Visitor information as a management tool

A review

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CONTENTS

Abstract

Provision of information to recreational users of conservation areas as a means of controlling their activities and behaviours is a widely utilised management tool. There are numerous different methods available for managers to communicate with visitors, however, these methods vary significantly in effectiveness. Examination of existing research into the application of information-based management methods in conservation areas led to the conclusion that both managers and visitors prefer information-based approaches to visitor management over more direct techniques such as regulation. Although information-based approaches are widely utilised, understanding of the most efficient and effective application of these methods is limited, and a complex range of variables needs to be considered in selecting and developing information-based management tools. Of the methods available, personnel-based approaches are generally more effective than media-based approaches, however they also tend to be more expensive and time consuming than media-based alternatives. In general, combinations of techniques tend to be more effective than individual techniques, and the tools and techniques selected need to be well matched to both the targeted management objective/s, the intended audience/s, and the settings in which they are to be applied. There is potential to develop a greater understanding of how persuasive communication theory may applied to visitor management, and further research could help to ensure that the efficiency, effectiveness and visitor acceptance of such approaches are maximised.

Keywords: visitor management, management tools, information-based management, recreational users, visitor impacts, conservation

1. Introduction

Managing recreational use of conservation areas presents a significant challenge to the individuals and agencies responsible. Although recreational access to conservation areas is important, this objective needs to be carefully balanced with environmental concerns and safety issues. This is a complex task. Management actions that serve to improve the experiences of recreational users can have negative impacts on the environment. Conversely, environmental management initiatives can diminish the quality of visitor experiences (Bayfield 1985). Furthermore, efforts to enhance visitor experiences' or limit environmental impacts may have implications for the safety of users, while attempts to ensure safety may impact on both visitor experience and the environment.

Although there are no set rules in relation to managing these issues, a common approach is to promote low-impact visitor behaviours, and control the patterns of use which are most destructive to the environment, while assessing the safety implications of any action or inaction. These visitor management efforts can be targeted at audiences both inside and outside conservation areas, using direct methods such as regulation, or indirect methods such as information provision, and modification of settings or access.

Indirect management is usually preferred over more direct methods by both managers and visitors (Cessford 1997, 1998; Cole et al. 1997) as it tends to be less intrusive. Indirect approaches are generally more in line with management objectives relating to allowing visitors to enjoy their experiences as fully and freely as possible. However, understanding of the best way to utilise indirect management tools and techniques to achieve specific outcomes is limited. The effectiveness of different approaches varies widely, and some techniques are more acceptable to visitors than others.

A key technique in indirect visitor management is information provision. Providing visitors with information is a more light-handed management approach than regulation or environmental modification. It also has the potential to instil an understanding and acceptance of the rationale behind visitor management policies, which over time may reduce the need for management interventions of any type. Lucas (1985) suggests that information provision is well suited to visitor management in conservation areas as visitors tend to be highly educated, and consequently more likely to receive and respond to management messages.

Informing people about conservation issues and values, the problems associated with recreational use, and ways in which visitors can reduce these problems is generally accepted as a desirable management approach.

This report briefly examines some theoretical issues relevant to indirect visitor management in conservation areas, identifies a range common management problems and related strategies, summarises the various information tools and techniques which are used in visitor management, and discusses three key areas to which information-based management approaches can be applied. A number of future research directions related to information-based approaches to visitor management are also discussed.

2. Persuasive communication theory

Theoretical and empirical studies of persuasive communication issues and techniques tend to stem from the realm of social psychology. However, there have been several attempts to summarise and apply communication theory in a way that is useful to conservation managers, most notably Roggenbuck & Manfredo (1990) and Manfredo (1992). These works have led to the identification of three conceptual approaches that can be applied to visitor management in conservation areas:

- Applied behaviour analysis
- Central route to persuasion
- Peripheral route to persuasion

2.1 CONCEPTUAL APPROACHES

2.1.1 Applied behaviour analysis

This approach promotes desirable behaviours through the provision of behavioural prompts, environmental manipulation, rewards for positive behaviour and/or punishments for negative behaviour. For example, providing small gifts as rewards for visitors who display desirable behaviours can act as an incentive to encourage such behaviour.

Although simple, this approach requires high levels of contact between visitors and management and does not necessarily increase visitors' understanding of why some behaviours are appropriate in conservation areas and other are not. The appropriateness of environmental manipulation or the provision of rewards and/or punishments in conservation settings is also questionable.

2.1.2 Central route to persuasion

This approach is the most commonly used in conservation education and management. It involves developing and delivering messages that are likely to be received, understood and accepted by visitors, who consequently modify their behaviours in line with the message. Because these behavioural changes are the result of knowledge, beliefs and attitudes that are accepted and understood by the visitor, it is likely that the desired behavioural changes will be long-lasting.

While common, this approach is complicated. Prerequisites for success include visitors with high motivation, good information processing skills, and the ability to modify their behaviours. Messages need to be well developed and based on rationales likely to be acceptable to visitors. People who develop messages should ensure they know who their target audience is, and tailor the message to this specific audience(s). Factors to be considered in tailoring a message will include the audiences' interests and knowledge levels. Messages should be

interesting, understandable and relevant. When selecting media for delivering messages, it is preferable to use those that permit audiences to process information at their own pace. This usually means using the written word. Controlling the environment in which the message is received is also important to ensure distractions are minimised and messages are received in time to be useful.

2.1.3 Peripheral route to persuasion

Under this approach, messages are considered almost a secondary tool in achieving persuasive outcomes. The actual persuasion is achieved through something other than the message, in many cases, the person delivering the message is the primary persuasive influence as in the example of a model endorsing a beauty product.

The peripheral route is often used when competition between many different messages is high, for example, in television advertising. In conservation environments, this approach is likely to be well-suited to busy visitor centres or popular trailheads. However, this type of learning is thought to be rather ineffective at producing behaviour changes that are long lasting, and there are also a range of significant challenges associated with using message deliverers which are likely to be effective.

2.2 KEY VARIABLES IN THE APPLICATION OF CONCEPTUAL APPROACHES

The various theoretical approaches outlined above indicate the complexity of visitor management in conservation areas. Each approach has factors that complicate its application in conservation settings, or diminish the likelihood it will be effective. However, there is a range of variables, which apply across the different approaches, and which can be manipulated to increase their likelihood of success. Roggenbuck & Manfredo (1990) have identified five key variables that are summarised below.

2.2.1 Timing

Timing is an important consideration in the use behavioural prompts, incentives, or peripheral cues. Prompts need to clearly relate to desired outcomes for the behaviour to be learned. Peripheral cues need to be provided at key decision points in order to have an affect. While achieving correct timing is straightforward for some decisions, it is very difficult to achieve with others.

Timing is a less critical factor in the central route to persuasion approach, however, messages need to be provided in time for them to be useful. For example, if you want people to remove their own rubbish from an area, they need to know this before they leave, and preferably, before they enter.

2.2.2 Content

The content of a message is important, and often receives the most attention. However, with the peripheral and behavioural change routes, content is relatively unimportant.

With the central route to persuasion approach, visitors need to be motivated and capable of processing a message. The message itself needs to provide strong arguments and generate positive responses (Petty et al. 1992). Arguments in messages need to be relevant, strong, novel, and simple enough for the recipient to comprehend (Ajzen 1992). Ending arguments with questions rather than statements can increase the likelihood that recipients win think about the message. Repetition of messages is likely to increase comprehension and acceptance (Petty et al. 1992).

2.2.3 Visitor characteristics

Visitors are more receptive to messages if they think they are part of the problem, have limited of prior knowledge and experience, and are part of small groups. Group leaders are generally more receptive to messages than group members, with the exception of highly experienced leaders, who tend to be less receptive.

2.2.4 Message source characteristics

The characteristics of the message source (whether an individual or an institution) are particularly important in relation to the peripheral route to persuasion approach. For example people are inclined to pay greater heed to messages which come from a source which is considered trustworthy and credible. Roggenbuck & Manfredo (1990) suggest that when agencies are faced with a distracted audience or a range of competing messages, they should seek out attractive or well-respected individuals to deliver messages.

2.2.5 Communication channel

Personnel-based techniques and some audio-visual tools are more appropriate for peripheral learning than those based on written information. With personnel-based and audio-visual approaches, the source can command as much attention as the message.

Techniques based on written information need to ensure visitors will have time to read and process messages. Drawing on a range of communication channels may help ensure visitors get the message. One or two key messages should be identified and focused on rather than trying to communicate too much.

The following section lists some common problems associated with recreational use of conservation areas, and identifies management strategies that can be applied to counter these problems.

3. Management problems and strategies

There is a range of common problems associated with managing recreational use of conservation areas. In 1995 the New Zealand Conservation Boards identified over 60 sites where visitors were having a detrimental impact. Key problems included:

- Track deterioration and erosion
- Clearance of vegetation for firewood
- Water supply contamination by human waste
- Disturbance of wildlife by off-road vehicles, jet skis, horses, dogs and guided tours
- Visitor impacts on fragile landscapes such as sand dunes and sub-alpine areas

There are also a range of other, often related problems of concern to managers, which can be seen in terms of social rather than environmental impacts. These include such things as crowding, visitor conflicts and inaccurate visitor expectations.

The Department of Conservation's Visitor Strategy (DOC 1996) identifies a number of approaches to managing problems associated with recreational use:

- Reducing the use of the site/area by visitors
- Modifying visitor activities and behaviours
- Modifying the timing of visitor activities
- Moving the visitor activity/facility/service somewhere else better able to cope
- Increasing the resistance of the site

A number of these strategies can be advanced through the application of information. The following section summarises a range of information-based management tools and techniques.

