facilitate on-ground works on private property e.g. (MDBC 1996).

While many of these definitions are broadly consistent with the characteristics described in Table 2, other examples from literature suggest ‘duty of care’ and ‘stewardship’ are used in ways that confuse their respective characteristics or result in them being used interchangeably. For instance, in its inquiry into catchment management, the Australian House of Representatives Standing Committee on Environment and Heritage (HRSCEH) suggests that like duty of care, stewardship is an obligatory ‘duty’. However, their descriptions clearly imply an additional characteristic that distinguishes the two terms. ‘Duty of care’ is concerned with the ‘here and now’, while ‘stewardship’ is concerned with the future and eternity (HRSCEH, 2001).

The Queensland Department of Natural Resources and Mines described the legal obligations of stewardship, confusing the voluntary and ethical concept of ‘stewardship’ with the obligatory and legal concept that is ‘duty of care’.

“The stewardship model, by contrast, draws the mutual obligations held between the resource holder and society within the boundary of the property right rather than deeming them to be external to the title. By this model, title holders accept their implicit and explicit legal obligations as stewards as a necessary condition of accepting title, not as something superimposed upon an otherwise autonomous right” (DNRM 2003, p 12).

In literature from the general public and non-government organisations, recurring themes about ‘duty of care’ included the lack of clarity in its meaning, the suspicion that it was a mechanism developed to allow governments to shift financial responsibilities for public good conservation on to landholders, and an assumption that non-productive conservation of biodiversity was solely a matter of public benefit (HRSCEH 2001; Industry Commission 1998). For example the National Farmers Federation submission contended:

The concept of a duty of care is increasingly used by Government and by the conservation movement to justify placing the burden of public good conservation on farmers (HRSCEH, 2001, p. 33).

The characteristics of ‘duty of care’ and ‘stewardship’ described in Table 3 provide a guide to assist with meaningful and unambiguous discussion about their potential application in the natural resource management field. Specifically ‘duty of care’ has a moral basis but is usually enshrined in legislation. It is externally imposed and obligatory, but it reflects a standard that is widely held by society, in effect a social norm, or one that governments seek to embed in society. It is usually articulated and/or supported by codes or guidelines, and is specific to particular entities. ‘Duty of care’ also appears to be about the present.

‘Stewardship’ also has a moral basis, but is clearly a personal ethic, internally driven and reflecting an individual, voluntary standard. It may show in behaviour, but other concerns may limit its expression. ‘Stewardship’ is never translated into legislation. In contrast to ‘duty of care’, it tends to be more worldly and holistic, and often has a spiritual foundation. An emergent and related characteristic of ‘stewardship’ is its focus on ‘eternity’ rather than the immediate.

Another major impediment for a statutory duty of care for biodiversity is the pragmatic one of making it socially acceptable. In the section below we present a framework for implementing a duty of care for biodiversity based on the Australian regional catchment/watershed scale, but potentially applicable in a range of situations. Our framework draws on information from the

document review and key informants, and builds on the model proposed by the Industry Commission (1998) in its inquiry into ecologically sustainable land management. The framework is designed to provide an operational guide to assist those developing a statutory duty of care for biodiversity.

A Statutory Duty of Care and Operational Framework

In this section we consider how a statutory duty of care could be structured in legislation and made operational in a regional catchment/watershed setting. While our focus is on the Australian context, this approach has wider relevance. Our main purpose here is to present a framework to provoke discussion about how a duty of care could function in a regional catchment/watershed setting, rather than deliver a finished product.

Legislation

Governance Arrangements

Responsibility for natural resource management in Australia largely rests with states and territories. Continuing with this arrangement we envisage that a statutory duty of care for biodiversity could readily sit within existing legislation such as the Victorian *Catchment and Land Protection Act 1994*, or the Queensland *Environmental Protection Act 1994*, if they were modified appropriately. Alternatively, a duty of care could be incorporated into new legislation, as happened in the South Australian *River Murray Act 2003*, or as part of a complete overhaul and simplification of legislation, as suggested by the Industry Commission (1998), and as happened in New Zealand with the *Resources Management Act 2003*.

Key Elements of Legislation

The statutory duty of care for biodiversity that we envisage could be phrased in the following way:

All land managers have a duty to the community (that values biodiversity), to take reasonable steps to ensure that their management does not cause foreseeable harm to the biodiversity over which they have influence.

This statement embodies a simple expression of a duty of care for biodiversity that could appear in the body of legislation. As well as *biodiversity* and *management*, it contains a number of terms including *land managers*, *the community*, *reasonable steps* and *foreseeable harm* that would require clear definition within the terms of a statute.

