

Management of Rock Art Heritage: through Preventive Conservation

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One of the greatest challenges for heritage management professionals is to develop strategies that find a balance between polar opposites. In the case of rock art management, we should try to retain the significance of sites by protecting the original fabric on the one hand, while promoting controlled public access, on the other. The primary problem for understanding the content of rock art in India is the absence of any standardized and detail documentation of the rock art and accounts on the site proper.

The paper throws light on the management aspects of rock art in India and deals extensively on its negative impact on the site too, this also suggest some remedies for it. Further, an appeal for both public awareness and scholarly encouragement for the progress of rock art study is made. Paper will cover and focus on the issues such as Preventive Conservation steps, Management and awareness among government departments, public; Management through education among people, children beginning from schooling, Management through Digital Technology for the safe guard of rock art sites and the documentation for further study; Tourism development programme, Rock art protection through mandatory Legislations and Executive Measures etc.

The result of present study has elevated the Indian rock art on the national or even international level and I am sure that now the rock art management from far off regions or nations may now turn to think about the importance of rock art heritage and will come together for the preservation and management of the sites. Although so far, it was more or less in a state of oblivion and regretfully suffered negligence or isolation in such studies in India.

Hence, these measures may be prove useful for all kind of rock art centers on theoretical as well as practical and may underline the basic framework for rock art management for the future generation of the world.

Introduction

According to Indian Archaeological Policy- 1915, A Resolution issued by the Governor General in Council on 22 October, 1915 at Calcutta:

“The functions of the Archaeological Department are, in the main, two – conservation and investigation. In the view of the Government both these functions have an equal claim to its patronage, and it will be seen from that follows that in recent years increasing attention has been paid to exploration and research of every kind. But for the present, owing to its persistent neglect in years gone by, conservation is, and for long remain, the paramount duty of the department. In the discharge of this duty the first essential is to take stock of the existing materials and to decide which of them are worthy of preservation”. And as mentioned in *National Conservation Policy For Ancient Monuments, Archaeological Sites and Remains Protected by Archaeological Survey of India (NCP – AMASR)* Article 3.02 Conservation of Monuments (Value based Approach):

“Preservation should be the major objective in the case of monuments with high archaeological value, such as, archaeological sites or remains of a monument or portions of monuments with decorative features, including applied ornamentation, such as wall paintings, inscriptions and calligraphy, sculptures, etc.

As text highlighted a wall painting which is not only for mural art, this is also for cave art. The rock art are considered as one of the fine arts practiced by early man to decorate the cave shelters. According to *Vishnudharmottara Purana (III Khanda)*, the practice of painting is the chief of all arts in this world. Perhaps, prehistoric people produced it for ceremonial and other purposes which we may never fully understand and appreciate.

Problems with rock art sites in India

India is one of the six major regions of rock art in the world. This is the biggest Centre of rock art in Asia. There are more than 2000 sites spread over the entire subcontinent from the Himalayas in the north to the Nilgiris in the south and from the Chota Nagpur in the east to the Aravali in the west. The main concentration of the rock art sites found in the Vindhya, the oldest mountain located like a girdle in the centre of the country. Both the forms of art are found in the country. The Vindhyan sandstone belt is the home of the

pictographs whereas the granite outcrops in peninsular south are dotted with the sites of the petroglyphs. India is perhaps the earliest country to discover true specimens of prehistoric art and also to realize its Stone Age antiquity as back as 1867.

During the last four decades nearly two third of the total sites were brought to light, on the other considerable damage has been done to rock art at prominent centers. Following are the factors which can be held responsible for the present deplorable state of preservation of rock art and mismanagement of the sites.

NATURAL PROBLEM	EXFOLIATION OF ROCK (CRACKS, FRACTURES, FISSURES)	FLOW OF WATER /RAIN EFFECTS	DEPOSITION OF SALT,CLAY, MINERAL COMPONENTS	DAMAGED BY INSECT	VEGETATION AL GROWTH	MICRO
						MACRO
						MEGA
NATURAL PROBLEMS BY HUMAN INTERVENTIONS	DAMEAGED BY ANIMAL	DOMESTICATED				
		WILD				
PROBLEMS DEVELOPED BY THE HUMAN ACTIVITIES	RESEARCHER THEMSELVES	INTENTIONALLY	DEFORESTATION			
			EXTRACTION OF NATURAL THINGS			
		NATURAL HUMAN	RELIGIOUS ASPECTS			

		BEHAVIOUR	VISITOR FLOW FOR PICNIC AND ANIMAL MOVERS
			DEVELOPE D/MINING/B LASTING/H UMAN SETTELEME NT

Threats

The preservation of this art is very necessary owing to the rapid rate of destruction caused by an unaware society. Since our beginnings, humans everywhere on earth have painted and engraved images on natural and artificial rock faces. Often sublimely beautiful, sometimes mysterious and inscrutable, these works of art, spanning the time period from our origins tens of thousands of years ago to the present, provide a global archive of the human impulse to express and communicate beliefs and ideas.

Now the more serious than the investigations of the rock shelters is the Preservation, Conservation and Management. Now time is gone for just discovery and documentation of the rock art site, this is time to think about its preservation and then interpretation. Out of numerous notable specimens of rock art available in India, only few have been brought under Central Governments protection like Panchmadhi caves, rock shelters at Hosangabad in Madhya Pradesh, painted shelters in undivided district of Mirzapur in Uttar Pradesh, and latest addition being the famous rock art at Bhimbetaka near Bhopal. At Bhimbetka, some good preservation work has been undertaken by the Archaeological Survey of India during last 10 years, nothing has been done in respect of other rock art sites. Some chemical work had been done at Hosangabad and Panchamadhi (Joshi, 2000-2001:119-123). In Mirzapur some sites had been protect but rest are ignored, whereas in Bihar, Laddakh, North East India, Gujarat etc are totally

ignored, neither Central Government nor State Government took interest to protect these earliest evidence of our ancestors (Tiwary, 2010:38-44).

There are multiple problems in conservation of rock art sites because of the diversities of medium, climatic condition and the human created vandalisms (Pandey, 1984: 215-216). The principal problems of conservation is faced in regard to a painted rock shelter, especially in sandstone zones, on account of the presence of cracks (Figure. 1), fractures, fissures and exfoliation, growth of vegetation (Figure. 2) and percolation of water inside creating moist conditions thus damaging the paintings (Figure. 3). The process of natural weathering of the rock art inherent weakness of the fabric also serve as decaying agents for the painted surfaces.

In practice, the two reasons cannot be always separated effectively: a factor of natural deterioration may be indirectly attributable to human modification of the environment. Sometimes the connection may be very obscure, if indeed it can be determined. For instance, ecological imbalances (Figure. 4) introduced by humans are frequently responsible for new conservation threats. Experience shows that it is judicious to first look for a humanly introduced cause in most instance of rock art deterioration. Deterioration to rock art shelters and structures is mainly caused such as natural weathering due to water, wind, direct sunlight (Figure. 5), insect (Figure. 6), vegetation growth and animals.

Location of rock art sites

Most of the rock art sites in central India are situated in the hills covered with thick vegetation which is practically impenetrable during rainy season and hardly accessible during the rest of the months of the year. The sites are in most cases far from beaten tracks of communication. The deciduous forests with heavy undergrowth are fraught with the dangers of wild animals and insects. The areas are not safe from the attacks of dacoits. Nearly 10 million tribal population lives in this part of the country. Although most of the tribal people are not hostile yet they dislike the entry of any outsider in their territories. Unlike the limestone caverns of Europe where the entry of each and every visitor can be checked on a single source the rock shelters in India are found scattered sometimes for several kilometers in the forest. The boundaries of such sites cannot be even fenced.