4. Information-based management tools and techniques

There are wide range of tools and techniques available for providing management information to visitors. These can be broadly categorised into media-based and personnel based approaches.

The following section describes 25 techniques that can be utilised in visitor management, and provides a brief assessment of the relative strengths, weaknesses and perceived effectiveness of each[1]. Although the usefulness of these approaches varies, it is considered valuable to detail as many options for consideration as possible. These techniques and their relative effectiveness as management tools are summarised in section 4.4.

4.1 MEDIA-BASED INFORMATION TOOLS

4.1.1 Commercial publications

Feature articles and informational columns can be published in local, regional, and national magazines and newspapers. Articles may address visitor expectation issues, describe appropriate on-site behaviours, or attempt to influence activity and site choices. Articles may specifically focus on these or other issues, or address them in the context of a more general article about a destination or activity.

Strengths

This technique is low-cost, requires no maintenance and allows issues to be covered in more detail than many alternative techniques. It allows for a consistent message to be provided to a large number of people, including those who may not stop at visitor centres or DOC offices. It also has potential to reach visitors while they are still planning their trips, and consequently to influence things such as location choice and expectations.

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[1]   This material is adapted from a study by Doucette & Cole (1993) in which United States wilderness managers were asked to identify educational techniques used and assess their effectiveness. The results of Doucette & Cole's research are considered generally applicable to visitor management in New Zealand. However, it is not recommended that management decisions be based solely on this material. The tools and techniques used, their application and effectiveness may vary between New Zealand and the United States.
Furthermore, as the study was based on anecdotal evidence from wilderness managers, rather than field testing and evaluation of the different techniques, the accuracy of conclusions may have been affected by the subjective views and bias' of respondents. Results from other research into the effectiveness of different information tools is included in some instances.

Although many readers may have no immediate intentions of visiting a conservation area, improved awareness of conservation issues among the wider population is considered a worthwhile secondary outcome.

Weaknesses

It is not possible to guarantee key messages will reach potential visitors, or specific target audiences. Even if messages are delivered, they may not leave a lasting impression on readers, or lead to behavioural changes. Written information is not responsive to its audience and provides no opportunity for discussion or questions.

Publications will not always choose to print material submitted. This problem can be minimised by discussing a publication's requirements with editorial staff before preparation of the article, ensuring subject matter, style and tone are appropriate for the publication, and that the article submitted is of a high standard. Drawing links with other current or long-standing news issues can increase an article's attractiveness to a publication.

Effectiveness

Low. Managers believe commercial periodicals describing minimum-impact camping techniques have helped improve some problems, particularly campsite deterioration and litter. Well-written and widely distributed articles on the natural history and behaviour of fish and wildlife are thought to have helped reduce activities that harm them. Managers have received positive comments from visitors about such articles.

The effectiveness of this approach may be enhanced by identifying key outcomes sought before preparation of an article. This process is likely to include determining what specific problems or issues are of concern, which types of visitors are involved, and where they come from. Research by Fazio (1979) highlights the need to ensure target audiences will be reached through any given publication. A feature article published in a regional newspaper aimed at communicating management messages to visitors was seen by few of his intended audience. It may be useful to research which publications are most often read by visitors. Provision of contact details at the end of an article provides the opportunity for follow-up by readers.

Ensuring the article is interesting, and its message clear is also important. High-quality photographs can help enhance a message, as well as improve the likelihood that an article will be read. Copies of published articles can be placed in areas where visitors might find time to read them (such as trailheads, visitor centres, local accommodations, equipment stores and huts). Attempts can also be made to coordinate articles with television and radio coverage.

4.1.2 Conservation sector publications

Feature articles and informational columns can be included in newsletters published by conservation sector organisations such as DOC. This may include national, regional and local level publications.

Strengths

Similar to commercial publications except there are additional opportunities to customise articles and distribute publications to target audiences. For example, visitors could be provided with opportunities to register on mailing lists to receive publications, and copies can be included in any package of materials sent to potential or previous visitors and organisations such as tramping clubs and schools. Issues can be covered in depth through this approach.

No maintenance is required and costs are moderate. Costs may include salary to research and write the article (often indirect), and the costs of layout and publication. Articles produced for existing publications are particularly cost effective. Bulk printing and distribution decreases the cost per copy and mass distribution can be achieved quite cheaply.

Location and timing of distribution can be controlled to increase efficiency.

Weaknesses

As with commercial publications, the target audience may be missed, or messages may not leave lasting impressions. This technique requires equipment and a facility for production, or contracting of services.

Effectiveness

Low effectiveness. Sector publications may appear more or less credible than commercial publications, depending on the visitor's disposition. Sector publications aren't as likely to have as widespread distribution as their commercial counterparts, but may be more likely to reach the target audiences. Copies of publications can be provided in places such as visitor centres, local accommodations, equipment stores and huts.

4.1.3   Brochures

These can range from single sheets of paper to small booklets with information specific to a conservation issue or area. They can be distributed free to visitors, either in information packages sent before a trip, or at DOC offices, visitor centres, or trailheads. Brochures are usually produced in response to public demand or a problem.

Strengths

Depending on how and where brochures are distributed, they may be able to influence visitor expectations, activity and site choices as well as on-site behaviours. Visitors can take brochures with them, they are easily referred to and can provide thorough and detailed information.

Brochures are relatively inexpensive per copy, and become increasingly so if large numbers are printed. Designing brochures for use in a number of different conservation areas can reduce costs.

Weaknesses

Many visitors will not read brochures or will ignore their advice. If the subject matter is misunderstood, there is no way to get additional information. The significance of certain information can be lost if the brochure is too cluttered, or if the visitor picks up too many different brochures. Brochures may end up as litter.

Effectiveness

Low. Some managers say brochures have been particularly effective in reducing problems with human waste disposal, and water contamination. They are an effective means of describing 'step-by-step' procedures for reducing recreation impacts and have been used to disperse use more widely (Lucas 1981). Some managers feel a brochure's effectiveness increases when it is given to visitors after a one-on-one discussion of the topic.

Huffman & Williams (1985) examined the effectiveness of a brochure in influencing visitors to consider going to less used sites and found it an effective tool in redistributing visitors to designated areas (though less so than computers which were also tested).

Some managers have expressed concern that brochures are used too frequently, with too little thought given to their effectiveness.

Defining the target audience and key messages that are to be communicated may enhance effectiveness. Text should be concise and the message simple. Managers, including field personnel, should have the opportunity to review text in its draft form. This is especially true if the brochure is intended to convey information visitors may not seek themselves, such as regulations. Open space and good illustrations can help make a brochure attractive. Large blocks of text can intimidate readers. Whether printing is done in-house or by a commercial firm, layout, printing, and paper should be of good quality. Brochures should be small enough to be carried easily into the conservation area.

Brochures must be revised and updated periodically. Some managers use a formal review process to estimate the effectiveness, accuracy, and cost of a brochure before determining whether to reprint, revise, or discontinue it.

Copies of brochures can be made available at visitor centres, trailheads, local accommodations, equipment stores and huts.

4.1.4   Maps

Maps are generally printed on accordion-folded paper, sometimes coated with plastic to make them waterproof. They usually contain information on topographic features, tracks, campsites and huts. Many also include information on regulations, as well as messages about appropriate activities and behaviours. In this regard, they are similar to brochures.

Strengths

Many visitors want to have maps. They also tend to keep them, and therefore, messages contained on the map can be read before, during, or after trips. Dowell & McCool (1983) found that 90% of visitors felt maps were a desirable form of information.

When maps are carried into conservation areas, they can reinforce messages presented before the trip. They can be distributed at relatively low cost.

Maps can be provided free or at low cost at DOC offices, visitor centres, and equipment stores. Permanent, water-resistant maps can also be posted at trailheads.

Weaknesses

Many visitors cannot read maps. Others are only interested in the information on tracks and topographic features and may ignore management messages included on a map. Space is limited on the front of the map and messages on the back can easily be overlooked.

Producing a new map is a major undertaking, so the decision to do so should come only after careful evaluation of the need. While a simple map—with only a boundary, tracks, and a few features—can be developed quickly in-house, a more detailed map with accurate topography is a complex product.

Effectiveness

Low. Maps are considered most effective in dealing with overcrowding and user conflicts. They have been used to disperse use more widely. A map for the Eagle Cap Conservation area in Oregon, for example, identifies heavily used lakes. The entire reverse side of the map is a cartoon illustrating techniques for minimum-impact recreation, as well as the undesirable consequences of high-impact behaviours.

The effectiveness of maps in managing expectations, controlling site choices and visitor behaviours will be dependent on the extent to which these goals are considered during the development of the map.

4.1.5 Posters

Posters are single sheets of paper ranging from A4 to billboard size. Effective posters typically convey one or a few important messages about appropriate use. They may be displayed on walls or bulletin boards at visitor centres, DOC offices, trailheads, and equipment stores. They can also be distributed to visitors and institutions such as clubs and schools.

Strengths

Posters provide consistent information in a simple and attractive format. They are easy to distribute, relatively inexpensive, and can be used at a variety of locations. Generic posters can be developed at central offices can be distributed to many different areas.

Demands on personnel time are generally low. The time involved will vary with staff skills and the proportion of the work done in-house.

Weaknesses

Posters can convey only a few messages. Attempts to get too many messages on one poster, or to display many different posters, are counterproductive. Most visitors may not read posters. Visitors cannot take them on their trips and consequently, the messages can be quickly forgotten. The messages may be overly simplistic.

Posters require periodic updating, reprinting, and replacing.

Effectiveness

Low. Managers consider posters to have been somewhat effective in reducing problems with campsite deterioration and human waste disposal. They felt

posters have been quite effective in reinforcing pack-it-in, pack-it-out antilitter messages.

