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# An Introduction to Human Dimensions of Wildlife Management:

Taking the North American Experience to Australia



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## **HUMAN DIMENSIONS RESEARCH UNIT PUBLICATION SERIES**

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## **An Introduction To Human Dimensions Of Wildlife Management:**

### **Taking the North American Experience to Australia**

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**Key Words:** assumptions, Australia, citizen participation, human dimensions, North America, public involvement, stakeholders, values, wildlife management.

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## EXECUTIVE SUMMARY

The practice and philosophy of wildlife management in Australia has been strongly influenced by an historical orientation toward vertebrate pest management. The training and experience of many managers has been dominated primarily by biological and technical aspects, with little or no attention to social issues. Nonetheless, many managers find their daily work increasingly preoccupied with what may be termed 'people problems.' These problems are associated with, among other influences, greater public scrutiny of wildlife management actions and increased involvement of social groups in decision making. Typically managers are poorly equipped to deal with this 'human dimension' of their work. In North America, workers have been investigating the human dimensions of wildlife management for over two decades.

Using a variety of social science techniques, researchers and wildlife managers often have collaborated to integrate highly relevant social information into wildlife management decision-making. Furthermore, public involvement in decision making in many situations has evolved toward sharing responsibilities between professional managers and communities. The authors draw on a body of North American studies to provide an overview of the emerging field called Human Dimensions, with an emphasis on findings of broad applicability to wildlife management in Australia. In particular, the importance of assessing assumptions and of investigating social values are explored. Finally, the importance of and benefits associated with the integration of human dimensions in wildlife management are discussed.

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## INTRODUCTION

The practice and science of modern wildlife management, already a diverse combination of theory, technology, information, methodology, common sense and communication, is becoming steadily more complex. Modern wildlife managers face a plethora of challenges, including new ecological problems, new technological tools, and even the restructuring of the organisations for whom they work. In addition, many accepted principles and underlying philosophies of the field are being seriously questioned (Romesburg 1981, Murphy and Noon 1991). At the same time wildlife managers are expected to be increasingly involved in, informed about, and responsive to, a variety of issues of sociopolitical dimensions (Nudds and Morrison 1991, Decker and Enck 1996).

Among these many issues, those that are frequently regarded as the most difficult are often described as the 'people problems' - situations that, in the view of many managers, threaten to seriously undermine their ability to 'do their job' (Schmidt 1990, Jones 1993). Some wildlife managers appear to view these intrusions on their time and professional lives as misdirected interference by ill-informed, non-experts with political or ideological agendas (Timm 1992). Alternatively, the comments made by the public may be viewed as simply ignorant, sentimental or unscientific barriers to making progress in real-life problems requiring definite management actions (L. Thomas and D. Jones, unpublished data). Such attitudes are especially likely in situations such as vertebrate pest management where, traditionally, human-wildlife conflicts have been mitigated by lethal or removal actions.

Frustration with these 'people problems' is likely to be particularly evident among managers working in situations exposed to high public scrutiny (Decker and Enck 1996). In many ways, this frustration may be largely a product of the long-term reluctance by wildlife managers (and frequently their academic educators) to recognize the importance of human values and perceptions in establishing the objectives of the profession. While the working conception of wildlife management (e.g., see Decker et al. 1992) has expanded considerably from its initial utilitarian themes (e.g., see Leopold 1933) to include, for example, a clearer conservation-natural resources orientation, the essential role of society in the evolution of these definitions has been largely ignored or minimised (Decker et al. 1992). While everyone seemed to agree in principle with Burger (1979:95) that "wildlife management is aimed at achieving human goals," in practice there appears to be a tendency for "professional wildlifers and agencies [to] set their own goals ..., with at least the implication that 'we know best'" (Burger 1979:95).

One result of these possibly widespread attitudes among wildlife management professionals is the strange juxtaposition of a blind acceptance of some broad societal goal (e.g., the control of rabbit populations) with a reticence to include current social attitudes (e.g., animal welfare concerns). This situation is further exacerbated by the fact that human values and attitudes (as they relate to wildlife) themselves change over time. Having made an assumption about some apparent community concerns, managers may be surprised to find their assumption is seriously out-dated or misdirected (Enck and Decker 1997).

## The Emergence of Human Dimensions

It has been the inability of traditional wildlife management approaches to adequately address 'people problems' that led to the emergence of interest in the 'human dimension' of wildlife management. Now recognised as a distinct sub-discipline within the field (Manfredo et al. 1995), human dimensions (as it has become known) emerged from a recognition of the necessity for including social information in areas traditionally dominated by biological and technical information (Decker et al. 1987). Starting in the 1960's, numerous North American wildlife professionals began to investigate how people's values affect and are affected by wildlife management decisions (Shaw and Zube 1980, Manfredo 1989, Purdy and Decker 1989). Interest has grown significantly over the past three decades and many agencies and universities throughout North America now have elements actively involved in research and teaching of human dimensions.

Staff in the Human Dimensions Research Unit (HDRU), located in the Department of Natural Resources at Cornell University in New York State, have been conducting human dimensions inquiries for more than 20 years. Recently the lessons of several decades of this work (largely state-based studies of specific problems) have begun to be assessed and synthesised (Siemer and Decker 1991, Decker et al. 1992, Decker and Enck 1996, Enck and Decker 1997). One conclusion to emerge from these reviews is that the relevance of this approach is not limited to specific issues of the eastern United States. Rather, the insights and overviews emanating from these studies provide a useful background for those considering the implications of human dimension of wildlife management elsewhere in the world.