Lack of coordination among different departments

Different departments of the central and state government work mostly in a single area with different views and interests. The forest departments under whom all the forested land and rock art sites come have little cooperation with the ASI, the body responsible for the management and protection of the past monuments. The grass root workers of the forest departments move in the forest in the particular area. They encounter with new rock art sites without any knowledge of archaeological importance. They could have helped in the exploration of new rock art sites had they been taught about the primary lessons of the rock art. They can also be helpful in preservation of these sites. Similarly, tribal welfare department can do the work in same field with the joint cooperation of Archaeological Survey of India and State Department of Archaeology. Similarly, the public works department sometimes, uses granite boulders and sandstone rocks as a raw material when it needs to construct a colony or a new road in the nearby areas without least consideration of their archaeological importance. Many painted rock shelters in the vicinity of Bhopal city were found blasted by using the dynamite.

Religious aspect

In India, the spiritual aspirants and hermits have always been in search of caves for meditation. The tradition of cave dwelling by the god seekers may be traced back to the vedic period. Thus most of the caves at beautiful and solitary places which were suitable for accommodation have been occupied intermittently by hermits (Figure. 7). On special days and occasions people from nearby villages and towns assemble at such places. Fairs and festivals are arranged and worships are performed in the caves. Naturally the caretakers of the cave adorn the places by white washing and painting the walls and ceilings of the cave. Holy words from the scriptures are written at prominent places. The cave walls soon get blackened because of the blowing carbon from the burning earthen lamps and perfumed sticks. The eternal dhunis or huge hearths of hermits also contribute their mite. Thus many good caves some containing prehistoric paintings can be seen totally damaged by the innocent hermits.

Amateur workers

For the study of rock paintings one requires as artist's hand and a scientist's mind. Most of the workers who wish to document and study the rock art in India, lack the first

quality. Petroglyphs already much faded and mutilated due to weathering are found in many superimposed layers. It is not always possible to record them photographically. Even then most of the workers document them with the help of the photographic documents. Paintings of the old phases being low under a white sinter layer, are better when they are moistened with water. Very few people know that water treatment is most harmful to rock paintings. They became more invisible when water is applied on them. It is said to record that many beautiful compositions at prominent sites have been obliterated due to the water treatment.

Preventive Conservation and Management Steps

Rock art conservation needs to establish its own methodologies and procedures. Meanwhile researches should be carried out in the country to compare the similarity between the problem of rock art deterioration in such diverse regions, of the several climate zones of the Australia, Americas, Sahara, Eastern and Southern Africa (Tyagi, 1996: 105-118), Indian subcontinent and if problems are of similar nature, their knowledge can be applied in the first instance as first-hand measures.

Management inside the Rock Art sites

However, In the case of ancient rock art conservation, we try to retain the significance of sites by protecting the original fabric on the one hand, while promoting controlled public access, on the other. The primary problem for understanding the content of rock art in India as well as in world is the absence of any standardized and detail documentation (Figure. 8) of the rock-art and accounts on the site proper. There are many methods and application related to true scientific approach (Figure. 9-10-11-12) the rock art site can be protect with the problems. Such as periodic checks should be made so that the water dose not collect on the roof of the shelter and cave where it is slowly directed towards the art work through porous rock and through cracks and fissures on the roof.

Physically Handling

Under the supervision of qualified conservationists and chemists, the cracks and fissures in the shelter from within and has to be filled the top and side of the cavern to be

watertight. Done by using suitable material like coloured cement or lime, depending on the nature of the stone surface, mixed with powdered parent rock or proper type of sand and desirable chemicals wherever necessary. Water should be directed off the roof by removing soil and by allowing the water to runoff, by opening drainage lines to the side of the shelters. To divert the flow of rain water (Figure. 13) from entering inside, suitable channels or slopes may be provided on the sides of a shelter. Further, to prevent the overhanging rock projections from falling, strong masonry support even using RCC (Figure. 14) could be provided by giving it a naturalistic rock form by matching with the feature of the shelters and the environment. But it must contain a date on its less conspicuous part indicating that it is an artificial support. And also those rock blocks which are prone to fall should be glued to the wall by filling organic high molecular material (Figure. 15) (S.P.Singh pers. discus.). Large pins of stainless steel can be used in the gaps between blocks, with wooden and later plastic spacing blocks (Batarda: 111-120).

Rock bolting can be done through Titanium Rod (Figure. 16) for better strengthening of the rock mass. The modern artificial dripline is usually of a silicon sealing compound which is applied with a pressure gun. And that should be digitally documented as in the process of weathering (Barnett, 2005:25–29). The silicon must have good bonding ability, but remain removable without damage to the rock; it must have a high thermal stability and resistance to moisture and ultra-violet radiation, and should be of an unobtrusive colour. Rock surface needs to be cleaned of organic deposits before the silicon is applied. Guttering can also be used to reduce excessive capillary action of water (Bednarik, 2007:95). To control the anti-termite treatment is to be launched taking care that this treatment also does not damage the paintings nearby. Monitoring periodically for re-inspection is recommended preferably at the end of every succeeding wet season.

Removing Vegetation and Biological Growths

There is considerable debate about removing vegetation and other types of biological growth from rock art sites. Undesirable vegetation should be periodically removed from within and top of cavern (Prasad, 2001:13). Professional conservators should address problems with lichens, algae and moss (Figure. 3) because a portion of the growth may

actually penetrate the rock matrix and scraping only removes a part of the plant. The rock surface may be weakened by the lichen and erode rapidly after it is removed. A conservator will be able to determine if removal is necessary. Non-professionals should never attempt to remove lichens or moss. Removal or pruning of vegetation (Figure. 17) in contact with rock art is usually advisable because the action of wind may cause scraping against the rock surface (Wijesuriya, 2010:233 – 248). A conservator should address all but the most minor removal of vegetation.

Management and Awareness

Planning, programming, budgeting is a continuing process that must be reviewed and updated at regular intervals. In this process we should keep in mind the Landscape of the site, which means “features of land areas as seen in broad view” it also means “lay out or enhanced (area of land) with natural feature’ so in this condition one has to be clear during site visit and declaration of the site that landscape of the site cannot be left and the whole area should be acquire and conserve as it is (Gutbrod, 2008:37–70).

One of the first steps we should take that the entire area enclosed by barbed-wire fencing (Figure. 18) with access providing through a turnstile gate. Also be taken steps for planting trees (Figure. 19) within the fenced area and can draw up a scheme for tunneling of the surrounding area so that the problem of abrasion by stone particles is checked and contained.

A general cultural notice board (Figure. 20) containing basic information in English and regional script about the site was also should be placed near the entrance of the rock art site (Pande, 1999:53-60). However, it should be match with the environment. A wooden platform (Figure. 12) should be made to prevent the cultural derbies underneath the surface of the rock art sites.

Approach to the Site Arrangements for Visiting

For the management point of view whole site should not be opened for the visitors in one time, here we should make some provision for those area of the rock art site only open for same period not for every area and for every time (S. B. Ota pers. discus.). As we declare a one site as a world heritage and Indian heritage sites, in this way we should maintain the ecological balance of the area, and then try to protect and preserve it. If the

site is open at all times, there should be adequate signposting; if the site is kept locked, there should be clear arrangements for the collection and return of a key; if it is open only by appointment, there should be a specialist guide or a specially trained local guide who has had clear instructions on what to do and say.

Trail Entrances

A well maintained, clearly marked trail is important for preserving the natural environment and establishing a managed presence along routes (Figure. 10) leading to rock art sites. It is always a good idea to include a visitor register at the trail head. Registers give a little formality to the entrance and are a visual focal point to mark the beginning of a trail. Visitor registers are useful to enforcement officers and can also include visitor feedback information.

Movement at and around the site

There should be an adequate and well-maintained road, preferably paved to limit dust, with off-road parking; the parking should not encroach on the site: vehicles should not park closer than about 100 m from the edge of the site; the parking area should be marked by a barrier between it and the start of the path. We should try to provide approach to the main group of rock shelters. These approach paths were to be unobtrusive and not more than a meter and a half in width with a row of stones on either side of the path. It has to be ensured that the path was periodically cleared of growth of vegetation and the stones (Figure. 10) on either side were duly given coat of lime wash from time to time.

Public Amenities

There should be a litter bin at the parking lot and it should be emptied regularly; consider the need for toilets and the supply of refreshments and other facilities such as a shop, public telephone, rest room, etc., depending on the number of visitors expected; consider the need to establish an interpretive centre separate from the site, where people can see displays and where you may be able to store material, provide accommodation, etc.