Poster effectiveness may be enhanced by keeping the amount of material on each (and the number of posters displayed together) to a minimum.

4.1.6 Signs

Signs made of wood, metal, fibreglass, or plastic can provide information to visitors when they are travelling or after they have reached their destination. Messages are necessarily brief, written to reinforce regulations or suggest proper behaviour (such as staying on the track, or staying out of areas being revegetated). The most common use of signs is to point out directions.

Strengths

The visitor receives simple messages, often at the exact location where that message is most important. Messages can reinforce regulations or provide general information. They are relatively inexpensive.

Well-constructed signs can last for many years. Simple signs can also be crudely fashioned for temporary use. Many agencies have specific guidelines for signs and well-developed procedures for producing them.

Personnel time requirements are generally low. Except where there is an extensive network, signs should require little time. More time may have to be spent on signs in heavily used destination areas with designated recreation sites, areas being revegetated, closed tracks, and toilets.

Weaknesses

The obtrusiveness of signs is a major disadvantage in conservation areas. There should be relatively few situations where educational signs are appropriate in conservation areas. They are particularly inappropriate in extremely remote areas. Their limited space and impersonality are also disadvantages. Signs provide no opportunity for questions or additional information. Dowell & McCool (1983) found that only 37% of visitors reported signs as a desirable information source.

Well-constructed, durable signs can be costly. Flimsy signs that must be replaced frequently are also costly. The degree of maintenance depends on the type of material used to construct the signs and their design. Theft and vandalism are problems, as is physical deterioration. Basic maintenance involves checking signs, documenting their condition, assuring their accuracy, and repairing or replacing them where needed.

Effectiveness

Low. Managers consider signs to have been somewhat effective in reducing problems with campsite and track deterioration, and litter. Signs may be spaced along a track near a trailhead to deliver messages on low-impact recreation. Signs have been quite effective in keeping people away from sensitive areas (e.g. revegetation areas) or in confining traffic to a small number of routes (such as a track to a toilet).

A recent study (Espiner 1999) looked at the use and effect of hazard signs in managing visitor safety at Franz Joseph and Fox Glaciers. Results suggest many visitors pay little attention to the content of signs. Although 90% of visitors noted the existence of hazard signs on the glacier access tracks, over 60% them were unaware of the key hazard messages. This may be partly due to the nature of the signage used in these areas. The introduction of new signage was able to increase visitor compliance with hazard messages by approximately 25%. However, it is not clear whether this was the result of improvements in the presentation of the message, or simply a function of an increased number of signs.

Another study assessed visitor attention to low-impact messages posted on trailside signs in a wilderness area in Montana (Cole 1998). Results suggest that if managers want visitors to read messages, they should ask for visitors' attention. They should not assume visitors will read messages simply because they are posted. However, attention is a prerequisite for behavioural change and simply asking for attention is a surprisingly effective means of increasing attention.

The effectiveness of signs may be enhanced by ensuring messages are short and simple, using positive phrasing and a friendly tone.

4.1.7 Guidebooks

Although primarily intended to provide general information about conservation areas and potential travel routes, guidebooks can also provide information intended to influence visitor expectations, activities and site choices and to deliver low-impact camping and other behavioural messages.

Although generally included as a separate section, guidelines for low-impact recreation can be interspersed throughout such books. Guidebooks range from brochures to books of several hundred pages. Most guidebooks are written commercially, however some are developed by managing agencies.

Strengths

Guidebooks are one way to discuss conservation area ethics, visitor expectations, and low-impact techniques in a publication visitors won't throw away. Many visitors want a guidebook. They keep them, and can refer to them when planning their trips. As a consequence, it is possible to deliver management messages to visitors in time for them to have the potential to influence behaviours, choices and expectations. Dowell & McCool (1983) found 71% of visitors considered guidebooks a desirable form of information.

Guidebooks are generally a low-cost and a low personnel-time option. Contributing to a commercially produced guidebook is inexpensive. In-house production can be expensive, but costs may be offset by book sales.

Weaknesses

Guidebooks can detract from the discoveries that are a part of the outdoor experience. They may increase use, and can alter the distribution of visitor use in ways that may be harmful. Visitors interested primarily in route information may ignore the book's messages about low-impact recreation.

With commercial guidebooks, the primary concern is making certain the book contributes to management goals rather than detracting from them. Managers should try to stay in touch with guidebook authors to suggest changes or add material related to their goals. Managers should be concerned about the tracks and destination areas that are mentioned or photographed, as well as comments about regulations and suggested behaviours.

In-house guidebooks will require considerable time for research, writing, graphics, layout, and production. Publication of a guidebook may take 2 to 3 years. The need for a guidebook should be carefully evaluated, due both to the cost of production and potential concerns about the implications for usage of conservation areas.

Guidebooks become outdated quickly, because of changes in routes, conditions, and regulations. Periodic updating is necessary.

Effectiveness

Low. Some managers feel guidebooks have been effective in reducing crowding and user conflicts by informing visitors about alternative travel routes and camping areas. Others feel the beautiful pictures and glowing accounts of selected places and trips have contributed to overcrowding and unrealistic visitor expectations. Some managers feel inclusion of educational material in guidebooks has reduced problems with disposal of human waste and deterioration of campsites and tracks.

Guidebooks should be easy to understand, concise, and simple. High-quality graphics, an attractive layout, professional presentation, and accurate maps are important. Guidebooks should be available to visitors when they are planning their trips and when they reach facilities near conservation areas. Guidebooks can be distributed or sold at visitor centres, DOC offices, and equipment stores.

4.1.8   Displays at trailheads

Displays at trailheads can contain information about regulations and techniques for low-impact recreation, as well as information on track conditions, natural history, and other items of interest. Typewritten messages, posters, newspaper articles, photographs, or other materials may be displayed. These items can be stapled to a board or placed in waterproof cases. Displays are related to posters and signs.

Strengths

Consistent, easily updated information can be made available at low cost. Messages are presented before the visitor enters the conservation area.

Most of the materials—posters, photographs, and so on-should are readily available from agency offices and should require little additional work.

The initial costs for materials can be substantial, but costs are low once displays are in place. Personnel time is generally low. Time is spent gathering materials and constructing the display cases or boards. Additional time is required to maintain and update the information. Little time is required after the initial development stage, if display maintenance is a part of other patrol duties.

Weaknesses

In some cases, the information comes too late for the visitor to modify behaviour (for example to bring a gas cooker rather than rely on a fire). Visitors just setting off on a trip may not take the time to read the display. This problem can be aggravated if displays are cluttered or unattractive. Visitors leave the messages behind once they leave the trailhead. Messages are often impersonal, overly simplified, and likely to be ignored or forgotten. There is no way for visitors to ask questions that might explain confusing messages.

Displays that are not protected from vandalism and the weather may require frequent attention.

Effectiveness

Moderate. This is the primary opportunity to educate visitors who do not contact the agency or are not contacted by a ranger. Some rangers feel displays have been effective in reducing many different kinds of problems.

Displays advocating pack-it-in, pack-it-out policies appear to have reduced litter. Managers feel displays have helped reduce problems with campsite deterioration, human waste disposal, and water contamination.

Minimising the number of messages presented may enhance effectiveness. Each message should be kept as simple, concise and positive as possible. Displays should be durable, attractive, clean, and current. Photographs and illustrations should be incorporated, rather than relying solely on text. Key conservation and management messages can be mixed with information most interesting to visitors (such as natural history).

4.1.9   Displays at DOC offices

Displays at DOC offices can include simple poster arrangements, bulletin board postings of articles, departmental announcements, and maps. These displays may be outside, in weatherproof cases, or inside. Displays may be similar to those at trailheads, although they may contain substantially more information. Visitors viewing these displays tend to be looking for more information and may spend more time viewing the display than visitors at a trailhead.

Strengths

Consistent, easily updated information can be provided at low cost. Visitors may take the time to read the information if encouraged to do so by personnel or an attractive display.

There may be opportunities for visitors to ask questions if they are confused or would like additional information. Messages are presented before the visitor enters a conservation area.

Low cost and low time requirements. It is an inexpensive means of communicating with visitors who do visit DOC offices, and an inexpensive supplement to a broader communication effort. Most of the materials should be readily available within DOC, and should require little additional work.

Much of the cost involves production of other educational materials, such as posters and maps. Time is spent gathering materials and perhaps in

constructing the display case. A little additional time is required to maintain and update the information.

Weaknesses

The small proportion of visitors likely to be contacted at DOC offices is the primary disadvantage. In some cases, the information comes too late for the visitor to modify behaviour (for example, to bring a gas cooker instead of relying on a fire).

As with other displays, too much information may be presented. Visitors may simply overlook all but the specific information they are seeking. Displays that are not protected from vandalism and the weather may require frequent attention.

Effectiveness

Low. Most visitors do not contact DOC before entering conservation areas. Consequently, this method is entirely ineffective for those users.

Effectiveness is likely to be enhanced by locating displays in highly visible areas, and having personnel available to answer questions. Minimising the number of messages presented is also important. Each message should be kept as simple, concise and positive as possible. Displays should be durable, attractive, clean, and current. Photographs and illustrations should be incorporated, rather than relying solely on text. Key conservation and management messages can be mixed with information most interesting to visitors (such as natural history).

4.1.10 Displays at visitor centres

Visitor centres often have long-term displays that include simple poster arrangements, articles posted on a bulletin board, DOC announcements, or maps. In addition, they may include slide shows, films or videos, three-dimensional models and interactive displays.

Compared with displays at trailheads or DOC offices, a wider range of material can be offered. More effort is usually invested in the presentations. Informational displays are often supplemented by brochures, maps, and books, and by trained personnel at information desks. Information on appropriate behaviours and other management messages is often interspersed with information on natural and cultural history, as well as details about specific activities and destinations.

