

Community perceptions of landscape values in the South Island high country

A literature review of current knowledge and
evaluation of survey methods

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Abstract

Results of a literature review of published surveys of community perceptions of landscape values in the South Island high country are reported, and a range of survey methods evaluated. The methods include quantitative questionnaires and photo preference surveys; qualitative interviews, focus groups and participant observation; and expert analysis of examples of cultural production, such as paintings. Good-practice benchmarks are identified for each method, and criteria for evaluation of methods presented.

Current knowledge is revealed to be fragmented and incomplete. There has been little systematic research into tourist or urban perceptions of high country, and there is uneven coverage of communities in the high country. The key finding of the surveys that have been published is that landscape values are not the same for all communities of interest, or in all parts of the high country. Urban communities and tourists emphasise iconic scenic values, while specialised or localised communities exhibit a more diverse range of preferences, particular to their situation. The nature of community is also diverse. Options for future research strategies are identified.

Keywords: High country, New Zealand, community, landscape values, perceptions.

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1. Introduction

1.1 CONTEXT

The South Island, New Zealand high country has been a long-standing focus of conservation science, and its management over the years has clearly reflected changing values and ideals. It is an iconic, highly contested environment (Le Heron & Pawson 1995), where frequently conflicting ideologies, intentions and actions impact upon and are played out within a dramatic landscape (Ashdown & Lucas 1987). One area of contemporary concern is the manner and extent to which the landscape values of high-country communities are recognised and expressed in conservation and resource management policy. This raises the question of the current status of knowledge about such community values.

There is growing acknowledgment of the need to recognise community perceptions and values in conservation policy and management (O'Brien 1995b). This reflects an awareness that the success or otherwise of policy is significantly influenced by the day-to-day actions of individuals and groups within communities. These actions typically express the shared values and ideals which give particular communities their shape and character. An understanding of community values is therefore an essential part of conservation management. Community values are also important in a political environment where there is increasing devolution of responsibility from central government, and its agencies, to communities. The Department of Conservation (DOC) has experienced continuing reductions in staff and resources (O'Brien 1995b) in the face of rising public expectations. O'Brien therefore argued that community participation in conservation is essential to achieve conservation goals, and this requires an understanding of community perceptions and values.

The need for community consultation is also embodied in statute, particularly the Conservation Act 1987 and Resource Management Act 1991 (RMA). Policy makers, land managers and development advocates must be able to demonstrate appropriate levels of consultation, and can face questioning or cross-examination within public hearings or the Environment Court over the extent and adequacy of their consultation processes. It is no longer enough to claim that community concerns have been identified—this must be demonstrated, and will be tested against best practice.

Conservation managers therefore need to be aware of, and understand, not only the values of the communities in which they work, but also the methods that can be used to identify and record these values.

Despite a long history of debate in the media and in scientific journals about the appropriate way to manage high-country landscapes, current published information of community perceptions of the high country is fragmented. Much of the knowledge acquired by consultants, planners and land managers in dealing with particular issues is either unpublished, or in grey literature, and inaccessible to operational conservation managers. There is also debate and considerable uncertainty about the respective merits of the different methods and approaches that may be used to identify community landscape values and perceptions. It appears that, in practice, policy makers and conservation

managers typically resort to 'expert' studies, rather than undertaking community surveys. However, this approach, while practical to organise (Zube et al. 1982) is coming under increasing challenge from the communities themselves.

Recent controversy over the designation of 'outstanding natural landscape' zones in a number of draft district plans (e.g. Banks Peninsula District Council, Far North District Council) has highlighted the type of problem that can occur when rural communities feel their views have not been adequately taken into account in policy development. In some areas, relations between the staff of public agencies and the rural communities within which they operate have, consequently, become strained. This works against the collaboration and partnership that O'Brien (1995b) argued is essential to conservation management in the future.

However, whilst the significance of community perceptions in the success or otherwise of conservation policy and management might be acknowledged, the role that DOC or other public agencies might or should have in undertaking formal research into community perceptions of landscape values is by no means clear. The statutory basis upon which public agencies operate, the political context, and the strategic policy and planning emphasis followed by any particular agency, all evolve over time. The relative priority of research into community perceptions, and even the relevance or validity of undertaking such research, is therefore open to debate. This report does not attempt to resolve such strategic issues of research policy. Rather, it focuses upon the current state of published knowledge and technique.

1.2 OBJECTIVES

This report has two primary objectives. First, to present a summary of current published information on community perceptions of landscapes in the high country, and to identify any significant gaps or shortfalls. Second, to review the range of methods available for investigation of community perceptions of landscape, including the establishment of criteria for evaluation of different methods, and the identification of methods suitable for application to high-country issues.

The report aims to improve conservation management by integrating and making more accessible to conservation managers the information on community perceptions of landscape in the high country that has already been collected; and by providing guidance on how best to identify community perceptions in the future, where that need has been identified.

1.3 APPROACH

The report is based upon a literature search undertaken between July 1997 and January 1998. The search had several components. First, a survey of organisations and individuals that may have done work relevant to the study was carried out. This involved an initial phone contact, follow-up letter, and a

further phone call to either thank respondents for their participation or request clarification. Those surveyed included all district and regional councils with statutory responsibility for parts of the South Island high country, Crown Research Institutes such as Landcare Research, AgResearch and Forest Research Ltd, planning and landscape consultants, farming representatives, recreation and conservation groups and university departments. The second technique was to search through library bibliographic databases such as Index New Zealand, CAB Abstracts, Apid and the Social Science Index, and published bibliographies such as Devlin et al. (1995) and Anderson (1996). Third, literature cited in each of the relevant studies was reviewed. Finally, a summary review of methods used for the assessment of community landscape values was undertaken. This included consideration of criteria that can be used to evaluate different field methods.

1.4 DEFINITIONS

The scope of the report has been determined by three key concepts: high country, landscape values, and community perceptions. The geographical focus has been the South Island, New Zealand high country, which comprises generally high-altitude land (over 300 m), typically mountainlands, hill country and intermontane valleys and basins. The definition has been applied broadly, rather than restrictively.

'Landscape values' is more problematic. As Swaffield (1991, 1993, 1998b) has demonstrated, 'landscape' is used in New Zealand in a range of ways by different people and organisations, depending upon their interests, disciplinary orientation and the context of use. The understanding of 'landscape' ranges from scenery, or the visual appearance of land, to a comprehensive description of the biophysical environment (for example, soil-landscape systems, or 'cultural' landscapes), and on to the human experience of particular environments; integrated land-human systems; and the conceptualisation of environments as culturally meaningful ideals. It is notable that the Environment Court recognises this range as valid in terms of the RMA. Clearly, the definition of 'landscape' adopted in any particular study will affect both the range of material surveyed and the methods used. 'Values' is also increasingly used in association with 'landscape', but seldom defined (Swaffield 1993). Its usage in this report recognises that for all the range of possible meanings, landscape implies some measure of scientific, cultural or psychological interpretation. It is not an objective phenomenon.

The third key term, community perceptions, is also potentially problematic. 'Community' has been widely used and critiqued within sociology, but is generally used to refer to a group of people, typically either living or working within a locality, or linked together by some shared interest or endeavour (e.g. the science community). There is usually an assumption that communities share common values or attitudes; however, this is not necessarily the case. 'Perceptions' has both a narrow and a broad meaning. Within psychology it has a specific technical meaning related to humans' sensory reception of external stimuli. However, it is frequently used in geographical and landscape architectural literature to refer to the way people and groups interpret environmental phenomena in a more general way.

'Community perceptions of landscape' values can therefore be defined in a number of ways, each legitimate in different disciplinary settings. Given the operational focus of this report, the definition we have adopted has been non-technical and pragmatic.

We report on any study which presents the results of a systematic investigation into what people in communities involved in high country say about high-country landscape. We comment upon the significance of the different approaches used by these investigations in the discussion.

1.5 LIMITATIONS

The report is based solely upon a desk study of published literature available in the public realm. It included an initial phone survey of potential sources, but we only report upon material that has been published. Nor did we undertake any archival or original documentary research from unpublished sources. We excluded unpublished reports (the grey literature) unless they had been subsequently incorporated in a published version; unprocessed surveys; and hearsay material derived from informal consultation. In addition, although several of the reports we reviewed included summaries of artistic and literary interpretations of particular parts of the high country, we have not attempted a comprehensive review of such material. We did, however, include these lodged in New Zealand university libraries, where these had been identified, even though formally unpublished, as they were publicly listed. In short, we focused on information available to managers in conventional published format.

The appropriate handling of tangata whenua material also required careful consideration. Clearly, tangata whenua have extensive and rich community perceptions relating to high country, which could fall within the terms of reference of 'landscape' values. However, 'landscape' is not a term typically used in traditional Maori knowledge. Furthermore, such knowledge clearly has special cultural and political status within legislation such as the RMA, and requires appropriate protocols in reporting and use. DOC has well-established procedures for tangata whenua consultation and involvement and we have taken the position that such knowledge, even if in a published form, falls outside the intent of this study. Operational managers seeking information on tangata whenua values are advised to work directly with relevant iwi or runanga. Similarly, methods of appropriate consultation constitute a separate, well-established body of knowledge, which it would be inappropriate to attempt to summarise here. However, where published studies of community values include tangata whenua as a part of a community, and report upon values within the same format as the wider community results, we have included the findings.

This report is based on work was done from mid 1997 to early 1998. We made a brief resurvey of the main journals etc. in early 2000, as part of the editing process, but cannot ensure that every possible source of relevant reports has been resurveyed. However, it seems unlikely that much new material has become available in the two years since the main survey.

1.6 CONTENT AND LAYOUT OF REPORT

The main body of the report is in three chapters.

Chapter 2 presents an analysis and evaluation of approaches to investigating community perceptions of landscape values, based upon a summary review of international and New Zealand literature. This includes development of criteria for evaluation of potential methods.

Chapter 3 presents an overview of published material relating to community perceptions of landscape values in the high country. This is undertaken in three ways:

- thematically, based on the focus of study (e.g. change in land use, tourism);
- geographically, as a cross reference to aid managers regarding availability of material;
- as a summary of the reported patterns of community perception, by general theme, and by community of interest.

Chapter 4 includes a discussion of the findings of the review, including the identification of major shortfalls or omissions in the material, and a summary critique of the methods used in the studies based in New Zealand that we have identified. It concludes with a review of the methods that might usefully be adopted in future investigations of community perceptions of landscape values. This includes a note of New Zealand 'benchmark' studies for the main approaches.

Our key finding is that the published record of community perceptions of landscape values in the high country is inadequate for either policy or operational use. Given the longstanding public interest and scientific effort devoted to high country in general, and conservation management in particular, it is notable that so little systematic research appears to have been undertaken into landscape perception. We find it hardly surprising, therefore, that landscape issues are frequently regarded as problematic and contentious.

The paucity of published research into landscape values clearly reflects the low priority accorded to this area by New Zealand public agencies and authorities in the past, and is in contrast to the extensive body of landscape perception research in North America, for example. It is also in contrast to the effort devoted to biophysical science in the New Zealand high country. Whether or not this situation continues in the future will depend, in part, upon the expressed needs of operational managers, and upon the willingness and ability of key agencies to address these needs.

There is a range of suitable methods available for investigation of community perceptions of landscape values, but the key step in selecting the best approaches is to determine the precise purpose of the study. Different criteria are appropriate for different goals, and no single approach can be claimed to meet all possible requirements. In the next chapter, we review the main approaches, and their strengths and weaknesses.

2. Methodological review and critique

2.1 LANDSCAPE PERCEPTION RESEARCH: A SUMMARY OVERVIEW OF APPROACHES

Prior to the late 1960s community perceptions of landscape received little academic attention. However, there is a long tradition of landscape appreciation as a focus of critical enquiry and creative endeavour within the fine arts and humanities, which can be traced back to the origins of the pastoral convention in classical Greek and Roman poetry (Williams 1975). In the eighteenth and early nineteenth centuries in England, landscape was a major focus of cultural interest, as aesthetic categories such as the beautiful, the sublime and the picturesque were compared and debated, in a search for the most appropriate principles for estate improvement. This debate can be interpreted as an early attempt to build a theory of landscape preference, and the concepts developed at that time continued to influence writers, painters and poets through to the twentieth century. Blanche Baugham, for example, when describing the views from the Summit Road above Christchurch in 1916, used terminology that would have been familiar to the main protagonists of the picturesque debate some 120 years earlier (Baugham 1916). Bowring (1997) has demonstrated that picturesque principles continue to underpin the professional practice of landscape architecture in New Zealand to the present day and, as such, form an important component of contemporary expert evaluations of landscape (see below).

Geographers and historians also have a long tradition of landscape interpretation, reading the landscape as text, and implicitly or explicitly making normative judgements concerning its quality or socio-cultural significance. Kenneth Cumberland provides some of the most systematic early examples of cultural landscape interpretation in New Zealand in his regional geographies (Cumberland 1946), whilst Le Heron & Pawson (1995) provide a recent example of a geographical approach to landscape.

