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## Management Planning for Conservation

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When confronted with places containing rock imagery, the site manager as conservator usually deals with two questions: First, identification of the natural and cultural processes of preservation and destruction; second, the adoption of acceptable conservation and managerial concepts and procedures to maximize preservation and minimize destruction of those aspects of the site and imagery deemed significant. For the purpose of this chapter, an assessment of the natural and cultural setting of rock imagery constitutes a substantivist approach, whereas the adoption of acceptable conservation concepts and procedures in dealing with these settings is termed a formalist approach. In other words, the conservator as substantivist deals with conservation data, contexts, and interpretation; while the conservator as formalist deals with appropriate conservation logic, concepts, and procedures deemed acceptable by currently successful practitioners in the field of conservation management (Stanley-Price 1994; Sullivan 1993a).

This chapter first considers some general substantivist issues concerning conservation of rock imagery. It then presents currently acceptable formalist concepts and procedures as set out in some recent conservation management plans. In many countries, particularly Australia, management plans are now an essential precursor to the conservation of places with paintings and engravings. The Australians have learned from experience that a sudden boom in visitation to painted and engraved places is often disastrous (Gale and Jacobs 1987). Subsequent success stories from Australia have shown that proactive planning and presentation as spelled out in a management document is a better conservation strategy than constant reaction to crisis situations (Sullivan 1984).

Management plans are designed to meet the need for informed planning, coordination, and intervention to save rock imagery for future generations. The layout and headings of the Management Plans section in this chapter can be used as a template by anyone who wishes to compile a management plan (fig. 3.1).

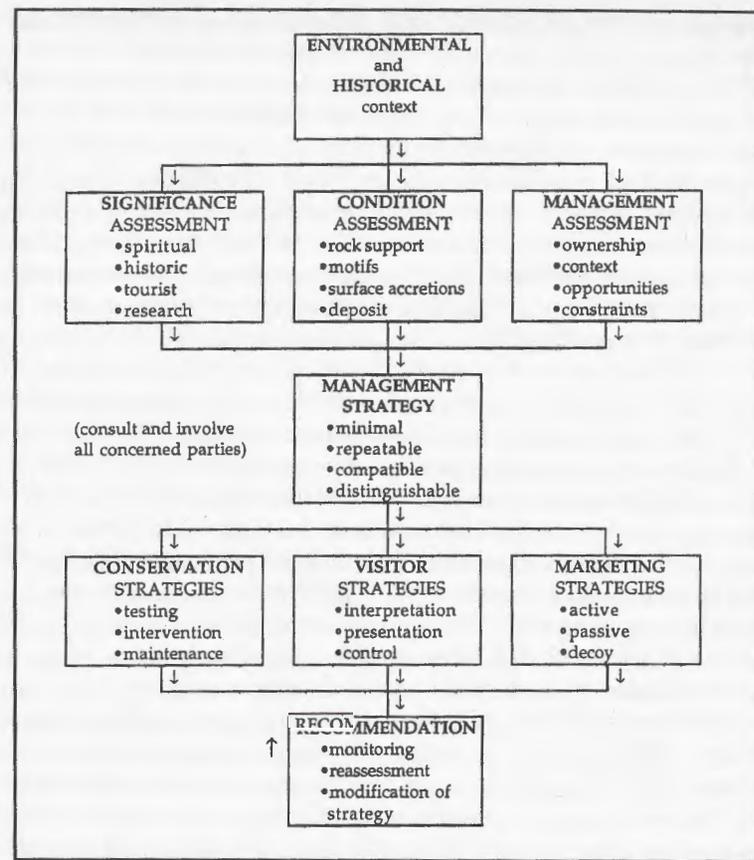


Figure 3.1. Outline of a typical management plan. (Adapted and modified from Stanley-Price 1994; Sullivan 1993b.)

Substantivist issues can be addressed within this formalist framework of conservation management planning. It should be remembered, however, that there is no single right way to manage places with rock imagery, partly because each place is unique, but also because conservation is a relative concept that changes through time. To illustrate this last point, I place conservation and management within a comparative anthropological and historical context.

### CONSERVATION MANAGEMENT IN ANTHROPOLOGICAL AND HISTORICAL PERSPECTIVE

A basic premise of this chapter is substantivist. It maintains that places with rock imagery cannot be properly managed in a vacuum, devoid of notions about theory and practice that define such places in different ways to people with different interests and agendas. The interests and agendas of traditional (or

indigenous) custodians, for example, often differ from those of Western managers, researchers, and casual visitors. Various managers, researchers, and visitors in turn will have different backgrounds and will approach places with rock imagery in divergent ways. Attitudes about places with engraved or painted images are constantly informed, modified, and changed by notions concerning their spiritual power, age, content, meaning, preservation state, surroundings, aesthetic appeal, research potential, and so on. Another premise is that the condition in which many engraved and painted places exist today is primarily the product of human interference instead of deleterious natural agents. Although there are exceptions, many paintings and engravings that lasted several centuries or more have deteriorated very quickly once visited in an uncontrolled fashion by a wider group of tourists and researchers (Bednarik 1989; Pager 1989; Vinnicombe 1976). Accordingly, our concepts concerning places with rock engravings and paintings ultimately determine how we interact with them and how long they will last.

By far the most engraved or painted rocks that attract attention today are the work of gathering and hunting people, and this chapter deals primarily with the imagery carved or painted by these people. Examples from across the world indicate that pre-literate communities, including gatherer hunters (Hedges 1993) and subsistence farmers (Tupara 1995), generally view places with engravings and paintings as imbued with spiritual power, even to those who deny authorship (Loubser and Dowson 1987). Moreover, there is widespread evidence that places with engravings and paintings were, and some still are, managed in one way or another by their traditional custodians (Mowaljarlai et al. 1988). Instead of reflecting a single creative episode, evidence abounds that non-Western custodians did not always preserve rock imagery in the conventional Eurocentric sense of the word, but constantly interacted with and modified existing engraved and painted surfaces by repainting, touching, and scraping (Hughes 1978; Loubser 1995). What we see today at engraved and painted rocks then, are not pristine representations of a single event, but the culmination of various actions considered as appropriate by the indigenous custodians. Furthermore, it is not only the images or places where they occur that are of importance, but the landscape and natural features that surround them (Deacon 1988; Mowaljarlai and Vinnicombe 1995). Traditional management practices often comprise a host of appropriate actions, commonly referred to as ritual observances, in and around places with engravings and paintings. These actions reinforce people's attitudes, and favor unchanging and conservative behavior patterns at such places, at times detrimental to the longevity of the imagery.

What is deemed as appropriate management practice is largely determined by social context during particular historical periods. In Europe, for example, icons in sacred places such as cathedrals were smashed during the religious changes brought about by the Reformation. Cultural heritage conservation as we know it today is a recent idea, and can be traced to the Enlightenment in Europe when a conscious appreciation of Classic Greek and Roman material items and buildings became commonplace (Cleere 1989). This appreciation of antiquities turned into fear at their permanent loss during the unparalleled industrial, commercial, technological, and population growth of the twentieth

century. It is within this expansionist milieu that the concept of non-renewable resources was born and disseminated. An upsurge in international cultural resource management was even adopted, albeit in modified ways, in non-Western countries. This does not mean, however, that non-Western cultures did not have an awareness of their past prior to Western influence. As shown above, non-Western cultures value rock imagery as communicating a sense of place with multiple spiritual meanings, including association with the perceived spirit world. This is in contrast with the most prevailing Western approach, which sees the same rock images as art, with an intrinsic aesthetic presence. In addition to this Western art gallery model, there is a Eurocentric scientific model, which imposes on the rock imagery an analytical rigor of identification, classification, and quantification.

The ongoing utilization of rockshelters by non-Western custodians can be construed as being in conflict with the freeze-frame methodology of most Western researchers and conservators. However, for the purposes of preservation, these differences in approach are not necessarily contradictory. Despite a few exceptional instances, decay of the images and rock substrate is generally not preferred by indigenous custodians. An apparent exception to this notion are certain Maori groups in New Zealand who believe that places imbued with the spirits of the ancestors should be allowed to decay naturally (Sullivan 1993b). But even this example does not imply that these people do not care for their ancestral places. On the contrary, Maoris generally consider unsolicited activities in sacred shelters as damaging to their spiritual integrity (Tupara 1995). Damage is a relative concept determined by the significance values and priorities of the people who interact with places that contain rock imagery. For example, by focusing solely on excavation, many conventional dirt archaeologists have unwittingly caused severe damage to nearby imagery in rockshelters through crowding and creating unprecedented amounts of dust. Today, however, there is generally a shared concern between indigenous custodians, archaeologists, and conservators that rock paintings and engravings should be protected against damaging natural and human agents. Moreover, there is a shared concern for the wider region in which the rock imagery occurs. This landscape conservation approach implies the integration of nature conservation and cultural conservation, and can only be advantageous to both.