Community involvement

The state and the archaeological researchers took it upon themselves to manage what they perceived as an abandoned historical legacy and saw no need to consult the local communities (Figure 21) regarding its significance and management (Taruvunga, 2003: 3-10). The lack of community involvement impacts negatively on legislation. The assumption we are making is that if the legislation had the support of local communities, then we would not have so much vandalism of rock art elsewhere. People would feel ownership of the sites.

Rock Art Documentation

No rock art site will last forever or remain always in a state of exceptional preservation. It is important to create a lasting archival record of all known rock art sites. Even sites that have been properly documented require periodic monitoring and updating of records (Loendorf, 1988). If several sites are in need of documentation, it may be advisable to concentrate on sites that are most affected by depreciative visitor behavior or other sources of natural degradation. Detailed documentation (Figure 8) is required before conservation measures can be implemented to provide a basis for before-and-after comparisons and so that conservators can locate the rock art that needs to be repaired. Documentation methods should be as non-destructive as possible and produce an absolute minimum of disturbance to any given site.

Management through Digital Technology

Computer technique provides a number of tools like AutoCAD (fig,8), Digital Cameras (Figure 22), and CD-Rom, which create image enhancements with Auto CAD, a computer aided drafting, programming through one can create maps and plot archaeological feature on a maps (Donna, 1995:35-38). Above all techniques can be useful for rock art study, research to access and massage information. However since one purpose of rock art recording is to preserve a record of its existence before it is destroyed by human, animal or natural force, caution should be used when considering how best to preserve that record for future use.

Further from conservation and for maintenance point of view there should be involve excavation of selected rock art sites, others like Palaeo-climatic study of the

sediments of that area where rock art sites are located, micro erosion study (Jeyaraj, 2004:91-100), application OSL-TL, AMS, ^{14}C and other dating methods to know the whole area as well as ancestor behaviour with the climate study. On the research front micro-documentations of rock art is a must and scientific investigation be done for understanding of the plan and strategy of the execution of motifs and artistic creations by their authors in time and space on the site and in the entire region.

Visitor Management Programme and conservation plan

Public interest in rock art tourism has risen over the past three decades in tandem with the worldwide increase in cultural tourism that is estimated at more than 240 million international travelers a year. In the Bhopal between 1996 and 2003, for example, there was a 10% increase in the number of adult tourists visiting historical and cultural sites. Although the product and its management operate in parallel, there is little real evidence of true partnerships between them. This divide is apparent in rock art tourism as well. It has meant that mainly heritage managers and impact assessors have addressed issues of theory, conservation methods, ethics and ownership in rock art tourism development, while those developing rock art tourism products have focused on co modification, pricing, promotion and other income-generating factors. This should come as no surprise. Rock art tourism, as with any other cultural activity, is influenced by a wide range of interests and agendas ranging from political ideology to bureaucratic pragmatism and has not been high on the list of either academic or business priorities. There are nevertheless opportunities for this situation to change if rock art researchers, managers and tourism operators work together more efficiently (Janette, 2006:379-399).

General concepts of visitor management and site protection may be adapted from many sources and combined to form a plan for managing a particular site. The single most important guiding principal in managing rock art sites is to become proactive instead of reactive to anticipated threats. Rock art sites of the any country receive a significant number of visitors must be managed for the type visitation they receive and the type of damage that results (Godwin, 1992), if our goal is to preserve the irreplaceable cultural resources found at the sites.

Management programs are mandatory whenever visitors know the locations of rock art sites or if sites can easily be found. At Petit Jean State Park, America the most

effective method for managing most sites is not to reveal their locations to the public. This may seem odd to some cultural resources managers but it has become standard practice in many parks, especially where large numbers of rock art sites are at risk.

Management through Education and Etiquette Suggestions among People

For the awareness point of view this topic should be add in the school course from the primary level with picture, and small detail of the rock painting (Odak, 1991:3-7). More and more Rock art sites should be declare protected by either A.S.I. or State Government after implementing strong rules. In neighbour area of rock art or in its vicinity, no factories should be allowed to build up, especially those discharging harmful gases and wastewater, in order to stop the source of pollution and keep the environment clean.

There should be etiquette suggestions (Figure 23) at the site that can be included on interpretive panels or in brochures that can be made available to visitors. Interpretive Panels Interpretive panels serve several functions. They can provide visitors with an overall impression of the significance and heritage of a site and introduce the concept of protecting cultural resources. They can also remind visitors that many Indians identify rock art sites as sacred places. These messages need to convey the idea that the site is a special part of the heritage of all humanity.

For the awareness, we should develop general educational programme, in which programmes like debate, school children (Figure 24) competition- debate on cultural heritage, competition on painting (Figure 25) can be held, and try to teach them the importance about our cultural heritage not only for the school children but school teachers as well as college students and professors. This goal may be achieved by organising exhibitions, lectures with colour slides, video films and group discussion with the public. (D. Dayalan pers. discus.) Use of audio-visual aids, which include leaflets, placed at the sites or at the nearby visitor's centers, can provide information and enhance protection. More informative signs, especially those interpreting imagery paintings are appreciate by visitors.

For the education about the rock art studies in India, following are some suggestion for the introduction of rock art as a teaching discipline (Mathpal 1993):

- 1) Rock art should be introduced from the primary and secondary level for the boys of 6-16 years, it could be included in the social sciences where the stone age cultures are described.
- 2) At matriculation and post graduation levels, rock art can be taught with history and art. There are several branches of art (geometric, decorative, or design and natural study).
- 3) At graduation and post-graduation levels, there is an ample scope for rock art. There are full fledged departments and curriculum of drawing and painting in degree colleges and universities. In practical papers, rock art may be made compulsory. Again, there is a subject ancient Indian History, Art and Archaeology in which special focus may be put on rock art.
- 4) For research, rock art may be prescribed as an important topic.
- 5) Degrees can be imparted in rock art through the arts and Crafts college. In the first year of the 5 year degree course in fine art, rock art can be taught with traditional arts.
- 6) The education departments of the central and state governments may be approached inclusion of rock art in education system.

Signage with Guidelines for Visitors

We can aware the visitors through signages and can develop awareness among them. The signage will be helpful not only to aware the visitors but to control them ethically. Follow the rules of the site landowner or public land manager where they are more restrictive than above. If some of the above seem overly restrictive due to site location, rock type, salvage status or other factors remember the essence of etiquette and ethics is to behave better than strictly necessary. Use binoculars to study, and telephoto lens or freehand sketches to record panels and panel details. Study the panel as an integral part of the site. Be constantly aware of the effects of your actions and others at rock art sites. Make your behavior a model. Speak out when needed to prevent damage to rock art.

Take time to appreciate the intricacy and detail of each rock art panel itself rather than trying to see the maximum number of panels. Do not interpret the panel, just sit

quietly and watch. Give the rocks time to speak to you. The signages should be follows like warning signs informing (Figure 23) visitors of penalties for vandalism should be located at or near the parking area. Posting these signs at rock art sites may offer an irresistible challenge to some people and lead to more damage than would otherwise occur. Marking sites with signs that proclaim: *"This site is being monitored"* can go a long way toward protecting a site and reminding people that monitoring is taking place. Signs posted at parking areas should not only mention warnings and penalties but should incorporate site visiting etiquette and brief descriptions of the significance of nearby sites. Some of the citations like *"Be our eyes and ears. If you observe behavior that may damage the rock art, please report it to the nearest employee immediately"*. (Be sure to include a phone number or other contact information). *Stay on the trail and avoid kicking excessive dust into the air. Dust will damage the rock art and make it harder for everyone to see. This does attach on the Surface and forms a cement layer over the paintings. Always stay plus minus 2 meters away from the rock face and never touch. Your hands although dry do contain salts and acids. This could attract itself to the paintings. There might be artifacts lying up close to the face. Limit the amount of movement within the shelter. You are just a visitor to a past; these Shelters are very important part of our history. Do take photographs or make sketches of these earliest artistic works. Do show the pictures to all of your friends and family. Do look up information about rock art on the internet and in books. There are plenty of pictures and information to almost all country's rock art. Do have a good time, be safe and act responsibly. Enjoy the outdoors and remember, it is about appreciating and preserving rock art, not about indulging ourselves.*

The social factors that have to be managed - usually by site managers - when offering rock art sites to tourists include: Rights and participation of descendant communities who maintain traditions that inspired the art; Interpretation of the meanings and motivations that inspired the artists, Provision of information about the rock art, Public expectations and attitudes towards rock art, Impact of visitors and facilities on the ambience of the site, Training of guards, guides and custodians, Rights of property owners, Rights of researchers, Management policies and legislation.