The theoretical basis for the picturesque is, as the name implies, largely derived from fine art. A distinctive feature of the original debates in the eighteenth century was their emphasis upon the development of categories of emotional response to landscape. The early geographical approaches to landscape interpretation, on the other hand, tended to use terminology derived from the biophysical sciences and early town planning movements to describe the appearance of landscapes. These aesthetic and geographical sources were drawn together in the 1960s. In the UK the demand grew from pressure for housing development in the rural landscape, and the need for planning policies to protect landscape quality. Fines (1968) undertook one of the earliest systematic areal surveys of rural landscape quality using formal aesthetic indicators; he used a sample of experts to derive his classification of landscape. At the same time, in the USA the passing of the National Environmental Policy Act (NEPA) led to a requirement for evaluation of the visual effects of

management practices on federal land. The United States Department of Agriculture (USDA) Forest Service (1973) published an approach to visual forest management that involved describing and evaluating both the formal visual qualities of landscapes and the spatial distribution of these qualities. The USDA work included an assessment of viewer sensitivity (derived from the distance between public viewpoints and the forest being managed), and this recognition of social or community context was to become a dominant influence in landscape evaluation literature later in the 1970s.

A third approach to landscape evaluation that developed around this period was more ecologically based. Ian McHarg, in his highly influential book 'Design with Nature' (McHarg 1969), argued for regional planning to be based on a systematic expert appraisal of biophysical and ecological patterns and processes. In McHarg's approach, landscape quality was assumed to derive from ecological quality. This led to a focus on concepts such as naturalness, or diversity, as criteria for evaluation.

Most New Zealand landscape evaluation studies over the past 25 years have been based, to some degree, on the type of expert approaches pioneered in the UK and USA. Increasingly, aesthetic and ecological attributes are being combined. Both the Canterbury Regional Study (Ministry of Works and Development 1984) and the more recent Canterbury Regional Landscape Study (Boffa Miskell Limited & Lucas Associates 1993) were primarily 'expert'-based approaches which incorporated both formal aesthetic evaluation, and ecological evaluation. In the earlier study, the ecological dimensions were assessed parametrically (i.e. landform, soils, vegetation etc.). In the latter study, land systems were an integrating concept.

It is important to note that the relationship between 'aesthetic' and 'ecological' qualities is currently a major area of research and debate. A number of authors have pointed out that perceptions of natural landscapes and ecosystems are frequently influenced by cultural aesthetic traditions, such as the picturesque. However, picturesque values seldom correspond to ecological values. Nassauer (1995) therefore argued that it is problematic to assume that ecological and aesthetic values can be easily combined, and advocates recognising explicitly that ecological goals must be consciously 'framed' in ways that are culturally familiar. This problematic relationship between aesthetic and ecological assessments of landscape values, and the need to analyse carefully the aesthetic assumptions that frequently underlie 'ecological' assessments, is a major weakness in many 'expert'-based landscape assessments.

From the early 1970s onwards the inclusion of issues of landscape or scenic quality in statutory regulation in the USA led to a desire for more explicit and scientifically defensible measures of landscape and visual quality. Approaches based on formal aesthetic principles were challenged by quasi-experimental methods drawn from psychology. Probably the most influential has been the 'Scenic Beauty Estimation (SBE) method' (Daniel & Boster 1976). These authors argued that scenic beauty is best approached through a stimulus-response model of perception. In this, measurable physical attributes in the environment are assumed to lead to particular responses in the viewer. An aggregate measure of scenic beauty for a particular setting can thus be developed using systematic survey methods that ask people to rate photographs of the setting. Multiple regression analysis then allows predictive models to be constructed that

identify the contribution that any particular element in the landscape (such as a water body) makes to its overall scenic quality. Mosley (1989) provided an early example of the application of SBE in New Zealand, in his assessment of wild and scenic rivers, while Thorn et al. (1997) have provided a more recent and more sophisticated application.

Publication of the SBE method led to an intense debate in the landscape literature between proponents of essentially quantitative methods (such as Daniel & Boster 1976) and advocates of qualitative methods using expert critics (e.g. Carlson 1977). In the SBE-type methods, particular visual qualities or attributes in landscape are assumed to acquire value by virtue of their contribution to population preference. That is to say, if the presence of a particular feature in a scene statistically explains (or predicts) patterns of preference within a population as a whole, it is assumed to represent scenic beauty.

Critics of this approach, such as Carlson (1977, 1995) argue that preference scores do not indicate value. They may help predict the average preferences of a population, but they say nothing about *why* this is the case, or about whether this *should* be the case. Carlson favours valuation based on the philosophical tradition, and argues for wider use of environmental critics.

Zube et al. (1982) were able to identify four contrasting paradigms of landscape perception in the literature: expert, psychophysical, cognitive and experiential. The *expert* category corresponds broadly to the aesthetic approach of USDA, while the *psychophysical* paradigm is typified by the scenic beauty estimation method developed by Daniel & Boster (1976). In addition, Zube et al. (1982) identified a *cognitive* paradigm, subsequently perhaps best represented by Kaplan (1985, 1989); and an *experiential* paradigm, well-expressed by Seamon (1979).

The *expert* approach uses either ecological or formal aesthetic criteria as the basis for assessment of landscape values. The primary assumption is that landscape quality lies within the physical landscape, and can be best evaluated by an experienced and discerning critic.

The *psychophysical* approach seeks measurable relationships between the preferences expressed by population samples, and objective attributes of landscape. The Scenic Beauty Estimation method described above is a typical example. The psychophysical approach is utilitarian in its focus, and makes no attempt to develop theoretical understanding. Rather, it attempts to produce predictions of scenic beauty that can be used in management.

The *cognitive* approach typically uses similar quasi-experimental methods to the psychological approach, such as preference scoring of photographs, but interprets the results somewhat differently. Kaplan (1985) argued that the results of preference tests could be used as an indicator of basic perceptual processes. She therefore used photographs to assess the meaning assigned by viewers to particular settings. She identified factors such as the degree of naturalness in a scene as important dimensions in determining perceptual response, and subsequently went on to interpret the patterns of response by what she described as a 'functional' model of perception.

The functional model of landscape perception interprets landscape in terms of its 'survival' and 'use' value. Kaplan (1985) focused on the qualities that have

been of most value in evolutionary terms, and identified four key dimensions in a landscape setting which have biological and cognitive functional value: coherence, complexity, legibility and mystery. That is, does the scene make sense, is it reasonably rich in detail, can it be easily 'read' in terms of access, and does it provide potential for further investigation—does it draw you in? The functional model has been extensively refined, debated and tested and other variations developed. Ittleson, for example, has proposed a 'transactional' model, which emphasises the interaction between development of cognitive categories and responses and external landscape stimuli (see Hartig 1993). The essential point of all these, however, is that landscapes can be valued on the basis of the way their composition and spatial structure affect our psychological and biological wellbeing. There has been very little work of this type in New Zealand, although the Auckland Regional Landscape Study (Brown 1984) is an example of an investigation that drew, in part, upon the theoretical elements of the cognitive approach. A number of 'expert' studies have also incorporated some of the indicators of landscape value derived from the cognitive approach into their criteria for evaluation. Bennett (1985) provides an early example. Cary (1995a), in reviewing current methods within the New Zealand context, drew out further theoretical and methodological links between landscape perception studies and the rapidly evolving cognitive sciences. He subsequently (1995b) developed an artificial neural network (ANN) technique to better link expressed preferences with cognitive categories.

The fourth research 'paradigm' identified by Zube et al. explored the *experiential* dimensions of landscape perception in more detail, drawing upon a range of theoretical sources. Seamon (1979), for example, focused upon the use of a phenomenological framework of understanding to assess the significance of individuals' responses to particular situations and settings. This experiential approach contrasts dramatically with the psychophysical and cognitive approaches in its approach to valuation. It places priority upon the subjective experience of particular landscapes, rather than attempting to develop objective measures of a population's general response to landscape. Much of the recent work on local community preferences for landscape undertaken in the USA and the UK adopts qualitative methods, similar to those pioneered by Seamon (1979), to determine the features of a local landscape that have particular meaning and significance for its communities. Typical methods include depth interviews, participant observation, and focus groups in which individuals and small selected groups provide researchers with detailed accounts of their particular interests and perceptions. Recent work in the upper Rakaia provided an example of the academic use of ethnographic field methods in the high country (Dominy 1990a, b, 1993a, b, 1995).

One weakness of the earlier studies classified by Zube et al. (1982) was their neglect of the social and political context of evaluation. Cosgrove & Daniel (1988) examined the symbolic meaning in landscape, using formal iconographic and materialist perspectives, arguing that landscape preference is essentially a social product, created in particular cultures and societies by particular social groups. Uzzell (1991) subsequently offered an update on the classification of approaches provided by Zube et al., which included a number of more recent developments in the socio-cultural approach to landscape perception.

The *socio-cultural* approach seeks to value landscapes on the basis of their social, cultural or political significance. It may use a range of methods. In some studies, the evaluation of significance has been based upon expert analysis of the way landscape values have been recognised in a range of cultural products and processes. A example of this is the analysis of images used by communities and their representatives to promote particular locations to tourists (e.g. Cloke & Perkins 1998). In other studies various social survey techniques have been used to determine landscape significance, ranging from photographic sorting (Q sort) combined with interviews, to depth interviews and participant observation.

While the experiential and socio-cultural approaches both use similar methods of qualitative research (interviews, participant observation etc.), there is a significant difference in emphasis in the theoretical framing of the research, and the interpretation of the results. In a socio-cultural approach it is assumed that landscape values or significance are fundamentally shared phenomena—an individual's response only assumes significance when placed into a social or cultural context. In contrast, the experiential/phenomenological approach is interested primarily in the subjective experience of the individual, which has significance independent of the social context.

Uzzell (1991) also distinguished an approach he described as action research. Action research is a social-scientific approach that attempts to link investigation of community attitudes and perceptions with educational programmes and environmental decision-making. It typically uses similar methods to other approaches (particularly interviews, questionnaires and focus groups) but carries the results forward into design or decision-making workshops, often described as charettes. Here, local communities work with local planners and designers to develop policies and plans for their areas, incorporating the results of the earlier surveys. Uzzell (1991) noted that this approach does not fit within the classification given by Zube et al (1982). In this report, we include action research under the socio-cultural approach, given its largely similar methods and its focus on the social and political context of values. There have been relatively few action research studies in the New Zealand high country. Recent work in Hurunui provides a good example of this approach (Lucas Associates 1995).

Zube et al. (1982) suggested that the different approaches, or paradigms, of landscape evaluation research can be placed upon a spectrum in terms of the way they each deal with the concept of landscape and with human perception. Expert studies tend to treat humans as passive observers of the landscape, and analyse landscape in terms of discrete dimensions (e.g. landform, land cover, cultural features). Psychophysical approaches include humans as respondents, but focus solely on measured responses to particular dimensions of landscape (e.g. scenic beauty). Cognitive (or psychological) approaches are more interested in the cognitive structure of human responses in relation to the physical structure of landscape. Socio-cultural approaches focus on how human ideals *about* and responses *to* landscape are socially and culturally structured. The experiential, or phenomenological, approach is concerned with the way humans are actively immersed in a holistic phenomenon we call landscape. The spectrum of approaches is illustrated in Table 1.

A wide choice of potential approaches to the assessment of community perceptions of landscape values is therefore available.

TABLE 1. APPROACHES TO LANDSCAPE EVALUATION.
(adapted from Zube et al. 1982).

APPROACH					
	Expert (aesthetic or ecological)	Psychophysical	Cognitive	Socio-cultural	Experiential (phenomenological)
Human	Passive	—————	—————	—————>	Active
Landscape	Dimensional	—————	—————	—————>	Holistic

2.2 OVERVIEW OF FIELD SURVEY METHODS

Landscape perception research has used a wide variety of survey methods, reflecting the diversity of disciplinary origins of the work, and the range of approaches (identified above). A useful evaluative distinction in the context of this report is between user-independent and user-dependent methods. User-independent methods are those which assume that landscape values or qualities can be determined by direct reference to the physical and/or visual landscape, without involvement of particular user groups. These typically apply predetermined evaluative criteria to particular landscape settings. The criteria are themselves derived from existing theory or theoretical assumptions. Hence the 'Vamplan' method, for example (Bennett 1985), systematically applied a series of visual quality criteria derived from several sources. In general, 'ecological' methods emphasise the use of principles developed from ecological theory (e.g. diversity), whereas aesthetic methods emphasise principles derived from the fine arts. However, these two approaches are frequently mixed or overlying; hence one of Bennett's visual criteria was 'naturalness'. Bowring (1997) has argued that one of the problems of such expert approaches is that they frequently take for granted principles that have been derived from earlier theories, without acknowledgment of the assumptions.

A number of the more recent socio-cultural approaches also adopt methods that do not involve direct survey of 'user' perceptions; for example, semiotics and iconography are based upon critical analysis of 'landscape' representations such as maps, images, photos, advertisements etc. However, although these are 'expert'-based methods, the focus of investigation is upon identification of the landscape values being expressed through cultural processes such as advertising. Hence the images produced by and within a culture or society are used as surrogates for other forms of community survey. These approaches are not normative, but attempt to identify the prevailing cultural values that are influential within the community.

The majority of studies of high-country landscape to date have been based on expert aesthetic or ecological assessment methods. More recently, some studies have used iconographic methods. However, studies of 'community' values must incorporate some direct investigation of users' views, if they are to extend beyond the user-independent approaches of most expert studies. For this we must turn to the wider range of user-dependent methods. These can be usefully divided into two broad categories. On the one hand, there are quantitative

methods based, typically, on the techniques of the natural sciences, or their equivalent in predictive social sciences such as psychology or economics. These are also known as quasi-experimental, in that they follow the same general approach to survey design as the experimental sciences. On the other hand, there are qualitative methods derived, more typically, from interpretive social sciences such as anthropology and cultural geography, or from the humanities.