Definitions

Land Manager

In simple terms a land manager is any person whose land management may directly influence biodiversity, either in the long or short-term. To limit the application of the term to rural land managers, there could be a caveat specifying a minimum area of land under management, thus excluding urban areas. This definition would embrace all private land managers including land owners and leaseholders, as well as public land managers. A broader definition of ‘land manager’ could include state and local government agents with planning and approval responsibilities that affect biodiversity, or those who may cause incidental harm to biodiversity in pursuing their statutory responsibilities, such as road or fire management agencies. In this article we will follow the narrower definition of land manager.

Biodiversity

Biodiversity is the variety of life, or more precisely defined as “the variability among living organisms from all sources including, *inter alia*, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems”(United Nations 1992).

Ecosystem

An ecosystem is defined as “a dynamic complex of plant, animal and micro-organism communities and their non-living environment interacting as a functional unit” (United Nations 1992).

The Community

We envisage that the duty of care is owed to the community, rather than to biodiversity directly.

The advantage of this approach is that it enables the community (that values biodiversity), to act as an advocate for it (Martin and Verbeek 2006), and as a witness to hold the duty-holder to account. In this way, the framework retains an anthropocentric character, and thus presents a less dramatic shift from the way the duty of care concept traditionally applies. ‘Community’ is a term most often used to denote geographically located communities, but as Dovers (2005) suggests, in the natural resource management context it is more usefully expanded to include a broader concept of the ‘community of interest’. Here we adopt this broader concept, following the typology of Harrington, Curtis and Black (2008). Effectively this would provide for open standing, allowing third parties, such as interested individuals, conservation groups or industry groups to take action in response to a perceived breach of a duty, and potentially providing them with a role as surrogate regulator.

Reasonable Steps

The concept of ‘reasonable steps’ stems directly from the tort of negligence, and underpins a duty of care. In a legal sense, ‘reasonable steps’ refers to the actions that a reasonable person would take or not take, in adhering to community standards (Nygh and Butt 1997). In the legal sense a ‘reasonable person’ is capable of reasoning, conducts themselves in accordance with community standards, and is influenced by the nature of the relationship between parties and the relevant personal characteristics of the defendant (Nygh and Butt 1997).

Foreseeable Harm

Foreseeable harm is predictable harm, based on the best available knowledge and scientific information; it is not accidental harm. The types of foreseeable harms to biodiversity that we envisage are those that have the potential to disrupt ecological processes (Pressey and others 2007), and include climate change, degradation or loss of biophysical habitats, altered hydrological flows, nutrient or chemical additions, unsustainable harvesting and introduced species (Bennett and others 2009). In the context of foreseeable harm to biodiversity, scientific uncertainty may arise, caused by, for instance, the lack of complete information; the incidence of

multiple, cumulative impacts; long lag phases before harmful effects become apparent; and the irreversibility of extinction. In these circumstances the precautionary principle provides a mechanism for dealing with scientific uncertainty, but owing to lack of clear definition, implementation guidelines and legislative provisions, it has not been applied in a consistent manner (Peterson 2006). Peel (2005) suggests that in Australia, courts may be starting to give more recognition to the precautionary principle.

Objectives

The legislation would need to define the specific objectives that it seeks to achieve. The key objective in this duty of care is the maintenance or improvement of biodiversity to a specified standard, as a result of taking of reasonable steps to avoid foreseeable harm to it. We see this objective as valuable in discriminating between actions that are the responsibilities of land managers, and other measures that seek to actively improve biodiversity, which may be perceived as ‘beyond a duty of care’. We suggest that the objectives be described only in general terms within the body of the legislation, leaving detailed specification relevant to catchment or sub-catchment settings to be described elsewhere.

Other Elements

Administrative penalties for non-compliance, and review processes also need to be included in legislation. Roles and responsibilities for monitoring and enforcement must be specified in the body of the legislation. In addition, our concept of a duty of care for biodiversity includes an important role for community-based committees. This is discussed further in the next section.