Economic factors that are managed - mainly by tourism entrepreneurs and business managers - to ensure the sustainability of rock art tourism includes: Location of the site

in relation to roads and sendees, Type of ownership of the site and tourism facility, Nature and level of income generated by tourism, Tourism marketing strategy, Co modification of rock art products, Extent to which local people lose or derive income from rock art tourism.

Signage: How to Minimize the Problem Regarding Rock Art?

- 1) As above mentioned, there are so many problems exist in management of rock art sites, but we can minimize the problems with some of the work like minimize the number of vehicles going to the site. Stay on existing roads.
- 2) Do not "pioneer" vehicle trails or parking areas.
- 3) Do not permit camp or build fires within one-quarter mile of rock art. With the signages of do not disturb lithics, firepits, vegetation, or micro-biotic soil crusts rock arrangements or other artifacts and site features.
- 4) Do not make 'rubblings'. Most people don't know how to do rubbings properly and then don't know what to do with them later. Besides, the art could easily be damaged.
- 5) Don't climb above the shelter and cave. You may dislodge loose stone that will fall and damage them and may be you too.
- 6) Fires are not allowed at this site. Report any fire or charcoal to the staff or nearest office so that we may clean it up.
- 7) Do not throw stones, dirt or other debris that may damage the rock art and disturb archeological deposits.
- 8) Never ever throw any liquid substance onto the paintings to bring them out for the photography.
- 9) You will help to destroy the painting in no time what so ever.
- 10) Never remove anything from the shelter. Any object within the shelter could be vital information on as to who occupied the shelter, could give age, and other information on the shelter. If you pick something up off of the ground - take a

good look at it, check it out. Let the others in your group check it out too, and then put it back where you found it.

- 11) Don't drive right up to a rock art site. Walk the last half or quarter mile. It is good exercise; you might see some wildlife or other interesting stuff along the way, hold your kids hand and do some bonding.
- 12) Never carry glassware with you and whatever you carry in, carry out. And if you want to really help, carry out some trash that someone not as considerate as you left behind.
- 13) Do not climb or disturb rocks in chimneys, slots, or gaps in the rock cliffs at rock art sites.
- 14) Do not attempt to remove graffiti, chalking, lichen, or bird droppings from rock art.
- 15) Do not apply any substance including liquid, powder, plastic, cloth, paper, or even strong floodlight, to or over rock art.
- 16) Do not allow pets, children or careless associates to behave improperly around rock art.

Management and Awareness among Government Departments and Public

In recent years, under the banner of the Southern African Rock Art Project (SARAP), the GCI has organized workshops focused on management, conservation, interpretation, and tour guiding of rock art sites. These have been held at the World Heritage Sites of Mapungubwe and the Cederberg in South Africa. The GCI recently began a partnership with the Institute for Professional Practice in Heritage and the Arts (IPPHA) at the Australian National University, to provide a workshop on the conservation and management of rock art as part of SARAP. Australia and the India face many of the same issues in the preservation of rock art. Both have a rich heritage of rock art sites and indigenous communities closely associated with them, and both suffer from lack of public awareness of the significance of these sites. We should also get together for such workshop.

Different management approaches for heritage sites, often values - based, have been developed in the Australia, Canada, New Zealand, United Kingdom, and United States of America, although these are increasingly being tested and implemented in other parts of the world in a wide variety of contexts. In many countries, the tradition has often been what we will call a conventional approach, in which decision - making follows a top - down model, with decisions depending on more or less centralized government bodies. This model offered overall protection for the sites, including legal and administrative frameworks for their conservation, which are extremely important; however, this system was also sometimes found to be limited, as it tended to consider the significance of places only from the point of view of “experts”. Management of cultural heritage essentially is the use of methods and tools developed for the protection, conservation, use, and enhancement of sites. These include strategic planning, both for day to day activities and for medium and longer term initiatives within a specific site or group of sites. Management and planning should aim at managing change, rather than trying to freeze a site in a given moment. The main idea is therefore to find the most appropriate solutions for the well being of a site and its users, taking into consideration its broader context, and keeping in mind its sustainability.

The first step is the proper identification and safeguarding the rock art heritage located in the little known areas and to record their names on a map with others. For future referencing, it is essential to compile a detailed and **illustrated inventory of rock art** in accordance with the location and state of the preservation of the sites in a state or region. Such a work should include all the known sites and particulars of their art and archaeological contents. Drawings of the paintings should be prepared.

Bodies like the Archaeological Survey of India and Anthropological Survey of India, Government of India, should serve as the nodal agencies in such a project. Universities and State Department of Archaeology, Rock Art Society of India, Indira Gandhi National Center for Arts and other qualified Institutions could also be assigned a specific area comprising rock art sites to collect and documents in installments. The work can also be undertaken as a project under the University Grand Commission, National Cultural Fund or the Indian Council for Historical Research If possible, UNESCO could also be approached for the purpose.

Role of Private Companies in the Preservation of Rock Art

Private companies have also played a meaningful role in the efforts to manage rock art in South Africa by removing rock art where it was necessary. An example of assistance provided by a private company was the installation and costs of an artificial drip-line of stainless steel in the roof of the Beersheba Shelter in East Griqualand. Companies like Mondi Forests, Anglo-American, AngloGold, De Beers and others have funded or still continue to fund the Rock Art Research Institute (RARI) at the University of the Witwatersrand and other rock art related projects. In KwaZulu-Natal, Lotto approved funding in 2003 for the Rock Art Research And Recording Unit (RARARU) and the Rock Art Mapping Project. Similarly we can promote our rock art sites with the help of our companies.

Like the management of any business organization, the successful management of rock art tourism is dependent on the different individuals and communities involved in the enterprise agreeing on the broad values and on the conservation principles that need to be met.

- 1) Facilitate and encourage the tourism industry to promote and manage rock art tourism in ways that respect and enhance the heritage and living cultures of descendant communities;
- 2) Facilitate and encourage a dialogue between conservation interests and the tourism industry about the importance and fragile nature of rock art, associated artifacts and oral histories including the need to achieve a sustainable future for them.
- 3) Trained managers to monitor and measure change at rock art sites open to the public and report on the results.
- 4) Proper security for the visitors should manage with the wild insect and animals and also from the ducat.

Rock Art Protection through Mandatory Legislations and Executive Measures

It was a general trend to exclude indigenous people in rock art management. This was manifested in the legislation of many countries around the world, which had an interest

in managing this fragile, irreplaceable heritage. This one sided approach to rock art management did not achieve the desired result of proactively managing rock art, and protecting it against defacement. The early forms of cultural legislation in Australia and other countries were intended to protect ‘cultural relics’. This legislation was criticised on the grounds that, by implication, the indigenous people were denied their rights to their cultural heritage, as the value of such sites was conceived of in national and historical terms, without acknowledging contemporary Aboriginal interest. The original constitution of Australia did not give any right to the Commonwealth government to make special laws for people of Aboriginal race. Under Section 51 (xxvi), the Commonwealth had powers to make laws with respect “the people of any race, other than the Aboriginal race in any State, for whom it is deemed necessary to make special laws”. The amendment was made in 1967 when the words “other than the Aboriginal race in any State” were removed, allowing the Commonwealth government to take responsibility for Aboriginal matters, especially in heritage matters.