Conflicts of interest often arise, however, in implementation of conservation management decisions, particularly in countries where aboriginal people still utilize and even paint rockshelters, such as in some parts of Australia and the United States. Here indigenous views concerning places with rock imagery are frequently trivialized or disregarded as quaint stories by Western observers, unfortunately including professional archaeologists and anthropologists. Often the definition of right treatment is imposed from outside, without due consultation or integration (Fourmile 1995). This particularly applies to highly plural societies, such as South Africa. Here the original San painters and engravers have been exterminated completely, but there is still the need to integrate divergent academic European and spiritual African approaches toward rock imagery places so that their various significance values can be maintained

(Loubser 1995). Even in those countries that have prehistoric rock imagery without any known ethnic connections, such as France, it is vitally important to interpret and represent past contexts of rock imagery to a visiting public (a point to which I will return later in this chapter). Comparative ethnology has demonstrated beyond any doubt that it is not only potentially demeaning to non-Western custodians, but simply wrong, to talk of gatherer and hunter paintings and engravings as art. Similarly, words such as "resource" and "site" should be replaced by the terms "heritage" and "place," respectively (Steinbring 1993). This is not a touchy-feely appeal to political correctness, but a pragmatic first step to successfully communicate with those non-Western custodians who have a spiritual connection to places with rock imagery.

These well-acknowledged problems and tensions are as much a part of wider political power struggles as of ideological differences. With the reversal of the colonial frontier and the ostensible empowerment of indigenous cultures, consultation between outside conservators and local people will become increasingly important. Whereas the conservator rarely has the time, money, or inclination to deal effectively with political issues, even on a local level, thoughtful adaptation to local needs should help resolve management issues. What complicates the consultation process, however, is that indigenous communities are seldom homogenous in political allegiances or ideological opinions (Gartside 1995). The existence of local factions with competing claims to places with rock imagery undoubtedly complicate the consultation process.

Over and above dealing with other cultures, conflicting views and approaches toward rock imagery exist between and within different vocational groups in Western culture. Archaeologists, conservators, farmers, treasure hunters, real estate developers, and tourists all represent multiple interests in places with imagery, sometimes converging, but more often conflicting. Conservators as management planners should take the views of all potentially interested parties into consideration. To accommodate different opinions is at least one reason for adopting flexible management principles. In the current climate of cuts in government spending, it is vital to include the needs of tourists and the public who may ultimately financially support conservation measures.

Now that I have touched on some of the more prevalent substantive issues encountered in the management of rock imagery, I consider the more pertinent formalist concepts deemed acceptable by current conservation managers.

## FORMALIST CONCEPTS IN CONSERVATION AND MANAGEMENT

As indicated above, the basic concepts of management and conservation practice are informed by the socioeconomic climate current at any particular time. Appropriate management practice, as understood by current conservators internationally, is to slow the clock of decay and preserve the integrity of a place for future generations to enjoy, study, and preserve (Stanley-Price 1994). To this end, visitation, research, and conservation should proceed in such a

fashion as to have minimum impact. Conservation should accordingly not be confused with restoration, where existing materials are modified, or new materials added, or both. The aim of conservators is instead to reduce the rate of decay of engraved or painted surfaces and their rock support, to manage and protect the places where these occur, and to educate the public and researchers about their significance and value. Conservation inevitably involves intervention in one way or another, even though conservators constantly attempt to minimize the impact of their actions. Acceptable conservation, in a broad sense then, is to slow rather than accelerate the rate of decay.

With very few exceptions, decay of the rock substrate and associated imagery is seen as destroying the significance values of a place, be it spiritual, archaeological, or aesthetic. Ideally, proper conservation and management actions, which include recording, analysis, treatment, and interpretation, should not impinge on any of these values. In practice it is extremely difficult to retain every single value for posterity; efforts to retain some values usually compromise the integrity of others. For example, removing dust to make paintings more visible to the art historian may destroy micro-organic evidence of potential interest to the analytical chemist. A way out of this dilemma is to establish the significance values through extensive research and consultation and then aim for minimum intervention.

The concept of *minimum intervention* holds that the existing place with rock imagery be altered as little as possible with regard to its significance values. Although absolutely no intervention is the ideal in current conservation practice, the nature and severity of problems at places with rock imagery most frequently make this impossible to achieve. For example, when large numbers of people begin visiting a place, it may become necessary to erect substantial barriers and so run the risk of damaging portions of the archaeological deposit and the rock face. The best that can be done under these circumstances is to cause minimum damage. Barriers should be erected in such a way that later removal will leave minimal scars, or at least so that construction techniques would not hamper any future protective measures. This brings us to the concept of repeatability.

A common thread that runs through all conservation and management work is the concept of *repeatability*. Reversible techniques should be favored over permanent ones. For example, when reattaching a loose slab to the rock face, the materials and techniques should be of such a nature as to permit the future removal of the slab without causing any damage. Unfortunately, absolute reversibility is impossible in practice. It is not possible, for example, to remove all residues of epoxies from the treated edge of the slab when the need arises. Due to the impossibility of absolute reversibility, conservators now more realistically aim at repeatable intervention where, for example, future re-attachment of loose slabs should not be jeopardized by current materials and techniques. For the same reason removable walking surfaces are preferable to more permanent ones. As in the case of minimum and reversible intervention, the main purpose of repeatable techniques is not to render impossible any similar or different treatments in the future.

A third concept to bear in mind when conserving and managing places with rock imagery is *compatibility*. The use of compatible building material at places with rock imagery, for example, implies that inert materials such as wood should be preferred over corrosive materials such as cement. When recording images by photography, water or chalk should not be used for enhancement. Care should be taken to ensure that the combination of introduced and original materials will perform favorably in prevailing environmental and cultural conditions.

The fourth and final concept that applies to acceptable conservation and management is what I call *distinguishability*. It is important to be able to distinguish between what the archaeologist, conservator, and manager has modified from that which existed prior to intervention. For instance, any additional material that was not on the rock before, such as newly added pigment, should contain modern chemical or physical signatures that are not only compatible with the rock, but also distinguishable from the original pigment. Likewise, walkways should be raised wooden platforms rather than stone paving, so that future archaeologists do not confuse the pavements as part of prehistoric surfaces. Alternatively, individual stones in a stone pavement should be marked with dates to avoid possible confusion.

Keeping these four basic principles in mind, the conservator, manager, and archaeologist can feel confident that he or she is on the right track, because the concepts are designed to dissuade planners from any grandiose schemes that may compromise or destroy the various significance values a place with rock imagery may have. I cite more examples of these conservation concepts when discussing the different aspects of management planning, which includes determination of significance values, conservation recording, condition assessment and sampling for physical analyses, hands-on conservation, and interpretation and presentation. To best comply with these four conservation concepts, or ideal prerequisites, it helps to adopt an appropriate conservation procedure before any intervention takes place.

## FORMALIST PROCEDURE OF CONSERVATION INTERVENTION

Once all interested parties have reached consensus that direct intervention is necessary to preserve those values deemed significant, it is advantageous to follow certain steps before implementing these decisions.

The first step is to conduct a baseline recording of the imagery and the condition of the rock, followed by more detailed observation and recording of signs of deterioration, also known as *condition assessment*. Once the most apparent natural and cultural processes of deterioration have been identified through analysis, a review of different intervention options should be made. As indicated above, the most repeatable, compatible, and distinguishable options should help the conservator to make a decision. Testing of preferred options is then undertaken and the results are reviewed. Only once all of these steps have been taken can there be longer-term implementation of appropriate intervention.

No conservation and management decision is final, as the results of intervention should be continually evaluated, monitored and, where necessary, modified.

Methods, techniques, and results of all the steps within the conservation process should be documented. All recordings (drawings or photographs) and written documents should be curated, filed, and stored in a safe place, so that future generations can evaluate the results of current intervention. Cataloging and archival storage for various types of documentation are aspects of conservation and management that have been too frequently overlooked in the past (Flood, Johnson, and Sullivan 1984; Padgett and Barthuli 1995). A well-kept archive of properly labeled historic photographs, which include dates, can be of benefit to conservators who wish to reconstruct the history of alteration and deterioration at places with rock imagery.