The Framework

Our framework (Figure 1) is presented as a guide to assist with implementation of a statutory duty of care for biodiversity. It focuses on promoting biodiversity through the maintenance or improvement of ecological processes that underlie effective biodiversity conservation (Bennett and others 2009). The framework conforms with much of the current dialogue concerning

biodiversity conservation across landscapes, in seeking to articulate quantifiable and “biophysically meaningful” (Fischer and others 2007) desired outcomes for biodiversity that incorporate measures of size, configuration and connectivity of habitats, as well as vegetation condition measures that collectively act as surrogates for ecological processes (Lindenmayer and others 2008; Oliver and others 2007; Parkes and others 2003; Wallace 2007). It follows closely the model proposed by the Industry Commission (1998) and Bates (2001) for a statutory duty of care, and is focused on application at a regional catchment/watershed or sub-catchment scale. The framework establishes that every land manager has some level of responsibility for biodiversity. It includes both mandatory and voluntary elements associated with a statutory duty of care, and provides positive pathways for action leading to compliance with the duty, ongoing improvement, as well as tiered sanctions to discourage or penalise non-compliance. It draws on the common law duty of care elements of *reasonable steps* and *foreseeable harm* to influence the type of response in the event of non-compliance. In this way, the duty of care can be tailored to take account of individual situations – environmental, social and economic. The same process can be employed to indicate where transitional assistance during a time of change may be appropriate. The framework is designed to accommodate changes in the duty of care that will inevitably result over time, with the advent of new technology, new knowledge, new expectations from society, delayed effects in ecosystem and biodiversity responses, or new climatic conditions that may impact on biodiversity.

[INSERT] **FIGURE 1** A framework to guide development of a duty of care for biodiversity

Key elements of the framework

The framework incorporates a process for determining whether a duty of care for biodiversity has been met. It is intended for use by regional natural resource managers and landholders, and offers multiple pathways for positive management of biodiversity while retaining the capacity to invoke sanctions where management is deemed to be causing foreseeable harm to biodiversity. The framework could facilitate a co-operative approach for addressing the decline of biodiversity in agricultural landscapes in a way that addresses criticisms of ‘command and control’ regulation,

while providing the dependability that regulation offers. Core elements of the framework are the *desired outcomes* for an ecosystem, and the *supporting practices* that, based on the best available information, are likely to lead to the desired outcomes.

“Desired Outcomes”

Desired outcomes represent visionary goals for each ecosystem within an area. In our framework the desired outcomes focus on maintenance of ecological processes, because a) they operate across landscapes and, b) they underpin the sustained protection of biodiversity assets (Bennett and others 2009; Pressey and others 2007), as well as the provision of ecosystem services that humans rely on (Wallace 2007).

In the absence of systems which directly measure ecological processes, we suggest the use of biodiversity elements as surrogates, such as measures of threat abatement or habitat condition, notwithstanding their limitations (Possingham and others 2006; Pressey 2004). These measures can be presented in terms of quantity, quality or spatial configuration, and lend themselves more readily to the setting of criteria for change and correlation with practices (Wallace 2007).

In practice, much natural resource management follows this approach, and is articulated in regional catchment strategies and various biodiversity management plans, which specify desired outcomes for improvement in biodiversity quantity, quality or spatial configuration, with a strong emphasis on voluntary participation of land managers. Our approach here seeks to articulate desired outcomes representing the avoidance of foreseeable harm to biodiversity through maintenance or minimum improvements in ecological processes (using measurable surrogates), and places an obligation on all land managers to manage their land in ways that contribute to the achievement of these outcomes.

Desired outcomes would represent the local interpretation of the objectives stated in legislation. They would need to be consistent with higher order targets such as those contained in regional catchment strategies, but be customised to have local relevance, and pitched at avoiding harm

rather than achieving substantial improvements. Although informed by science, they would be social constructions (Wallace 2007). Desired outcomes could potentially include measures of improvement in, for example, retention of ground litter providing habitat for reptiles and amphibians, extent of weed infestations, area of protected riparian corridors, or condition of understorey vegetation in remnants.

A set of desired outcomes for each ecosystem within a sub-catchment area would be a mandatory requirement of the duty of care. The specific details of desired outcomes could be treated in two ways:

1. They could be incorporated into statutory legislation, for example as schedules, or
2. They could be embedded in documents such as Regional Catchment Strategies or Biodiversity Action Plans.

“Committee of Reasonable People”

Responsibility for determining the desired outcomes would rest with committees of appropriately informed and reasonable people, comprising representatives with expertise and/or interest in biodiversity, drawn not only from the local community, but also more broadly from the community of interest. It is envisaged that committees would operate at a sub-catchment scale, and develop desired outcomes specific to ecosystems occurring in their area. Models for this type of committee can be found; for example the Community Management Networks of Victoria and NSW which undertake conservation management in specific, regional ecosystems across multiple land tenures (Context P/L 2008). Ostrom (1990) also describes a range of community committees that have been established to address environmental management at local scales. As well as defining desired outcomes, these committees could potentially play a role in deciding if non-compliance has occurred, and whether transitional assistance is appropriate.