Strengths

Consistent, easily updated information can be made available to visitors. If personnel or an attractive display encourages visitors, they may take the time to read the information. Complex information can be communicated. There may be opportunities for questions and answers, or to provide supplemental information in brochures or maps. Messages are presented before the visitor enters the conservation area.

Costs for this option are considered moderate. Although the development of displays may be expensive, subsequent costs are relatively low. Maintenance is minimal beyond periodic revision of displays and materials distributed at the centre. Personnel time required is low. Some time is spent initially in gathering materials, but little additional time is required to maintain and update the displays.

Weaknesses

The primary disadvantage is the small proportion of visitors who come to visitor centres. In some cases, the information comes too late for the visitor to modify behaviour (for example, to bring a gas cooker rather than relying on a fire).

As with other displays, too much information may be presented. Visitors may overlook all but the specific information they are seeking.

Effectiveness

Low. Most users do not go to visitor centres before entering conservation areas. Consequently, this method is ineffective for them. However, it is an inexpensive way to communicate with those who do use visitor centres, and an inexpensive supplement to a broader communication effort. This may be a particularly effective way to teach plant and animal ecology in hopes of changing behaviours that harm vegetation and wildlife. It may also be a good way to communicate a relatively complex message to a minority of visitors.

The key to effective use of this approach is to entertain as well as educate. Effectiveness is also likely to be enhanced by minimising the number of messages presented. Each message should be kept as simple, concise and positive as possible. Displays should be durable, attractive, clean, and current. Photographs and illustrations should be incorporated, rather than relying solely on text. Key conservation and management messages can be mixed with information most interesting to visitors (such as natural history).

Opportunities to distribute brochures so messages can be reinforced at a later date should be taken, and personnel made available to answer questions.

4.1.11   Films

Reel-to-reel films illustrating practices for low-impact recreation can be shown at visitor centres and department offices, in schools, or to other organisations.

Strengths

Films are an attractive and familiar medium. Concepts can be expressed clearly with pictures and soundtrack. Films can be mailed. They are easily shown to large groups. Potential visitors can be reached before their trip when they have time to absorb messages. When conservation staff show films, they can answer questions.

Low cost and personnel time requirements, as long as the film is not produced in-house. Minimal maintenance required beyond periodic equipment cleaning, film splicing, and storage.

Weaknesses

Films may not reach most visitors. They may miss target audiences. People heading into the backcountry are unlikely to want to take the time to view a film. Films are also hard to modify for different areas and can be quickly outdated.

Effectiveness

Moderate. An entertaining film can capture the visitor's attention, but messages may be quickly forgotten. Films may be particularly appropriate for dealing with a complex subject, such as the susceptibility of wildlife to disturbance by visitors and behaviours that minimise disturbance. Managers also feel films are particularly helpful in reducing behaviours that lead to campsite deterioration.

Matching film length to audience requirements may enhance effectiveness. Visitors heading into the backcountry will probably prefer shorter films (perhaps 5 to 10 minutes) than visitors to more developed areas. Films should be considered as a supplement to other types of information, not a replacement.

4.1.12   Videos

With recent advances in technology, videos have become a valuable educational medium. They are easier to use and less expensive than films. Videos can be shown at DOC offices or in visitor centres. Moreover, they can be copied inexpensively and rented or loaned out. They can be produced in-house or by a commercial firm.

Strengths

Videos are attractive, entertaining, and familiar. They can be mass-produced and distributed widely at relatively low cost. Complex ideas can be communicated, and confusing sections replayed.

Information can be communicated before trips, when visitors have time to absorb messages and change their behaviour.

Generally low cost. Although the cost of developing a professional video can be relatively high, once developed, long-term costs are low. Little personnel time is needed unless the video is developed in-house and maintenance is minimal. A number of high-quality videos already exist.

Weaknesses

Videos may not reach most visitors and may miss target audiences. Visitors heading into the backcountry are unlikely to take the time to view a video. Videos are expensive to modify for different areas and are quickly outdated. However, they can be modified more easily and more cheaply than films.

Effectiveness

Moderate. Similar to films, but may be disseminated more widely. For example, most people have video players at home and can watch videos there. Managers feel videos are particularly effective in reducing problems with track and campsite deterioration, and human waste disposal.

Effectiveness may be enhanced by carefully considering video length. Visitors heading into the backcountry will probably prefer shorter videos (perhaps 5 to 10 minutes) than visitors to more developed areas. Videos could be longer if intended to be viewed at home.

Videos should be entertaining and of professional quality. Videos should be considered as a supplement to other informational media, not a replacement. Video rental outlets may carry the videos, for rent or free of charge, making them available to a large audience.

4.1.13 Commercial television

Commercial television can be used if managers make guest appearances on talk shows or contribute items for news broadcasts or public service announcements. Public service announcements can be produced to address specific problems.

Strengths

Television is a familiar source of information for most visitors. Most people spend a lot of time watching television. Messages can reach a wide audience at a time when some viewers may be receptive. Messages can also be targeted to national, regional, or local audiences. A wide variety of materials—from people and equipment to slides and videos—can be used.

Personnel time and costs are low. Sending public service announcements to television stations or contacting stations about events costs little. However, television spots are expensive to produce. No maintenance is required.

Weaknesses

Limited broadcast time is available. Target audiences may be missed and there is little control over the time of day that messages are shown, or the frequency with which they are shown.

Effectiveness

Low. Managers feel television programmes have been most successful in reducing the disturbance of fish and wildlife by conservation area visitors, and problems with litter. However, the ability to control message delivery through this medium is limited. Fazio (1979) ran a half-hour video tape on a local television station aimed at providing management information to visitors. Results showed that few of his target audience actually received the information.

Targeting of this technique may be improved through advertising the programme in other media that have been shown to reach specific groups. Developing a good relationship with television stations may also help if this leads to clips being shown at times when target audiences are most likely to be reached.

Assuming that a television broadcast does reach its target audience, using visual appeal and human interest for an entertaining production may enhance effectiveness. A good story line backed by good visual material is important for a short spot. For a longer show, additional skills are needed such as poise before the camera and the ability to get the most out of visual props and individual scenes.

4.1.14 Slide shows

Short slide programs (5 to 10 minutes) may be shown at department offices and visitor centres before people enter conservation areas. These may be turned on by the viewers themselves, or shown by information personnel. Longer shows (15 to 30 minutes) are usually more general. They may be shown at regular times in agency offices or visitor centres, or shown to special groups by information personnel.

Strengths

Slide shows can have a strong visual impact, and they can reach a wide audience. They are relatively inexpensive and easy to update. They can educate visitors before they enter conservation areas. If agency personnel show the slide show, they may use the occasion to promote other topics, such as volunteer projects.

Slide shows can be produced in-house by local personnel and consequently are able to specifically address local conditions and situations. Although the initial cost of equipment to produce and show slide shows can be substantial, overall costs and personnel time requirements are low, unless the show is shown frequently and personnel are needed to show it. Minimal maintenance is required. Slide shows are easily updated by changing slides.

Weaknesses

Most visitors may be missed. If information personnel are unavailable, questions can be left unanswered.

Videos are slowly replacing slide shows because videos are easy to duplicate and distribute.

Effectiveness

Moderate. Most managers feel slide shows are the most effective educational medium that does not require personnel. They can effectively illustrate and potentially reduce a wide variety of conservation area problems.

The effectiveness of this medium may be enhanced by using high-quality slides and recordings. Scripts should be positive, direct and simple, avoiding lists of do's and don'ts and judgmental tones. An entertaining show that takes advantage of human interest will be more likely to keep the audience's attention.

Slide files should be regularly updated so new slides are available as needed. Everything possible should be done to encourage or require visitors to watch the show before entering conservation areas, and if possible, personnel made available to discuss the show or answer questions.

4.1.15   Commercial radio

Short public service announcements, usually lasting less than a minute, can be produced and sent to radio stations. Alternatively, personnel can appear on radio talk shows or contribute to special programs on specific conservation topics.

Strengths

Information can be aired quickly and changed easily. Large numbers of people can be reached at minimal cost.

Weaknesses

Most visitors are likely to be missed. Short messages may be misinterpreted, particularly since they aren't accompanied by pictures. Messages may not attract listeners' attention and may be quickly forgotten. The messages may be broadcast at times of the day when few listeners are likely to tune in.

Effectiveness

Low. Managers generally considered commercial radio the least effective technique. Keeping announcements short with a clear, concise message may enhance effectiveness. However, some managers feel longer programmes are more effective, because they offer more opportunity for discussion and for questions and answers.

Providing a radio station with several spots of varying lengths and on a variety of topics may increase the likelihood of broadcast. Spokespeople who plan to be on a radio show should be good speakers and be well prepared. Talk show hosts can be sent background information in advance of the show. Managers can work to develop good relationships with radio station employees.

4.1.16   Agency radio

Agency offices can broadcast scheduled announcements and continuous information. These broadcasts usually deal with topics such as weather conditions, campsite availability, and track conditions, but may also include messages on subjects such as low-impact recreation behaviours.

Strengths

Consistent information can be provided at low cost. Information is easily revised and up-dated. The agency controls the timing and content of broadcasts. Visitors can get up-to-date information as they drive to the conservation area.

Moderate cost, low maintenance and low personnel time. Transmitting and recording equipment is costly, but equipment purchased for another purpose can sometimes be used.

Weaknesses

Most visitors are likely to be missed. Short messages may be misinterpreted, particularly since they aren't accompanied by pictures. Messages may not attract listener's attention and may be quickly forgotten.