## AN OUTLINE FOR MANAGEMENT PLANS

### Reasons for a Management Plan

All management plans start with the rationale for why a particular place or cluster of contiguous places ought to be managed. Conservation and management do not happen automatically; places are either managed in a planned fashion or they will be managed by visitors and researchers often not cognizant of conservation concepts. In many instances, the deterioration of places has a human component, be it the choice of inferior pigment by the original painters or the nature of people's interaction with the paintings through the ages. As mentioned above, many rock paintings and engravings we see today have withstood the ravages of natural deterioration, and often deterioration cannot be ascribed to natural causes alone. Far more ubiquitous, but often less apparent, are the deleterious results of increasing and uncontrolled human presence in the vicinity of places with rock imagery. Increased use of the landscape by developers and farmers, for example, can modify the drainage of an entire area which in turn effects the hydrology of places with rock imagery, frequently to the detriment of prehistoric imagery (Thorn and Dean 1995). Also, the secret use of shelters with rock paintings by people who feel a spiritual attachment to such places, such as revivalist movements among indigenous people or New Age adherents, often goes unnoticed. Management problems vary from one place to the next, and place-specific management recommendations are of the utmost importance. But even place-specific management assessments should be investigated and presented within the context of the wider landscape, both natural and social.

Management plans are convenient places to spell out the most appropriate ways of managerial care and presentation. A systematically compiled conservation plan has many benefits, not the least being that it provides an explicit written document reporting the results of meticulous observation, recording, and consultation. Included in all management plans are assessments of the environment, history, research, natural condition, interest groups, negotiations, administration, management strategies, and interpretations. Based on their

assessments of natural deterioration and visitor pressure, as well as the wishes of the people they consult, conservators use management plans to recommend remedial actions that may reduce deterioration of the rock and images, as well as determine the type of visitation appropriate at a place.

The input and consensus of all interested parties is needed before any conservation recommendation can be implemented with any degree of success. Instead of being a final or legal document, a management plan serves as a written charter that binds all those interested people who helped in the formulation of its recommendations. Being disseminated to relevant government bureaucracies, funding agencies, and private foundations as a printed document, a management plan based on consensual decision-making creates a sense of shared investment, praise, responsibility, and accountability. To my mind this is the main advantage of a written management plan over a less integrated approach. Presented in a systematic fashion, with the main recommendations summarized in bulleted format at the end of the document, the plan may help avoid misunderstanding between different entities normally involved in the management process.

A management plan should be updated every two years in order to review the success of recommended actions and to address possible changes in significance and conservation priorities. Also, the requirements and concerns of newly interested parties need be included in an updated management plan as the incorporation of new interest groups may change the significance values of a place and subsequent recommendations.

Over and above significance values, it is the condition of an engraved or painted place and the surrounding area that determines the choice of conservation and management strategies. Although a consideration of the range of significance values logically precedes a condition assessment, the findings of a condition assessment can overrule that of significance values if, for instance, a loose rock face poses a serious threat to the safety of visitors.

The range of significance values and the condition of the place and the surrounding area must be assessed before making any conservation management recommendations. Although neglected and often deliberately ignored or even scorned, the interpretation and presentation of the rock imagery by trained ethnographers comprise vital components within any management plan. Significance values of places with rock imagery and the surrounding area are made more meaningful when viewed in a regional environmental and cultural setting.

### Natural and Cultural Setting

In the spirit of current heritage management reports written by cultural resource managers, management plans for places with rock imagery are always introduced by referring to the local setting, which includes descriptions of the environment, prehistory, and history. Background descriptions should not be too lengthy and should include only those aspects of geology, climate, soils, vegetation, wildlife, and culture deemed relevant in the formation, alteration, and continued existence of the places with rock imagery. A description of the setting helps readers to better understand the terrain, topography, number and variety of

nearby places with rock imagery, ease of access, regional population densities, and the most appropriate ways to represent a place to visitors.

### Assessment of Significance Values and Implications

An increasing number and variety of people are interested in rock paintings and engravings. Apart from native custodians, anthropologists, archaeologists, and art historians, interest more recently comes from chemists, physicists, geologists, government agents, revivalist groups, and tourists. Typically then, significance values of places with rock imagery include: spiritual (supernatural power of place and appropriate ritualized conduct), domestic and subsistence (housing, stock-keeping, and plant gathering), research (archaeological, physical analyses, and dating), aesthetic (scenic location and visually pleasing imagery), tourist (recreation, curiosity, and business), and educational (interpretation and presentation). These categories frequently overlap, but are retained for the purposes of this chapter. Different stakeholders in places with rock imagery often enter into conflict, not only because they benefit from promoting specific significance values over others, but also because they differ about concepts and procedure. Significance values or any combination of significance values often appear contradictory, and can only be resolved by extensive consultation and consensual decision making.

Significance is not necessarily inherent in places with rock imagery, but is invented by people. Obviously, the natural properties and appearance of a place with rock imagery may help in the formulation of particular concepts and values. Once these values are created and adopted within a particular culture, the appearance and presentation of that place will in turn help reproduce those values. It is also true that modification of the natural properties and appearance of a place, by natural or artificial means, will change its significance value. Moreover, drastic and nonreversible socioeconomic changes may be accompanied by the reinvention of significance values. Whatever the case, places with rock engravings and paintings almost always have a range of significance values, which depend not only on the beliefs, interests, and actions of people, but also on the actual contents and appearance of the area, the rock support, and the images. This two-way relationship between place and people applies to the entire range of significance values a place might represent, including spiritual and scientific.

An example of how modification of the rock and surrounding landscape may affect spiritual and scientific values can be found in the Soutpansberg area of South Africa, where the construction of European houses and fences in the vicinity of boulders with rock paintings is seen by local Venda subsistence agriculturists as "chasing away the ancestor spirits" (Loubser and Dowson 1987). Intermittent removal of lichen from the painted boulder surfaces by the same Venda people in turn destroys the scientific value of these places in the eyes of some scientists, such as lichenologists.

The examples below, drawn primarily from southern Africa, Australia, and North America, illustrate the most commonly encountered significance values and their conservation management implications.

*Spiritual Significance and Implications.* Archaeologists and conservators have only relatively recently begun to realize that what they previously thought of as static prehistoric sites are in many instances localities of ongoing or reinvented cultural practices. Of all cultural practices, spiritual values are the most unchanging and tenacious (Bloch 1974), and it is perhaps not surprising to see them manifested time and again at rockshelters all over the world. Technology, social structure, and economic relations may change virtually overnight, but religious conceptions tend to survive these changes, often in secrecy. Multiple reasons exist for such secret activities. Although there are exceptions, traditional clan, age-group, or gender-based activities often occur in isolation; European settlers and governments who appropriated land from indigenous people tend to limit access to formerly aboriginal places; and revivalist movements who wish to hide their activities from mainstream churches do so under the cover of darkness. The existence of secret religious practices makes them very difficult to study, but suggestive evidence from various rockshelters and statements by informants from around the world indicate that conservation managers need to address this invisible factor in the conservation of places with imagery.

Places with rock imagery have spiritual significance to four broad categories of people: indigenous peoples who are the direct descendants of painters and engravers in a particular area; revivalists who want to reestablish broken links with their former cultures and places of habitation; subsistence agriculturists who supplanted the original gathering and hunting people in a region; and various New Agers who embrace the spiritual and shamanic values of preliterate cultures. These categories frequently overlap, and it is also difficult at times to reconstruct the historical relationships between each category and the places containing rock imagery. I address the conservation and management implications of the activities of each category in turn, beginning with indigenous peoples.

Colonial impact on indigenous societies was of such a magnitude that virtually everywhere in the world there was a break in painting and engraving traditions. A notable exception is the ostensible continuation of painting by some Aboriginal people in the remoter parts of northwestern Australia (Elkin 1930). Here a deeply rooted tradition of repainting exists, and at one rockshelter with Wandjina paintings, up to forty-four layers of pigment have been identified (Clarke 1976). Ethnographic research among Aboriginal communities indicates that overpainting has various functions, the most important being to renew and increase rain, animals, plants, and people (Blundell 1982). This had an economic component as well, since each clan was responsible for the replenishment of their particular animal or plant species. Moreover, the repainting sessions brought together groups of people for cooperative hunting and foraging expeditions.

Inspections of rock paintings elsewhere in the world also show definite signs of overpainting. For example, various relatively tiny paintings of eland by the extinct San of southern Africa show traces of multiple applications of ochre; some of the Giant Mural paintings in Baja California have been partially re-outlined or re-infilled; and a Wuckhumni (Yokuts) informant in California

showed me how they "brighten up" their paintings by re-application of pigment. According to this Wuckhumni spokesperson, a member of each Wuckhumni clan was responsible for the upkeep and repainting of images in their particular rockshelter; according to the same spokesperson, the practice was discontinued about eighty years ago. Among the Modoc and Klamath on the Columbia Plateau, a shaman's "assistant" was said to periodically repaint the shaman's motifs to ensure that they remained fresh (Spier 1930:142-43).