Wildlife management in Australia is currently confronting a multiplicity of human-based challenges, many of which are similar in nature to those experienced by North American managers (Temby 1995, Korn 1992). Equally, it is clear that there is no consensus on the direction forward (see Jones 1993, 1995; Korn 1992, 1995). It is our opinion that there is much to learn from the extensive experience of human dimensions studies from North America. Equally it is imperative that Australian wildlife managers design a human dimensions approach that is appropriate and relevant to the particular situation existing in Australia.

This paper is designed to summarise some of the main principles and findings of the somewhat inaccessible or less well known North American studies for managers in Australia. The overall aim is to present a distillation of some key elements of human dimensions that may be important for modern wildlife management procedures and practice in Australia. The issues explored represent only some of the many facets of this complex field but they are considered fundamental. Underlying this aim is the conviction that wildlife managers do not require specialised training in social science methodologies to make use of human dimensions information in their daily work. Such a background is essential for those undertaking original research but an appreciation of the basic tenets of the approaches used and their relevance to real-world situations is far more important to the typical manager. Furthermore, we wish to emphasise the positive outcomes and benefits for managers that are able to incorporate these insights into their overall approach to their work (see Decker and Chase 1998).

## Influences on Wildlife Management in Australia and North America

Human dimensions difficulties are likely to be especially potent in situations where wildlife management has a strong emphasis on what could be regarded as traditional population-manipulation goals: preserving, maintaining or producing viable populations of wildlife (e.g., Hudson and Rands 1988). Although there are now many similarities in the ways that wildlife management is practised and taught in Australia compared to Europe and North America, there are also some important differences of relevance to this discussion.

This brief review is not a detailed international comparison of the field nor is it a treatment of the evolution of wildlife management in Australia; such a review remains to be completed. Notwithstanding the general lack of direct information, it may, however, be fair to portray wildlife management in Australia historically as being influenced heavily by European sporting-game management philosophies and techniques yet being mainly preoccupied with vertebrate pest management (e.g., Jarman 1990). If so, it would appear to be likely that Australian managers turned to North American authorities for advice and information.

For various historical reasons, wildlife management in North America has been very different to that practiced in Europe (Hudson and Rands 1988). To give one important example, most hunting in Europe has been restricted or regulated by (typically) hereditary landholders (especially in Great Britain) or highly controlled hunting organisations (e.g., France, Germany, Sweden), whereas North American hunters have always had far greater access to large areas of game habitat (Hudson and Rands 1988, Lenzini 1992). This single aspect has had a major influence on the development of the field of wildlife management in the two continents, with European practice being dominated by intensive (and often idiosyncratic) management on individual estates as compared to large-scale but more generalised techniques being applied in North America (Hudson and Rands 1988, Lenzini 1992). Such differing historical influences in part explain how the 'science of managing wildlife' has expanded and evolved dramatically in North America (Leopold 1933). Given the similarity of Colonial land ownership patterns, this also partially explains why the field in Australia has been more heavily influenced by North American rather than European practices and approaches. Other historical influences have also had lasting legacies (e.g., Colonial laws, forms of wildlife exploitation, etc.) but will not be dealt with here (but see Reiger 1979, Lenzini 1992).

Thus, since the advent of modern wildlife science in the 1930s, North American wildlife managers have tended to concentrate on population enhancement and maintenance, specifically (in Leopold's [1933:3] words) "the art of making land produce sustained annual crops of wild game for recreational use." In addition, this new profession was involved in reducing populations of natural predators as well as dealing with agricultural pests.

Their austral counterparts were, at least initially, either British-style game managers (who struggled with the lack of appropriate 'game' species (Allison 1969, Frith 1973)) or those primarily concerned with confronting introduced and native species classified broadly as 'pests' (Frith 1973). Until relatively recently, however, most of this pest management was undertaken by individual landholders without the direction or knowledge of relevant agencies (Jarman 1990).

With a few notable exceptions (e.g., Ratcliffe 1938), organised and ostensibly scientific wildlife-related research did not occur in Australia until after the Second World War (Frith 1973); only since the 1950s have biologists in this country been employed specifically for wildlife research and management (Jarman 1990). Compared to the relatively long history and rather specific goals of North American wildlife managers, the profession in Australia is both young and small (see Decker et al. 1992 and Brown et al. 1994). Nonetheless, the diversity of influences (including, for example, historical attitudes and laws, and the dynamic interactions between ownership, responsibility for, and access to, land and wildlife resources) has produced a profession no less complex and multi-faceted than that of North America. We would argue, moreover, that a crucial step in the development of contemporary wildlife management in Australia will require a careful and reflective assessment of these influences, an important task that cannot be attempted here.

Until fairly recently, wildlife managers in both continents have been somewhat removed from direct interactions with different stakeholder groups. Those professionals employed in wildlife management have often been scientists and technicians working on specific single-species, population-level projects for state or federal agencies, with little or no contact with outside groups. Project goals were largely derived from agency or government policies with any assessments of progress and alteration of aims occurring within the relevant organisation. Even when policies may have resulted from the initiative of external stakeholders (such as farmers' groups lobbying for pest reduction), managers have been relatively free to undertake whatever actions they themselves deemed appropriate.

Since the 1980s, however, many segments of the profession in North America have been increasingly involved in direct interactions with the public, often in the context of conflicts over differing values for wildlife held by different groups, including the managers themselves (Decker et al. 1992). This exposure to the views and criticisms of the public has led to significant levels of frustration within the profession (e.g., Schmidt 1990, Timm 1992). But it has also enhanced awareness among managers of the convictions and arguments of important societal groups and has, in certain cases, led to re-evaluations of management goals and actions (e.g., Decker and Gavin 1987). In general, the same cannot be said of the profession in Australia where managers have remained relatively shielded from their publics, even though they may have become more aware of their presence. It is hardly surprising, then, that this history has not prepared Australian wildlife managers well for the complexity, inevitable scrutiny, and direct involvement by a variety of public groups in their work that now occurs.