Effectiveness

Low. Effectiveness may be enhanced by using roadside signs to inform visitors they can tune-in for useful information. Messages should be clear and concise in short announcements. Using high-quality recordings presented by good speakers, and keeping messages up to date will also contribute to effectiveness.

4.1.17   Computers

Computer terminals located at agency offices, visitor centres, and equipment stores can be programmed to provide conservation area information when visitors touch the screen or strike a key. Web-sites can be developed to provide access to a wide range of detailed information. In some cases, computer games may be used to teach a conservation ethic or techniques for low-impact recreation.

Strengths

Computers are becoming an enjoyable and familiar way of getting information. Consistent, up-to-date, detailed information can be supplied at relatively low

cost. Visitors can obtain the specific types of information they desire. Information is provided before the visitor enters the conservation area. Websites can provide a wide range of information to large numbers of people, and email allows quick responses to specific questions and information requests.

Anecdotal evidence suggests a correlation between the types of people who regularly visit conservation areas and those who own computers and use the internet.

Weaknesses

Most visitors may be missed. Only a few visitors can use an on-site computer at one time. Although ownership of personal computers and internet access is increasing all the time, many people still do not have ready access to computer-based information.

Information is presented impersonally. There may be little opportunity for questions and answers if information personnel are unavailable.

The cost of the computer hardware and software can be moderate to high. The cost of programming and keeping information current can also be quite high. However relatively little time is required to program the computer and to update and maintain the system.

Hardware needs to be maintained and repaired, and information needs to be updated regularly. In-house computers need to be checked daily to make sure they are functioning correctly.

Effectiveness

Doucette & Cole's 1993 research gave computers a low effectiveness rating. Most managers surveyed felt that computers had not been effective visitor management tools. However, some thought computers could be used effectively and suggested better systems should be developed and tested for this purpose.

Growth of computer use has increased dramatically since 1993. Types of use have also changed. The DOC website is now being used by approximately 8000 people every month. Although more research and evaluation is needed to determine the nature of this use, and the contribution it makes to visitor management objectives, it seems likely that there is significant potential for computers to be valuable and effective information tools.

Making computer systems and sites easy to understand and use, entertaining and informational may enhance effectiveness.

Huffman & Williams (1985) examined the effectiveness of computer-based information in influencing visitors to consider going to less used sites, and found computers to be an effective tool in redistributing visitors to designated areas. Computers proved more effective than brochures, which were also tested.

4.2 PERSONNEL-BASED TECHNIQUES

This section describes eight personnel-based techniques. These involve face-to-face contact between the visitor and agency personnel.

4.2.1 Personnel at agency offices

Receptionists and clerical personnel may greet visitors, provide information, and issue permits, if they are required. These employees may also provide educational messages to visitors. Visitors can be required to visit the agency office, usually to obtain a permit. They may also be required to attend a presentation on low-impact recreation.

Strengths

Office employees are already working, so new employees don't have to be hired. Salary costs are not increased. In some places, office employees present messages personally to many visitors, allowing for questions and answers.

Moderate cost. The proportion of personnel costs truly related to education is usually low. In some situations, costs may be high, normally in areas with heavy use, where a substantial proportion of visitors contact the agency.

Weaknesses

Most visitors do not stop at agency offices. Those who do visit may not be the types of visitors causing most of the problems. Office employees may be too busy with their other responsibilities to spend time educating visitors. Unfamiliarity with the conservation area can reduce credibility. Unless employees are trained, they may provide poor information.

Effectiveness

Moderate. Managers feel this is the least effective of the personnel-based techniques, perhaps because agency offices tend to be far from conservation areas and office employees may not receive adequate training.

Effectiveness will vary directly with the knowledge and credibility of employees. Managers felt this technique was most effective in reducing problems with visitor conflicts and overcrowding.

Effectiveness may be enhanced by making sure employees are credible, well trained, and clear that visitor education is a core component of their job description.

Adjusting staffing levels to reflect the varying numbers of visitors on different days and during different seasons is important. Information needs to be accurate, up to date, and consistent with information provided elsewhere. Providing incentives, such as maps, or introducing a mandatory permit system will encourage visitors to come to agency offices.

4.2.2 Personnel at visitor centres

Visitor centre employees are primarily information specialists. They provide information on natural and cultural history and answer questions about weather, track conditions, and when to go. They also can provide messages

about what to expect in specific locations, advise on activities and site choices and educate visitors about appropriate behaviours.

Strengths

Information staff are usually experienced and skilled. The information provided is consistent and easily updated. Visitors can be contacted before their trip. Visitors' recreation plans, knowledge, and experience can be checked. There are opportunities for questions and answers.

In addition to working directly with the public, centre employees may also develop displays, brochures, and other educational materials.

Weaknesses

High cost and high use of personnel time. Costs can be reduced by relying heavily on volunteers, however, this can also reduce effectiveness if the volunteers are poorly trained or are not credible.

Personnel needs are highly seasonal and may vary between weekdays and weekends.

Since many conservation-area visitors bypass visitor centres, they will be missed. Hours of operation may be too short to catch visitors who arrive late. Visitors may forget messages if they are not reinforced after they enter the conservation area.

Effectiveness

Moderate. Personnel at visitor centres are considered particularly effective in reducing overcrowding. They can provide information to help some visitors steer away from heavily used trails and destinations. Managers also felt visitor centres were particularly good places to help visitors learn ways they could avoid disturbing fish and wildlife. This might relate to the value of natural history displays in visitor centres for education about fish and wildlife.

Krumpe & Brown (1982) found that providing visitors to ranger stations with information about alternative routes led to some 30% of visitors making changes in their planned route. However the proportion of people who contact the managing agency or stop at visitor centres prior to entering a conservation area can be highly variable.

Training visitor centre staff in communication techniques, information about the area and low-impact recreation behaviours may improve effectiveness. Ideally, they will also develop personal experience in the area to increase their credibility.

Effectiveness may also be enhanced by supporting verbal messages with written materials visitors can take with them, setting hours of operation to contact the most visitors, and encouraging visitors to visit the centre.

4.2.3   Personnel at trailheads

Personnel can contact visitors at trailheads. Although their primary function is usually education, they can also act as natural and cultural history interpreters, collect statistics, patrol tracks, maintain trailhead displays, maintain campgrounds, and take care of other tasks. Trailhead personnel may use visual

aids and they may hand out written materials. They can advise visitors of conditions to expect in specific areas, and inform them about appropriate behaviours and activities. In some places, all visitors must listen to a talk on low-impact recreation before entering a conservation area.

Strengths

Personal education allows the opportunity for discussion and questions. Personnel can become highly skilled because their primary function is contact with visitors. Messages can be targeted to different users, based on the employee's intuition. Visitors are left to enjoy the conservation area once the initial contact has been made.

Weaknesses

Visitors may be contacted too late to change certain behaviours. Many visitors may be missed if a few personnel must cover many trailheads. Visitors who begin trips early or late in the day may be missed. Costs can be very high, and personnel can sit idly during slow periods.

Effectiveness

Moderate. Trailhead personnel are considered to be particularly effective in reducing problems with overcrowding and visitor conflicts, litter, track and campsite deterioration. They can help steer visitors away from overcrowded areas and situations with potential for conflicts. In addition, they can demonstrate ways to avoid other problems.

Training sessions at the beginning of the season should include orientation to the area, low-impact practices and philosophy, and communication techniques. Personnel should also be given an opportunity to become familiar with the backcountry.

Effectiveness may be enhanced by using personable, experienced, well-trained personnel. Shifts can be scheduled to when they can contact the most visitors. Visual aids and written materials can be used to reinforce messages and attract visitors. Including information about natural and cultural history and other items of general interest may help to keep the visitors' attention.

4.2.4 Personnel at campgrounds

Campground personnel primarily operate and maintain developed campgrounds. Where campgrounds are close to trailheads, however, these personnel also can provide information and educate visitors. Techniques for low-impact recreation, and advice about site choices and expectations can be included in campground interpretation programs.

Strengths

Campground visitors are often receptive to contacts by campground hosts. Costs associated solely with educating conservation area visitors should be minimal.

Weaknesses

Few campground visitors enter the backcountry. Most conservation area visitors do not use developed campgrounds.

Education is likely to be only a minor part of someone's job operating a campground.

Effectiveness

Moderate. Managers feel that personnel at campgrounds are most effective in reducing problems with overcrowding, litter, and vandalism.

Because the employees are not hired or asked to volunteer primarily to educate conservation area visitors, training is very important. Preseason training should include an orientation to the conservation area, techniques for low-impact recreation, and communication skills. Personnel should be encouraged to visit the conservation area themselves.

4.2.5   Personnel at public meetings

Personnel may speak at meetings of recreation groups or they may attend planning and public policy meetings. Detailed talks on conservation area use can be presented to recreation groups. The speaker may use visual aids, such as slide shows or videos, and may hand out written materials. Opportunities for questions and answers are usually provided.

Strengths

Audiences can be targeted, at least at certain types of public meetings. Persons attending meetings are usually particularly interested in the topic. One employee can speak to a number of potential visitors at once. Questions can be answered. Visual aids can be used to emphasise points. Written materials can be handed out so the messages can be reinforced later.

Low cost and personnel time. These meetings are usually too infrequent for the cost of education to become substantial.

Weaknesses

Only a small portion of visitors can be contacted in this manner. Numbers at meetings can vary widely, and attendees may not match target groups. In many cases, practices to reduce the impacts of conservation area recreation will only be a peripheral issue at a meeting.

Public meetings may also be called to oppose restrictions on recreational use of conservation areas. Groups such as off-road motorsport, hunting and fishing enthusiasts may challenge current or proposed policies restricting or prohibiting access.