The establishment of community-based committees is not without challenges. These include initial decisions about appropriate membership and skills, and issues around parochialism, time

constraints of community members, and adequate resourcing (Farrelly and Conacher 2007; Martin and others 2007). Committees of this type may not be suitable in some areas. Recognition and respect by government would be a critical component in their successful operation (Ostrom 1990).

“Supporting Practices”

A set of supporting practices forms the other core element of the framework. We suggest that current recommended practices (CRPs) for an ecosystem are appropriate for achieving reasonable outcomes for biodiversity. The term *current recommended practice* follows the definition given by Clifton and others (2004, p.3):

[Current recommended practices are] *specific management practices that are recommended by industry and adopted by at least some leading producers to achieve land use that is more sustainable from economic, social and/or environmental perspectives.*

As Clifton and others (2004) explain, this terminology modifies the synonymous term, *best management practice*, by recognising the inevitability of changes in such things as knowledge, technology, climate, and societal expectations that will result in changes to our concepts of recommended management practices. CRPs should also be distinguished from practices that are required by legislation, which are sometimes described as *minimum standards*.

CRPs would be based on the best science and information available, notwithstanding imperfect knowledge about biodiversity, ecological processes and responses. Unlike the desired outcomes, CRPs would remain voluntary, but their adoption by land managers would guarantee compliance with the duty of care. However land managers would have the opportunity to develop innovative practices that achieve the desired outcomes in more cost-effective or convenient ways.

Together, the desired outcomes and the CRPs would elaborate a standard of acceptable biodiversity management for each ecosystem within a designated sub-catchment area. Land managers employing management practices that were deemed insufficient to achieve the desired outcomes would not be meeting the duty of care.

“Monitoring”

Monitoring of biodiversity is already a statutory requirement of environmental agencies in Australia. It is envisaged that existing long-term, centralised monitoring processes would provide the basis for biodiversity monitoring relevant to this framework. However, where problems were detected in particular locations, then provision for locally-based monitoring would need to be made.

“Compliance with the Duty of Care”

It is envisaged that most land managers would achieve compliance with the duty of care in the course of their normal management. Compliant land managers would be eligible to participate in programs offering incentives for biodiversity conservation works beyond the duty of care.

“Non-compliance with the Duty of Care”

Non-compliance with the duty of care would remove eligibility for participation in voluntary incentive programs. In this way, the duty of care would provide a barrier discouraging degradation, but no barrier to innovation (Driesen 2003). It would also reduce the problem of ‘crowding out’, where the availability of financial incentives can undermine motivation for voluntary action (Frey 1997). A range of sanctions for addressing non-compliance is proposed, depending on the risk to biodiversity, and the context of the non-compliance (whether ‘reasonable steps’ were taken, and whether the harm to biodiversity was ‘foreseeable’). Positive measures, such as education, information, and transitional funding, to assist non-compliant but willing landholders to move to a level of compliance, form key components of this framework.

For non-compliant and unwilling land managers an enforcement pyramid, incorporating a range of tiered, negative sanctions is proposed (Braithwaite 2002). Sanctions include peer pressure, administrative measures (e.g. infringement notices), as well as stronger punitive measures, such as civil legal penalties. Where costs are involved in the transition to compliance, the framework draws on the concept of ‘reasonable’ measures, incorporating economic and social considerations, to determine whether or not an impacter-pays approach should be adopted. Where it is deemed

unreasonable for a land manager to pay all costs in order to achieve compliance, financial assistance may be offered for a specified, transitional period. Transition payments should be distinguished from incentive payments for voluntary conservation management above the duty of care, in name, intent and duration. It is envisaged that peer pressure, along with the legal status of the duty of care and the articulation of desired outcomes, would play a strong role in encouraging positive measures to achieve compliance with the duty of care.

“Enforcement”

We do not address enforcement in any detail in this article, although it is an important consideration in the development of a duty of care. We limit our suggestions to a proposal for a tiered approach to enforcement powers and penalties, based on the seriousness of the breach of duty and the risk of harm to biodiversity. Enforcement powers could range from informal communication from neighbours, formal communication from an authorised committee, infringement notices issued by statutory authorities, through to civil law penalties issued by tribunals or courts. Similarly, a spectrum of penalties including shame (not enforceable), administrative measures, financial measures, through to legal measures could be established. The impetus to resolve issues through less formal approaches would come with lower transaction costs and more rapid access to adjudication of cases.