## WHAT IS HUMAN DIMENSIONS AND WHY DOES IT MATTER?

The 'human dimension' of wildlife management is that sphere of the field concerned with the way that people's values about wildlife affect and are affected by the decisions made by managers (Purdy and Decker 1989). Thus, human dimensions is concerned with identifying what people think and do regarding wildlife and its management, understanding why, and incorporating that knowledge into management programs (Decker and Lipscomb 1991). However, it is not simply being aware of any such information per se that is important; it is the integration of relevant human dimensions information into the framework of the wildlife management decision

making process that renders the approach useful (Berryman 1987, Gigliotti and Decker 1992). In the contemporary environment, the application of major wildlife management actions without regard for the beliefs and attitudes of relevant groups (stakeholders, advocacy groups, the general public, for example) is often likely to produce negative public reactions (e.g., Connelly et al. 1987, Decker and Enck 1996). Conversely, the gathering of nonspecific, general sociological data is likely to be of little use unless it can be related directly to the specific problem at hand. Ideally, appropriate human dimensions data, however obtained, can be intermeshed into the planning process along with such data from the ecological, economic, technical and other aspects as are available (Decker et al. 1992). Together, these features call for careful and informed problem definition.

## Impediments to Human Dimensions

Such a procedure assumes, of course, that the people involved in the decision making appreciate why they are dealing with this type of information. Successful integration of human dimensions has faced at least three serious impediments in North America (Decker et al. 1987). First, most managers have traditionally regarded biological and ecological information as the primary determinant in planning wildlife management. Second, there has been poor communication between wildlife managers and those associated with human dimensions. This has exacerbated the third impediment: the lack of credibility that this essentially sociological information has among many wildlife managers (Decker et al. 1987, Decker and Enck 1996). Most of those working in the profession have been trained in sophisticated ecological and environmental sciences, but frequently receive negligible instruction in the social sciences (see Wenner 1987). Although there are numerous examples of excellent human dimensions courses at the tertiary-level in North America, obstacles remain evident among significant numbers of people currently working in the field (Brown et al. 1994). In Australia, there is a growing awareness of the need for this approach but relevant components in tertiary courses remain relatively minor (Hart 1996).

While no studies have as yet focused on the obstacles to integrating human dimensions in Australia, there is considerable informal recognition of similar attitudes to those described above among those working in the field (Korn 1995, Temby 1995, Jones 1995). Clearly we must assume that the integration will be slow but it will be greatly aided by an equally clear determination that we make a decisive start.

## A First Step: Checking Assumptions

All scientists are taught the importance of recognising and accounting for bias, especially those biases that may lead to erroneous conclusions or the favouring of personal preferences. Indeed, an acknowledgment that all people have inbuilt tendencies to be subjective rather than objective is fundamental to the scientific method. Nonetheless, despite a commitment to random selection of plots and blind sampling procedures in experiments, for example, we need to be aware that numerous deep (and possibly inherent) biases remain. This can be seen, for example, in the assumptions managers may hold concerning a particular public's probable reaction to a



certain management plan. In these situations assumptions are used in place of the necessary but unknown factual information about the group being considered (e.g., Enck and Decker 1997). Assumptions used in this way are inevitably based on the managers' experience and mediated by personal values, and may implicitly include judgements about people's beliefs, attitudes and behaviours critical to the issue being considered (Decker et al. 1991).

The application of personal assumptions is, however, unavoidable in much decision making about wildlife management. The information necessary for evaluations of alternative management aims or actions will never be perfect (i.e., exactly comprehensive, timely and accurate) and assumptions must often be made in its absence (Enck and Decker 1997). Assumptions may operate at every level of the decision-making process, with a variety of effects and influences on the way decisions are made and on the reaction of the public that follows. Moreover, managers also plan and act within their own value systems, implicitly making judgements about the comparative worth, importance or impact of decisions without a reference to alternative values (Steinhoff et al. 1987).

Clearly, managers' ability to make effective and informed decisions will be enhanced when the assumptions they are making are acknowledged. In some circumstances, accepting a level of bias may be a useful step forward. In others, it may be important to assess the assumptions to determine their reliability. Such a task is not, however, simple or straightforward. Indeed, the very issue is likely to cause great anguish in most biologically trained wildlife managers. Nonetheless, this is an area that has been usefully addressed by human dimensions workers; the implications of this work are foundational to much of the human dimensions mission.

Recently, Enck and Decker (1997) reviewed numerous human dimensions studies conducted over the past two decades. Although these studies considered a variety of issues, the authors found that they all involved at some level an examination of assumptions. In essence, the studies identified an accepted wildlife management assumption (i.e., 'we assume these people think that...') and then proceeded to assess its validity (i.e., 'these people actually think...'). This review begins with the expectations of the managers themselves and allows them to evaluate how reliable their expectations are.

A detailed description of the methodologies and theoretical approaches used by the workers undertaking these studies is beyond the aims of this review. Suffice it to say that a variety of appropriate social science techniques were employed, whereby people were asked to respond to a series of questions, either in person, through telephone surveys, one-to-one interviews, or in focus groups etc. (for a useful introduction to some of the techniques involved see: Kellert [1980]; Decker [1990]; and papers in Decker and Goff [1987]). Enck and Decker (1997) isolated a number of assumptions that they proposed as being commonly held (currently or historically) among North American wildlife managers. These assumptions implicitly underlay decisions concerning wildlife management; two of these are relevant to the aims of this paper.