The key difference between the two groups of methods lies in the intended use of the results. Quantitative, quasi-experimental methods are commonly used to build mathematical models of relationships (e.g. user preferences for particular landscape attributes), which can then be used to predict future patterns of preference etc. The Scenic Beauty Estimation (SBE) method described above was developed precisely for this purpose, to enable federal land managers to model the likely effects of management actions upon perceived scenic beauty, in advance of the actions (as part of the federal requirement for environmental assessment). The work of Thorn et al. (1997) on forestry impacts in Nelson is intended to achieve the same purpose, enabling managers of private forests to predict the effects of their planting and harvesting plans upon perceived scenic beauty, and to thus avoid the worst impacts.

Much of the landscape investigation carried out within the 'cognitive' paradigm also uses quasi-experimental quantitative methods drawn, typically, from psychology to attempt to develop theoretical models of landscape perception. These can also be used to inform future management and decision-making in similar ways to the SBE predictive model. The analysis of wilderness perception by Kliskey (1992) falls generally within this approach.

The key operational significance of the quasi-experimental quantitative methods is that they require carefully controlled and standardised survey procedures (hence, quasi-experimental), and require statistical sampling of respondents. This means that the number and choice of people to be surveyed depends on the levels of statistical significance required by the analysis. This is because the aim is to predict population-wide patterns of perception based on a selected sample. This requirement can cause practical difficulties in many operational situations.

In landscape perception research, the most common quantitative methods are the ranking and rating of photographs, or questionnaires. In photographic ranking and rating, photographs are used as surrogates for the 'real' landscape (Shuttleworth 1980). Usually, photographs are taken by the researcher on the basis of a predetermined sample design. Sometimes this is a random survey of views within a defined area; in others it is photographs of predetermined landscape features, identified as being of potential significance. The precise selection, framing and exposure of each photograph is undertaken according to standardised procedures, to avoid bias towards any particular image. The photos are then presented to respondents in one of several ways—most typically as slides projected onto a large screen—and the respondents are given a standardised set of instructions to score or rank the images in particular ways according to the research design. The results are noted on standardised record sheets, and then analysed using one of the now widely available statistical packages.

In questionnaire surveys of landscape values, words are used as indicators of respondents' views or values. In some techniques, the range of words used is derived from the respondents themselves; in others they are derived from previous studies, or wider theory. Respondents then select, rank or rate different words or phrases according to their individual evaluation of a particular landscape setting. In some more-sophisticated surveys, sets of photographs are evaluated using sets of words as descriptors. In others, the emphasis is upon the identification of the respondents' choice of words to describe particular landscapes (Cary 1995a). The results are analysed statistically to identify key words and concepts used to describe or value particular landscapes. Other questionnaire methods are more open-ended, asking respondents to describe or evaluate landscapes in their own words, which can then be analysed using techniques such as content analysis (counting the occurrence of frequently used words or descriptors).

The outcomes of quasi-experimental methods are, typically, either tables of percentage responses (e.g. '65% of respondents ranked water as a major feature of valued landscapes'), or multivariate equations. Mosley (1989), for example, developed the following equation to describe and predict the effect of key variables upon perceived scenic beauty of rivers:

$$SC = 4.12 + 2.29AFOREST + 0.62 \log (ANG PROM) + 0.0007 RELIEF + 3.46 ALPINE + 2.00AWATER + 1.42 \log (CONFIN) - 0.06 COLOR$$

Translated, this says that the main predictors of scenic beauty are the presence of native forest, high relief, alpine rock and snow, water, enclosure, and colour, with each attribute having a different degree of influence.

In contrast, qualitative methods are largely derived from disciplines where the aim of research is interpretive. That is to say, the outcome is enhanced understanding rather than prediction. This will, it is hoped, lead to improved decision-making, but is not intended to provide detailed management prescriptions. The most common methods of qualitative landscape research are depth interviews and focus groups, where selected individuals or groups are encouraged to describe and discuss in detail their values and preferences with respect to particular landscape settings. The purpose of these methods is to identify landscape values and meanings as they are subjectively defined and experienced by the respondents.

Just as in quasi-experimental methods, there is a large body of literature that deals with procedural requirements. The focus, however, is not standardisation in an experimental sense, but to ensure maximal integrity of the recording and interpretation of individual subjectivity and group beliefs. The interviewer/researcher is the research instrument, and must be acutely self aware of how the respondents' perceptions and values are drawn out and interpreted. The outcome is a 'rich' description of the values of individuals or groups. Selection of respondents is not based upon statistical sampling, which is theoretically meaningless in this context. Instead, respondents are selected as key informants according to their expected significance to the study. Swaffield (1994, 1998b), for example, wished to investigate language used by policy makers and policy influencers, and therefore selected informants from a range of policy-relevant interest groups. Similarly, Fairweather & Swaffield (1995) selected key informants from a range of community sectors in the Mackenzie/Waitaki Basin.

The outcome is not a predictive model of the whole population (however defined), but a profile of views (meanings, values) that exist within the target community.

One advantage of using key informants rather than population sampling in many New Zealand situations is that it enables researchers to identify the range of views held, and to characterise the types of people holding those views, in a relatively efficient way. A problem with quasi-experimental statistical sampling is that in many rural or high-country settings, the 'population' is very difficult to define—it comprises, typically, a small number of residents, different interest groups, and a range of visitors from elsewhere within and outside New Zealand. Morris et al. (1997) found, for example, that in the Mackenzie and Waitaki Basins there was no single, homogeneous 'community' but, rather, a series of overlapping and fragmented communities of interest with differing spatial configurations. Statistical sampling of such populations is problematic.

Other qualitative methods that have been used involve participant observation, where the researcher spends considerable time—possibly months—living and working with a community, recording their everyday lives and actions, and qualitatively analysing key themes or structures of meaning and value in their lives. Dominy's studies of the Upper Rakaia (Dominy, 1993b, 1995) provide perhaps the best example of this approach (see also Morris et al. 1997).

Focus groups are being widely used in community action research in New Zealand and internationally. In these, key informants and opinion leaders from a community are brought together for periods of several hours to several days. Typically, their interactions are orchestrated by one or more researchers, who guide the group through a process of identification of values and valued locations and, frequently, preferred actions, in relation to a particular landscape setting (e.g. Lucas Associates 1995).

An increasingly popular device is the community 'charette' in which focus groups move from identification of shared values to development of plans or policies for the future. Selection of participants for focus groups and charette studies is a critical factor. Community groups or organisations are often involved in selecting participants. A common technique is to incorporate feedback stages into the process, so that results of a focus group session or charette are summarised and then disseminated back to the wider community, who have the opportunity to comment upon the results, or participate in a subsequent group meeting or stage in the charette. However, it is also important to recognise the potential for such techniques to inadvertently 'exclude' people. Another concern is that focus groups are not designed to deal with high levels of diversity, which tend to be suppressed by the process.

Feedback is also an important feature in much individual-focused ethnographical research, in which a researcher may have a succession of meetings with a key informant, clarifying at each stage the conclusions of the preceding meeting before exploring further details or nuances of meaning. Acknowledgment of the 'ownership' of data is also important.

Lucas (1994) used a more systematic form of feedback known as Delphi; this involves key informants responding to a series of questionnaire-type surveys in which the results of the previous survey are provided to respondents in subsequent surveys. The aim in Delphi is to explore the possibility of

convergence of views and, hence, achievement of a consensus. Other qualitative techniques involve self-administered surveys, in which key informants are asked to keep diaries or take photographs which identify landscape features as expressions of particular value or significance to them.

Finally, it is worth noting that there is a long-established research tradition, relatively little used in New Zealand, which draws upon the discipline of phenomenology, in which the emphasis is upon the sensitisation of an experienced researcher to the essential qualities of a landscape and its community. In some ways this appears, superficially, to resemble the 'expert' approach discussed above. However, it differs significantly in that it draws upon quite different philosophical and disciplinary sources. These emphasise the development of an empathy with a situation that is not structured by previous knowledge (as in most 'expert' approaches) but, rather, seeks to distil the inherent qualities of a setting by close observation and direct experience. Possibly the most respected historical example of such work is the account of Walden Pond by Henry Thoreau (1817–62). The essential element (which is frequently missing in other methods) is that of systematic self reflection.

It will be clear from the preceding account that some types of survey technique can be used in more than one way in landscape perception research. Photographs, for example, have been used as controlled stimuli in quasi-experiential psychophysical research (e.g. Mosley 1989; Thorn et al. 1997) or in work that is more socially oriented, such as that of Lucas (1994) or Swaffield & Fairweather (1996). Some methods also 'bridge' approaches. The use of Q method in Fairweather & Swaffield (1996), for example, combines the investigation of individuals' subjective responses to photographs or images which evoke particular experiences, with interviews which seek the wider social and cultural context of responses. It thus combines experiential and socio-cultural approaches.

The critical feature in every case, however, must be an explicit recognition and consideration of the theoretical and methodological basis for the research. The advantage of methods such as interviews and questionnaires which are flexible and easy to administer is also a significant potential disadvantage, in that they are easy to administer by staff who may have insufficient knowledge of, or experience in, their assumptions and applications. This can result in research findings that are lacking in scientific credibility (and hence operational validity).

Table 2 summarises the methods typically used in different approaches to landscape evaluation.

2.3 EVALUATION CRITERIA FOR SELECTING METHODS TO IDENTIFY COMMUNITY LANDSCAPE VALUES

2.3.1 Existing criteria

There is little published literature that attempts to systematically evaluate the full range of approaches and methods being used for landscape perception research. As noted above, Zube et al. (1982) and Uzzell (1991) developed classifications, but neither undertook a comparative evaluation against a

TABLE 2. METHODS USED IN DIFFERENT APPROACHES.
(after Zube et al. 1987; Daniel & Vining 1983; Uzzell 1991).

EXPERT		PSYCHOPHYSICAL	COGNITIVE	SOCIO-CULTURAL	EXPERIENTIAL
USER-INDEPENDENT METHODS		USER-DEPENDENT METHODS			
'Ecological'	'Aesthetic'	Predominantly quantitative		Primarily qualitative	
<ul style="list-style-type: none"> • Field survey • GIS analysis • Systematic valuation of biophysical landscape attributes against defined quality criteria based on ecological or biodiversity principles 	<ul style="list-style-type: none"> • Field survey • Systematic valuation of visual and physical attributes against defined criteria based on principles of fine art, or derived from cognitive research • Expert critique from philosophical principles of aesthetics 	<ul style="list-style-type: none"> • Quasi-experimental surveys of landscape users (visitors, community, general population) using photographs which are rated or ranked according to perceived beauty, attractiveness etc. and analysed using multiple regression type techniques 	<ul style="list-style-type: none"> • Quasi-experimental photo preference surveys (as in psychophysical) used to test hypotheses derived from functional themes of perception etc. • Quasi-experimental questionnaire surveys based on psychological techniques (e.g. semantic differentials) to determine meanings assigned to landscape settings or features 	<ul style="list-style-type: none"> • Qualitative type surveys (e.g. participant observation, depth interviews, focus groups, self-administered surveys) interpreted by reference to social and political interests, or cultural theory • Iconographic or semiotic analysis of cultural products (e.g. advertisements) • Action research (e.g. charettes) 	<ul style="list-style-type: none"> • Ethnographic surveys of key informants • Qualitative analysis and interpretation • Self reflection upon key landscape phenomena

specified standard. However, Daniel & Vining (1983) developed a set of criteria for selection of methods which is still widely cited. They specified four key criteria: reliability, sensitivity, validity and utility, and explain them as follows.

Reliability is a test of consistency. It asks whether different methods will produce agreement when measuring the same type of phenomena in different applications. Daniel & Vining (1983) argued that methods such as expert evaluation are of questionable reliability, in that a range of experts are likely to evaluate the same phenomena differently. Even an individual expert will make different judgements at different times. However, they acknowledged that there is insufficient data on this. In contrast, they argued that psychophysical methods have been developed to a high level of reliability, and this has been demonstrated by numerous consistency tests.

Sensitivity is a test of whether a method is sensitive to changes in the phenomena being measured. A sensitive method will identify even minor variations in the way an individual or community values a particular landscape; whereas an insensitive method may only identify major shifts or differences in values. Daniel & Vining (1983) noted that phenomenological or experiential methods are highly sensitive to subtle differences in landscape quality (or value). In contrast, they argued that 'expert' approaches are limited in their sensitivity, by the nature of the categories that are typically used for evaluation. Describing a landscape in terms of overall 'naturalness', for example, could disguise a wide range of detailed variations in ecological modifications.

Validity is the third criterion identified by Daniel & Vining (1983), and assesses the extent to which a particular method actually measures the quality it claims to measure. In the context in which they were writing, this referred to whether any particular method actually identified landscape 'quality'. An example in the

New Zealand context would be: if a survey is undertaken in order to identify 'outstanding landscapes' in terms of the RMA, by asking respondents to rank photographs according to their judgement of 'attractiveness', does this equate to an assessment of what is outstanding? Daniel & Vining argued that validity is continually being assessed through practice and policy implementation, and that at any particular point in time it can be best achieved by triangulation—the application of different methods to the same phenomena. If two or more methods produce similar results, they argued, there can be greater confidence in their validity.