Effectiveness

Moderate. Managers feel this technique can be particularly effective in dealing with visitor conflicts, and disturbance to fish and wildlife. Groups that are prone to conflicts, such as large organised groups and other interest groups, can be specifically targeted.

Effectiveness may be enhanced by making sure speakers are knowledgeable and skilled at public speaking and facilitating meetings if conflict is likely. Employees can be encouraged to provide educational messages.

Speakers should have time to carefully prepare their presentations. Taking advantage of other types of meetings presents a greater challenge.

4.2.6 Personnel at school programmes

Personnel can put on seminars or programmes for schools. Programmes can be presented in classrooms or at a conservation area. They can be single classes or a series of classes. They can be formal lectures, skits, or skill courses. Use of these programmes in the United States has increased dramatically over the past decade. Curricula are now available for a wide variety of programmes. Materials can be provided to teachers, or presentations can be given by agency employees or volunteers.

Strengths

Large numbers of people can be reached. Young people can be educated when they are still forming opinions. Topics can be covered in depth. Questions can be answered. Subsequent school programmes can reinforce the message.

Materials can be costly to prepare, but a wide variety of materials are now available. Costs of preparing and giving presentations should not be high. Costs can be reduced by using volunteers. Developing programmes may also take a lot of time, but thereafter, little time should be required.

Weaknesses

Many students who attend the programs may never enter conservation areas. Many other students who later visit conservation area may never be contacted.

Effectiveness

Moderate. Some have asserted that educating young school children is a highly effective means of education (Bradley 1979). Managers feel such programmes are most effective in dealing with simple behaviours, such as littering and vandalism, rather than more complex behaviours.

Effectiveness may be enhanced by using skilled professional educators to present school programmes. Including a wide variety of media, such as hands-on activities, will help to keep the students' interest. Programme material should be varied so it is appropriate to the audience.

Programmes that are run over a period of years, are more likely to produce positive results.

4.2.7 Personnel in the backcountry

Personnel that patrol a conservation area can educate visitors. The proportion of time such employees spend educating visitors varies greatly between areas. In some places, backcountry rangers are told to discuss expectations, activity and site choices and low-impact behaviours with as many visitors as possible. Elsewhere, educational contacts are the exception.

Strengths

Backcountry personnel are highly knowledgeable and credible. They may be perceived as role models. They have frequent opportunities for demonstrations and specific examples of inappropriate behaviour and their effects can be pointed out. Backcountry personnel can answer questions and visitors often have time to talk with them.

Weaknesses

Because recreational users are highly dispersed, many visitors will not be contacted. Costs per contact are high, if education is the employee's primary job. Some visitors feel contact with agency representatives is intrusive in the backcountry.

Effectiveness

High. Managers consider this technique to be effective in dealing with most problems. One exception is reducing disturbance to fish and wildlife. It is difficult to understand why managers felt personnel in the backcountry weren't as effective in reducing disturbance of fish and wildlife as in reducing other impacts. Perhaps opportunities to demonstrate low-impact behaviour with respect to wildlife are minimal in the backcountry.

Effectiveness may be enhanced by making sure backcountry personnel are friendly, knowledgeable, and sensitive to visitors' needs and wishes. Intensive training is critical. Most programmes have preseason training sessions that cover many topics, including techniques for low-impact recreation and communication skills. Approaches to visitors should be low-key and avoid self-righteousness.

4.2.8   Interpreters

Interpreters educate visitors in a variety of ways, from providing general information, to leading walks, developing educational programmes, and developing displays. They are usually based at agency offices, visitor centres, or developed campgrounds.

Strengths

Interpreters are highly skilled. Communication is very personal and often highly meaningful to the visitor. Interpreters are usually credible. Visitors are usually interested in the contact and receptive to the message. Topics can be covered in detail and there is opportunity for questions and answers.

Weaknesses

Most conservation area visitors will not attend interpretative events, so most visitors are missed. Interpreters are generally more experienced with the general public than with experienced backcountry visitors. They are usually more knowledgeable about natural and cultural history than about techniques for low-impact recreation.

Effectiveness

High. The relatively small number of managers who use interpreters generally feel they are relatively effective in reducing the entire range of management problems.

Effectiveness may be enhanced by selecting good communicators with an interest in conservation. Interpreters can be encouraged to include information about the problems of high-impact recreation and the behaviour that can prevent such problems. Interpreters should also gain personal knowledge about the conservation area, and be kept aware and up-to-date about conditions.

4.3   INNOVATIVE APPROACHES

In addition to the range of information tools and techniques applied to visitor management detailed above, Doucette & Cole (1993) have also identified a range of other approaches which are less commonly used, but potentially useful.

4.3.1   Travelling displays and exhibits

These can be taken to major trade shows, conferences, shopping malls, and local events. This technique is most effective when agency personnel are present to interpret the exhibit and talk with visitors. Skills courses (a series of 'stations', each offering hands-on treatment of a specific concern) and quizzes about low-impact recreation can supplement displays. Brochures and posters can be handed out.

4.3.2   Self-guided or agency-guided trips

On self-guided trips, visitors receive a guidebook with information on travel routes, natural and cultural history, and techniques for low-impact recreation. Agency-guided tours can include more detailed discussions of the techniques for low-impact recreation. In some places, rangers join outfitters on a yearly trip to develop good working relationships, exchange information, and discuss techniques for managing recreational use of conservation areas. Trips for leaders of organisations might be another option. Although expensive, these programs have the advantage of teaching by example, which is often considered the most powerful of all teaching techniques.

4.3.3   Seminars and workshops

These can be provided for agency personnel, outfitters and guides, clubs and interested members of the public. Instructors may be university professors, agency professionals, rangers, or skilled members of the public. Classes can be free or fees can be charged. Clinics can be given on specific subjects such as techniques for low-impact recreation. Clinics can be a great way to educate agency office personnel who contact the public but do not generally work in conservation areas.

4.3.4   Co-operative management agreements with non-governmental organisations

In the United States, organisations have 'adopted' several conservation areas. They help educate visitors, patrol the backcountry, maintain tracks, clean up litter, and rehabilitate damaged areas. Leaders of clubs and groups such as the

Boy Scouts who attend classes can pass the knowledge on to their members. Information packets can also be sent to leaders of such groups.

4.3.5 Demonstrations

Many types of demonstrations are feasible. Some conservation area areas have built sample campsites at agency offices, visitor centres, trailheads, or schools. Demonstrations of outdoor gear can be good places to discuss techniques for low-impact recreation. Brochures and posters can be handed out there as well.

4.3.6 Incentives

Incentives can be provided to visitors who are knowledgeable about techniques for low-impact recreation, use appropriate behaviour, or accept suggestions for altering their site choices. In one area in the United States, rangers distribute discount coupons for outdoor gear when visitors reduced recreation impacts.

4.3.7 Correspondence

Effective correspondence with the public has good potential for education (Fazio & Gilbert 1981). People requesting information are usually making plans and are receptive to brochures and information. If the reply is a form letter, a personal note will increase effectiveness. With access to email technology increasing rapidly, this tool provides a quick, easy and direct way of corresponding with potential visitors. Quick replies are important.

4.3.8 Litterbags

Litterbags can be provided to visitors entering a conservation area. Many visitors forget to bring litterbags with them. Litterbags increase the likelihood that visitors will pack out their litter, and can be printed with management messages.

4.3.9 Bulletin boards

In heavily used areas, information about appropriate behaviours, site choices and regulations can be posted on bulletin boards. This technique has the potential to be obtrusive, and consequently should be a last resort. Bulletin boards can be most useful in informing visitors about areas they should use or areas they should avoid.

4.3.10 Track information guides

Information on tracks can be provided to visitors. Guides provide an opportunity to encourage visitors to try less used tracks, reducing crowding elsewhere. A number of areas have used interactive computer programs to help visitors select tails. Krumpe & Brown (1982) demonstrated the effectiveness of using maps with information to redistribute use.

4.4   SUMMARY OF EFFECTIVENESS

Table 1 presents a summary of the various personnel and media based tools and techniques available in order of effectiveness.

TABLE 1. TECHNIQUES, AND THEIR EFFECTIVENESS AS A VISITOR MANAGEMENT TOOL.

TECHNIQUE	EFFECTIVENESS
Personnel-based	
Personnel in the Backcountry	High
Interpreters	High
Personnel at Agency Offices	Moderate
Personnel at Visitor Centres	Moderate
Personnel at Trailheads	Moderate
Personnel at Campgrounds	Moderate
Public Meetings	Moderate
School Programmes	Moderate
Media-based	
Displays at Trailheads	Moderate
Films	Moderate
Videos	Moderate
Slide Shows	Moderate
Computers	Moderate*
Commercial Publications	Low
Conservation Sector Publications	Low
Brochures	Low
Maps	Low
Posters	Low
Signs	Low
Guidebooks	Low
Displays at DOC Offices	Low
Displays at Visitor	Low
Commercial Television	Low
Commercial Radio	Low
Agency Radio	Low

*   Effectiveness rating has been increased by the author from Low to Moderate based on anecdotal evidence. Given the rapid development of computer and internet technology and usage since Doucette & Cole's original chart (1993), the effectiveness of computers as a management tool is likely to have increased.

5. Three key areas

The Department of Conservation has identified three key areas it considers are particularly suited to the application of information-based management approaches. These are:

• Visitor expectations

• Activity and site choices

• On-site behaviour

The following section presents a brief discussion of these areas and some of the issues associated with applying information-based approaches to their management.

5.1 VISITOR EXPECTATIONS

Walmsley & Lewis (1984) found that people draw on information from a variety of sources to compile images of the recreational potential of places and environments. It is often these cognitive images, not objective reality, which then form the basis of recreational behaviours and location choices.