### **Assumption 1: People who complain about wildlife want them removed**

This is a widely held assumption among wildlife managers, based on the apparent evidence of many complaints made about dangerous or nuisance wildlife. But do the people most directly affected want eradication of the species involved?

One of the most pronounced wildlife-human conflicts in the eastern United States is that associated with high densities of white-tailed deer (*Odocoileus virginianus*) in many rural and suburban areas. In rural locations, deer have long been associated with damage to crops while in towns they cause significant harm to gardens and ornamental plantings and are involved in a large number of collisions with vehicles (Decker and Gavin 1987, Connelly et al. 1987, Stout et al. 1993).

It was assumed that the negative economic impacts of the deer were the primary concern of those making complaints. However, a series of studies confirmed that the main concerns of the public were associated with human safety, in the form of injuries due to car accidents and exposure to disease transmitted by ticks (Decker and Gavin 1987, Connelly et al. 1987, Decker et al. 1990). These findings led to educational programs designed to assist the public on developing realistic assessments of risk and on the importance of hunting in reducing deer populations.

This assumption was also evident among managers when black bear (*Ursus americanus*) populations in the Catskill Mountains region of New York State began to rise during the 1970's. With increasing numbers of landholders experiencing damage, it was assumed that previously high levels of tolerance were being seriously eroded (Decker et al. 1981). Surprisingly, studies of landholders showed that those experiencing light to moderate damage were more tolerant than those experiencing no damage (Smolka et al. 1984). A subsequent study found that increased contact with bears led to increased knowledge and appreciation of the species. Thus, rather than instigate population reduction strategies, managers designed education programs and increased their capacity to respond to calls for assistance from affected landholders (Decker and O'Pezio 1989).

In Australia, wildlife agencies assumed that community tolerance of the noise produced by suburban roosting Torresian crows (*Corvus orru*) would be extremely low, requiring major population reduction programs (Everding 1996). In reality, surveys of residents living in the immediate vicinity of large roosts showed that most people were either neutral or positive toward crows, despite the noise (Jones and Everding 1993). Although 18% of affected residents rated the problems as 'serious,' only 15% of this group approved of destruction of the birds and none approved of the removal of the roost trees as a means of control (Jones and Everding 1994).

In dealing with problems like this where the source of the conflict may be apparently clear (for instance, the noise of roosting crows), action based on the original assumptions (that complainants wanted birds removed by shooting or the removal of their large roosting trees) would almost certainly have led to a major public outcry, resulting in poor publicity and decreased credibility for the agency. In this type of conflict, even basic human dimensions information can allow managers to identify and deal directly with those most affected by the conflict, while

developing management options that account for the views of the majority (Jones and Everding 1993). Nonetheless, judgement and sensitivity are essential.

**Assumption 2: People who are concerned about the welfare of individual animals are opposed to wildlife management.**

Treatment of individual animals has become a key consideration in a wide range of wildlife management programs and practices (Schmidt 1989, 1990). Pressure to include animal welfare considerations in management policies is international in its expression (e.g., Fraser and Sutherland 1996). Activism among some extreme elements of the animal liberation movement (see Singer 1990) has received wide publicity and has left many wildlife managers in Australia and North America feeling threatened and defensive. In the minds of many wildlife managers, the animal rights and animal welfare movements pose serious challenges to the very existence and practice of their profession.

Wildlife managers may be apprehensive about expression of animal welfare concerns because those concerns focus on individual animals, in contrast to the population-level focus represented by most wildlife management policies (Schmidt 1990). Managers also may be reluctant to consider animal welfare concerns because, in a communications environment where the distinction between animal rights and animal welfare has become blurred (Schmidt 1990), many managers have come to assume that people expressing concern for individual animals are against any wildlife management actions and are therefore a threat to the profession (Schmidt 1990, Timm 1992). As a result, groups expressing animal welfare concerns have often been excluded or marginalised from decision making and made the direct and indirect target of 'education' about the benefits of wildlife management (Enck and Decker 1997).

However, there are a number of indications that the assumption as expressed above is too simplistic. For instance, a series of recent studies has shown that, despite having expressed concern for the welfare of individual animals, a majority of those involved in wildlife rehabilitation (Siemer and Brown 1993) and voters supporting hunting bans (Decker et al. 1993), were not opposed to population reduction practices per se. On the other hand, these people did express clear views that such actions must be justified and that certain, specific unethical practices be discontinued.

These studies have important implications for wildlife managers in general. Rather than being anti-management, ideological extremists intent on preventing all practice, there is possibly an unexpected level of understanding among such people about when some action is necessary. However, it is equally clear that groups holding animal welfare concerns are particularly vigilant and have the very real capacity to cause considerable disruption to an agency that continues to undertake what these stakeholders believe to be unethical practices. This suggests that dialogue and open communication with these stakeholders is highly desirable.

But a round-table of wildlife managers and animal welfare representatives is unlikely to be fruitful unless there is some level of mutual respect and understanding of concepts and practices. From the managers' perspective, the assumption may remain that those sitting opposite hold

views fundamentally opposed to their own (e.g., Schmidt 1990). However, studies such as those cited above have also shown that, despite stated differences, animal welfare groups often share with managers many concerns for the natural environment (Siemer and Brown 1993). Furthermore, independent studies of attitudes among wildlife managers themselves have demonstrated high levels of concern for the pain and suffering of individual animals (Brown et al. 1994). Enck and Decker (1997), in considering these findings, suggested that there is probably a much closer alignment between wildlife managers and other wildlife-conscious groups in society than may be evident or admitted by the profession.