These examples echo evidence from Australia and strongly suggest that the act of painting is as important as the image itself. Repainting in all of these instances is a highly significant and integral part of culture, and it is now generally accepted in conservation circles that indigenous custodians with an uninterrupted tradition of painting and repainting have every right to continue (Ward 1995). Certainly, no reasonable person can assert that the conservation of material culture should take precedence over the continuation of a living culture.

Whereas Aboriginal communities in northern parts of Australia can talk about repainting as a continuation of established practices, the uprooted Aboriginal communities in southeastern Australia see it as a revival of extinct cultural practices. According to workers in the Australian southeast, revivalist Aboriginal groups wish to restore faint "motifs to their condition on the day it was created" (Morris and Hamm 1995:65). Restoration in this sense has strong Eurocentric connotations and could be a reflection of the acculturation of these people. Nevertheless, such cases should be handled with utmost circumspection, and not only because they are so emotionally charged, but also because it may prove beneficial in the long-term. Recognition should be given to the traumatic changes that produced today's southeastern Australian Aboriginal communities and the current aspirations of these communities. Displaced indigenous people are somehow seen by outside observers as not as real and certainly not as admirable as their prehistoric ancestors (Sullivan 1983), and for this reason they have been either completely disregarded or used as token consultants until recently.

Viewed from the standpoint of the archaeologist and conservator, the problem with repainting is that it could destroy other significance values at a place with prehistoric imagery, most importantly the aesthetic appeal and scientific research potential of existing paintings. Places earmarked for repainting should first be recorded and the range of significance values be established. By means of extensive consultation certain alternatives can be proposed or, if the alternatives do not prove viable, compromises can be made. For example, repainting can occur only if the painter uses pigment without an organic binder, so as not to jeopardize any future attempts to date underlying pigment by the radiocarbon method. Moreover, materials used should preferably be compatible with and distinguishable from traditional ones. Generally speaking, my own experience and statements in conservation literature indicate that indigenous people are not necessarily against physical analyses and dating, as long as it does not undermine their own interests or interfere with the spiritual integrity of places (see also Ah Kit 1995).

The spiritual significance of places with rock imagery may outlast the extinction of their creators by many years. Certain rockshelters with San

paintings and rocky hills with San engravings, for example, continued to have spiritual significance to the Bantu-speaking agriculturists who displaced the San in many areas of southern Africa during the nineteenth century. Sotho- and Xhosa-speaking people generally respected their San predecessors as "people of the soil," and although they frequented rockshelters and hilltops formerly occupied by San bands, the agriculturists tended not to interfere with the San paintings or engravings. According to informants' statements, only diviners could chip the paintings to obtain red ochre for powerful medicine; anyone else tampering with the paintings was branded a witch. Even in areas where people could not still remember the San, they continued to show respect to the paintings and engravings (Loubser and Dowson 1987; Ouzman 1995). Many believed, and still believe today, that certain painted shelters are passages to the underworld where their ancestors reside. People approach such places with gifts when asking ancestors for fertility and other favors, such as rain. Gifts are either placed on the deposit in front of the paintings or squashed into cracks or holes in the rock. Avoidance and respect of many San rock paintings probably explain why they have lasted in areas where agriculturists settled in great numbers.

A more recent development is the visitation of special ancestral places in the eastern Free State of South Africa by busloads of black pilgrims working in the major urban centers. Virtually all of these places also contain rock paintings. As part of the ceremonies in the wilderness, pilgrims write their names in charcoal and chalk on the rock surface, sometimes on top of paintings. At a rockshelter in the Caledon River Valley, a pilgrim told me that the names on the rock face signified membership to credit unions and burial societies existing within the pilgrim community. The names written on the rock face thus appear to have an economic role among the pilgrims. Whatever the case, the charcoal and chalk lettering are in this instance relatively easy to remove from the rock surface and paintings with a rolling poultice. Without due consultation such removal is an exercise in futility, since names and dates reappear soon after the unannounced arrival of the next busload of pilgrims. This type of behavior is obviously not an isolated occurrence, as Masao (1996) has reported related activities in the painted shelters of central Tanzania. Extensive research and lengthy consultation with pilgrims visiting painted places for spiritual reasons would be necessary before there can be any formulation of effective management solutions.

To the best of my knowledge the involvement of New Age people at places with prehistoric imagery is also not properly researched. At remote shelters in Baja California, for example, I witnessed bundles of human hair meticulously placed in cracks within boulders and in branches of shrubs. Signs of this type of activity are far more pronounced across the border in the United States, where boar heads, statues, and candles are placed within shelters containing rock paintings (Loendorf 1996). Bearing in mind that visits are primarily during nighttime, their general impact on the shelter walls and imagery is difficult to assess, other than physical damage caused by candle wax and blood stains. Research and consultation are of utmost importance to address the impact of New Age activities.

As mentioned before, the surrounding landscape plays an important role in the spiritual significance of a place. Ethnographic evidence from across the world indicates that indigenous peoples ascribe equal significance to the upkeep of cultural features (paintings and engravings) and natural features (rocks and plants) (Loubser 1995; Mowaljarlai and Vinnicombe 1995). Subsequent subsistence agriculturists, who replaced gathering and hunting peoples in certain parts of the world, also ascribe significance to the area surrounding rock imagery and often do not approve of foreign structures on this landscape. For these and various other reasons to which I shall return, conservators should bear the total landscape in mind when compiling management plans, even in cases where the original painters and engravers are long dead.

*Domestic and Subsistence Significance and Implications.* Gatherers and hunters in many parts of the world also inhabited the shelters they painted. The San of southern Africa, for instance, undoubtedly occupied the rockshelters that bear traces of their paintings. To them, as in the case of most gathering and hunting cultures, the sacred and profane were closely intertwined, if not inseparable (Ingold 1990; Walker 1996). Their ritual activities were accordingly not spatially separate from everyday household activities. Indeed, it is conceivable that painters and engravers inadvertently damaged their own work by conducting everyday activities in the shelters. A case in point is the Sydney Basin in Australia where Hughes (1978) found a direct relationship between the rapid accumulation of weathered sandstone and occupied shelters. Careful examination of the deposit in such shelters and the dust encrustations on the rock surface, for example, may contain clues about past activities associated with the rock imagery. Conservation should accordingly not focus solely on the imagery. Moreover, Eurocentric academic preoccupation with the artificial conservation of places with imagery should not automatically override everyday uses of such places by their indigenous owners without due consultation (Fourmile 1995).

Subsequent occupation of places with rock imagery sometimes leaves valuable evidence about their changing uses. When Sotho agriculturists replaced the San in the interior mountains of southern Africa, for example, they herded cattle and built clay houses in suitable abandoned rockshelters. Whereas the herding of stock damaged or destroyed the paintings on the lower parts of vertical rock faces, the clay walls of their houses built against the rock actually preserved the underlying paintings. It appears that the clay acted as poultices that extracted damaging salts and so protected much of the underlying pigment from salt weathering. This inference needs substantiation by chemical analyses of the relevant surfaces.

The cliff-dwelling tradition in the American Southwest is another example of utilization of painted rockshelters for housing. As in southern Africa, the association of house structures with rock paintings may be fortuitous and no causal link between imagery and structures can be automatically assumed. This does not diminish the potential research and historical significance values of these places. On the contrary, shelters with signs of occupation are at times

associated with important people and events. The imposing U-shaped Liphofung Cavern in Lesotho, for example, has historic significance among the Sotho-speaking people of the region, since their King Moshoeshoe I camped there during two of his important military campaigns in the early nineteenth century. Retaining the integrity of the stone walls in such shelters is important when any conservation management strategy is devised.

Caverns such as Liphofung are still used by local Sotho-speaking people to pen their cattle during the night. Women frequent the same rockshelters to collect edible wild plants growing under the driplines. Driplines in semi-arid regions, such as the Lesotho Highlands, create microenvironments conducive for the growth of relatively dense shrubbery. Such shrubbery is in turn suitable to browsing domesticates, such as goats. Bearing in mind that suitable shelters occur on communal grazing land under the jurisdiction of local headmen, it is inadvisable to conserve them without due consultation. For example, closing such shelters for conservation purposes proved to be disastrous at a painted sandstone shelter known as HaBaroana. Here a wire fence was erected in front of the paintings to control increased tourist visitation in the 1970s (Ambrose 1988). The fence was eventually torn down by local people who used the material for constructing their own cattle byres. Any conservation management decision at places such as Liphofung and HaBaroana should accommodate the everyday subsistence needs and activities of the people and their animals. The training and employment of local guides is one conceivably viable alternative.