This change of thinking in Australia and indeed other countries in the 1970s and 1980s, led to a move towards more participatory approaches in the management of cultural resources. Cultural legislation acknowledging the spiritual significance of rock art sites to the Aboriginals, the American Indians, etc. was declared. Australian examples are provided by legislation from South Australian (Aboriginal Heritage Act no. 12 of 1988), Western Australia (Aboriginal Heritage Act, 1972) and Northern Territory Governments and Commonwealth’s Aboriginal and Torres Strait Islander Heritage Protection Act, 1984. Legislation motivated by a more participatory approach has enhanced the community involvement of different indigenous groups in the management of their cultural resources. Such legislation meant that indigenous people had a legal standing when they felt that their views were not properly addressed.

In India there are already legislations for the protection of cultural heritage sites but they need some change or modifications and implements strictly. Having identified the environmental factors that need to be understood before a rock art site is opened for tourism, managers need to assess the social consequences of public or private ownership and cultural property rights. The ICOMOS Cultural Tourism Charter (ICOMOS, 2002) recognises this in the following principles:

- 1) Since domestic and international tourism is among the foremost vehicles for cultural exchange, conservation should provide responsible and well-managed opportunities for members of the host community and visitors to experience and understand that community's heritage and culture at first hand.
- 2) The relationship between heritage places and tourism is dynamic and may involve conflicting values. It should be managed in a sustainable way for present and future generations.
- 3) Conservation and tourism planning for heritage places should ensure that the visitor experience would be worthwhile, satisfying, educational and enjoyable.
- 4) Host communities and indigenous peoples should be involved in planning for conservation and tourism.

For the protection and development of the world rock art a committee has been developed, which is known as a Rock Art Committee (RAC) the aim of the Rock Art Committee is to promote international co-operation and to provide advice to ICOMOS and to UNESCO organs on their activities in the field of rock art. CAR initiates and co-ordinates worldwide actions in favour of the knowledge, the protection and rehabilitation of humankind's rock art heritage, through the following activities and interventions aimed at raising the awareness of States to this heritage:

- 1) By promoting international co-operation in this field,
- 2) By establishing links between researchers and specialists,
- 3) By providing advice to international organisations,
- 4) By promoting and producing publications,
- 5) By creating a world inventory of rock art,
- 6) By developing traditional methods and modern digital techniques for documentation and preservation of rock art, including those, which are inexpensive, non-tactile and non-intrusive, as well as protective devices.

CAR has developed a draft *Charter for Rock Art* in view of its ratification as an ICOMOS doctrinal text. Furthermore, in co-operation with ICOMOS International and

the UNESCO World Heritage Centre, the Committee is developing a series of Regional Thematic Studies and Pre-Nomination Guidelines as new tools to ensure a better representation of rock art sites on the Word Heritage List in future.

Some other projects and action like Rock Care - Tanum Laboratory of Cultural Heritage. This is reflected in the Air Pollution Project of the National Heritage Board that was carried out between 1988 to 1996. The results from the analyses of the effects of environmental pollution that were undertaken, indicated that almost 75% of the rock art sites were suffering from negative effects. The project, Rock Care - Tanum Laboratory of Cultural Heritage, indicates the focus of the work that aims at the following objectives:

- 1) To arrange seminars and meetings so that the Rock Care project can use the help of a network of international expertise.
- 2) To develop new methods for the presentation of rock arts and to improve access to the sites.
- 3) To produce further methods for protection against environmental destruction and deterioration.
- 4) To develop new methods for documentation and to make an effort for comparable results between different countries.

To prevent those negative impacts, the CAR and the president of ICOMOS Sweden initiated a public debate in the newspapers, on radio and television. Public opinion in favour of stopping the motorway is increasing. The Swedish National Heritage Board has produced a video "*The Rock Carvings of Tanum - World Heritage at Risk*" presenting this priceless cultural heritage. The ICOMOS International Scientific Committee on Rock Art - CAR recognizes these problems and the urgent need for counteractions. Several immediate measures are planned to enhance co-operation, the spread of expertise and the development of long-term strategies. A first step is to produce a global report on the state of rock art based on reports and interventions by the active members: *Entering 2000 - the State of Rock Art*. The report has been presented at the Annual Valcamonica Symposium. The committee has started work to set up a web page connected with the ICOMOS server and open to the public in order to inform about its activities and to

encourage co-operation among members. Further, it has initiated the development of a charter for rock art research and management including ethical rules. Another important issue to deal with is the management of sites open to the public. Due to a lack of accurate documentation and adequate information for visitors, opening up site for visitors might turn out to be a counterproductive step. An example is the habit of infilling engravings with red paint to make them more visible to visitors, a frequent use in Scandinavia. If done with inadequate skill, this method can "deform" the engraved images and therefore also degrade the visitor experience. Further, it can destroy substrates on the rock surface that are possible to date. Thus, competent specialists should apply the method only with the uttermost caution.

The Committee considers it most important not to deliberately invite visitors to sites that have not been secured in terms of their documentation and preservation. It is recommended that the basic procedure always be the following:

- 1) Survey of area and documentation of panels using appropriate techniques and methods.
- 2) Inventory and mapping of damage and signs of erosion, exfoliation and cracks etc.
- 3) Application of adequate conservation methods. (If the site is in great need of such treatment, it should not be opened to the public)
- 4) Construction of wooden walkways, signposts and production of interpretation maps, folders etc. (Walkways and signposts should be constructed in harmony with the requirements of the site, in order not to disturb the landscape and the visitor experience. If the site belongs to a certain group of people like the indigenous population, it is a fundamental prerequisite that they are invited and consulted at every step of this process).
- 5) Opening of the site or panel to the public (This measure should always be preceded by a close analysis of the "carrying capacity" of the site that should never be exceeded.)

An alternative to opening a site to the public is to leave the actual site or panel in its natural setting undisturbed by visitors and instead present it to the public in the form of copies made by casts, as is the case of Mont Bego in France. (Gutiérrez, 1996: 209 – 225) However, since taking casts implies the use of certain chemical substances that might prove to be harmful to the bedrock, a safer method might be to use enhanced photographs or similar images. In order to eliminate the negative elements of casts, it is advisable to use other non-tactile/physical methods for copying, such as a laser-scanner. Such an application based on the use of an easily movable, high-speed laser-scanner for field documentation is being developed in the Rock Care Project of the Swedish National Heritage Board.

The use of protective coverings based on geo-textile materials is another important and less expensive method that has been developed in the EU Interring project "Rock Carvings in the Borderlands", a joint Swedish-Norwegian project. The coverings can be easily applied and removed when necessary. Their main use is to reduce the oscillation of temperature, and especially their passage through zero degrees. This will minimise the length of time below freezing and prevent exfoliation and other sorts of deterioration. This will considerably prolong the life of some of the panels. Full-scale testing has been taking place in Sweden for a couple of years, and this year an evaluation of the results will be made.

Problems of rock art conservation are connected with all kind of archaeological sites. These sites can be said to be easier to protect because of their global status, regardless of the threats discussed above. The situation for the many more common sites and areas is often more troublesome. In some countries, there is a whole suite of problems connected with the conservation and management of rock art. These include a series of factors ranging from negative effects of infrastructure development to a lack of legislation and financial resources. The Centre for the Conservation of Historic-Cultural Heritage in Irkutsk (Siberia) should be mentioned for Russia as the organisation, which commenced a rock art conservation project along with their area of responsibility for extensive recording, and an inventory of rock art sites. This started in 1987 at rock art sites of the Upper Lena River and in 1992 it commenced for the Lake Baikal area. Experts in rock art, conservation, biology, and geology work together in the Rock Care

team. A management strategy was developed based on international experience in the field of rock art conservation.

The situation in India can be summarized as follows which I have personally felt while my exploration in Kaimur range of Bihar, the following problems in the rock art management:

- A lack of legislation and activity of heritage protection organizations,
- The need for introduction of the internationally approved standards and expertise,
- An increase of public awareness: popularization of rock art as an integral part of cultural heritage,
- Development of ethics and strategies in rock art protection,
- Needs to joint work with Archaeologist, Anthropologist, Geologist, Biologist, Paleontologist, Paleobotanist, Art Historians etc.

This summary of the situation is applicable to many other areas and sites in the world too.