One crucial agenda item for any possible meeting between managers and those advocating animal welfare should be the formulation of agreed working definitions of key aims. At a fundamental level, discussion itself over what is meant by 'ethical' and 'unethical' or what animal welfare versus animal rights means in the local situation can be invaluable in clarifying these complex concepts (Schmidt 1990, Kellert 1996). It is becoming commonplace for managers and their apparent opponents to find that many of their motivations have very similar origins (Manfredo et al. 1995). However, the most important potential in such discussions is for both sides to seriously consider alternative perspectives. Managers may feel they have the weight of sound science on their side but how are they to allow for those that argue ethics? It is in such dilemmas that managers confront one of the most fundamental of falsely held assumptions: that science can answer ethical questions. Although remarkably few scientists seem aware of the constraints of the scientific method and its approach to knowledge (Medawar 1985), the unavoidable 'paradigm clashes' of contemporary wildlife science is an appropriate place for such human skills as humility and mutual respect (Kellert 1996).

A more frequent case, though, is likely to involve dealing with unrealistic expectations by some sections of the public. A major contemporary example concerns the control of large birds on airport runways; though animal rightists may argue against any action, majority community opinion is likely to oppose this. Admittedly, many conflicts are much less straightforward and involve extremely polarized stakeholders (Timm 1992). Human dimensions inquiry may not make these issues easier to solve, but may produce information that will raise the quality of public dialogue even on such divisive issues (Decker and Enck 1996).

## THE IMPORTANCE OF VALUES

Thus far, the relevance of human dimensions to decision making and practice in wildlife management have been demonstrated by the implications of a number of studies. But these findings are themselves interpretations of often complex results of carefully conducted research; the implications and key issues we have highlighted may not necessarily be self evident to someone examining the completed questionnaires obtained by the studies. Just what is being studied? What do those conducting human dimensions research actually look for?

This issue goes to the heart of this relatively new field. As explained above, this specialisation arose out of a concern among practitioners about how people themselves affect and are affected by wildlife management (Purdy and Decker 1989). At its core are human 'values,'

those human attributes that refer to perceived worth or significance of things and are normally expressed in relation to other things (Steinhoff 1980). This issue is of some theoretical and methodological complexity (for further details see Brown and Manfredo 1987, Kellert 1980, and Manfredo et al. 1995). For our present purposes, it may be worth emphasising that human dimensions workers often distinguish between two meanings for values: 'held' values and 'assigned' values (Brown 1984). Held values may be viewed as concepts about objects (which may include ideas, behaviours, experiences, etc.) and as such may be discernible in people's attitudes. Assigned values, on the other hand, focus on and indicate the worth of the same objects. These values underlie the two basic questions in human dimensions: (1) what values form the basis of our attitudes towards wildlife; and (2) what wildlife types and numbers and the opportunities they provide are most valued by people (Brown and Manfredo 1987)? In general, the latter question tends to be of more immediate importance to the manager though determining the former is often part of longer-term planning.

Many wildlife managers, typically trained in so-called quantitative 'hard-science' fields, may question how such intangible attributes can be measured directly. Indeed, such values (here, specifically held values) cannot be measured directly; they can only be inferred using a series of social 'indicators.' These may include things such as statements of belief and expressions of opinion, gained through interviews, questionnaires, or other means. Extracting or discerning these values from the indicators will depend on how the researchers classify the information obtained; many different systems have been developed (Steinhoff 1980). This results in a wide variety of 'wildlife values' data, using various criteria and conducted in a host of different situations. Although these data are potentially useful to managers, there exists considerable confusion about how to apply this information to real-world problems (Berryman 1987). Often managers with the best intentions and genuine respect for their stakeholders, may simply use the values information as very generalised clues to how a particular program may be accepted or implemented. This does not represent a professional integration of all the available information; surveys and opinion polls should not be used as surrogate referenda aimed at determining 'what the majority want' (Decker and Chase 1998), and then simply using that preference as the management goal.

Improving the usefulness of wildlife value information has been a fundamental aim of human dimensions workers for some time (Decker 1990). To this end, considerable attention has been directed toward developing a means for obtaining useful values information that would involve standardizing the way values are 'measured' while retaining their relevance to a wide variety of situations (Purdy and Decker 1989). One result has been the Wildlife Attitudes and Values Scale (WAVS), which has been progressively tested and fine-tuned in numerous studies primarily in New York State (Purdy and Decker 1989, Decker 1990).

Purdy and Decker (1989) show how managers have been able to use information from WAVS to gain a better understanding of how individuals and groups value wildlife. They suggest that this information is most useful when considered together with other information. Two illustrative examples of the use to which WAVS has been put are provided by studies of attitudes towards white-tailed deer in suburban areas (Decker and Gavin 1987) and an investigation of the reasons why people participated in hunting (Purdy and Decker 1986). Again, both are also assessments of the assumptions held by managers themselves.

In one location on Long Island, New York, an increase in complaints about deer suggested to managers that public tolerance of deer population levels had been exceeded (Purdy and Decker 1986). However, a WAVS survey indicated that most residents believed deer to be an aesthetic asset to the neighbourhood. Those experiencing damage to gardens, while stating that such problems should not simply be accepted (the attitude of most unaffected people), agreed with the majority that traditional control means (hunting and shooting) were unacceptable (Purdy and Decker 1986). In their conclusion, Purdy and Decker (1986) emphasised that, as a result, managers face the challenge of developing innovative management approaches appropriate to the suburban situation. This is an explicit recognition of a condition now virtually endemic in modern wildlife management especially in cities (e.g., see Jones and Thomas, in press).