“Managing Change”

Over time, changes in knowledge, technology, and societal expectations will occur. A duty of care framework needs to have the flexibility to adapt with these changes, and an adaptive management cycle incorporating monitoring, reflecting and learning is suggested. Normal practice for review of regulation specifies a five year cycle (OBPR 2008). With new instruments, more frequent review may be preferable to allow for settling in (Gunningham and Grabosky 1998), and this may be appropriate for a statutory duty of care. Where a review results in changes to the desired outcomes and/or supporting practices, it is envisaged that transition payments would be available for a specified period, where it was deemed unreasonable for land managers to fund changes

themselves. As above, transition payments should be distinguished from payments for voluntary conservation management. After the transition period, the new desired outcomes and supporting practices would be incorporated into the new duty of care, setting a new standard of normal biodiversity management. This change phase is represented in Figure 2.

INSERT ABOUT HERE **FIGURE 2** A framework to guide development of a duty of care for biodiversity (change phase)

DISCUSSION

Our examination of the semantic foundations of ‘duty of care’ and ‘stewardship’ suggests there is a suite of underpinning characteristics that can be used to distinguish the terms. A clear appreciation of these distinctions by researchers, policy makers, program managers and land managers may allow discussions about biodiversity conservation and the potential role of a duty of care, to proceed with a shared understanding, overcoming the confusion that currently prevails.

In this article we have shown that a statutory duty of care has some significant advantages as a potential policy instrument to promote biodiversity conservation on private land. Most importantly it has the potential to fill an existing policy gap, by establishing accepted standards for ongoing biodiversity management across all land tenures including private land. These are normative standards, and have the potential to minimise or avoid types of foreseeable harm to biodiversity that are currently permissible under existing legislation, such as harm resulting from unregulated stock access to riparian frontages.

Our proposed framework needs further development and testing, but we have completed a desktop evaluation of its design. The framework incorporates a number of good regulatory design principles into its structure (Driesen 2003; Gunningham and Grabosky 1998).

1. It sets a standard of acceptable biodiversity management that includes desired outcomes for biodiversity and supporting practices that, based on current understanding, will lead to achievement of the outcomes.

2. Its focus on outcomes leaves land managers to decide which practices to adopt, and provides opportunities for the development of less costly, innovative ways to achieve the outcomes.
3. It is designed as an instrument that stands with other instruments. It thus invites the application of multiple policy instruments, by providing a range of alternate pathways to address non-compliance.
4. The framework incorporates a tiered response to non-compliance, ranging from positive measures designed to move land managers to a compliant state, to tiered negative sanctions as a last resort where no intention to comply with the standard is indicated.
5. It provides for community-based committees to play important roles in determining locally relevant, desired outcomes for biodiversity, and potentially in monitoring and compliance efforts within local areas.
6. The standard for biodiversity management could be used as an eligibility criterion for participation in incentive programs offering financial assistance for works beyond the duty of care. The standard could then also function as a means to reduce the phenomenon of ‘crowding out’.
7. The framework accommodates change, and includes provision of transitional assistance under particular circumstances.

We think this framework outlines a way in which a statutory duty of care for biodiversity could operate in Australian regional catchment/watershed settings. We intend to test the framework in this setting through further case study research, initially for its social acceptability. The framework is potentially of much wider relevance, and could be adapted to operate at a range of geographic scales, and under a variety of governance arrangements. However, any attempt to apply it in a particular setting would need to consider how it would ‘fit’ with the relevant legal, policy and governance institutions, as well as the availability of resource capacity (financial and expertise) to

implement it.

The framework here is offered as a concept for consideration and discussion amongst policy makers, land managers and other stakeholders, about its use as a tool to assist with the development of a statutory duty of care for biodiversity.

ACKNOWLEDGMENTS

Our thanks go to the many people whose ideas and comments have infused this paper, including interviewees and participants in workshops discussing duty of care, held at the Department of Sustainability, Melbourne in April 2007 and September 2008. Associate Professor Ian Lunt, School of Environmental Sciences, Charles Sturt University engaged in valuable discussions about the interface between the duty of care framework and ecological processes. Gabrielle Lyndon, Librarian at the Productivity Commission in Melbourne, very graciously allowed us electronic access to public submission documents. We are very grateful to the two reviewers whose comments and suggestions have greatly improved this paper. This research is supported by a post-graduate scholarship from the Future Farm Industries Cooperative Research Centre.

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