Above all the steps, which has been taken in world can be also apply in India but keep in mind that all the rules should maintain the Indian phenomena's. The immense heritage of rock art is vulnerable to natural processes of wear, obliteration and destruction, which are further accelerated by human acts. Every day bits and pieces of rock surfaces are falling apart. Development projects, road construction, home building, and agriculture can hardly be stopped, but measures need to be taken to document and record rock art in its current state to assure that its testimony will remain for future generations. After all this work, a conservation point of it is essential to know that all application in this work should be reversible.

Lastly, protection of rock art sites is a great task and government alone cannot meet this challenge properly. Can we develop a mechanism for public-private partnership, and someone from our side may play a role of liaison between them for co-operation? The importance of sites is only emphasis with the applications of these technologies. Protection of rock art sites is a great task and government alone can't meet this challenge properly. It is time to realize and meet our responsibility for preservation

and further study of rock art as being an important part of our proud cultural heritage. We should at least endeavor to make and have records of this art and culture for the edification and knowledge of the future generation.

References

- Athens Charter. 1931. The Athens Charter for the Restoration of Historic Monuments. http://www.icomos.org/docs/athens_charter.html
- Barnett, T., A. Chalmers, M. Díaz-Andreu, P. Longhurst, G. Ellis, K. Sharpe, and I. Trinks, 2005, *3D Laser Scanning for Recording and Monitoring Rock Art Erosion*, *INORA* 41, pp.25–29
- Batarda António Pedro Fernandes, José Delgado Rodrigues, *Stone consolidation experiments in rock art outcrops at the Côa Valley Archaeological Park, Portugal*, pp. 111-120
- Bednarik, Robert G., 2007, *Rock art science, the scientific study of Palaeoart*, Aryan Books International, New Delhi, p.95
- Dean, J. Claire, 1998, "*Condition Assessment of Site 3CN185 (Rock House Cave), Petit Jean State Park, Arkansas: With Special Reference and Recommendations Regarding the Treatment of Graffiti*", Report, recommendations and treatment proposal for Rock House Cave, Petit Jean State Park, funded by a Preservation Education grant from the Arkansas Historic Education Program of the Arkansas Department of Natural Heritage.
- Detailed provided by Dr. S.P.Singh, Director, National Museum Conservation Branch, New Delhi, 2009.
- Discussion with Dr. D.Dayalan, Superintending Archaeologist, Temple Survey, South Indian Zone, Chennai during structural conservation camp at Sanchi, M.P., 2009.
- Discussion with S.B.Ota, Regional Director, Central Zone, Archaeological Survey of India, during structural conservation camp at Sanchi, M.P.
- Donna Yodar, 1995, *Computerized Management of Rock Art*, Purakala, vol. 6, No.1-2, pp. 35-38
- Godwin, Luke, 1992, Carve your name with pride? Visitor behaviour of Blacks Palace art site complex, Central Queensland Highlands. *Rock Art Research*: 9 (2)
- Gutbrod, 2008, *The Rock Art Stability Index A New Strategy for Maximizing the Sustainability of Rock Art*, *Heritage Management*, Volume 1, Issue 1, Spring, Left Coast Press, pp. 37–70

- Gutiérrez, M. de la Luz, Hambleton, E., Hyland, J., and Stanley-Price, N., 1996, The Management of World Heritage Sites in Remote Areas: The Sierra de San Francisco, Baja California, Mexico, *Conservation and Management of Archaeological Sites* 1 (4), pp. 209 – 225
- ICCROM (International Centre for the Study of the Preservation and Restoration of Cultural Property) 1999 Conservation and Management of Rock Sites in Southern Africa, COMRASA 99, Zimbabwe Rock Art Management Training Manual, Rome.
- ICOMOS (International Council on Monuments and Sites) 1964, The Venice Charter: International Charter for the Conservation and Restoration of Monuments and Sites. http://www.icomos.org/docs/venice_charter.html
- Janette Deacon, 2006, *Rock Art Conservation and Tourism*, *Journal of Archaeological Method and Theory*, Vol. 13, No. 4, Advances in the Study of Pleistocene Imagery and Symbol Use, Part 1, pp. 379-399
- Jeyaraj, V., 2004, *Rock and Cave Paintings of the Ancient Past in India and their Care*, (ed.) Studies in art and archaeology conservation, B.B.Lal commemorative Vol., (eds.) A.S.Bist, S.P.Singh, Agam Kala Prakashan, Delhi, pp. 91-100
- Joshi M.C., 2000-2001, *Address and Reports of the Sixth Congress*, Bhabhua, Bihar, 25-27 May, pp.119-123
- Loendorf, Olson, Conner, Dean 1988, *A manual for Rock House Cave Art Documentation* A manual originally prepared for research at Pinion Canyon Maneuver Site and later adapted for the National Park Service as a workshop manual.
- Mathpal, Yashodhar, 1993, Teaching of rock art in Indian Context. *Purakala*, pp. 47-49.
- Pande, B.M., 1999, *Management of Bhimbetka and Adamgad*, (ed.) Bansi Lal Malla, Conservation of Rock Art, IGNCA & Aryan Book International, New Delhi, pp. 53-60
- Pandey S.K., 1984, *Indian Rock Paintings & Its Problem*, (ed) Rock Art of India, pp.215-216
- Prasad, A.K., 2001, *Recently Discovered Pre-Historic Rock Painting and Rock Inscriptions in Nawadah, Giridih, Kodarama and Jamui district of Bihar*, Art and Archaeology of Eastern India, (Proceeding of National Seminar) Ed. Nasim Akhtar, Patna Museum, Patna, p. 13

- Taruvinga, P., and Ndoro, W. , 2003 The Vandalism of the Domboshawa Rock Painting Site, Zimbabwe: Some Refl ections on Approaches to Heritage Management. *Conservation and Management of Archaeological Sites* 6 (1), pp. 3 – 10
- Tiwary, S.K., 2010, *Management of Rock Art Sites, Pragma-Bharati*, Vol. XV, (ed.) Dr. B. K. Chaudhary, The Journal of the K.P. Jaisawal Research Institute, Patna, pp. 38-44
- Tyagi G.S., 1996, *Conservation of Rock Art in India*, Recent Perspective on Prehistoric Art In India and allied Subject, Essay In Honour of Dr. Shyam Kumar Pandey, (eds) R.K.Sharma, K.K.Tripathi, Aryan Book International, New Delhi, pp. 105-118
- UNESCO 2004 Monitoring World Heritage. World Heritage Papers, No. 10. Paris: UNESCO World Heritage Centre, ICCROM
- UNESCO 2008 Operational Guidelines for the Implementation of the World Heritage Convention. Paris: UNESCO World Heritage Centre
- Wijesuriya, G., 2010, Conservation in Context. *In Conservation and Preservation: Interactions between Theory and Practice. In Memoriam Alois Riegl (1858 – 1905)*. M.S. Falser, W. Lipp, and A. Tomaszewski, eds. pp. 233 – 248. Proceedings of the International Conference of the ICOMOS International Scientific Committee for the Theory and the Philosophy of Conservation and Restoration, April 23 – 27, 2008, Vienna, Austria. Florence: Edizioni Polistampa.