In the second example, the HDRU was asked to investigate reasons for the continuing decline in the number of people participating in hunting in New York (Brown et al. 1987). This was of direct concern to wildlife agencies because, among other things, hunting is a primary means for controlling deer populations. Previously, hunter's values of wildlife were typically regarded as 'consumptive.' Studies of graduates of hunter training courses showed this to be a misleading simplification. Contrary to expectations, hunters consistently held values relating to wildlife's benefits to society above those related directly to hunting (Purdy and Decker 1986). In addition, the studies identified an important sociological effect; participants from families in which hunting was well-established held higher wildlife values overall compared to more 'recreational' hunters, who often started hunting for social reasons. Practically, the high positive values shown for the ecological and social significance of wildlife identified a basis for education programs aimed at both hunting and non-hunting publics (Connelly et al. 1987).

The value of WAVS for wildlife managers lies in the reliability of the scale and the relative ease of interpretation of the results. Nonetheless, it must be stated clearly that the items used, the formulation of the questionnaires, the selection of people to be included in the surveys, and the analysis and interpretation of the results are all specifically focused on the aims and needs of a particular situation. The existing WAVS items, as published, cannot be taken as being suitable for a survey in another situation. Nonetheless, the procedure and methodology represents a potentially valuable template for wildlife managers in other situations. Provided suitably trained and experienced personnel are involved in the planning, item generation, selection and screening, and appropriate analyses are applied, adaptations of WAVS could provide a valuable tool in the evolution of human dimensions in Australia and elsewhere. Furthermore, properly conceived and integrated, this approach could form the basis of a fascinating international comparison of wildlife attitudes and values, a task impossible at present because of a lack of data.

## INTEGRATING THE HUMAN AND BIOLOGICAL DIMENSIONS

From the studies and their implications discussed so far it should be evident that the field of wildlife management has evolved considerably over the past several decades. The reasons and philosophies underlying these changes are complex and will continue to be evaluated and assessed for some time. There can be little doubt, however, that the principal cause of these changes relates

directly and indirectly to people, their increasing involvement in decision-making processes, and the recognition that human values do need to be appreciated. This is not to say that wildlife managers have become universally receptive to people's views and attitudes (though many have). And it certainly does not suggest a widespread acceptance of the importance of human dimensions in wildlife agencies and universities. But at the very least it does indicate that the influence of these human dimensions is being felt and responded to (though often as pain or pressure) throughout the field.

North American wildlife managers had begun to respond to these influences en masse by the end of the 1980's, but the nature and scale of their responses suggested a level of collective confusion and resistance that one might expect of a profession transitioning toward a more integrated system of wildlife management decision-making. Wildlife professionals in North America now find themselves in a high-stakes race to make this transition before their authority to manage the people's wildlife resources is severely limited through legislative actions, such as ballot initiatives and referenda (Beck 1998, Whittaker and Torres 1998).

In an effort to facilitate this transition, Decker et al. (1992) developed a comprehensive paradigm of wildlife management that attempts to provide managers with a route through the complex management landscape confronting the field today (Decker et al. 1992). We do not wish to repeat the details of this paradigm; instead we would draw attention to some features of relevance to the present discussion.

First, the paradigm goes to some length to define and describe (within the context of its focus on wildlife management) aspects relating to the broad area of aims. Typically some specific policy, generated by the agency, is the primary directive to which management is aimed, a scenario that assumes all relevant knowledge lays within the agency while the public is 'served,' almost, in absentia. Decker et al. (1992) argue, however, that this ignores the fact that contemporary wildlife goals are formed best when they account for the wider social component - the 'management environment' - incorporating the traditions, religious beliefs, values and philosophies of the public and all constituent groups. This is simply an acknowledgment, long espoused in the texts (e.g., Leopold 1933), that management is conducted because its end products are valued by society. Thus social values are the principal motivation for wildlife management (Decker et al. 1992).

This emphasis on management aims being derived from society rather than from 'in agency' should also be accompanied by a close scrutiny of the role that managers themselves play in the 'solving' of wildlife management problems. Inevitably, this will involve a re-assessment of the relationships between the manager and the people he or she will be dealing with. Many managers are already involved in numerous consultative and advisory positions. As the recognised and certified authority in an area of relevance, it has been normal, even 'natural,' for managers to think of themselves as the experts, providing advice and information to people reasonably regarded as 'clients' (Burger 1979, Decker et al. 1996). In such a relationship, the manager, working (typically) as the biological expert, may listen dispassionately to the views of the others, but is rarely obliged to take serious account of the 'non-experts.' Although often productive and effective in certain circumstances, such expert-client interactions are rapidly becoming less

workable and acceptable, because (among other reasons) of the increase in the number of people and groups claiming to hold an interest or 'stake' in the issue being considered. Appreciating that these people and groups are more accurately recognised as stakeholders rather than clients has been proposed as one of the key philosophical shifts required by managers moving into the social complexities of the new century (Decker et al. 1996).

Another major conceptual challenge for managers is to be able to see that their professional effectiveness is more likely to be enhanced by designing for and facilitating greater involvement and influence by stakeholders (Decker and Chase 1998). Contemporary wildlife management problems are increasingly likely to involve clashes over values held by different societal groups (a people-people conflict) rather than a straightforward wildlife-people conflict (Decker and Chase 1998). If so, the solution to such conflicts is going to depend less on a manager's biological expertise and more on his or her ability to manage interactions between stakeholder groups. This prospect may not be welcome news but needs to be soberly appreciated, especially in light of the following trends identified for North America: increasing people-wildlife conflicts, many location specific; greater public expectations for tailored management solutions; broader management responsibilities; and continuing limitations on agency resources (Decker and Chase 1998). It does not take special prescience to recognise each of these trends in the Australian situation.