Early European farmers who replaced indigenous people in southern Africa (and elsewhere in the world) used rockshelters to herd their stock and sometimes for habitation. With improvement in farming practices, however, rockshelters are less frequently used for keeping stock. Through the years unannounced visitation to painted and engraved places has become a growing concern to farmers. Uncontrolled visitation is accompanied by erosion, damage to property, stock theft, the spread of weeds, and the increased risk of fire. When planning the development of places with rock imagery with increased visitation in mind, the wishes and concerns of private property holders on neighboring land should be taken into consideration.

*Research Significance and Implications.* Since archaeologists have been in the forefront of visiting, researching, and publicizing rock images, they are also most frequently viewed and treated as the *de facto* custodians of these images. Current management and conservation approaches and actions are, perhaps not surprisingly, tailored to prevailing archaeological paradigms and needs. It can be argued, for example, that the current freeze-frame approach to conservation and management is tied to the culture history approach in archaeology where there is concern for the integrity of layers on the rock and associated deposit in adjacent occupational areas. Similarly, concern for the surrounding environment can be linked to the ecological interests expressed by processual archaeologists. More recent developments in cognitive archaeology witnessed an increasing concern with the indigenous cultural setting of rock imagery. Historical archaeology likewise created an awareness of European

utilization of places after their displacement of indigenous communities. Of course, like history and art history, trends in archaeology are ultimately informed by the wider sociopolitical milieu in which they exist.

Ironically, for one reason or another, there is almost always dissonance between theory and practice. For instance, in their fervor to reconstruct culture historical sequences and past environments from excavated evidence, archaeologists frequently disregard the integrity of the rock face and the potential research information it may contain. Alternatively, those archaeologists focusing on recording prehistoric images can be negligent about the deposit; for example, when they erect heavy scaffolding. Moreover, cognitive archaeologists who document the perceptions of indigenous people may somehow forget about them when it comes to presentation of the information or making management decisions.

Archaeologists as the most active researchers of places with prehistoric imagery are at times also responsible for the messy appearance of rockshelters. Excavations of rockshelters not only destroy archaeological deposit, but frequently contribute to inadvertent bumping against rock surfaces with paintings or engravings. Archaeological excavation is anathema to the concept of repeatability, and the least that could be done by archaeologists is to minimize excavations and their impact on the surrounding area. Dust can be reduced, for example, by placing removable protective sheeting on the deposit and by carefully hanging sheets in front of the images. Any stabilization of the soil surface with organic binders, such as polyvinyl acetate, is not advisable since it could contaminate samples for radiocarbon dating. The placement of spoil heaps should also be arranged with care so as to minimize impact on other significance values. All excavation units should be backfilled and marked by diagnostic corner stakes. The use of plastic sheeting to line old excavations is strongly discouraged, as plastic traps moisture, promotes microbial activity, and ultimately breaks down. Instead, the use of appropriate geosynthetics in the reburial of excavated units is strongly recommended. Geosynthetics, comprising nonwoven polypropylene fabrics, are not only relatively inexpensive, easy to install, and durable, but also transmit moisture and air (Agnew and Levin 1996). The reburied deposit is accordingly able to breathe and so maintain a moisture equilibrium.

In terms of available technology, archaeological recording of buried artifacts and features is only possible by means of excavation. Whereas proper recording in "dirt" archaeology can only take place by means of destructive excavation, most rock imagery is apparent on the surface and need not be destroyed during recording (but see Watchman 1992 for evidence of buried pigment). Ideally then, recording of rock images is repeatable. In reality, however, people have unnecessarily destroyed rock engravings and paintings by adopting damaging recording techniques. The most common recording technique of rock imagery today is photography (see Loendorf, ch. 2, this volume). Photography has obvious conservation advantages over other recording techniques, one being that the camera does not touch the rock engravings or paintings during the recording process. Unfortunately, engravings and paintings are sometimes faint and many photographers resort to artificial enhancement, such as wetting paintings and

chalking engravings. These actions not only have deleterious effects on the rock surface and pigment, but may jeopardize attempts to analyze and date possible residues contained by the imagery. Frequently photographed painted panels in the Caledon River Valley of southern Africa and the Pecos River Valley of Texas, for example, show signs of differential weathering as a result of repeated wetting in the recent past. Even the use of chalk to highlight faint engravings jeopardizes future attempts at physical dating and analysis (Francis, Loendorf, and Dorn 1993:716).

Archaeologists are increasingly joined by practicing chemists and physicists in collaborative efforts to analyze, identify, and date rock encrustations and pigment (see Rowe, ch. 7, this volume). Recent research has shown that engraved and painted surfaces often contain multiple layers of intricate stratigraphy (Watchman and Campbell 1996). Various forms of physical analyses, such as X-ray diffraction and infrared spectrometry, can yield valuable information on the inorganic and organic composition of the various layers on or near the rock surface. Identification of the mineralogy and organic content of the various layers has yielded information about techniques and age of manufacture, as well as factors of deterioration. Moreover, microscopic examination has located plant and animal remains in pigment (Watchman and Cole 1993). With the development of accelerator mass spectrometry (AMS), calcium oxalate layers and other organic remains could be directly dated by the radiocarbon method. The age of varnish layers in rock engravings has also been determined by the cation-ratio method (Dorn 1983). However, both AMS and cation-ratio dating are experimental and not without problems; improvements in the techniques will hopefully yield more conclusive results. Since sampling for analyses and dating could potentially destroy large parts of engravings and paintings, it should be minimal and done with the utmost care and planning (see Dorn, ch. 6, this volume). In other words, current attempts in analysis and dating should not jeopardize future work.

From a conservation point of view, minimal sampling for scientific analyses and dating is advisable, and then only if there are specific research or conservation questions that need clarification. In compliance with acceptable conservation procedures, any attempt to take samples for physical analyses and dating should be accompanied by careful recording, planning, documentation, and consultation. Once it has been decided that sampling is warranted, then only very small areas should be sampled and clearly marked on accompanying maps of the particular locality with imagery.

Due to the destructive nature of archaeological and related research, the assessment of academic research value must be given careful consideration. An explicit selection process may help counter mindless data collection. The relative research value of a place can be judged by answering the following questions (Bowdler 1981):

1. Is this knowledge relevant to current research questions?
2. Can rock imagery contribute relevant knowledge unavailable from other sources—oral or documentary?

3. Can a place with rock imagery contribute relevant knowledge unavailable from other places with rock imagery?

Research significance will of course change through time, and this accentuates the need for minimal destruction during research. On the other hand, if a place is targeted for complete destruction by dam or road building, representative samples can be taken and stored for future research. If the necessary financial and logistical support can be marshaled, entire panels can be removed for storage in museums. Any removal should be under the auspices of a highly experienced rock quarry manager or stonemason. Removal is only an emergency measure and is not recommended, because of various ethical, interpretive, and practical problems of having a rock outside its field context (Loubser 1994a).

Despite these reservations about the impact of academic investigations on places with rock imagery, the results of careful and well-formulated research are central to interpretation. Interpretation is in turn crucial to the effective presentation of places with rock imagery to the visiting public.

*Aesthetic Significance and Implications.* An important reason why tourists visit painted and engraved places is that they are nice to look at. This is accentuated by the tendency of visually appealing paintings and engravings to survive in equally spectacular remote areas. The visual and aesthetic appeal of prehistoric imagery and its natural setting make such places a far greater attraction than, for example, the stone flake scatters of prehistoric gathering and hunting camps. Not surprisingly, many researchers have backgrounds in art history, and they approach the paintings from an art historical perspective (Skotnes 1994). Rockshelters and caves with brightly colored paintings in particular have attracted the attention of such scholars. This is perhaps one reason why the colorful rock paintings of the American Southwest have been studied more intensively than the relatively unattractive engravings of the American Southeast, for example. Visual impact was undoubtedly important to the original painters as they spent considerable time, effort, and care to obtain, prepare, and apply the different colored pigments. Placement of the motifs not only underscored their spiritual significance, such as images placed meticulously against natural cracks in the rock support, but also accentuated their visual impact, such as the dramatic positioning of the massive animal and human images against the high walls and ceilings of shelters within the big canyons of the central Baja California peninsula.

Measured in terms of the money spent by visitors traveling to areas with attractive shelters and the frequent publication of rock art books with colorful photographs, the aesthetic significance of prehistoric imagery is currently a central component in justifying and financing conservation efforts. Conserving the aesthetic integrity of rock imagery is accordingly of vital importance in the context of current demands.