Figure



Figure 1



Figure 2



Figure 3



Figure 4

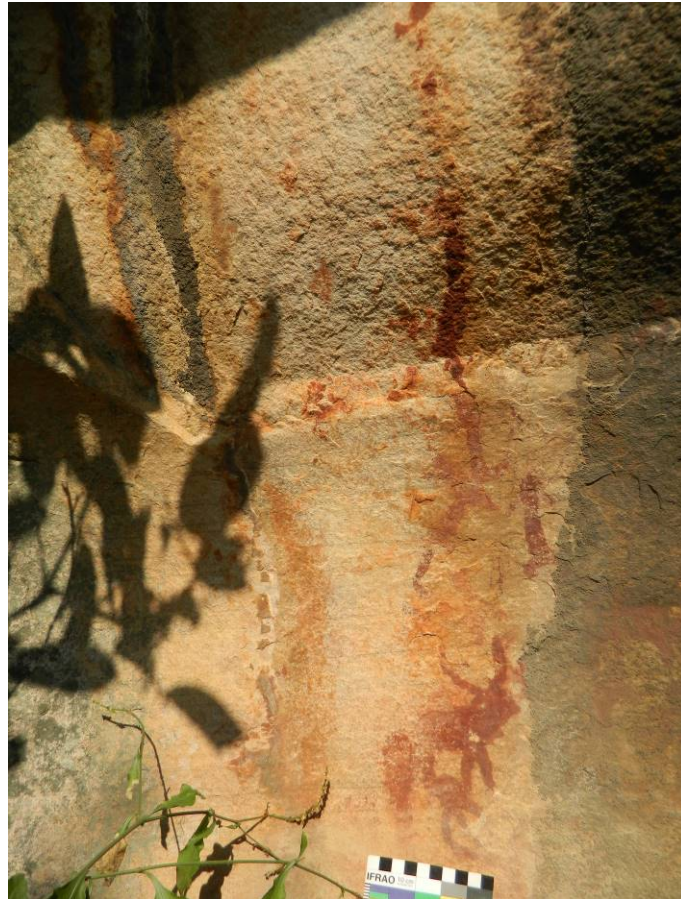


Figure 5

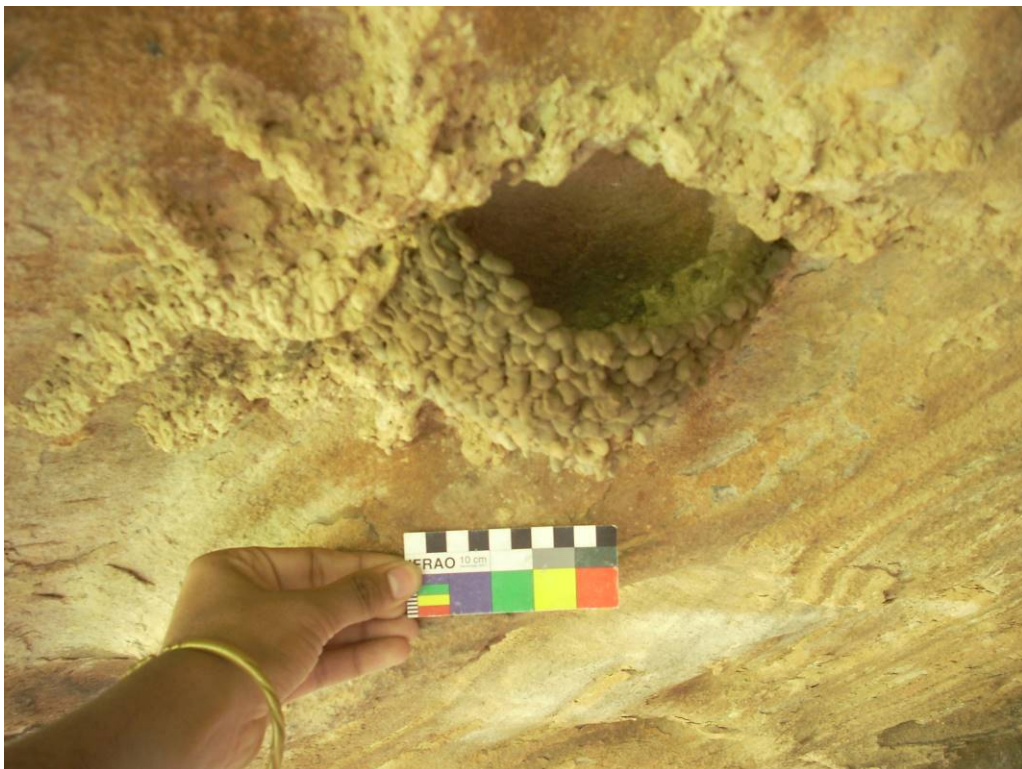


Figure 6



Figure 7

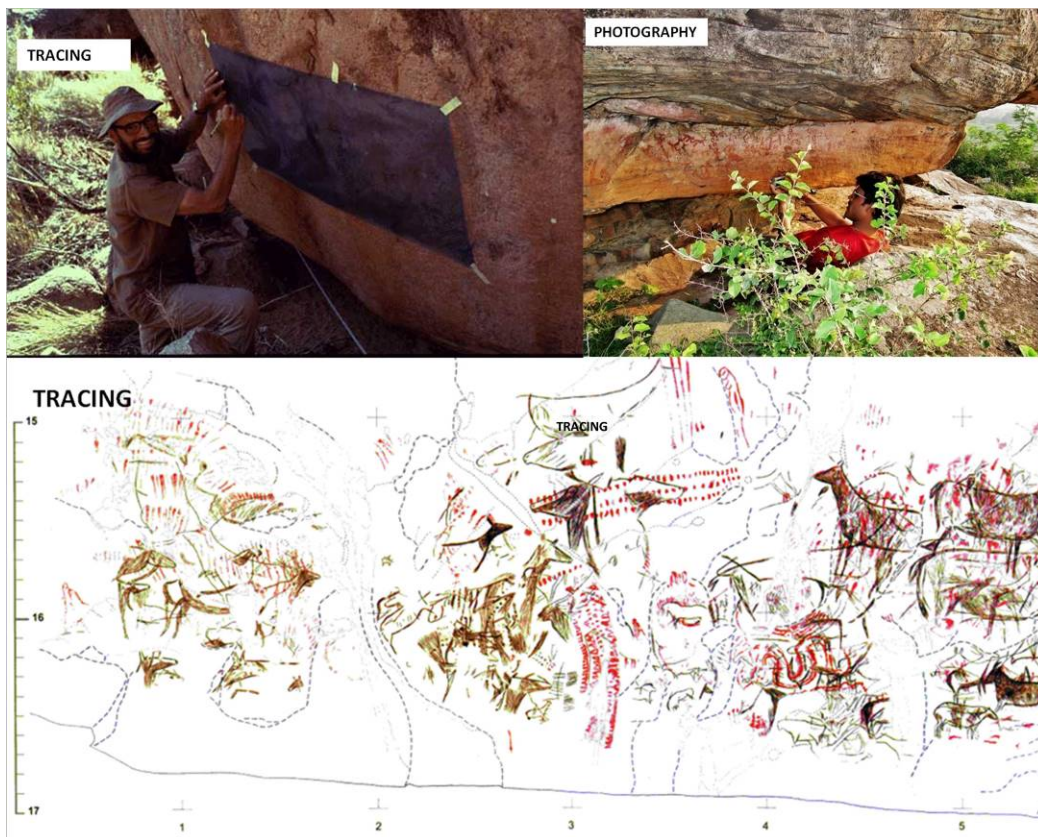


Figure 8



Figure 9