Although unsettling, this view of the future should not be taken as alarmist. Rather, the motivation behind the present review is that an appreciation of the role of human dimensions should provide managers with the foresight necessary for the task ahead. As mentioned previously, one crucial aspect of dealing effectively with increased stakeholder involvement is for managers to accept and enable this to occur in a transparent and deliberate way. Decker and Chase (1998) envision a move away from the traditional 'authoritative expert approach' described above. Within their model, many apparent manager-stakeholder interactions still tend to be dominated by the person in the position of expert (the manager), with relatively little weight being given to stakeholder input. This relationship does change, however, in circumstances where the manager is confronted with an unfamiliar situation and must initiate contact and information from the stakeholders (an 'inquisitive approach'). Nonetheless, stakeholders remain on the periphery of the decision-making process.

These approaches quickly become untenable when the diversity of stakeholder groups involved make management consensus extremely difficult for a manager attempting to act as 'voting chair.' In these circumstances, Decker and Chase (1998) suggest a move to an approach they term 'transactional,' where the manager initiates and implements processes where the stakeholders interact directly between themselves, rather than through the manager. Although time-consuming and initially expensive to establish, such processes hold great promise, especially in particularly contentious conflicts. In the U.S., numerous 'citizen task forces' or community-based committees have been established with particular success in dealing with suburban wildlife issues (e.g., Hansen and Beringer 1997, Lund 1997).

The transactional approach retains the professional standing of the manager but greatly increases the input and influence of the stakeholders. A logical extension of this trend in the future



is for managers to play an even less direct role, with agencies sharing or delegating authority to the stakeholders themselves - a 'co-managerial or delegatorial approach' (Decker and Chase 1998). In these situations, managers may provide specific expertise, managerial skills, law-enforcement authority and training, but as part of an extensive team of stakeholders sharing a common management goal.

The second component of the paradigm we wish to emphasise is that of management actions. As Decker et al. (1992) point out, actions are often regarded as being synonymous with wildlife management per se, as though the implementation of a control measure was the objective itself. Yet the paradigm shows that actions are simply one aspect of the overall process of management. Critically, actions are undertaken to achieve some response in the wildlife population or, indeed, the people, in question. Alarming, much historical (and current) wildlife management fails to focus adequately on the response of the situation and seldom provides an evaluation of the management action. Thus, the essential elements of assessment, refocussing and self-correction are often ignored, leading to a lack of efficiency and poor accounting.

As emphasised above, an improvement in the management process must involve an ability to be adaptive and responsive to both evaluations and changes, biological and societal, over time (Krueger et al. 1986). Furthermore, agencies and managers should develop proactive, rather than reactive, management practices. We see this as particularly important; through an enhanced sensitivity to societal views and an awareness of the depth and type of values held by different groups, managers should be able to serve and shape society's goals for wildlife, with higher levels of satisfaction for both agency objectives and community values. The future is only likely to bring further complexity as more stakeholders seek to make their voices heard. While some degree of anxiety is to be expected, we believe that an appreciation of this paradigm will be of considerable value to managers.

## Two Cautions

It is important, at this point, to emphasize two cautions to wildlife managers who may be encountering human dimensions inquiry for the first time. First, the results reported in some studies may seem to be 'self-evident,' 'obvious,' or even trivial. This reaction may result from the way that frequently complex sociological results have been interpreted and then reworded into a more accessible and simplified form of words. At best this is illuminating, at worst it can be misleading. Some form of 'translation' is always necessary; nonetheless, this is a process that should not be interpreted as meaning that the approach is trivial or obvious. All science requires interpretation into a mode appropriate to a specific audience. Successful human dimensions work, being typically conducted for wildlife scientists rather than academic sociologists, will be that which allows even complex findings to be clearly comprehended by a sociologically 'lay' audience. The onus here is clearly on the researcher: care must be taken to ensure that the appropriate findings are made accessible rather than 'difficult' information trivialized.

A second and related caution concerns who should conduct the necessary human dimensions studies. While we hope to convince our readers of the necessity for wildlife managers to be aware of the importance of the approach, this is not a field that the untrained can enter as primary researchers without a reasonable awareness of appropriate methodologies. We emphasise

this point because some managers have attempted to take existing questionnaires, designed for a highly specific study, and apply these to very different situations. While tempting, such attempts are likely to yield only spurious results. In the absence of a larger population of trained human dimensions researchers, the most prudent initial step at present would be to seek assistance from people known to use standard sociological methods.

## Learning from Controversies

We are aware that many managers regard the current climate of 'client sensitivity' and 'agency compassion' as one of professional abrogation of duty, accompanied by an overall decline in scientific rigour and discipline in the face of public comment (see also Timm 1992). These are very real concerns and, for some managers, are seen as serious threats to the integrity of the field. It is, therefore, important to maintain perspective as we consider how best to move forward.

First, most wildlife management controversies are complex and typically involve multiple issues and public groups. When confronted by this apparent diversity of opinion, managers may be tempted to listen selectively to certain groups. It is crucial, however, that despite the concerted efforts of particular stakeholder groups to advance the importance of their particular cause, agencies must ensure that all sides of the argument are heard (Decker 1994). Human dimensions information may be particularly important in cases where one particularly vocal group's demands threaten to dominate other less vocal groups. (One reason for this is that opinions about wildlife issues are often based on relatively vague information rather than personal experience. Even strongly stated opinions can and often do change following a direct personal experience, such as an injury, accident or sustained nuisance activity by wildlife [e.g., see Jones and Thomas, in press]). Agencies that appear to the public to represent or consider only selected stakeholder positions lose credibility in the long run. Wildlife management must be seen and understood to be a long-term partnership between an agency and the public, with shared goals (Decker 1994).