Finally, Daniel & Vining (1983) acknowledged that *utility* is an important criterion. Utility refers to the efficiency and generality of a method—does it produce reliable, valid results at relatively low cost in time, materials and personnel, and can it be used with little or no modification in a wide range of settings? One of the major attractions of 'expert' methods, they argue, has been their high degree of utility; it was precisely this need which led to the standardised Vamplan approach (Bennett 1985). It could also be argued that it has been consideration of utility that has led to the dominance of expert approaches in recent years.

Using this set of criteria, Daniel & Vining (1983) argued for further development of the psychophysical and cognitive approaches, which they thought held most promise for the future. This suggestion and the criteria upon which it is based have not gone unchallenged, however (Carlson 1977, 1995, Wood 1988). The main point of contention is that Daniel & Vining (1983) placed very heavy emphasis upon measurement of landscape preference, and upon development of predictive models of preference, and drew extensively upon psychology for their approach and evaluation. This emphasis can be questioned on the grounds that, firstly, the approach is not without its own limitations and, secondly, that there are other disciplines with valid approaches to landscape values, and other ways of evaluating research methods. For example, Carlson (1977, 1995) argued that the emphasis upon measurement and prediction favoured by Daniel & Vining (1983) tells us very little about why certain landscapes are preferred or valued. Wood (1988) went further, arguing that the type of approach they advocated actively diminishes our understanding of landscape, by narrowing the focus of investigation to a detached, two-dimensional visual image, as opposed to the full range of landscape experience.

It is therefore important to recognise the possibility of other evaluation criteria in selecting methods for assessing community perceptions of landscape values, particularly those that involve qualitative approaches. Silverman (1985), for example, proposed that for evaluation of qualitative methods in social science the key criteria should be the plausibility, coherence, richness and theoretical fruitfulness of the results. Plausibility and coherence refer to whether findings of the research make sense in the wider context, and whether they 'hang together'; richness refers to the extent to which they provide new empirical knowledge; while theoretical fruitfulness refers to whether the research has raised or clarified theoretical questions. These criteria focus on the interpretive significance of research: that is, does it help us understand why certain landscapes are valued, rather than predicting what those values are likely to be in a given population. They are, therefore, quite different in emphasis from the criteria proposed by Daniel & Vining (1983), and if applied to the five approaches reviewed above, would produce quite different conclusions.

More recently, Baxter & Eyles (1997) have offered additional criteria for assessment of qualitative research. Based upon a review of published articles within cultural geography, they suggested that four criteria should be used in assessing research findings: credibility, transferability, dependability and confirmability. A test of *credibility* asks whether a piece of work offers an authentic representation of the experience being investigated. *Transferability* is an assessment of whether the findings can be extended beyond the study situation. *Dependability* is a test of whether idiosyncrasies and variability in researchers' approach and interpretation can be minimised. *Confirmability* assesses the extent to which results can be checked by third parties.

In discussing these criteria, Baxter & Eyles (1997) acknowledged that they are analogous to conventional criteria used in quantitative evaluation (e.g. the criteria of Daniel & Vining 1983) but argued that they are not the same, as the nature of the tests is different. In other words, they accept that both quantitative and qualitative research may be evaluated in broadly similar ways, but argue that the detailed tests must differ, in recognition of the differences in the nature of the research traditions.

2.3.2 Application to investigation of community perceptions in New Zealand

One of the problems in attempting to translate these criteria directly into operational situations in New Zealand is that they are highly generic, and are primarily aimed at the research community, rather than at operational managers. They emphasise dimensions of research which are aimed at developing improved theory, and which can meet international peer-reviewed standards. Furthermore, as noted, there are significant differences in emphasis possible depending upon whether the research is primarily predictive or interpretive in nature. In their basic form, therefore, they do not provide a practical guide for operational managers needing to evaluate existing research or specify new work.

In order to develop a working guide it is necessary to explore further the purpose of research into community perceptions of landscape value. It was argued in the introduction that improved understanding of community perceptions is an important part of conservation management, but such understanding could be needed and used in a number of different ways. At the macro scale, there is a potential need to improve our understanding of how more general theories of landscape perception apply to New Zealand communities. At present most of the theoretical knowledge about landscape values that underpins operational decisions is derived from publications originating outside New Zealand. There is a growing concern within other social science disciplines that theoretical models developed elsewhere may not be directly applicable to New Zealand's unique social and cultural conditions, and that they may require testing and refinement in New Zealand before being used in management. This is likely to apply as much to landscape perception as to other aspects of social theory.

A second possible requirement for landscape research is to enhance our overall understanding of the high country, and provide a context within which government policy is developed: for example, major policy initiatives in tenure and land management.

A third potential research need is to describe in detail community perceptions of landscape values on a particular issue, as part of the public evaluation of a specific regional or district policy, a proposed development, or proposed management strategy. This is likely to be a continuing requirement, and is the area in which methods and results come under close scrutiny—by the communities affected and by decision-making bodies such as planning authorities, conservation boards, and the Environment Court. It may also require periodic monitoring of community perceptions.

Finally, knowledge of community perceptions may be required as a specific input to local management decisions, either with the intention of minimising opposition to proposed change, or of directing management actions towards meeting specific community concerns.

Each of these research needs has significantly different priorities, in terms of the generic criteria identified above. The requirements for knowledge intended to refine theory come closest to the criteria of Daniel & Vining (1983), and Baxter & Eyles (1997). The main additional criterion is the self-evident requirement of relevance to the theoretical tradition being addressed.

Knowledge about community perceptions of landscape values required for overall policy formation must meet three requirements. Most importantly, it must be credible to politicians and the public: that is, it must be seen to provide an authentic representation of values held by a community. Policy analysts require knowledge to provide insight into policy-relevant issues. Finally, senior managers require the knowledge to be dependable, and not be subject to individual researcher bias.

In preparing evidence on community perceptions of landscape values for public hearings into development or management proposals, there are two key audiences. First, hearing authorities and the Environment Court require evidence that is objective and independent, which in terms of the criteria reviewed equates to being 'dependable'. There is also a need for a sensitive understanding of community values concerning particular landscapes. This is essential to achieve credibility with the community itself. Any monitoring activity requires reliability as a priority, in order to ensure comparisons are valid.

Finally, at the operational level, managers typically seek focused and robust information that enables them to take decisions. Utility is the key priority at this level. However, with increasing community involvement in decisions, credibility is also vital, whilst with increasing accountability being required, knowledge must also be dependable.

Based on this analysis of need, we propose the following key criteria for evaluating approaches and methods for investigation of community perceptions of high country landscape values:

Credibility This is the extent to which a particular approach or method authentically represents community perceptions of landscape values. In other words, if a member of the community sees the research results, will they recognise them as a fair and accurate reporting of the landscape values of that community?

Dependability This is the extent to which users can be confident that the landscape values reported are not biased by the researcher's own interests or prejudices.

Utility This is the extent to which the method itself can be easily and economically applied.

It may be important to ask whether the approach provides good insight into the reasons for particular values being favoured. Is the approach sensitive to the more subtle nuances within a particular community and, in the case of monitoring, is it reliable over repeated applications?

Table 3 summarises the differences in emphasis for the three areas of operational research.

Finally, there is a general requirement for ‘best practice’ in all publicly funded activity, which applies to all types of application. In the context of the RMA, this is expressed in the requirement under Section 32 of the Act for benefit cost testing of proposed policies or rules. In the context of this report, it can best be expressed in the expectation that whatever approach or method of investigation is adopted, there is an overriding requirement that it meet the best practice standards prevalent in the particular field. Best practice can be determined in several ways. The conventional method in academic research is peer review. Publication in a peer-reviewed publication is therefore a good working indicator that a method meets ‘best practice’ for the particular discipline and application. In professional practice, peer review is becoming more prevalent, but is seldom reported in the public realm. However, professional recognition through awards is a good indicator. Determinations of the Environment Court are also good indicators of professional ‘best practice’, in that they frequently identify evidence which had a particular influence on the outcome, and also note situations where the evidence was not accepted as valid. Methods used by professionals can also be compared with similar methods that have been subject elsewhere to formally published peer review.

This report identifies some ‘benchmark’ studies that exemplify current best practice in different approaches. This enables account to be taken of the range of indicators identified above. In the next chapter, benchmark studies are identified and briefly discussed for each of the main approaches, as part of the overall review of current knowledge.

TABLE 3. DEFINITION OF PURPOSE AND CRITERIA FOR OPERATIONAL RESEARCH.

PURPOSE	THE QUESTIONS WE ARE TRYING TO ANSWER?	PRIORITY	OTHER CRITERIA
Context for policy	<ul style="list-style-type: none"> • What are the broader social or cultural values concerning the landscapes we are managing, which should be taken into account when policy is developed? 	<ul style="list-style-type: none"> • Credibility 	<ul style="list-style-type: none"> • Insight • Dependability
Evidence for evaluation of particular change	<ul style="list-style-type: none"> • What do communities value in the particular landscape under consideration? • What impacts will a proposed change have upon community perceptions? • How do perceptions of value change through time? 	<ul style="list-style-type: none"> • Dependability 	<ul style="list-style-type: none"> • Sensitivity • Reliability
Operational direction	<ul style="list-style-type: none"> • What actions should managers take in order to protect or enhance existing values? • What actions should be taken to minimise negative effects of change? 	<ul style="list-style-type: none"> • Utility 	<ul style="list-style-type: none"> • Dependability • Credibility

3. Report on current knowledge

It is possible to organise literature review material in a number of ways. Given the operational focus of this report, three summary reviews are presented, each organising the material in ways designed to meet the needs of different potential users. Readers should select the review that best meets their particular needs. Reading all three in sequence can be instructive, but may also appear repetitive.

The first summary review organises the material thematically, grouping studies according to their primary focus. The themes that emerged are landscape change, designation of outstanding landscapes under the RMA, landscape as a factor in recreation and tourism, and forestry in the landscape. The next, shorter review orders the material geographically. Finally, an overview is presented of the overall patterns of community perceptions of high-country landscape values that have been revealed within the literature.

3.1 THEMATIC REVIEW

3.1.1 Landscape change

A number of studies (particularly in the past decade) have examined high-country communities to assess the impacts of change resulting from hydro development (Houghton 1980, O'Reilly 1992) or change in land use or tenure (Dominy 1990a, b, 1993a, b, 1995; Taylor, Baines and Associates 1990, 1993, 1995; Morris et al. 1997). All these studies used qualitative, in-depth interviewing, with the exception of the initial survey of farmers by Taylor, Baines and Associates (1990). Cushen (1997) investigated wider community perceptions of change in high country, based mainly on a questionnaire survey.

Houghton (1980) dealt only with the immediate river environment of the lower Waitaki River and attitudes towards proposed river developments, and is therefore not particularly relevant to this report. O'Reilly (1992) studied the sense of place of long-term residents in Clyde before and after the construction of the high dam. She noted that despite a deep sense of loss for the river, many in the community had adjusted to the changes caused by dam construction. The physical environment was a stabilising factor. Respondents contrasted the expansive open craggy character of the golden hillsides of Central Otago with the 'claustrophobic West Coast' and 'green Taieri Plains'. The hills were felt to provide security and strength. Although the golden colour of the hills was mentioned, gorse, thyme and fruit trees were the most commonly mentioned vegetation. O'Reilly (1992) highlighted the way that community perceptions are closely linked to locality. The results suggested that perceptions of landscape values will vary throughout the high country depending on historical and geographical characteristics.

Dominy's work in the Upper Rakaia (Dominy 1990a, b, 1993a, b, and 1995) also highlighted the importance of locality, and showed the way that high country issues are expressed differently depending on context. Her work was done

against the background of the Ngai Tahu claim against the Crown, and the potential implications of this for pastoral leasehold land. She gave evidence to the Waitangi Tribunal on behalf of high country farmers (1990a, b) about their attachment to the land. Dominy emphasised the continuity of high-country inhabitation (1993b) and in her paper about toponymy (1995) she showed how inhabitants use naming strategies to create meaning in the landscape by diminishing its scale, and telling stories of local events through the landscape in which they occurred. These papers demonstrate the importance of inheritance, and the attachment of high-country families to the landscape through their intimate knowledge of its topography.

With the increasing number of claims on the ownership of the high country, conflict between community interests has become more apparent. Ryan (1995) dealt with three of these conflicts through interviews mainly with farmers: Maori claims, foreign ownership, and the contest between production and conservation. However, Ryan didn't give much emphasis to landscape perception. White (1994) looked at the attitudes of recreationists such as the Federation of Mountain Clubs (FMC) over the Treaty of Waitangi claim for Mt Cook/Aoraki by Ngai Tahu. He suggested that recreationists' concern about corporate take-over of this 'icon' was unfounded, and concluded that although Ngai Tahu had been forced to adopt a western corporate model in its dealings with government, this did not mean that the tribe had any intention of developing Aoraki in a commercial sense. As noted in the introduction, tangata whenua values fall outside the specific focus of this report. However, this is an appropriate point to note the extensive documented coverage of Ngai Tahu values within the claims to the Waitangi Tribunal (Evison 1986, 1987, 1988). In addition, there are a number of other publications that specifically address tangata whenua values relating to the high country, for example Brailsford (1984), Evison (1993a, b).