Care should be taken, however, not to preserve the aesthetic appearance of a place at the expense of other significance values. In terms of the conservation principles outlined above, particularly the undesirability of restoration, it is not

recommended to highlight faded imagery or to add new images. When removing visually distracting graffiti from the top of paintings, it is standard procedure not to infill the damaged spaces within the original motifs. If badly damaged original motifs are indeed infilled, this should be done by a qualified conservator who would incorporate distinctively modern signatures in the pigment, such as glass microspheres.

It is also not desirable to remove surface accretions simply to render the images more visible or attractive to the viewer. Bonded dust accretions on the rock surface and pigment may contain information about past environmental conditions and cultural practices, and should be left alone if possible. Indeed, samples taken from bonded surface accretions have been submitted for successful residue analyses and dating (see Rowe, ch. 7, this volume).

It is, however, desirable to remove recently introduced dust for aesthetic and preservation reasons. Dust not only obscures underlying paintings, but also damages underlying rock substrate and pigment through abrasive action. Dust can be proved recent in origin by various straightforward techniques, including testing the degree of adherence with a brush and comparing photographs taken over a considerable time period. As in the case of other hands-on conservation work, it is important to involve a trained conservator in the assessment and removal of dust. Analysis of the dust and groundwater for salts by an analytical chemist may also be necessary. Recent dust is mostly stirred up by archaeologists, pot hunters, careless conservators, and increasing numbers of tourists.

*Tourist Significance and Implications.* Visitors from across the world have been interested in the more publicized prehistoric painting traditions, particularly the Franco-Cantabrian cave paintings dating to the Upper Paleolithic (see Clottes, ch. 15, this volume). The famous painted caves of southern France in particular have become an integral part of French cultural heritage and are marketed accordingly. In France a substantial amount of money has been spent to conserve and manage caves, frequently with tourism in mind (Brunet et al. 1995), which has included constructing a partial replica of Lascaux Cave. Money spent by tourists visiting the caves is undoubtedly welcomed, but does not entirely explain the pride that the French have in "their" cave paintings. The national pride expressed by the French is in stark contrast to the general apathy expressed toward equally spectacular paintings of pre-conquest peoples in countries such as the United States and South Africa. Australian agencies only started promoting Aboriginal rock art as part of a broader outback experience in the 1970s (Gale and Jacobs 1987; Walsh 1984). United States government agencies have only just begun to do so.

Systematic surveys of visitor attitudes and behavior at Aboriginal places with rock imagery by various Australian investigators indicate that people visit painted and engraved places as part of a wider wilderness experience (Dragovich 1995; Gale and Jacobs 1987). A similar survey done by Deacon (1993) in the rugged southwestern mountains of South Africa indicated that hardly any people visited the area with the sole purpose of seeing its colorful rock paintings. Together, the Australian and South African surveys indicate that tourists are primarily interested

in the surrounding landscape, instead of the imagery itself. Tourist marketing campaigns emphasize the natural setting of painted and engraved places at the expense of other significance values, and so reinforce the one-sided view of such places as natural instead of cultural. This in turn helps perpetuate widely-held Eurocentric views of indigenous people as nature's children (Blundell 1996). Interestingly, this presentation is in contrast to the presentation of French cave paintings as "our cultural heritage" (Brunet et al. 1995:1).

Although developers of nature areas in various countries outside of Europe have used rock paintings and engravings to attract tourists, they have hardly spent any money on developing such places to cope with increased visitation. It is only once developers realize that nonrenewable rock imagery is literally disappearing in front of their eyes that they start to call for help, often too late. Proactive management plans in close liaison with all stakeholders is vital before opening places with rock imagery for tourist visitation.

If management plans are to be effective, they cannot rely on intuitive assessments of visitor pressure. Systematic and long-term observations of visitor pressure are essential to devise effective management strategies, since the visitor population and the pressure placed on the imagery is far from uniform. Studies in Australia (Gale and Jacobs 1986) and the United States of America (Pilles 1993) have shown that certain sections of the visitor population place the rock imagery at greater risk than others. Gale and Jacobs have shown that children most frequently place at risk the imagery at Uluru in central Australia, while Pilles has identified groups of teenage boys as the main culprits for vandalism at the Red Cliff rock paintings in northern Arizona. These high-risk visitor groups were found to respond well to the introduction of simple and direct signs asking them not to touch the rock imagery.

Since perceptions of the imagery to a large extent guide the behavior of visitors, it is also important to assess and address these perceptions before places are managed with public visitation in mind. Unmanaged places often appear dirty and uncared for, with no signs to identify the images or to inform visitors about the different significance values the place may have. Due to generally bad presentation and lack of interpretation, uninformed visitors can hardly take all the blame for their improper conduct.

In both Australia and South Africa tourists damage painted shelters in similar ways. Most of the damage appears to be inadvertent, such as when large groups of visitors crowd into painted shelters. Crowding in shelters causes people to brush against painted surfaces and kick up fine abrading dust. But researchers have suggested that when people are in smaller groups they may cause even more damage. When visitors are in a small group or by themselves, for example, they are far more likely to touch the painted surfaces or make fires in painted shelters (Gale and Jacobs 1987; Mazel 1982). This is most likely due to the fact that visitors within bigger groups regulate each other constantly (Sullivan 1995). Generally speaking, an increase in uncontrolled visitation increases the chances of vandalism, irrespective of group size or composition.

There are various ways to protect painted and engraved places from an increase in visitor pressure. These include drastic measures such as closing places

with rock imagery to visitors. The caging of caves and shelters is often the only way to stop visitors from entering them (Mark and Newman 1989). Caging usually occurs as a desperate attempt to prevent rapidly increasing numbers of visitors from damaging painted or engraved surfaces. However, in the long run caging is not a preferred management technique. Cages not only impinge on the integrity of painted shelters, but may draw unnecessary attention and challenge passing tourists to break in. Frustrated visitors who are unable to take proper photographs through badly planned grilles often go to great lengths to bend or cut the bars for better viewing. Over and above these problems, the installation of cages damages the associated archaeological deposit and often leaves damaging cement residues and ugly rust stains or holes on the rock face. The use of incompatible materials and nonrepeatable techniques in the construction of barriers requires specialist conservators to remove and rectify (Finn and Hall 1995). If absolutely necessary, cages should be designed not only to physically and aesthetically fit the shape of the particular place with rock imagery, but also to be removed with minimal damage to the rock and associated deposit. Alternative protective measures may also be considered, such as planting shrubs with thorns in front of places with imagery. Revegetation of known access routes and camouflage of actual places with rock imagery are in accordance with accepted conservation principles, as long as deposits or structures are not disturbed. Proper inspection, recording, assessment of the entire area, and consideration of viable alternatives should be conducted prior to closing sites to tourist visitation.

Effective closure of all places with rock imagery to visitors is counter-productive, to say the least. It is far more desirable to manage, conserve, and present select places in their original settings. Indeed, it is not visitation alone that causes damage, but uncontrolled and unmanaged visitation by uninformed tourists. Little Petroglyph Canyon, in the Coso Range, California, is probably the single most heavily-visited rock imagery place in the United States. Yet, even with thousands of visitors per year, it is nearly pristine, largely because visitation is limited to tours preceded by brief educational introductions.

Most damage caused by visitors, then, can probably be attributed to a lack of knowledge about the range of significance values represented by such places and acceptable behavior necessary to retain these values. Accordingly, to modify inappropriate behavior, it is important to present selected sites to visitors with interpretation and education in mind. Australian managers decided to open and manage selected sites for intensive visitation during the late 1970s (Walsh 1984). This not only allowed for the effective concentration of money and effort, but also drew public attention away from the majority of places that should be protected from visitors.

The selection of places for intensive management depends on various criteria. These include history of visitation and accessibility, condition of rock surface and imagery, significance values of imagery, uniqueness, and costs.

Perhaps a good rule of thumb in developing visitation is to work within the existing visitor pattern (Sullivan 1995). Places already known to tourists and the general public are very difficult to close indefinitely, and every effort should

be made to see if such places can be managed and protected with visitation in mind. However, well-known places that are very fragile and damaged, such as Samuel's Cave in Wisconsin, are best closed to any unauthorized visitation (Loubser 1994b). In order to determine which places to open for public visitation, a regional perspective is necessary so that visitors are offered representative examples. Also, decisions should be based on wider plans concerning infrastructure development for tourists and developmental costs.