The severity of problems associated with visitor expectations is related to the degree of fit between expectations and actual experiences (Manning 1985). When potential visitors base their expectations as to the nature of an environment or experience on cognitive images rather than objective reality, there is potential for a significant gap to develop between expectation and experience. When expectations are not matched by experiences, visitors may be disappointed. People who are looking forward to 'getting away from it all' in an isolated wilderness area are unlikely to enjoy a trip as fully as they otherwise might if high numbers of other users are encountered in their 'isolated wilderness'.

Consequently, attempts to modify visitor expectations through the provision of accurate information about locations and conditions has the potential to improve the quality of visitor experiences in conservation areas. Accurate information helps visitors choose locations that provide the type of experiences and environments they are seeking, and can also reduce levels of dissatisfaction when potentially undesirable situations or conditions are encountered. People tend to react negatively when they encounter types of use or users they are not expecting. If visitors understand and accept the range of activities and users in given area, the impact of such encounters tends can be reduced (Cole et al. 1987).

Planning for trips to conservation areas can begin weeks or even months before the event. Information received during this planning stage can play an important role in the establishment of visitors' expectations. Consequently, the ability to provide accurate information to visitors when they are still in the planning stages of their trip is desirable. However, the ability to control the type information received by potential visitors is limited. Management messages are

only one of a variety of sources of information that can contribute to visitor expectations.

Information sources can be broadly grouped into the formal and informal (Mathieson & Wall 1982). Informal sources include such things as talking with friends, relatives or other visitors. Informal information is usually unstructured, and the quality and accuracy of this type of information is dependent on the observational skills of the provider and any personal biases they harbour. In contrast, formal information sources are designed to communicate a consistent message about the qualities of a place or environment.

Informal information received from by word of mouth can be a significant factor in the development of visitor expectation. Recipients generally consider this type of information to be up-to-date, personally relevant and mostly believable (DOC; Tourism Resource Consultants (TRC) 1993). However, the ability of conservation managers to influence the nature and content of word of mouth information from these informal sources is limited.

Information from official sources can also be an influential factor in the development of visitor expectations. The ability to influence messages provided through these sources is greater than for informal sources. Attempts can be made to inform visitors about the range of activities accepted in a given area, the number and type of users, and physical conditions.

Both media and personnel-based information tools can be used by managers to influence visitor expectations. Word of mouth from official sources such as DOC staff, tour guides, transport operators and VIN personnel has been identified as an important information source by visitors (TRC 1993). Written information sources such as guidebooks and brochures are also useful. In most instances, using a range of different techniques is likely to be most effective, assuming that the messages presented reinforce rather than contradict each other. The ability of managers to control, co-ordinate and deliver the messages provided by various formal information sources, including word of mouth from staff, is central to their ability to influence visitor expectations. Delivering a consistent message through a variety of mechanisms is perhaps the best way to counter the potential of informal information sources to create inaccurate visitor expectations.

If managers wish to contribute to or modify the cognitive images potential users have of a specific area, they need to utilise tools that deliver messages to audiences outside the area. However, this approach may not be suitable for all situations.

The specific tools selected will depend on the nature of the expectation issue being addressed and the target audience. A key challenge for managers is to present information to potential visitors before they have formed expectations. Information provision also needs to be balanced to allow visitors to retain a sense discovery of discovery during their trip.

5.2   ACTIVITY AND SITE CHOICE

Visitor's location and activity choices can influence both the environmental and social impacts of recreational use of conservation areas. The combined impact of visitor choices produce uneven distributions of use (Lucas 1990). Most people tend to select common access points, tracks and campsites (Lucas 1980, Roggenbuck & Lucas 1987) and therefore some areas tend to be heavily used while others are rarely visited.

As visitor number to any given site increase, the potential for environmental degradation also increases, and the perceived quality of the visitor's experience may decrease as a result of crowding or conflicts between activities. In addition to the amount of use in a given location, problems can also result from the type and timing of use. (Cole et al. 1987). Consequently the ability to influence or alter location and activity choice is an important issue for conservation managers.

The most common management approach to crowding is to redirect some users to areas that are less heavily used. Potential activity conflicts and activity related environmental degradation can be managed by redirecting visitors to areas where their chosen activities will not bother others or damage the environment. Potential visitors can be advised of alternative sites, including those outside conservation areas, and encouraged to use them. Techniques applied may include maps, brochures, answers to inquiries and personal suggestions.

Several recent studies in New Zealand (Cessford 1997, 1998) have found visitors prefer management initiatives to influence visitor choices to be information-based. Approximately 70% of respondents in these studies agreed that provision of information was a desirable management approach. In contrast, more direct options such as introducing booking or permit systems, or increasing charges at peak times were seen as undesirable by 70% of respondents.

Additional analysis of results found that age, nationality and crowding perception all had an influence on visitor attitudes towards management options. For example, New Zealand respondents were more resistant to management intervention in general than overseas visitors. Options that were thought to reduce perceived freedom, or introduce a 'commercial' component into recreation were particularly unpopular with New Zealanders.

In situations where visitors are feeling crowded, New Zealanders become more supportive of management intervention, favouring information-based approaches over other methods. In contrast, overseas visitors appear to consider direct interventions preferable to information-based approaches when managing crowding issues.

These results suggest there is potential to tailor visitor management initiatives to meet the preferences of primary user groups. However, it is important to distinguish between visitor preferences for specific intervention options, and the actual effectiveness of the intervention as a visitor management tool.

Although visitors seem to prefer information-based approaches to visitor management, attempts to use education and information to alter visitor location and activity choices have met with varied success. The results of a number of

these studies provide support for the work of Roggenbuck & Manfredo (1990) outlined in section 2.2 of this document, which identify key variables influencing the effectiveness of indirect visitor management methods.

Krumpe & Brown (1982) found that providing visitors to ranger stations with information about alternative routes led to some 30% of visitors making changes in their planned route. However, most visitors did not contact the managing agency or stop at a visitor centre prior to entering a conservation area.

The problem with delivering information to visitors was highlighted further by Lucas (1981), who found brochures aimed at redistributing visitors in a wilderness area were largely ineffective. In examining the reasons for this it was discovered that fewer than half of the study participants had actually received the brochure. Of those who had received it, over three-quarters obtained it from a trailhead dispersal box. Only 12% had obtained the brochure from a visitor centre or agency office.

Roggenbuck & Berrier (1981) had more success when they tested the effectiveness of informational brochures, and a combination of a brochure and a personal contact in modifying visitor location choices. Both information treatments were found to be effective in modifying visitor location choices, however, results indicated a high variation in response to the combined approach. Some types of groups proved more likely to respond positively to the combined approach. In particular, medium sized groups, those with little previous experience in the area, groups without formal organisation, and those arriving more than 3 hours before nightfall were more likely to accept suggestions to relocate.

The content of messages intended to influence activity and site choices also seems to be an important factor in their effectiveness. Schomaker (1975) distributed information to visitors about the usage levels of various tracks in a wilderness area, with the expectation that users would alter their decisions about which tracks to use, in favour of those with lower usage. However, results showed the intervention had little influence on track selection, and the study's conclusions suggest that providing more detail about alternative track options, rather than just usage levels, may have proved more effective. Subsequent studies (Canon et al. 1979; Krumpe & Brown 1982) supported this conclusion.

The information provided to visitors in the Roggenbuck & Berrier (1981) study, included not only descriptions of, and directions to, a number of alternative locations, but information about the damage caused by concentrated use of an area, and the benefits of dispersal in protecting wilderness resources and maintaining solitude. This supports suggestions that the effectiveness of efforts to alter site and/or activity choices will be enhanced by the provision of explanations as to *why* visitors should consider alternative sites or activities, as well as details about the alternatives.

Lucas (1981) suggests that people need to feel confident about the amount of information they are provided with, and the accuracy of that information if they are to feel secure enough to alter decisions or change familiar behaviours.

The way information is presented has also been shown to contribute to the effectiveness of efforts to influence visitor activity and site choices (Krumpe &

Brown 1982; Roggenbuck & Berrier 1982). The use of a sequential decision making process seems to be common in choosing a recreation site. Krumpe & Brown (1982) found people tend to eliminate potential sites on the basis of specific criteria they consider important, proceeding from the most to the least important variables until a choice is made. Using this model as a basis for the presentation of information intended to redirect visitors to less used areas significantly increase dispersion.

The ability to influence visitor choices is also related to timing. Effectiveness tends to be greater when information is provided to people early in their decision-making processes. Ideally, contact will be made with visitors before they reach their intended destination. Lucas (1981) suggested that a study designed to redistribute visitors from one trailhead to another was unsuccessful because people did not receive information until they had arrived at their selected trailhead, by which time they had a strong commitment to their selection. In contrast, mailing information to previous visitors has proved to be effective in influencing a range of location choices, for subsequent visits by recipients (Lime & Lucas 1977). This does not mean that information provided after visitors arrive in an area cannot be effective in influencing activity and site choices, as a number of studies have demonstrated (Oliver et al. 1985; Roggenbuck & Berrier 1981).

5.3   ON-SITE BEHAVIOUR

Problems associated with recreational use of conservation areas are often the result of visitor behaviours, rather than simply the number of visitors entering an area. Visitors that do not practice low-impact behaviours are responsible for the majority of environmental damage, and can significantly reduce the quality of experience of other users (Lucas 1985).

Managers have suggested that many behavioural problems stem from ignorance rather than malice (Bradly 1979; Hart 1980). Consequently, educating visitors about appropriate behaviours in conservation areas is a common approach to reducing environmental and social problems. Assessments of the effectiveness of interventions aimed at altering behaviours also tend to reflect the belief that behaviour is influenced by a persons knowledge and attitudes.