Taylor, Baines' longitudinal study of farmers in the high country (Taylor, Baines and Associates 1990, 1993) was part of the Rabbit and Land Management Programme. It sought to assess the role of social factors in the implementation of sustainable agricultural practices. They noted that size of property, age and education of farmers, and land degradation varied between districts in the study, and that these factors influenced the way farmers saw the land. Landscape issues were covered briefly and appeared to be interpreted differently by different farmers. Some felt that the Mackenzie Basin was a unique landscape that was deteriorating because of wilding pines, while others felt that afforestation was important as a way of halting degradation. The authors noted that there was some confusion about landscape with respondents both liking the landscape the way it was now and wanting to plant trees. They also noted that many farmers had only spent small amounts of time away from the high country and generally had little tertiary education. The authors suggested that this led to a 'traditional'-type farmer who did not favour dramatic changes.

This theme was also highlighted by Morris et al. (1997) in their extended in-depth study of the farming community in the Mackenzie/Waitaki Basin. This research sought to understand the preferences expressed for various land use scenarios (Fairweather et al. 1994) (which is discussed under the forestry theme). Morris et al. (1997) questioned the idea that there is a single coherent community in the Basin and also found that landscape was not a widely used

concept, although it was more common among those who had an interest in tourism. Overall, they felt that although there was a clearly recognised need for land use diversification, the traditions of fine wool farming and lack of capital would inhibit that diversification.

One approach to reducing land use conflict, or at least defining problem areas, was investigated by Wardle et al. (1993a, b) and Wardle (1994a, b). This approach used a spatial information decision system (Lupis) to generate resource capabilities. Preferences for improved pasture technologies, forestry and conservation were then mapped to show potential sites of land use conflict. A somewhat similar GIS-based approach was used by Kliskey (1992) to map conceptions of wilderness, using wilderness perception mapping (WPM), in the back country. He acknowledged that wilderness for one person will not be wilderness for another and proposed, instead, a wilderness purism scale (based on Shultis 1991) in order to map different conceptions of wilderness.

Cushen (1997) explored public perceptions of high country in the context of Treaty settlements, tenure change and foreign ownership. Using a questionnaire survey of residents in Otago and Westland, complemented by interviews, the study identified three key elements of high-country identity: pastoralism, wilderness and Crown land. There were some variations in perception and in response to change, depending upon the ethnicity, gender, age, place of residence and socio-economic status of respondents. People with direct experience of high country had more diverse and multifaceted perceptions.

O'Brien (1995a), in her study of community perspectives of riparian landscapes in Marlborough, found a high level of community interest in river landscapes, but also noted that the appropriate level of regulation preferred by the community depended on the focus of concern. This meant that strong action was requested over water quality issues, regulation was tolerated to protect intrinsic values, but access should remain largely unregulated. She interpreted this to mean that the local communities were explicitly requesting a partnership to manage river landscapes that would require change from both sides. O'Brien described her work as action research carried out through a number of stages. These included initial interviews, a discussion document and submissions, and a community meeting with topics being refined throughout this process. However, she found such strong feeling among the local community that each step in the process restated the initial concerns.

In summary, the literature has emphasised that community values are highly context dependent. The ethnographic studies in particular have revealed the depth of emotion underlying certain issues, which confirm that the local community can be a powerful force for or against landscape conservation. However, such studies usually require lengthy time in the field and their results are not necessarily transferable to other communities in the area. In contrast, GIS techniques are now being used to map the geographical dimensions of landscape values and responses to change over larger areas.

3.1.2 Outstanding landscapes

Areal landscape assessments and classifications of various parts of the high country have become increasingly common since the RMA required councils to protect outstanding natural landscapes. Most of these studies have been based solely on expert opinion (for example: Boffa Miskell Partners Limited 1992a, b;

Glasson 1992; Bennett & Davie Lovell-Smith 1993). However, one earlier study and a number of more recent ones have included community input. A study of the Waitaki Basin (Petrie 1979) included a brief comparison of landscape preferences between landscape staff and 20 other staff members of the Department of Lands and Survey. However, because of the small numbers from a narrow background, this study has limited relevance. A national study of wild and scenic rivers (Mosley 1989) used a psychophysical approach, where user preferences were analysed to score rivers and identify key factors used to predict scenic beauty. This type of study only assesses the visual attractiveness of photographs and can be difficult to interpret; for instance, a stream in Fiordland and the Avon River in Christchurch received similar ratings. Overall, however, Mosley's findings confirm the wider international literature, which shows that preferences are closely tied to the landform, relief, indigenous vegetation and particular types of water.

In the Canterbury Regional Landscape Study (Boffa Miskell Limited & Lucas Associates 1993) a mixture of expert and community approaches was used to identify outstanding landscapes based on six different categories: scientific values, legibility, transient features, aesthetic qualities, shared and recognised symbols, and tangata whenua values. Community input was focused on the identification of shared and recognised symbolic values, with surveys of art, literature and tourist information, and on the recognition of tangata whenua values. The study of landscapes of the Hurunui District (Lucas Associates 1995) used the same land systems approach as the basic framework, but also included greater public participation, with the use of focus groups who were asked to identify those landscapes they especially valued. The study found that areas near the main divide were generally regarded as outstanding, while large areas of high-country basins were not regarded as significant. This emphasises again the importance of 'picturesque' qualities of high relief, bare rock and dramatic mountain settings, as opposed to the more subtle features of lower relief areas. Boffa Miskell Limited (1996) used a similar questionnaire and focus group approach to investigate the Lees Valley for Waimakariri District Council, and although landscape was not a primary focus, it emerged as one of the key qualities of the area. The use of focus groups clearly has significant potential for highlighting local community values.

3.1.3 Landscape as a factor in recreation and tourism

There have been a number of surveys of recreationists in the high country. However, few have asked about attitudes or perceptions of landscapes (Aukerman & Davison 1980) and most have, instead, concentrated on visitor impacts and carrying capacity. Gibbons (1976), in her study of visitors' perceptions of the Mackenzie Basin, explicitly included scenery as a recreational resource. This questionnaire study asked 196 winter visitors to Tekapo (predominantly skiers) about what pleased them most about the Mackenzie Basin. 60% stated it was the scenery, isolation and peacefulness. When asked about changes to the landscape, hydro development was viewed somewhat unfavourably (the Pukaki dam and hydro scheme was being built at the time), farm development received mixed responses, while increased tree planting was viewed favourably by 77%. Gibbons felt that this contradicted their liking of the existing treeless character of the Basin. This suggests that investigating landscape changes requires some visual stimuli, rather than relying on the respondent to interpret a verbal statement about what more trees might mean in reality.

Two national surveys have dealt with water-based recreation. The New Zealand Recreational River Survey (Egarr & Egarr 1981a, b) was interested in boating and included an expert assessment of the scenery of each river. The New Zealand Angling Survey questioned anglers about the rivers they used and also included questions about scenery and solitude. It was undertaken in the 1978/79 season but not completely written up until 1987 (Teirney et al. 1982, 1987a, b and Richardson et al. 1984a, b, c, 1986). These studies found that although high country rivers were less used because of difficulty of access, the people that did use them rated them highly because of the unique fishing experience and, especially, the scenic values and solitude.

As part of investigations into the hydro potential of the Kawarau river in Central Otago, the Ministry of Energy commissioned a study of all recreational uses of the river, including its scenic value to both local householders and visitors (KRTA Planning & Kearsley 1982). The questionnaire study of 602 visitors and 200 locals used adjectival ratings such as dull, picturesque, impressive and exceptional, as well as ranking the importance of landscape elements. The study found that the impressions of visitors and residents were largely similar, but that locals found the scenery more exceptional than visitors, and that the movement of the river contributed most to the landscape. The visitors felt that the rocky outcrops were the most important element in the landscape.

There have been a number of questionnaire and photo preference surveys dealing with attitudes to and perceptions of wilderness (Kearsley 1983; Schultis & Kearsley 1988, 1990; Schultis 1991; Kliskey & Kearsley 1993; Kliskey 1995). The work concentrated on what people understood wilderness to be; for example, what facilities are found in protected natural areas and whether these are liked or disliked. Kliskey (1993) identified four elements of wilderness imagery: absence of human impact, naturalness, remoteness and solitude. Back-country users tended to have a purist approach, while holiday-makers and tourists tended to be more tolerant of facilities. There was quite strong disapproval by both groups of roads that opened up wilderness areas. The studies confirmed that wilderness is strongly associated with bush and native forest and the authors felt that this may inhibit understanding of tussock grasslands.

A number of other researchers have studied users and non-users of national parks or conservation areas (Simmons 1980, Booth 1986, Clare 1988, Lomax 1988, and Espiner 1995). However, they dealt largely with motivations and attitudes regarding the concept of national parks, and the use of parks and other areas. Moore (1995), in a survey of psychological research in outdoor recreation, concluded that most studies have ignored the contribution of place to recreation. He noted that where recreationists return repeatedly to particular environments (such as rock-climbers or canoeists) it is likely that they will develop a sense of place.

One study that has attempted to link travel motivation theory with sense of place is Smeaton (1993), which studied visitors to the West Coast. Cloke & Perkins (1998) explored links between tourist activity in high country settings, and a broader iconography of adventure tourism in New Zealand. Schöllmann et al. (1998) identified the iconic role of high country landscape within the imagery of place promotion for Christchurch, indicating the way that high-country landscape is increasingly being used as part of wider tourism promotion in New Zealand.

There have not been any published studies of how contemporary conservationists perceive the high-country landscape. Usually they are grouped with recreationists and assumed to all have similar views (see Norton 1991). However, the variety of conservation interests, from species habitat protection and biodiversity to heritage landscape protection, may lead to different emphasis being placed on different aspects of landscape. The High Country Landscapes Seminar of 1984 (Bishop & Findlay, 1991) found that many local body organisations and government departments felt that the technical considerations of conservation science dominated any concerns about landscape experience.

Kearsley & Higham (1997), in a recent literature review for the Parliamentary Commissioner for the Environment that looked at the effects of tourism, noted that scenic amenity was an important part of visitor experience. However, they confirmed that there had been very little research into the relationship between tourism and the landscape. One study that has some relevance to this topic, although it will be discussed more extensively under forestry, is that of Thorn et al. (1997). They asked New Zealanders and visitors from outside New Zealand whether production forestry was a positive or negative factor in the landscape. New Zealanders who lived in heavily forested areas tended to be slightly negative, while those from areas with less forest were slightly more positive. Visitors, mainly from North America, Japan and Europe, had strongly favourable opinions about the contribution of production forestry to the landscape. This supports the anecdotal evidence given by Scott (1993) that many visitors couldn't believe that the high country wasn't forested. This preference for pine species may be because they are native and characteristic trees in their home countries.

Kearsley et al. (1998) reported some tourist perceptions of high-country destinations, as part of a survey of New Zealand destination images. Based on questionnaire responses from domestic and international tourists, they identified landscape elements that were significant in visitors' images of particular destinations. The survey revealed the importance of 'iconic' landscapes in popular destinations such as Queenstown.

3.1.4 Forestry in the landscape

During the last two decades of the 20th Century, forestry in the high country became a contested landscape issue (Swaffield 1991, 1994, 1998a, b). Those in favour of forestry cited its ability to halt the land degradation caused by rabbits, hieracium and overstocking, as well as sustaining incomes from the land and creating jobs. There were, however, a range of views as to the most desirable shape and scope of forestry. Those opposed to land use change involving forestry had a number of different concerns. Concerns were expressed by traditional landholders, conservationists, the former Electricity Corporation of New Zealand and tourism operators. Traditional landholders who regarded fine wool production as the essential land use believed that wool production could be threatened by excessive forestry or by the spread of self-sown wilding trees downwind from forests. Conservationists who regarded the tussock grasslands landscape as a national icon were worried about loss of indigenous plants to forestry. Electricity Corporation of New Zealand feared that trees would reduce groundwater and run-off inflows into hydro lakes. Tourism operators were worried about the changing landscape and the possibility of views being obstructed by forests.

The earliest study to deal explicitly with forestry in the high country was Murray (1986). He focussed on what influenced farmers' decision-making with regard to exotic forestry. He found that farmers tended to perceive an attractive landscape in terms of good farming land and that wilding spread was disliked by most because it could take over productive land. Murray also found gender differences in reported attitudes, with women less dominated by practical farming considerations and more likely to value landscapes for aesthetic reasons. Swaffield (1991) sought to understand the way the concept of landscape was used in resource management. He interviewed 58 key decision-makers in a case study of exotic forestry in the Craigieburn Basin, and found that conflicting views of landscape only made sense when they were placed in the context of an individual's overall frame of reference in regard to land management in the high country. While some residents considered 'landscape' concerns to be an example of outsiders meddling where they didn't belong, others thought they represented legitimate concern for the landscape ecology of the high country. The meanings of landscape used were often linked to the advocacy of particular professional groups such as scientists, landscape architects or conservation advocates. Swaffield (1998b) saw this as part of the wider political struggle over land use. The majority of decision-makers felt that modest incremental land use change was the most likely and acceptable outcome, but this was disputed by conservation and recreation lobby groups who argued for the status quo. Swaffield (1994, 1998a) were based on the same case study but dealt specifically with attitudes to trees.