There are various ways to instruct and control tourists. An ideal way of doing this without impinging on the integrity of places is to train and employ guides on a permanent basis. Great care should be taken to ensure that training is thorough, however, as bad guides are often worse than no guides at all (Gale and Jacobs 1987). It is advisable to train the guides not only about proper conservation conduct and ecological principles, but also about the range of significance values of a place, and their interpretation. Much-needed job opportunities can be created for guides in underdeveloped parts of the world. Unfortunately, the training and employment of guides is costly and therefore not always viable.

Removable structures can be installed in lieu of guides, or to supplement guided tours. High visitor levels inevitably cause damage, such as trampling the underlying deposit, stirring of dust particles, and scratching the rock surfaces. Timber or galvanized steel boardwalks and viewing platforms have been erected to keep visitors away from the rock imagery and fragile archaeological surfaces at various locations in Australia (Brown 1995; Brown, Hughes, and Stanton 1995). Such structures are usually constructed to rest on the deposit and not to touch the rock surface or any other significant features that may occur at a place with rock imagery. In consultation with interested parties, certain natural vegetation and rock features are left intact, and the walkways and platforms are designed around these. In compliance with minimum alteration to places with imagery, no holes are drilled in the rock surface to attach hand rails. Prior to and during the construction of raised walking surfaces, a trained conservator should be present to ensure minimal impact to the place and the surrounding landscape.

The psychological barrier created by a boardwalk between the viewer and the imagery should not only look good but also contain informative material (fig. 3.2). Interpretive information, preferably graphic copies of the images with brief explanatory texts, are normally placed as lecterns on the handrails of boardwalks to enhance understanding of the images and the culture responsible for their creation. To avoid congestion, boardwalks should have no dead-ends, and an exit should be separate from the entrance.

The installation of raised wooden boardwalks at selected places with imagery also involves the upgrading of facilities around those places, such as stabilization of footpaths, and the discouragement of access to neighboring places, including the revegetation of access paths. Although heavily visited places with boardwalks are sometimes viewed as sacrificial in terms of conventional conservation wisdom, such well-built and maintained places seem to have survived increased visitation remarkably intact (Walsh 1984).



Figure 3.2. Example of a boardwalk within a painted rockshelter.

A well-constructed and maintained boardwalk is a physical testimony of managerial investment and care at an intensively-visited place. Even places not frequently visited by tourists, including those rendered ostensibly invisible to outside visitors by conservation managers, should have some physical sign of managerial concern and presence. Isolated places that are not actively managed for visitors often look uncared for, and are usually littered with branches and other debris. If a nature walker accidentally finds such a place, it may help to have it in a fairly tidy condition and with a low-cost stand to help create the impression of importance. The installation of a sturdy stand supporting a container with a visitor register at remote places is an effective managerial tool in this regard. Visitor registers have several managerial functions, the most obvious one being to provide people with a place to write down their names and comments. Properly designed, a visitor register can include interpretive copies of the rock imagery and brief explanatory texts. By prompting visitors to record any praise or complaints, they may reduce the incidence of graffiti and vandalism while simultaneously providing information about visitor needs and attitudes (Dragovich 1995; Sullivan 1984).

The recreational opportunities of areas in which rock imagery occurs usually include more popular activities such as hiking, rock climbing, and bird watching. The history of tourism at a place should help formulate management options. Visitation to most remote places is of the soft variety; relatively small groups of people come with friends or families. Such visitors are usually self-inspired and willing to take some strain in experiencing and photographing what they deem to be of interest. Unlike "hard" tourism, the soft variety is not geared toward comfort, aggressive marketing or an elaborate infrastructure. At such places, every effort should be made to retain the integrity of the place and to educate the visitor about the various attractions and how to conserve them. Once the limits of acceptable change to the area have been established, it will become possible to estimate person-impact hours. Regular monitoring of the area may be necessary to establish or adjust the limits of acceptable change.

Hard tourism is experienced at the more frequently visited shelters in Australia and the famous caves of France. The deposit in some of the French caves has been totally destroyed, so that they have no archaeological research significance left, apart from the rock imagery. Given this situation, the development of an elaborate infrastructure is justified. In the Sarre Grotto, for example, a computer-controlled sound and light system both guides the visitor and provides commentary (Achiary et al. 1995). Landscaping in the environs of the cave adds to its impact and appeal.

Money generated by tourists who are willing to pay to visit places with rock imagery can go a long way to finance preservation. Dramatically presented places, such as the Sarre Grotto, both entertain and inform. Education of tourists begins even before they leave their houses, and popularization of rock imagery in the media, particularly the internet, television, and colorful publications, helps to sensitize people about the more popular rock imagery.

Even remote places in their natural setting can inform visitors by means of nicely-designed graphical representations and texts presented on a lectern or in a visitor book. Contrary to popular belief, places with rock imagery are not self-explanatory; information based on careful anthropological and physical research should be used to educate visitors about the range of significance values and conservation concerns. Apart from the fact that many images are not immediately apparent to the untrained eye, few people are aware of their spiritual significance, for example. The goal of interpretation should be to surprise visitors with new information and so positively change their attitudes and behavior.

Interpretation is inevitable and should be guided by the results of thorough research, both scientific and humanistic. The effective presentation of interpretation is central to the preservation of rock imagery and ought to be considered as the most important aspect in any management planning. Tourists leaving a place without having been confronted with explicit interpretation will be none the wiser. Indeed, the perpetuation of uninformed interpretation can be bad for conservation. Those people who are convinced that rock images are maps to buried treasures, for example, will inevitably indulge in destructive activities, often to the direct detriment of the imagery (Henson 1996). Moreover, many uninformed park managers assume that prehistoric imagery is a non-version

of graffiti, and are accordingly reluctant to spend any money on the upkeep and presentation of places with prehistoric rock images. One-sided interpretations in general can be damaging to the imagery, since by overemphasizing one significance value, others may be destroyed in the process. For instance, overzealous attempts to enhance the aesthetic impact of a place by cleaning crusts from painted surfaces may impede physical analyses and longevity. On the other hand, any runaway obsession to sample and date the imagery can severely compromise the aesthetic value and condition of a place. Balanced interpretation, presented to the public in the form of signs and pamphlets, is accordingly vital for the preservation of places with rock paintings or engravings.

It certainly helps not to swamp rock imagery places with interpretive signs and visitor centers. Managers should be cognizant of the fact that most tourists visit places with rock imagery only as part of a wider interest in the landscape. It is accordingly helpful to introduce interpretation by playing up to the preconceived notions and preferences of visitors. Cleverly designed interpretations introduce the visitor gradually from what is commonly known to the more esoteric, and often unexpected, knowledge gained from meticulous research.

## CONDITION ASSESSMENT, INTERVENTION, GRAFFITI REMOVAL, AND MAINTENANCE

Many rock surfaces with paintings or engravings may be older and in a better condition than commonly assumed. Dating of natural crusts on painted surfaces in Australia indicate that such crusts can be unexpectedly old, and analyses of those crusts indicate that dust, salts, and silica can add to the surface rather than subtract from it (Watchman 1992). It is accordingly wrong to assume that weathering processes that formed rockshelters in the first place will necessarily destroy them. Weathering is not always constant or unidirectional. For example, cavernous weathering in rockshelters appears differential and dynamic; in some areas it may be active, while in others it may have halted or even reversed.

Appearances can be deceptive, and a misplaced reliance on a cursory assessment of the condition of rock imagery is no exception to this rule. Extensive and careful observation and analysis may indeed yield unexpected results, such as that flaked rock surfaces are actually more stable than smooth ones within the same rockshelter. This is so because ostensibly loose flakes and flake scars may actually have been restabilized by silica, while an apparently stable smooth rock face could have a potentially dangerous crack immediately behind it. This example, albeit based on a combination of personal observations in separate rockshelters in Baja and Utah, accentuates the need for a close and thorough examination and analysis of the rock substrate, pigment, engravings, and surface encrustations by a trained conservator. Deterioration is not readily discernible to the eye and can only be measured over a prolonged period with the aid of chemical and physical tests (Thorn and Dean 1996). Among the less visible factors that could lead to major losses of rock imagery are salts and moisture distribution, and the hygroscopic response of pigments and minerals.