Second, managers need to accept that the public is usually capable of understanding wildlife management programs and the consequences of various management options so long as they are provided with sufficient and appropriate information. Managers' fears of too much public influence are unlikely to be justified provided that the process of public participation is well planned and managed (Decker 1994).

Finally, wildlife agencies that use human dimensions information solely for 'client satisfaction' and 'public approval,' at the expense of their broader societal goals, are indeed abrogating their responsibilities. Agencies must beware of the tendency to be 'poll-driven' by using opinion surveys as surrogate referenda (Decker and Chase 1998). Public scrutiny is only likely to increase and agencies perceived of being primarily interested in their image are similarly likely to lose credibility.

The need for openness and transparency in dealing with the public seems to be paramount in the current climate. Timm (1992:6), in viewing the current gap between the public and the wildlife profession, suggested that we help bridge this gap:

*"...by being honest, by being forthright with information, whether it's what we think people want to hear or not. We must be more sensitive to the opinions of others, while being unafraid to espouse our own opinions and our own values. We must also be trustworthy - trust that is built on truth, both in word and deed."*

## MOVING AHEAD: EVOLVING AN AUSTRALIAN HUMAN DIMENSIONS AGENDA

It has been a fundamental concern (and indeed a primary motivation) among those promoting human dimensions that the information gained by this approach be relevant and applicable to the real-world, day-to-day practice of wildlife management (Mattfeld et al. 1984). This is, we believe, essential for the continuing professional activities of Australian managers and the agencies they work for. The wildlife management profession in North America has faced a number of major challenges over the past few decades, and none more serious and influential than that of dealing with people (Berryman 1987). Similar social influences are no less prevalent in this country.

Despite the lack of citations herein, it should not be assumed that human dimensions approaches are unknown in Australia. On the contrary, there are numerous examples of well designed, carefully facilitated stakeholder-agency working groups operating throughout the country, some of which have been in place for extended periods of time. While the most extensive of these have been associated with wildlife management on a vast geographical scale (e.g., kangaroo management across states; fox, pig, and rabbit control [e.g., Mitchell and Noble 1994, Prevett et al. 1996, ENRC 1995]), there also are many examples of smaller efforts aimed at understanding local human-wildlife conflicts. These have often been associated with suburban conflicts (e.g., Jones and Everding 1991, Temby 1995, Thomas and Jones, in press) but others have focused on obtaining human dimensions data for application to conservation or the management of dangerous wildlife (Benzaken 1992, Salleras 1994). Some of these are also excellent examples of successful community-based programs (e.g., Prevett et al. 1996, Salleras 1994), an area of growing interest among agencies (see Sieper 1996).

An additional area of enormous importance and sensitivity in Australia relates to indigenous issues in relation to wildlife management. There are numerous recent examples of excellent cross-fertilization between traditional owners and agencies where human-dimensions style approaches have been adopted (e.g., Benzaken 1992, Kennett 1997). Unquestionably, this will be an area of special challenges and opportunities for Australian wildlife managers in the near future.

Further evidence for the growth of interest in human dimensions can be gauged by the increasing contribution of this field to the annual meetings of the Australasian Wildlife Management Society (including a major human dimensions symposium held during the 1994 meeting). Clearly, there is abundant evidence of both basic human dimensions research and its

application in a wide variety of situations. Does this mean, therefore, that a paper such as this is redundant? Are these North American examples of little relevance to the Australian scene?

We strongly believe that the answer to both questions is no. Indeed, it is because Australian human dimensions work is becoming increasingly recognised, utilized and required that those involved in the field need to be aware of the field as it is developing internationally. There can be little doubt that Australian wildlife managers stand to gain considerably from the extensive experience of workers from North America. Our two societies show many similarities, and the influences being felt by wildlife managers would appear to be moving in the same directions (Decker and Chase 1998).

Nonetheless, many differences also exist and these matter as Australian managers develop practices and goals appropriate to the particular situations they will need to deal with. Therefore, it may often be inappropriate for Australian managers to adopt American processes or utilise findings gained from studies of farmers in northern New York State. The problem for Australian managers, hungry for human dimensions information, is that almost all that is currently available is not Australian. For example, by far the majority of citations relating to human dimensions in Australia discovered during the preparation of this paper remain as unpublished conference abstracts. It is inevitable that the North American literature will remain the primary source of advice for some time.

We would like to conclude with a distinctly positive perspective. It is likely that many managers reading this paper will feel overwhelmed by the apparent burden of having to learn and adopt all sorts of new practices and ideas. We believe that many managers are already aware of the inevitability of closer involvement with various stakeholders. For these people, the nature of the job they thought they had has already changed.

It is our conviction that an awareness of human dimensions could potentially transform a manager's professional and personal satisfaction markedly. For example, many managers seem to feel that they will be required to make all the difficult and sometimes unpopular decisions for the stakeholders, or perhaps to serve them unfailingly (and uncritically). Such fears are almost always unjustified; in contrast, stakeholders can be an invaluable asset for managers by helping to formulate ecologically sound and socially acceptable management options. However, this can only happen when managers know enough about the stakeholders to know which issues matter, where the expertise lies and how to encourage the most useful interactions. In such circumstances, managers may achieve the public recognition and appreciation so often absent today.

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