This issue of community input was highlighted in public hearings of Mackenzie District Council's Plan Change 21, which was designed to make forestry proposals easier to implement. The proposal included landscape guidelines based on a community survey by Scott (1993), the former mayor of Mackenzie District. His study was of between 50 and 100 people, two-thirds locals, one-third visitors. Despite limitations in the methodology, Commissioner Hearn reportedly accepted the results in apparent preference to the findings of a purely 'expert' study (Boffa Miskell Partners Limited 1992a, b).

Fairweather et al. (1994) and Fairweather & Swaffield (1995) investigated preferences among 77 stakeholders for different land use scenarios involving forestry in the Mackenzie and Waitaki Basins. These were photo modelled using computer editing technology, based on four generic land form types showing the effects of 15% and 70% land cover by plantations in 50 years. Each photo also provided information on predicted effects on soil status and income. Respondents were asked to use a Q-sort method to arrange scenarios from most to least preferred. Analysis of factors produced three key themes: plantations, grazing/trees, and conservation; with respondents who expressed each theme preferring a different landscape aesthetic. Those who preferred plantations appeared to favour naturalistic-shaped plantations extended by wilding spread because it visually blended forestry into the landscape. The preference for a grazing/trees theme emphasised clear land use boundaries, while those who expressed a conservation theme preferred clean open tussock grassland, although small clearly defined plantations were acceptable.

In follow-up research (Fairweather & Swaffield 1996), 22 of the original 77 respondents were asked to reassess the original Q-sorts and then to assess a new composite scenario with sequentially introduced background data. This re-study

found there was a large degree of stability between May 1993 and May 1995, with only three of the 22 having significantly different Q-sorts. In addition, the first choice in the compromise scenarios remained the same, although second and third choices tended to alter with additional information. These studies were primarily aimed at understanding the way preferences worked rather than finding majority support for one preference, and the authors acknowledged that probable land uses in the future will be more diverse than modelling could hope to achieve. Some of the detailed photographic predictions have also been challenged, which illustrates the technical difficulty of coping with scale and uncertainty when using visual images as predictive tools (Orland 1992).

Lucas (1994) also used computer-edited photographic modelling of landscape change, based on an initial survey of representative vegetation, vegetation change, and predicted vegetation change in the high country. Using a postal survey of 123 people who had broad-ranging interests in the high country, this study found that indigenous vegetation was highly acceptable, wilding spread was undesirable, and there was no general support for exotic vegetation.

The statistical methods used in this study were rudimentary. Cary (1995) re-used the images in a more sophisticated analysis of perception, comparing three analytical methods and a new technique known as artificial neural networks (ANN). However, the respondents for the survey were Australian students, so the study is of interest here mainly for its methodology, rather than its substantive findings. Cary found that perceptions expressed in words were similar to those derived from scoring images.

A visual modelling approach was also adopted by Thorn et al. (1997) in their study of exotic plantation forestry around Nelson. They used computer modelling software to create realistic images of alternative possible forestry regimes. These images were used to study preferences for vertical planting lines up slopes, as opposed to horizontal contour plantings, and the use of buffer planting. While there was general acceptance of either contour or vertical planting, there was a preference for contour planting in the middle years of the tree life cycle, based on single scenes. Buffer planting for the single site that was shown was favoured by 80% of respondents. As noted earlier, Thorn et al. also asked respondents to rate the contribution of exotic forestry to the landscape. New Zealanders from areas with existing forestry tended to dislike forestry, while those from other areas rated it higher. Visitors from outside New Zealand were much more positive. Thorn et al. noted the difficulty of creating defensible data, and coupled with the desire to question a large sample of respondents, this meant that the range of scenarios tested was limited when compared with the Mackenzie study. The site of the study also has only limited relevance to the high country.

Forestry studies have therefore taken two approaches: qualitative study of stakeholders, and quantitative study of the broader population. Swaffield (1991, 1994, 1998a, b), Fairweather et al. (1994) and Fairweather & Swaffield (1996) took the first approach, aimed at understanding how individuals and groups perceived the landscape, to facilitate decision making and planning. Thorn et al. (1997) used the second approach to answer pragmatic questions about which forestry design is least likely to cause complaints. The work of Lucas (1994) fits somewhere in between, with its more inclusive definition of stakeholders and an emphasis on identifying a consensus position on acceptable vegetation change.

3.3 GEOGRAPHICAL REVIEW

The studies identified were also analysed to determine their geographical distribution.

Three patterns emerged. First, there were some studies that focused on groups of users or communities of interest whose concerns were related to high country generally. Egarr & Egarr (1981a, b), for example, surveyed water-based recreation on a national basis; similarly, Mosley (1989) was concerned with river classification nationally. Kearsley et al. (1998) investigated destination images throughout New Zealand, including high country destinations; and Evison (1986, 1987, 1988a, b, 1993a, b, 1997) focused upon Ngai Tahu values and heritage.

Second, a number of studies focused on particular parts of the high country for particular purposes. These ranged from Kliskey's surveys of wilderness perceptions in NW Nelson (Kliskey 1992), and the wilderness mapping of Kliskey & Kearsley (1993), to Dominy's ethnographic studies of community in the Upper Rakaia (Dominy 1990a, b, 1993a, b, 1995), and to KRTA Planning & Kearsley's (1982) survey of responses to hydro systems in Otago. Several studies had a regional focus—for example, Boffa Miskell Limited & Lucas Associates' (1993) Canterbury Regional Landscape Study, and Cushen's (1997) study of public perceptions in the southern South Island. The location and focus depended very much upon specific client needs, or research interest.

Third, there was a notable concentration of studies on the Mackenzie and Waitaki Basins. These were carried out in response to problems of ecological degradation and associated land use change (Gibbons 1976; Petrie 1979; Houghton 1980; Taylor, Baines and Associates 1990, 1993; Boffa Miskell Partners Limited 1992a, b; Scott 1993; Wardle et al. 1993a, b; Fairweather et al. 1994; Wardle 1994a, b; Fairweather & Swaffield 1995, 1996; Swaffield & Fairweather 1996; Morris et al. 1997).

The studies identified in the review are summarised geographically in Table 4.

TABLE 4. GEOGRAPHICAL LOCATION OF STUDIES.

Non-specific	Egarr & Egarr 1981; Booth 1986; Evison 1986, 1987, 1988a, b, 1993a, b, 1997; Lomax 1988; Mosley 1989; Schultis 1991; Kearsley et al. 1998.
Nelson/Marlborough	Richardson et al. 1984a, b; Clare 1988; Kliskey 1992; O'Brien 1995a; Thorn et al. 1997.
North Canterbury	Simmons 1980; Murray 1986; Teirney et al. 1987a, b; Dominy 1990a, b, 1993a, b, 1995; Tau et al. 1990; Swaffield 1991, 1994; Boffa Miskell & Lucas Associates 1993; Lucas 1994; Espiner 1995; Lucas Associates 1995; Ryan 1995; Boffa Miskell 1996; Chapman 1996.
West Coast	Smeaton 1993.
South Canterbury/North Otago (Mackenzie/Waitaki)	Gibbons 1976; Petrie 1979; Houghton 1980; Teirney et al. 1982; Tau et al. 1990; Taylor, Baines and Associates 1990, 1993; Boffa Miskell Partners Limited 1992a, b; Scott 1993; Wardle et al. 1993a, b; Fairweather et al. 1994; Wardle 1994a, b; White 1994; Fairweather & Swaffield 1995, 1996; Swaffield & Fairweather 1996; Morris et al. 1997.
Otago, Southland	KRTA & Kearsley 1982; Richardson et al. 1984c, 1986; Schultis & Kearsley 1989; Kearsley 1990; Boffa Miskell Partners Limited 1991; O'Reilly 1992; Bennett et al. 1993; Kliskey & Kearsley 1993; Cushen 1997; Cloke & Perkins 1998.

3.4 SUMMARY OF REVEALED COMMUNITY PERCEPTIONS

3.4.1 General themes

The most notable feature of the community perceptions of landscape values revealed in the literature is their diversity and particularity. While generic images, ideas and values for high-country landscape can be identified through expert assessment (e.g. Ashdown & Lucas 1987), the surveys of community perceptions that have been undertaken highlight the fact that the detailed dimensions and features of landscape valued by any specific community or interest group are largely particular to that community. And, typically, the more closely involved a community or interest group is with a specified area of the high country, the more particular are their dominant landscape values. The corollary of this is that the evidence suggests that those groups least involved with, or least familiar with the high country, are the least discriminating in landscape valuation. Hence, the few surveys of international tourists' perceptions of landscape that have been undertaken indicate a general awareness and appreciation of mountainous relief, lack of obvious development, and 'green and gold' patterns of vegetation (e.g. Clare 1988, Kearsley 1990, Kliskey & Kearsley 1993, Kearsley et al. 1998). However, they do not discriminate particularly between, for example, indigenous and exotic trees (Gibbons 1976, Thorn et al. 1997). Mosley (1989), who surveyed perceptions of wild and scenic rivers, similarly identified 'generic' qualities of natural setting, relief and presence of indigenous bush as salient features which were valued across a wide range of interest groups.

These generic landscape qualities of the high country correspond closely with the international literature on landscape perception, which identifies naturalness, relief and presence of water as consistently valued landscape attributes. However, the literature also recognises that familiarity and involvement are important factors in perception and preference, and the New Zealand studies clearly support these findings. New Zealand respondents, for example, place significantly higher values on the presence and condition of tussock grasslands than overseas visitors, and conservationists and runholders are more discriminating over landscape detail than urban recreationists.

As the focus shifts to communities or interest groups with close affinity to a particular location or activity, then the salient features of the landscape to which they assign value become more detailed and unique. Local residents of river valleys, for example, appear to focus particularly upon the qualities of their local river. In Clutha District, the dramatic relief, rocky outcrops and dynamic movement of the main rivers were highly valued (KRTA Planning & Kearsley 1982, O'Reilly 1992). In the Lower Waitaki (Houghton 1980) it was the river as a landscape feature which was noted, and its recreational use. In the Lees Valley, on the other hand, residents' perceptions of landscape appeared to be structured by the broad open basin within which they live; features noted include views, scenery, remoteness and indigenous vegetation (Boffa Miskell Limited 1996). In the Hurunui district, focus groups of local residents showed greater discrimination of coastline landscape categories that had been identified at a regional level (Lucas Associates 1995). At the most specific scale of community in the upper Rakaia gorge, Dominy (1990a, b, 1993a, b, 1995) identified community- and family-specific naming strategies as essential elements of the way landscape was valued.

The first key finding from the literature review, therefore, is that community perceptions of landscape values in the New Zealand high country are strongly scale- and place-dependent. The landscape attributes of particular value to 'a community' depend upon the scale at which that community is defined, and the extent to which it is closely identified with a particular landscape. While it is possible to identify generalised iconic values of high-country landscapes, they cannot be assumed to be the dominant values for any particular community. More typically, 'iconic' values provide a backdrop for more detailed responses from 'inside' communities. 'Outsiders' (i.e. international tourists, urban visitors), on the other hand, may only express the general values. It is also notable that the context dependency of studies of primarily non-Maori communities parallels the highly place-specific pattern of Maori values.

In addition to the scale- and location-dependence of landscape values, the survey evidence also highlights the variability and diversity in conceptions and expressions of 'community'. Taylor, Baines and Associates (1990, 1993) noted significant differences in the nature of community between the parts of the Rabbit and Land Management Programme that were in Otago, and those that were in Canterbury. This matches with observations by Morris et al. (1997) about the questionable status of 'community' as a planning concept in the Mackenzie Basin. The nature of community clearly varies according to the history of a locality.

The research approach can also affect emphasis of findings. Swaffield (1991, 1994, 1998) identified a number of distinctly different 'frames of reference' upon the issue of trees in the high country, based on depth interviews; yet Lucas (1994), using a postal Delphi technique to largely similar respondents, concluded that there was widespread consensus over the same issue.

Perceived external 'threat' is a powerful stimulus for community. Swaffield (1998) noted a desire to retain local control over land management as an important factor in determining community frames of reference regarding forestry in the eastern high country, and landscape concerns in a number of other localities are also structured in part by response to external influences. For example, Dominy (1990a, b, 1993a, b, 1995), documented the attachment of upper Rakaia families to the local landscape, and their emphasis on continuity of occupation to resist claims of 'visual' ownership by urban interests (i.e. recreational, conservation and environmental management interests seeking to control landscape change) and 'symbolic' ownership by Maori. Naming strategies were also utilised to reduce the apparent scale of the landscape. What were 'mountains' to outsiders were named by residents as if they were just extensions of the home farm, as a form of enforced domesticity of the landscape.

The second key point to take from the literature is, therefore, the need to specify and define 'community' in its local context. The bounds and nature of 'community' cannot be assumed, yet the nature of a particular community is integral to its expression of landscape values.

The third point to emerge from the analysis is the significant diversity of values that can be found, even within specified geographic communities. Proximity of residence is no guaranteed predictor of shared landscape values. In the Mackenzie Basin, Fairweather & Swaffield (1994), Fairweather et al. (1995), and

Swaffield & Fairweather (1996) identified three different themes of response to different landscape scenarios. Each theme expressed different landscape values:

- in favour of increased plantations,
- in favour of mixed land use,
- in favour of conservation.

However, these themes cut across interest groups. For example, some farmers favoured plantations, some favoured mixed land use, and some favoured conservation. Taylor, Baines and Associates (1990, 1993) found similarly diverse interpretations of preferred directions of change. These findings must be qualified, however, by the comment that the Mackenzie Basin appears to be more socially fragmented than some other areas. Small communities elsewhere in the high country (upper Rakaia, Lees Valley) appear to display greater coherence and consistency in values (Dominy 1990a, b, 1993a, b, 1995, Boffa Miskell Limited 1996).