Following a review of a number of studies of persuasion in conservation settings Manfredo (1992) concluded:

- Persuasive interventions such as interpretative programmes and educational workshops are often effective in increasing knowledge, favourable attitudes and positive behavioural intentions about rules, resource ecology and protection.
- Personal persuasive interventions are often no more effective than some non-personal methods in increasing knowledge and favourable attitudes.
- Findings regarding the relative effectiveness of various non-personal persuasive interventions are mixed, but often brochures, slide programmes and cassette tapes are more effective than signs in improving knowledge, attitudes and behavioural intentions.

- Use of mulitple media to convey the persuasive message is generally more effective than a single media.
- Persuasive messages are generally more effective in improving knowledge, attitudes and behavioural intentions of people with low knowledge and little experience.

Irwin (1985) found that after contact at a trailhead, between 90–100% of visitors agreed they should comply with a range of low-impact behaviours such as packing-out rubbish and burying human waste. Results from a number of other studies show that information provision can not only lead to the acceptance of behavioural principles, but positively influence a range of visitor behaviours (Schwabb 1982; Weiss & Knudson 1980). Oliver et al. (1985) found that the environmental impact of recreational visitors on camping areas can be reduced by providing information about appropriate behaviours.

Lucas (1985) suggests that because visitors tend to be highly educated, information provision is a useful behavioural management tool. In some circumstances simply providing information about appropriate behaviours may be sufficient to meet managerial objectives. However, achieving long-term behavioural change generally requires more than a list of instructions. Lucas suggests that given the educational status of most users, managers should provide detailed explanations about the implications of certain behaviours, and present recommended alternatives, rather than simple lists of do's and don'ts.

The potential of information provision to effectively modify visitor behaviour is likely to be enhanced by matching the type of information provided and method of presentation to the patterns and processes people follow when undergoing a behavioural change.

Research in the area of social marketing indicates that behavioural change tends to occur in stages, over a period of time. Andreasen (1995) has identified the following stages in behavioural change:

- **Pre-contemplation**—people have yet to consider the target behaviour as appropriate for them.
- **Contemplation and preparation**—people think about and evaluate recommended behaviours, decide to act, and try to put in place whatever is needed to carry out the behaviour.
- **Action**—people are doing the behaviour for the first time.
- **Confirmation**—people are committed to the behaviour and have no desire to return to previous behaviours.

Understanding this process can assist in the development of strategies that will lead people through these steps. The goal should be to move the target to the next stage, rather than trying to achieve the desired behaviour in a single step. Key communication goals for managers in order of delivery could include creating awareness, persuading, creating action, and maintaining change (Andreasen 1995).

6. Summary

There is a range of information tools and techniques used by managers to combat problems associated with the recreational use of conservation areas. These can be broadly categorised into media-based and personnel-based approaches. Twentyfive distinct approaches are detailed in section 4 of this report.

Given the complexity of the task of influencing human behaviours and decision-making processes, current understanding of the application and effectiveness of information tools is limited. It is not possible to guarantee that any given management goal will be met through the provision of information to visitors.

In part, this is related to the difficulty of message delivery. People will not always receive information intended for them, or may not receive it in time for it to be a useful management tool. However, even when a message is successfully delivered to a target audience, the receiver may not pay attention to the information, or may choose to disregard it.

Despite these difficulties, available research indicates that information-based approaches to visitor management can make a positive contribution to a range of conservation management goals. The magnitude of this contribution is dependent on a range of variables. Understanding and manipulating these variables in line with management objectives is critical if information is to be a useful visitor management tool. Key variables include such things as visitor characteristics, message content and timing. The extent to which these variables can be controlled and manipulated is considered central to the effectiveness of indirect visitor management techniques.

Although understanding of the best way to achieve specific objectives through the application of information tools is limited, each approach has a number of identifiable strengths and weaknesses, and while none of the information tools and techniques identified in this document are considered highly effective, some options are clearly more useful than others. Table 1 summarises the perceived effectiveness of different approaches.

In general, personnel-based techniques, particularly personnel on-site in conservation areas, are considered more effective than media-based approaches. However, the relative efficiency of personnel-based methods is less clear as they generally require a greater investment of resources than media-based methods.

Given the complexity and problematic nature of indirect visitor management, and the limited research and evaluation available about the effectiveness of different approaches, managers may find it best to consider the range of tools and techniques as providing a portfolio of communication options. In most situations, the application of several different techniques is likely to be most successful.

In selecting and developing information-based management methods, it is necessary to identify targeted management outcomes, key audiences, and how

to best express and deliver messages to these audiences in a way that will both reach them, and influence their activities and behaviours.

The application of specific techniques (individually or in various combinations), can have a range of positive and negative outcomes in terms of management objectives. The potential implications of specific management interventions should be carefully considered before selecting an approach. Detailed assessment and planning of initiatives will enhance positive outcomes. On-going evaluation of the effects and effectiveness of initiatives will allow any unforeseen side effects to be recognised and managed, and contribute to future decisions about which tools and techniques are appropriate in a specific situation.

Information tools and techniques can make a valuable contribution to the management of visitors in conservation areas. There is significant potential for the extent of this contribution to increase over time if relevant authorities are willing to invest in ongoing research and evaluation to improve understanding how to best utilise these tools.

7. Future research needs

Research into information-based approaches to recreational visitor management in the conservation sector is limited. Research that does exists tends to be small-scale, highly specific in relation to the techniques examined and areas focused on, and primarily conducted in the United States. Although much of this research can be considered generally applicable to New Zealand, caution needs to be applied in using it as the sole basis for indirect visitor management initiatives in New Zealand.

There is a range of variables which cannot necessarily be generalised from the United States to New Zealand. These include such things as differences in the nature of the New Zealand conservation estate as compared to United States wilderness areas, types of use, user profiles, management structures and objectives, audience familiarity with and responsiveness to different techniques, and the development and operational costs of different techniques.

The Department of Conservation is currently undertaking a Visitor Information Review, with the intention of developing a national visitor information policy. Ideally, such a policy would be informed by the results of a comprehensive programme of research and evaluation, lead to a consistent, effective and efficient national approach to visitor management, and serve to ensure that this programme is developed and maintained over time. At present such a programme does not appear to be in place.

Co-ordination of visitor management information at a national level would ensure that consistent messages are received by visitors within and between different conservation areas. Without a co-ordinated approach, there is potential for varying, and even contradictory messages to be presented in different locations. A co-ordinated national approach would mean that

management messages are reinforced to visitors over time, regardless of the specific area they are visiting. A uniform approach may also help preserve the credibility of the message source and consequently, enhance its effectiveness.

Key research directions for consideration include:

- A review of key problems associated with recreational visitor management.

- Identification of the user groups most implicated in these problems.

- Identification of current approaches to managing key problems and their suitability for targeting key user groups. Examining the relationship between specific management problems and particular user groups will help define the target audience for any given management messages.

- The applicability of current market segmentation data to information-based visitor management efforts. Are the key variables in the market segmentation model comparable to the key variables relevant in the targeting of information-based management messages?

- Evaluation of awareness of key visitor management messages among visitors and the general population.

- The development of a structured programme of front-end, formative and summative evaluation to guide the development and application of new indirect visitor management initiatives and the modification of existing initiatives. This programme could assess the best way to effectively communicate specific management messages to specific target audiences, and encompass components such as the type of information provided, the style and tone of presentation and the communication medium utilised. Key factors in successful approaches could be isolated and applied.

- Identification of the factors that limit visitor compliance with indirect management messages, and the specific environments and user groups to which these factors are most applicable.

- Researching the ability of specific commercial media to deliver messages to target audiences will improve the efficiency of investment in communication efforts. In the first instance, attempts could be made to source existing audience data from media production companies, advertising agencies and a range of other sources. This information could then be used to guide any subsequent primary research into this area.

- Detailed evaluation of the DOC website, including its structure, content, usage, and potential contribution to specific visitor management objectives.

- A cost/benefit analysis of visitor management methods. This research could assess existing knowledge about the effectiveness of the various visitor management techniques (both direct and indirect), the implications of each approach for wider conservation values, and the resource implications of each approach. The results of such a project could provide an invaluable tool to decision-makers and policy advisers in assessing how to best meet conservation management objectives within available budgets.

- Evaluation of non-Departmental information sources and education programmes to determine the degree to which key messages match those of the Department, and to assess the potential for these alternative information providers to contribute to DOC visitor management objectives.

- Analysis of the potential to improve the contribution of private sector operators (e.g. tour companies, accommodation and equipment suppliers and guides) to Departmental visitor management objectives.

- Identification and testing of other potentially useful theories of persuasion and communication, including those developed for the commercial sector, which could be adapted and applied to visitor management in conservation settings.

8. Conclusions

- Both managers and visitors prefer information-based approaches to visitor management over more direct techniques such as regulation.

- Although information-based approaches are widely utilised, understanding of the most efficient and effective application of these methods is limited.

- A complex range of variables needs to be considered in selecting and developing information-based management tools.

- Of the methods available, personnel-based approaches are generally more effective than media-based approaches.

- Understanding of the relationship between the efficiency and effectiveness of different methods is limited. For example although personnel-based methods are considered relatively effective management tools, they also tend to be more expensive and time consuming than media-based alternatives.

- Combinations of techniques tend to be more effective than individual techniques.

- The tools and techniques selected need to be well-matched to both the targeted management objective/s, the intended audience/s, and the settings in which they are to be applied.

- There is potential to develop a greater understanding of how persuasive communication theory may applied to visitor management.

- Further research could help to ensure that the efficiency, effectiveness and visitor acceptance of such approaches are maximised.

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