Instead of relying on well-publicized diagnoses and treatments elsewhere, diagnoses and treatments must be location specific (Silver 1989). Specific assessments are necessary for a variety of reasons. For example, the mineral composition of rock and pigment not only varies from one rockshelter to the next, but also from one location to the next within a single rockshelter. Besides the requirement for localized assessment, an understanding of material science is required to better understand the processes of preservation and deterioration. Although it is commonly known that salts and water pose a threat to the stability of a rock surface, in some instances certain minerals and water can actually help preserve the surface of a rock. For this reason alone it is advisable to avoid hands-on removal or addition of material. Bad intervention is often worse than no intervention at all. For instance, the installation of artificial drip-lines without proper assessment and understanding of the materials and processes affecting the rock surface can actually accelerate weathering instead of slowing it down (Thorn and Dean 1996). Moreover, since the use of ethyl methacrylate to reattach flakes and ethyl silicate to consolidate loose grains are still experimental, these should be done only as a last resort by a trained specialist conservator of rock imagery.

Hands-on conservation intervention is done best when it conforms to the following step-like procedure: consultation with all interested parties, recording, assessment, review of alternative treatment options, testing of preferred options, and actual intervention. This type of intervention is possible under ideal conditions, but in the real world intervention is usually done in a hurry in reaction to semi-emergency situations. Nevertheless, the key is to always keep in mind minimum intervention, repeatability, and distinguishability when interfering with the rock face. Also, proper recordation and documentation are crucial in any hands-on exercise.

Recording is not an end in itself as its aim is always problem driven and task specific. It is inevitably selective and the level of effort is ultimately dependent on available finances and the selection of relevant variables. Accordingly, recording with condition assessment in mind is different from recording with interpretation as an end product. Whereas the rock images are always the points of reference, and therefore always need recording, condition recording emphasizes cracks, joints, flakes, mineral accretions, biological activity, and so on. Condition observations are usually recorded on transparent overlays covering color photographs of the relevant areas. Annotated symbols indicate the type and distribution of natural and cultural features on the rock face, as well as points that need sampling for analysis, identification, and possible treatment. Recording sheets for each image provide space for descriptive text and sketch drawings. The rock face usually comprises a complicated layering of natural and cultural strata, the physical and chemical properties of each layer affecting the condition of underlying and overlying layers. To better record and understand the deterioration of rock and pigment, the compilation of a Harris diagram may help the conservator at locations with complicated stratigraphy (Loubser 1996; Keyser, ch. 4, this volume).

But perhaps even more than natural deterioration, vandalism is the most visually detracting form of damage at places with rock imagery. Graffiti, prehistoric or recent, is a particular expression of vandalism. Bearing in mind that most graffiti impinges on the integrity of rock imagery and promotes further graffiti, its removal is justified. This does not imply that all graffiti should be removed, however. Careful investigation, including liaison with colleagues and members of the local community, should precede any graffiti removal. Graffiti may be prehistoric and could contain potentially useful information about sorcery, to mention but one example (Grove 1981). More recent graffiti, or the place where it occurs, may have historical, spiritual, or sentimental value to the local community, and in these instances it is better left alone.

Graffiti in southern Africa and parts of the United States is often the result of gang disputes over territory. Removal in such instances tends to be futile as it treats symptoms instead of causes. One experimental effort to help stop graffiti in this regard was launched in South Africa, where gang members were closely supervised in the removal of their own graffiti (Janette Deacon, personal communication).

Once it has been decided to remove graffiti, removal should proceed with the utmost caution. It is a well-known fact that overzealous and indiscriminate removal can leave ugly scars, or even destroy original pigmented and engraved surfaces. Tested removal techniques are preferable to experimental ones and it is important that professional conservators be hired to remove graffiti. Time permitting, trained conservators will normally precede their removal with tests on the whole range of graffiti present on the rock face. Such tests are usually not done on top of the rock imagery, and it is only once their results are known on related surfaces that they can be attempted on imagery.

Although not necessarily trained in the detailed techniques of graffiti removal or reintegration, the manager should know certain fundamental conservation principles guiding the removal of graffiti. First, graffiti removal or reintegration is a cosmetic exercise aimed to reduce the visual impact of graffiti, as it is virtually impossible, and may be inadvisable, to remove every single trace of graffiti. Second, removal tests are best done in strict order, starting with the simplest and safest techniques and progressing to more complicated and risky ones. For this reason, dry techniques of removal should always have priority over the use of solvents. Soft utensils are obviously better than harder ones. When using solvents, non-toxic ones are preferable. Third, reintegration of scratched graffiti into the rock surface is a final option if no other technique of removal works. Reintegration is best done by disguising scars with water soluble acrylic paint. But since even acrylic paint may be negatively affected by variations in temperature and humidity, it may be a good idea not to reintegrate every single bit of graffiti.

When confronted with graffiti, the manager will do well by keeping the following points in mind:

- remove applied graffiti in a timely fashion as it tends to bond with the rock substrate

- consult all known documents and people so that graffiti deemed significant can be left alone
- hire trained conservators to remove graffiti
- record graffiti and motifs prior to removal
- document removal techniques and places of removal
- avoid over-cleaning
- it may not be necessary to remove every single bit of graffiti
- do not disturb graffiti on top of rock imagery
- regularly monitor places that have been "cleaned"

Regular inspection is part of any sound conservation management practice. Regular monitoring does not necessarily imply intervention, but rather assessing signs of deterioration and the need for various degrees of intervention. *Maintenance* implies minimal intervention and cleaning of places with rock paintings or engravings, which includes brushing away loose dust and removal of trash and dead plant or animal remains. *Preservation* implies hands-on treatment in addition to regular maintenance, such as diverting water by means of artificial barriers. *Restoration* is an intervention step beyond preservation, and involves actions such as removal of graffiti and lichen. *Reconstruction* is the most severe form of intervention, and involves the repainting or regrooving of imagery. In terms of what constitutes acceptable conservation practice, reconstruction is only acceptable under exceptional circumstances. Any intervention must be accompanied by close consultation between all interested parties.

## ASSESSMENT OF THE CONSERVATION MANAGEMENT CONTEXT

In conjunction with the assessment of the various significance values and the condition assessment, an assessment of the administrative context of any specific place(s) with rock imagery is necessary before drafting a management proposal. The management assessment implies the determination of opportunities and constraints that may influence how a place can be managed for the purposes of conservation. A checklist for establishing management context might include the following (Nicholas Stanley-Price, personal communication):

- Who has legal responsibility for the place?
- What financial resources are available for the conservation and maintenance of the place?
- Can the manager of the place make decisions about what happens on location or are these made at another level?
- What are the local or regional land-use pressures?
- What are the present and projected visitor patterns?
- What needs or interests does the community have regarding the place?

As a rule, places are best managed when they are the responsibility of custodians who inherited their position, be it indigenous spiritual custodians or private capitalist farmers. Depending on the conservation knowledge and concern of such custodians, effective control over access from outside appears as an important factor in preserving the painted or engraved rock surfaces. Impoverished communities in the underdeveloped parts of the world lack the political, financial, and administrative capacity to deal effectively with uncontrolled visitation, unfortunately. In underdeveloped situations innovative strategies should be based on a substantial, albeit slow, process of involvement, negotiations, and empowerment.

Since management and conservation are long-term concerns, it is imperative that financial support be ongoing in nature. The adoption of internationally accepted charters on conservation, such as the Australian "Burra" version of the ICOMOS (International Council on Monuments and Sites) Charter for the Conservation of Cultural Places (ICOMOS 1988), is one way of publicizing and gaining financial incentives and support for local conservation and management measures, including tax breaks and education funding. Care should be taken, however, not to usurp local rights by unilateral claims about national or world heritage significance.

## MANAGEMENT POLICY AND RECOMMENDED MANAGEMENT STRATEGIES

The main purpose for managing a place can be determined with a greater degree of authority and confidence if it is based on good background information concerning significance, condition, and management contexts. The presence or absence of particular significance values, together with the good or bad condition of a place and the management opportunities and threats, all help with the determination of the management purpose. The purpose for managing a place defines the management policy, which in turn helps define recommended management strategies. Management strategies typically include recommendations about conservation, presentation, maintenance, visitor levels, and marketing. No conservation management policy or strategy is final, however, since it is always dependent on changing significance values which the places with rock imagery may experience.

Conservation planning is highly variable, most often because it does not take place under ideal situations from a conservator's point of view. Successful conservation plans are accordingly those that are realistically suited to the cultural and economic condition of the surrounding society. This also implies that all key players must be involved in the design of a management policy and associated strategies. Last, but not least, it is of vital importance that conservation planning and practice be realistic in terms of cost, technical feasibility, and the ongoing management structure and funding.

The main contention of this chapter is that the secret of rock image conservation lies in the proper management, education, and involvement of

people, rather than in the constant hands-on repair of damage caused by people. Put another way, prevention by means of low-key informative presentation is more desirable than high-profile intervention preservation. Only time and critical analysis will tell if this is indeed a democratic and workable model for conserving places with rock imagery.

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