Particular interest groups (for example, recreationist groups) may exhibit some generally shared values, as it is shared interests that draw otherwise spatially dislocated people together. For example, Teirney et al. (1982, 1987a, b), Schultis & Kearsley (1989), Schultis (1991) and Mosley (1989) identify some generic themes of landscape value within groups of anglers, back-country recreationists, and canoeists. In each case, the landscape attributes most valued are those which underpin their special interests. However, there is also significant diversity within such groups.

Community of interest may therefore imply some common landscape values, but community of location is not inevitably going to be expressed in common values. In the following sections, the findings as related to specific communities of interest are summarised.

3.4.2 Farmers

The most distinctive feature of farmers' approach to landscape values in the high country is an emphasis on control, identity and productivity. The literature reveals that high-country landscapes are valued primarily as expressions of livelihood and lifestyle. The landscape features that are most valued depend on the location and particular profile of the farming community involved, and of the individual farmers. Murray (1986) noted that landscape attractiveness for farmers in the Lees Valley and upper Waimakariri was related to productive potential, and this theme re-emerges in Dominy's work in the upper Rakaia (Dominy 1990a, b, 1993a, b, 1995), and in the diverse studies in the Mackenzie and Waitaki Basins (see section 3.3 above).

Traditional pastoralists most strongly favour open, well watered and favourably orientated country. Exotic shelter plantations are acceptable in the proximity of homesteads etc., and only become problematic when there is a perceived risk of wilding spread or when their scale threatens to reduce available grazing. Farmers with more diversified farms appear to accept significantly greater landscape modification, provided the change is under their control. Conflicts over landscape change become most acute when they are associated with significant changes of ownership (Ryan 1995), or in the way they are represented and handled in resource management processes (e.g. in district plan development or resource consent hearings) (Morris et al. 1997, Swaffield 1998b).

Lucas (1994) identified widespread recognition amongst farmers of the landscape values of indigenous vegetation. Landform is also a significant dimension of landscape value for farmers, as Dominy (1995) demonstrated; although, as noted above, it cannot be assumed that farmers shared the wilderness values associated with high relief that is frequently a feature of recreationists. More typically, distinctive landform features are valued as boundary markers, and symbols of continued occupation.

For farming communities, therefore, landscape values in the high country are intimately linked to the significance of particular landscape features for production, and as symbols of occupancy, although more conventional conservation values (e.g. indigenous vegetation) may also be recognised.

3.4.3 Residents

In many areas, most residents are farmers and therefore express farming values. However, there are also a number of high-country settlements whose residents are not farmers. The limited evidence available suggests that landscape values of such communities are particularly associated with distinctive features and landforms, complemented by features that have particular recreational value for either residents or visitors. As noted earlier, gorge or valley communities in Otago have recognised particular values in the dynamics of river movement, and in the rock outcrops which give their locality its distinctive character (KRTA Planning & Kearsley 1982, O'Reilly 1992). Communities located in broad, open valleys appear to value the river as a linear point of reference (Houghton 1980), while communities in broad, open basins (Mackenzie Basin, Lees Valley) value views, ridgelines and vegetation patterns (Gibbons 1976, Scott 1993, Boffa Miskell Limited 1996). In Nelson, residents of the Rai Valley and Golden Downs have an antipathy towards forestry cover (Thorn et al. 1997), possibly because it disguises distinctive landform, and this is a frequently repeated theme in responses to potential afforestation elsewhere.

On the scattered evidence available, therefore, it seems most likely that the significant landscape values for any particular high-country community will be those that make their locality distinctive. This is entirely consistent with international findings.

3.4.4 Recreationists

Recreational users are an important community of interest in the high country, and frequently overlap with residents, as well as introducing interests from the lowlands. On the limited evidence available, two features stand out. First, high-country recreationists assign value and significance to landscape features that evoke a picturesque sense of naturalness and wilderness, particularly dramatic terrain, water, and indigenous forest and scrub. By the same token, absence of visible human presence or modification is valued, enabling a sense of solitude (Teirney et al. 1982, 1987a, b; Mosley 1989; Schultis 1991). Second, particular interest groups (e.g. anglers, canoeists, trampers) value those features and settings which are particularly relevant to their preferred activities.

O'Brien (1995a) also noted the importance of access, and that many recreational groups feel a sense of guardianship for the high country, particularly if their activity involves significant periods spent in the mountains.

Some of the tensions that emerge between recreationist and farmer groups (Swaffield 1991, 1994, 1998a; Ryan 1995), arise because each group has different values concerning 'ownership' of landscape; recreationists typically emphasising 'public' ownership, farmers emphasising 'private' ownership. Both link the different types of ownership to stewardship.

3.4.5 Tourists

The little evidence available suggests that tourist perceptions of landscape values in the high country (both domestic and international tourists) focus upon relatively generic, 'scenic' values of picturesque mountains, rivers and forests (Gibbons 1976, Boffa Miskell Limited & Lucas Associates 1993, Clare 1998, Kearsley et al. 1998). They tend not to discriminate between exotic and indigenous forests, and international tourists may even express preference for exotic forests (Gibbons 1976, Thorn et al. 1997).

3.4.6 Others

With the exception of tangata whenua values, already noted, there is little systematic material available on landscape perceptions of other community interests or groups—conservationists, for example. There is also little attention in the literature to the values of specific populations, such as children, women, or minority ethnic groups (other than Maori), although Cushen (1997) included explicit comparisons of different population attributes, and found significant variation in perceptions.

4. Discussion and Conclusions

4.1 CURRENT KNOWLEDGE AND SHORTFALLS

The primary objective of this study has been to present a summary of currently published information on community perceptions of landscape values in the high country, and to identify significant gaps and shortfalls. The main conclusion of the review is that there has been only a limited amount of published work dealing specifically with community perceptions of landscape values in the high country. Some of the knowledge that is available has been obtained as a minor part of studies with other goals (e.g. recreational surveys); very little research has been published that specifically identifies community perceptions of landscape value. Our phone survey of councils and consultants (see section 1.3) revealed that most community consultation undertaken as part of landscape assessments under the RMA was done as part of predominantly 'expert' evaluations, and is not reported or published separately. 'Community' values are not typically separated from 'expert' values in the final reports.

The material that is available is focused upon four areas of concern: community responses to landscape change; the identification and designation of outstanding landscapes in terms of the RMA; landscape as a factor in recreation and tourism; and landscape impacts of afforestation. The material falls into two

categories: non-specific surveys, either of national issues (e.g. angling) or related to all high country; and location-specific issues dealing with particular developments or land use change. Geographically, the study sites are spread throughout the South Island, but with a concentration upon the Mackenzie and Waitaki Basins with, conversely, very few further south into Otago and Southland.

Three significant features of the research on community perceptions of landscape values are worthy of particular note. First, although there are clearly some generic qualities of high-country landscapes which are widely recognised and valued, each geographical community, or community of interest, has quite particular values specific to its concerns. The more tightly defined a community, the more specific and distinctive its landscape values. Hence, even on the basis of very partial information, it can be concluded that high-country landscape values are not homogeneous, and are significantly context-dependent.

Communities of interest (e.g. tourists or urban populations) that are detached from the high country tend to express generalised and relatively generic landscape values (the iconic high-country landscapes of tussock, scree, lakes and forest). Geographically defined communities value landscape qualities that are distinctive and specific to their location. Communities of shared interests (e.g. recreationists) tend to value particular landscape qualities most relevant to their interests (e.g. types of river). The landscape values relevant to a particular conservation management area or issue cannot, therefore, be inferred from the generally accepted iconic images of high country, except in the most crude terms. Some location-specific research is needed.

Second, 'community' is very diverse in its expression. There are differing degrees of community in different parts of the high country, and the geographical patterns of communities of interest are also diverse. It is not possible to talk of 'community' as a given; it must be carefully defined in any particular context.

Third, there are some communities with strongly shared landscape values, and others with quite diverse values. Again, this must be determined by specific investigation. Some general contrasts between types of community can also be identified. Farmers are particularly sensitive to, and value, aspects of landscape which symbolise occupancy and control, or which have functional significance for production. There is some evidence to suggest that the landscape values of any particular residential community may be related to the landscape qualities which make that community distinctive. Recreationists value three aspects: generic high-country wilderness qualities, symbols of access, and qualities particular to their pastime (e.g. white water rivers).

However, this evidence of general patterns of landscape values must be treated cautiously, as it is based on a very limited number of surveys. The most significant fact to emerge is how little systematic knowledge is available. The thematic review demonstrated that there is very little available research on community perceptions of landscape heritage or landscape conservation values in the high country; little material on urban or tourist landscape values; and a very uneven geographical distribution of systematic knowledge.

4.2 CURRENT APPROACHES: METHODOLOGICAL APPRAISAL OF NEW ZEALAND STUDIES

The literature review identified five broad categories of approach to landscape evaluation:

- expert-based
- psychophysical
- cognitive
- socio-cultural
- experiential/phenomenological.

Each approach is characterised by specific assumptions about the nature of the relationship between human perception and landscape qualities, and by typical methods best suited to that approach. However, there is also overlap between approaches, particularly in the use of particular methods. Questionnaires, for example, have been used in both cognitive and socio-cultural studies. There is also a significant trend towards hybrid or multi-method studies, in which several methods, or even more than one overall approach, are combined to strengthen the validity and integrity of the results.

There are examples of high-country studies that correspond to the full range of possible approaches identified in section 2.1. Table 5 classifies the studies identified in the literature review according to the five broad categories.

It is important to note that the majority of 'landscape' studies in New Zealand fall into the 'expert' category, and were thus omitted from detailed consideration in the review. The classification only included those studies that relate to the high country, and have some explicit reference to community values in their landscape evaluation. A number of expert-based studies (e.g. Boffa Miskell Limited & Lucas Associates 1993, Boffa Miskell Limited 1996) include some combination of expert assessment with either community feedback, or assessment of cultural products (e.g. painting).

Of the landscape studies that have focused explicitly on community values in some way, most high-country work can best be classified as 'cognitive', in that it typically uses questionnaire surveys of attitudes administered in a quasi-experimental format. These range from early studies by Gibbons (1976) to more recent examples by Espiner (1995), Ryan (1995), Chapman (1996), Cushen (1997), Kearsley et al. (1998). The majority are not directed primarily at 'landscape' issues but include or reveal 'landscape' as one of a range of concerns or variables. Kearsley (1990), Kliskey (1992, 1995), Kliskey & Kearsley (1993), Higham (1998) report on a sustained investigation into wilderness perceptions, combining questionnaire surveys with GIS mapping.

There have been very few 'psychophysical' studies; the study by Mosley (1989) was the earliest that included high-country landscapes and used a fairly standard 'scenic beauty estimation' (SBE) method. However, Thorn et al. 1997 represents a state-of-the-art SBE approach using digital image editing and psychometric survey.

There have been several recent studies using experiential and socio-cultural approaches which constitute substantive research projects. These are the work of only a few individuals (notably Dominy 1990a, b, 1993a, b; Swaffield 1991, 1994, 1998a, b; Fairweather et al. 1994; Fairweather & Swaffield 1995, 1996; O'Brien 1995; Swaffield & Fairweather 1996; Morris et al. 1997; Cloke & Perkins 1998).

TABLE 5. CLASSIFICATION OF HIGH COUNTRY STUDIES, BY APPROACH
(after Zube et al. 1982).

EXPERT (with some acknowledgment of community input)	PSYCHOPHYSICAL	COGNITIVE (broadly defined)	SOCIO-CULTURAL (including iconography and action research)	EXPERIENTIAL/ PHENOMENOLOGICAL (including ethnography)
Boffa Miskell Limited & Lucas Associates 1993 Boffa Miskell 1996 (Note: purely 'expert' studies are not listed)	Mosley 1989 Thorn et al. 1997	Gibbons 1976 Houghton 1980 Simmons 1980 Egarr & Egarr 1981 a, b KRTA Planning & Kearsley 1982 Tierney et al. 1982, 1987a, b Kearsley 1983, 1990 Richardson et al. 1984a, b, c, 1976 Booth 1986 Murray 1986 Clare 1988 Lomax 1988 Schultis & Kearsley 1988 Taylor, Baines and Associates 1990, 1993 Kliskey 1992, 1995 Kliskey & Kearsley 1993 Scott 1993 Smeaton 1993 Lucas 1994 White 1994 Cary 1995 Espiner 1995 Ryan 1995 Chapman 1996 Cushen 1997 Higham 1998 Kearsley et al. 1998	Fairweather et al. 1994 Lucas 1994 Wardle 1994a, b Fairweather & Swaffield 1995, 1996 Lucas Associates 1995 O'Brien 1995a Swaffield & Fairweather 1996 Cloke & Perkins 1998 Schöllman et al. 1998 Swaffield 1998a, b	Evison 1986, 1987, 1988, 1993a, b, 1997 Dominy 1990a, b, 1993a, b, 1995 Swaffield 1991, 1994 O'Reilly 1992 Morris et al. 1997

Note: Studies have been classified according to their predominant approach to landscape issues. Some studies included multiple sections, which drew upon more than one approach (e.g. Boffa Miskell Limited & Lucas Associates 1993), while others are hybrid (e.g. Swaffield 1994). The dominant theoretical framework has been followed in this classification. In a few cases, studies are generally oriented towards one approach, but deal with landscape in a way that falls into another (for example, Taylor, Baines and Associates' (1990) work in the Mackenzie Basin).

Applying the criteria developed in Chapter 2, it is clear that the different New Zealand high-country studies have strengths and weaknesses that are broadly comparable to equivalent categories overseas. To recap, the primary criteria proposed for selection of survey methods are credibility, dependability and utility, supplemented by insight, sensitivity, and reliability.

Expert approaches, incorporating some community input, can offer a combination of utility (i.e. ease of use), with sensitivity to community concerns. However, their dependability (i.e. freedom of individual bias) derives entirely from the experience of the researcher, as does their credibility.

The quasi-experimental psychophysical and cognitive approaches, using methods such as questionnaire surveys and photo preference surveys, can provide dependable and reliable predictive knowledge. However, they have

two limitations. Questionnaires are typically cheap and easy to use, but do have some problems when dealing with landscape values, as they require respondents to infer the landscape expression of verbal descriptors. For example, 'plantations' means quite different things to different cultures and interest groups. This can limit the sensitivity of the technique to variations in landscape detail. On the other hand, photo preference surveys, while reliable, require high quasi-experiential standards and are expensive and complex to administer, giving lower utility. The validity of such methods for determining values has also been challenged (Carlson 1977, 1995).

Socio-cultural studies, including action research, using methods such as depth interviews, focus groups, Q Sort and iconography, offer high degrees of credibility and insight, and appear to be well-suited to providing contextual understanding for policy formation. They can also provide sensitive and credible input on community values to formal planning, management and consent hearings and processes. However, the methods used are typically of only average utility, as they can be labour-intensive, compared with, for example, questionnaires. Some can be quite reliable: Q Sort has been shown to be as reliable as psychophysical methods in longitudinal surveys (Amadeo et al. 1989, Palmer 1997). Dependability relies heavily upon the experience of the researchers: best practice is therefore essential if the results are to be used in public hearings.

Experiential studies, based upon methods such as participant observation and depth interviews, offer credible, highly sensitive and insightful understanding of community perceptions. However, they are highly location-specific and time-consuming and so are of doubtful utility for many operational purposes. However, if targeted to particularly relevant or influential communities, they can provide valuable input to both policy formation and development-related hearings, as Dominy demonstrated for Rakaia (Dominy 1990a, b, 1993a, b, 1995).

The main conclusion that can be drawn is that no single approach or method is clearly more effective or rigorous than the others. Each has particular strengths and weaknesses. The most defensible approach, where possible, is to combine two or more approaches. Multi-method studies are becoming increasingly common when dealing with or investigating complex social issues, and appear to be the most effective way to address the demands of landscape perception research. Unfortunately, combination of methods, while methodologically robust, can be significantly more expensive than single methods, and hence of lesser utility than a single-method approach.

Given the diversity of possible approaches, the relatively high costs of many of them, and the reliance upon the interpretive skills of the researcher to achieve dependable and credible results, it has been argued that that any study undertaken must meet benchmark standards of best practice. In this section, the existing range of high country studies is evaluated against indicators of best practice. The indicators used are peer-reviewed publication or professional recognition, particularly the Environment Court. Potential further developments of several methods are also noted.

As has been noted, there are few primarily 'expert' studies in the high country with community input. The categories of landscape value used in the Canterbury Regional Landscape Study (Boffa Miskell Limited & Lucas Associates

1993) has been recognised by the Environment Court, and re-used in subsequent studies, although the report has not been formally adopted in policy by the regional authority for whom it was proposed. Similarly, while the landscape study for the Hurunui District Council (Lucas Associates 1995) provides a useful example of the use of focus groups, the findings of the report were subsequently contentious within the community. The report on Lees Valley (Boffa Miskell Limited 1996) also included significant community input. It should be noted that expert landscape assessment of rural areas in terms of the RMA has been particularly controversial in recent years (Swaffield 1998b). As a result it is difficult to identify 'best practice' examples that are widely accepted in the rural community. In many cases, however, it is not the detailed method that has been problematic, but the way that results have been translated into proposed policy (Swaffield 1998b).

The two psychophysical studies reported (Mosley 1989 and Thorn et al. 1997) have been subject to peer review. Mosley (1989) can be criticised for the selection of respondents (which was largely opportunist), but Thorn et al. (1997) represents current international best practice in the approach. It should be noted that Thorn et al. focused upon very specific management needs. As Mosley (1989) found, the psychophysical approach is problematic when applied at a broad scale, and provides only limited guidance in policy development (as opposed to management). Hull (1995) has subsequently noted, in the American context, that psychophysical methods must be grounded or 'calibrated' in particular locations before being used for management guidance. Their future value is likely to be in determining operationally specific management questions, rather than in developing broad policy.

Very few reports in the 'cognitive' category have been published in peer-reviewed journals. Furthermore, many of the studies are based upon questionnaires developed for other purposes, which suggests the confidence that can be attached to the landscape results should be qualified. For the same reason, few of the studies make the landscape theoretical basis of the research explicit. Two studies provide a basis for longer-term programmes on community perceptions of landscape values using cognitive-type methods. These are the social assessment methods used in the Rabbit and Land Management Programme (Taylor, Baines and Associates 1990, 1993; Higham 1998), and the perceptual mapping approach associated with tourism research of Kearsley (1990), Kliskey & Kearsley (1993), Kliskey (1995) and Higham (1998). In the first, Taylor, Baines and Associates incorporate 'landscape' issues as a dimension of a systematic approach to social assessment. Such studies are inevitably location-specific, and thus sensitive to the particularities of local values. The potential limitation is that 'landscape' values typically emerge from within more general community surveys that are not necessarily attuned to the methodological needs of landscape perception research. Thus, while the knowledge gained is location- and community-specific, it is, typically, not grounded in landscape theory, or articulated in any level of detail.

The perceptual mapping approach, on the other hand, is well grounded in a broader theoretical framework, and usually linked to related work—on destination image, for example. The limitation of this work for studies of landscape values is that it relies on text to represent landscape. The extensive North American literature reported in Zube et al. (1982) and Uzzell (1991) (see

Chapter 2) suggests the importance of also using visual stimuli to represent landscape to respondents. However, both social impact and perceptual mapping approaches have potential to develop more specific 'landscape' dimensions, and could thus form part of the basis for future landscape investigations.

Of the socio-cultural studies, Lucas Associates' (1995) study of the Hurunui provides a benchmark for action research, based upon Environment Court recognition of other studies using similar techniques undertaken elsewhere. Cloke & Perkins (1998) provide a benchmark for iconographic research, whilst Fairweather & Swaffield (1995) and Swaffield & Fairweather (1996) provide the benchmark for Q Sort method using images. Both the latter approaches have been subject to international peer review before publication.

In the experiential approach there are few current examples. However, those that are available have been published in peer-reviewed journals. Dominy (1990a, b, 1993a, b, 1995) provides the most substantial benchmark for detailed ethnographic community studies whilst Swaffield (1994, 1998a, b) provides a benchmark for policy-related landscape research based upon depth interviews.

In summary, the most methodologically robust studies have typically been those undertaken specifically with a landscape focus, by professional researchers. There are examples in each of the categories that meet peer-reviewed publication standards. The choice of approach must therefore depend on the purpose of the study (as noted above), with methods selected according to best practice in the disciplines concerned.

4.3 FUTURE NEEDS AND APPROACHES

We have argued that the published research on community perceptions of landscape values in the high country is notable for its fragmented and incomplete coverage. There are, nonetheless, examples of a range of approaches to landscape research which fulfil different needs.

Included in this range are examples that meet academic and professional best practice (as well as examples that are less methodologically robust in terms of 'landscape' research). The challenge for DOC policy and operational staff is to determine first, what priorities, if any, exist for future research into community perceptions of high country landscape values, and second, which of the possible approaches might be most appropriate in any particular situation.

The review of coverage indicates that it is not feasible to identify specific gaps in knowledge; the current material is notable for its paucity. With the exception of the Mackenzie and Waitaki Basins and, to a lesser extent, North Canterbury, geographical coverage is very limited. Virtually no research appears to be available for Southland, the West Coast or Nelson/Marlborough. In regard to interest groups, farmers appear to be covered best, with conservation groups least well addressed. The situation is more analogous to the early stages of a complex jigsaw, where there are large areas missing, than to the later stages where only a few pieces remain to be identified.

However, the review has also identified that community perceptions of landscape values in the high country are, to a significant degree, scale-, location- and context-dependent. Three possible research strategies can therefore be identified. The first is to develop a long-term programme that attempts to build a database in a systematic way, targeting a range of different communities of interest. Such a strategy might include experiential, socio-cultural and cognitive studies, seeking detailed understanding of particular issues and communities, as well as broader community profiles. The advantage of such a strategy would be the development in an integrated way of a robust and accessible database for future policy and management. However, this would require long-term research funding which, in many cases, will come in advance of specific operational needs. It would also be difficult to link such research to specific conservation outcomes. By its nature, such systematic survey work is more closely related to public-good science goals aimed at sustainable management of the high country as a cultural, recreational and tourist resource.

A second possible strategy would be to undertake a needs analysis of current DOC policy, and of emerging operational issues, and to develop a focused research programme aimed at current conservation priorities. This could include collaboration with the Public Good Science Fund and other research purchasers such as regional councils, and include a range of experiential, socio-cultural, cognitive and psychophysical studies. This would have the advantage of being strategically and operationally relevant. The disadvantage is that this still requires a significant increase in funding over current levels.

The third possible strategy is to continue the status quo, with minimal landscape perception research being undertaken by DOC, and to rely on 'windfall' research from other providers, perhaps complemented by occasional 'hotspot' investigations on an as-needed basis, based upon expert studies with community input. This would clearly minimise research expenditure, at least in terms of 'landscape' research. However, there are disadvantages. These include:

- The potential diseconomies of not understanding relevant community perceptions of landscape values and their potential to complement DOC activity (as identified by O'Brien (1995b)).
- The likely opportunity costs arising from operational problems due to a lack of prior understanding of community values.
- A continuing fragmented database that is not conceptually integrated and thus does not build in a systematic way upon current and future research from other sources.

At a more detailed level we have identified several criteria which we believe should be priorities in assessing choice of method for any particular study. These vary in emphasis depending upon the purpose of the research. We have noted that there is significant choice of approach that is feasible for the main applications, and that there are benchmark examples of all the main approaches available, applied to the New Zealand high country. There is, therefore, no simple recipe for which method to adopt; each situation requires some measure of analysis to determine the most productive approach. It is likely to be most fruitful for DOC managers to focus on their required outcomes, and to engage consultant researchers with expertise to develop appropriate detailed research plans. There appears to be a current shortfall in expertise in this latter area as there are relatively few researchers with sufficiently broad-ranging skills and

expertise in landscape-related research to be able to develop research designs that span approaches. This suggests that some level of strategic planning is needed. For example, an annual workshop could be held for operational managers from conservancies with high-country responsibilities, to determine and coordinate annual work plans and budgets for landscape perception research.

Table 6 summarises the suite of potentially suitable methods that have been proven in New Zealand.

TABLE 6. SUITE OF POTENTIAL APPROACHES AND METHODS, WITH NEW ZEALAND BENCHMARKS.

APPROACH	METHOD	NEW ZEALAND BENCHMARK EXAMPLE
Expert	Ecological, iconographic, community review	Boffa Miskell Limited & Lucas Associates 1993
Psychophysical	Scenic Beauty Estimation: preference scoring of computer edited images	Thorn et al. 1997
Cognitive	Perceptual mapping: multi-variate analysis of questionnaires Social assessment—questionnaires plus interviews	Kliskey & Kearsley 1993, Kliskey 1995 Taylor, Baines and Associates 1993
Socio-cultural	Q sort: photo selection plus interviews Iconography: image and documentary analysis Action research: focus groups, charettes	Fairweather & Swaffield 1995, Swaffield & Fairweather 1996 Cloke & Perkins, 1998 Lucas Associates, 1995
Experiential	Ethnography: depth interviews and participant observation	Dominy 1990a, b, 1993a, b, 1995

4.4 CONCLUSIONS

- A review of literature reporting upon field surveys of community perception of landscape values in the high country reveals that the available knowledge is fragmented and very incomplete. Nonetheless, there are examples of studies which follow each of the main approaches to landscape perception research identified in a review of international literature, and New Zealand high-country studies which provide benchmarks of best practice in each of the main approaches.
- On the basis of the material that is available, community perceptions of landscape values in the high country are notably context- and scale-dependent. They become more location-specific for particular geographical communities, and more focused upon particular attributes for specialist communities of interest.
- Incorporation of community perceptions of landscape values into conservation policy and management will require several types of research: studies aimed at providing policy context, studies focused upon public

hearings into particular policy, development or management proposals, and studies aimed at operational management. Each requires somewhat different attributes in the research.

- Three key criteria have been identified for evaluating research approaches. They are credibility, dependability, and utility. Other criteria of significance for particular applications are the ability to provide insight, sensitivity, and reliability. Different combinations of criteria have been recommended for the three main applications.
- Approaches have been identified that are best suited to the different applications, and benchmark examples of each identified.
- Three possible research strategies for the future investigation of community perceptions of landscape values have been identified.

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