Figure 10



Figure 11

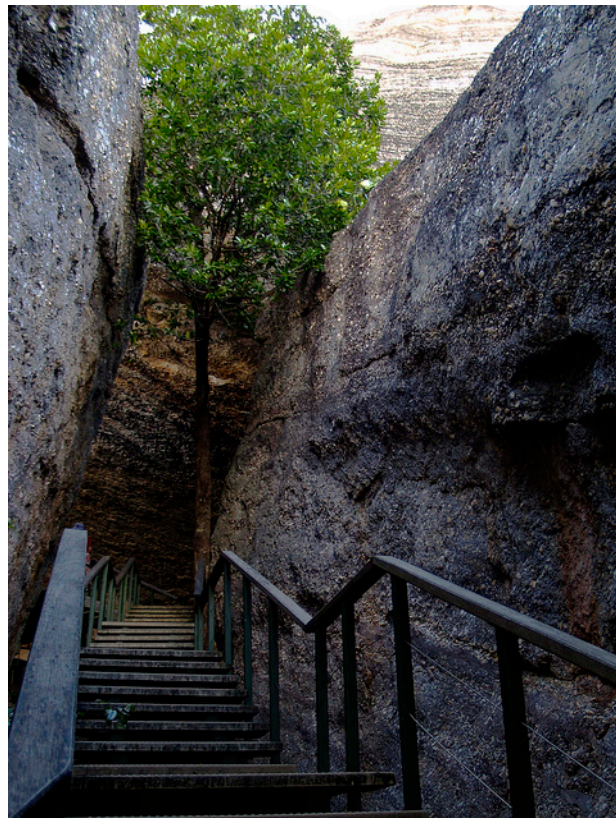


Figure 12

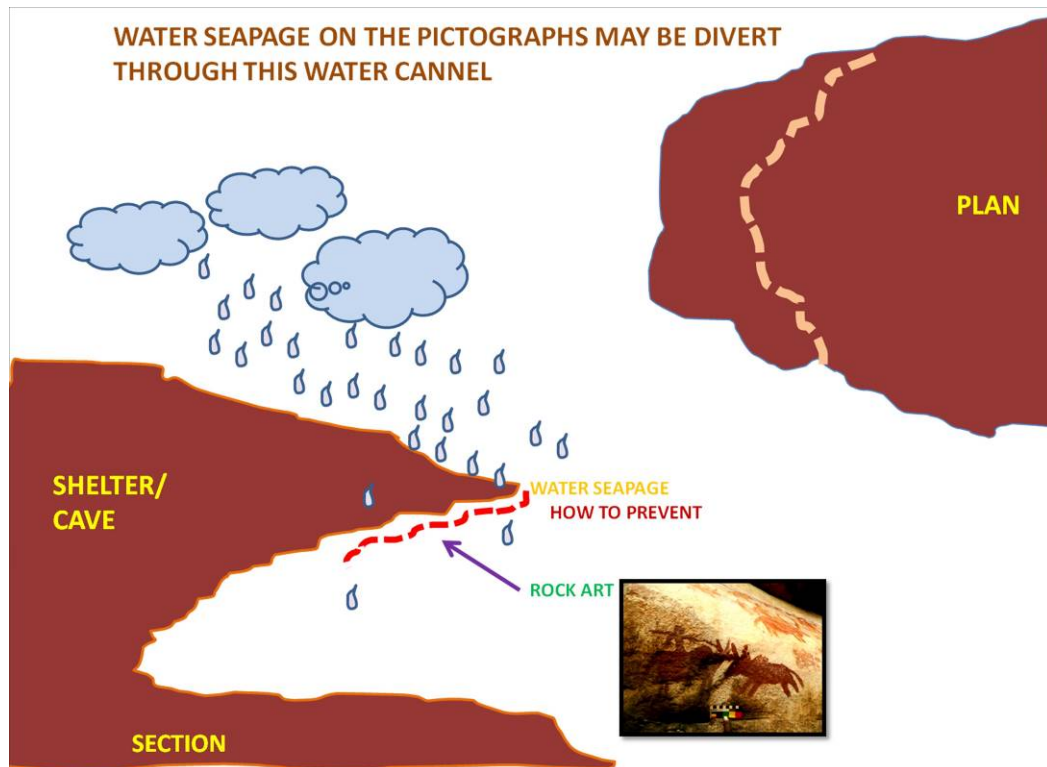


Figure 13

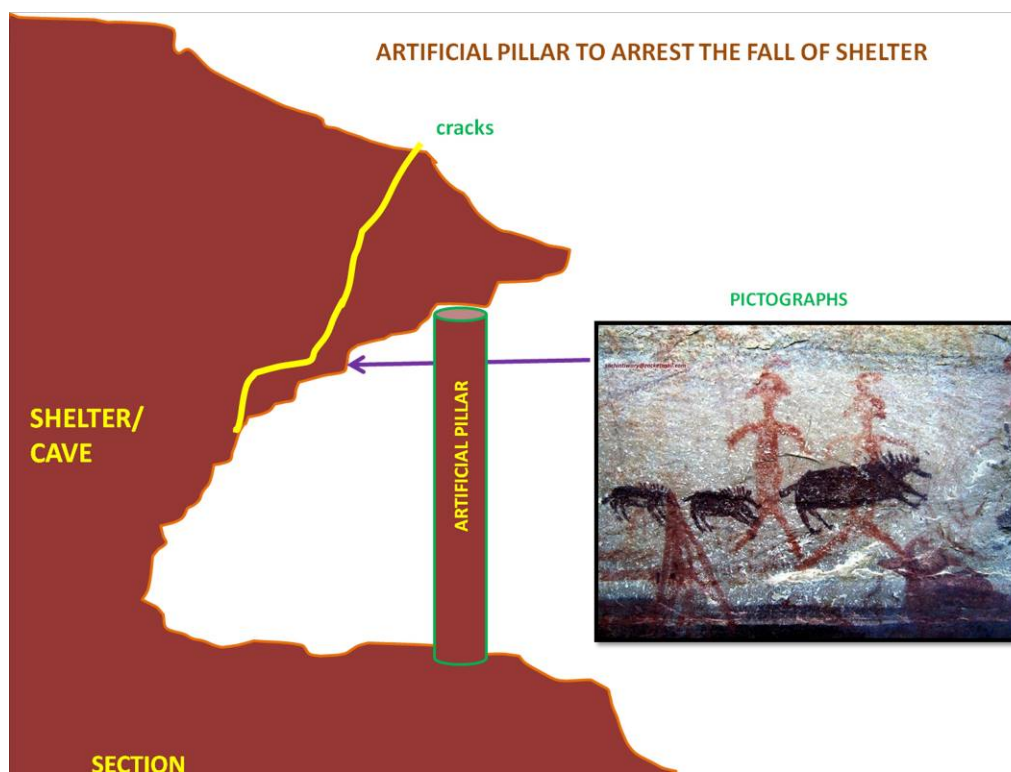


Figure 14

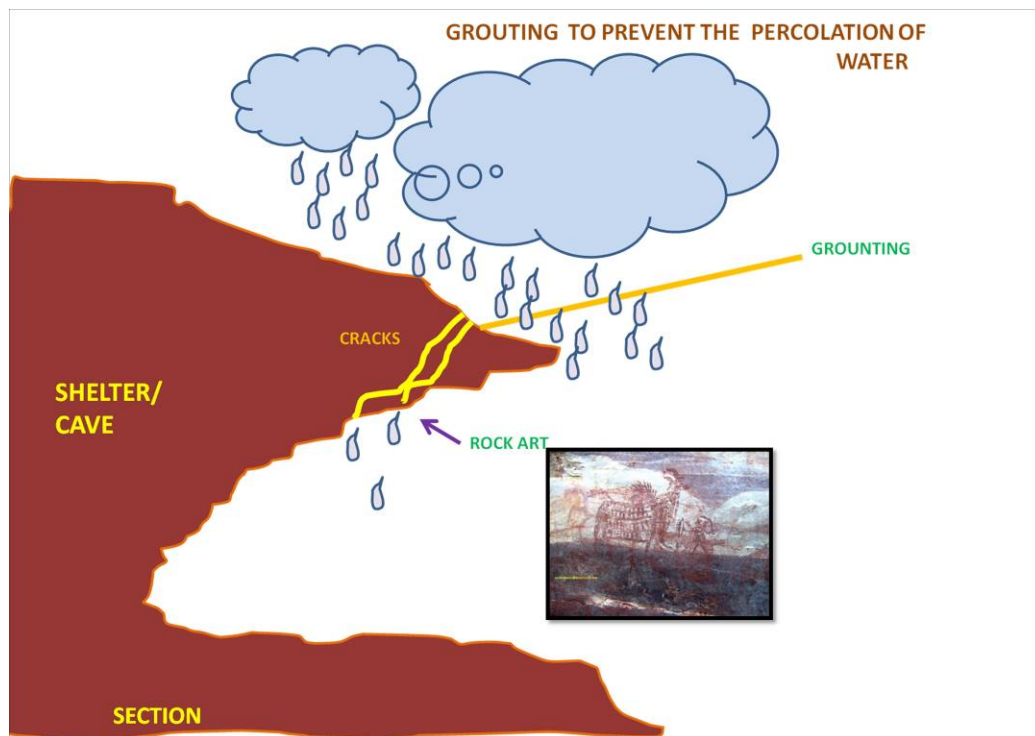


Figure 15

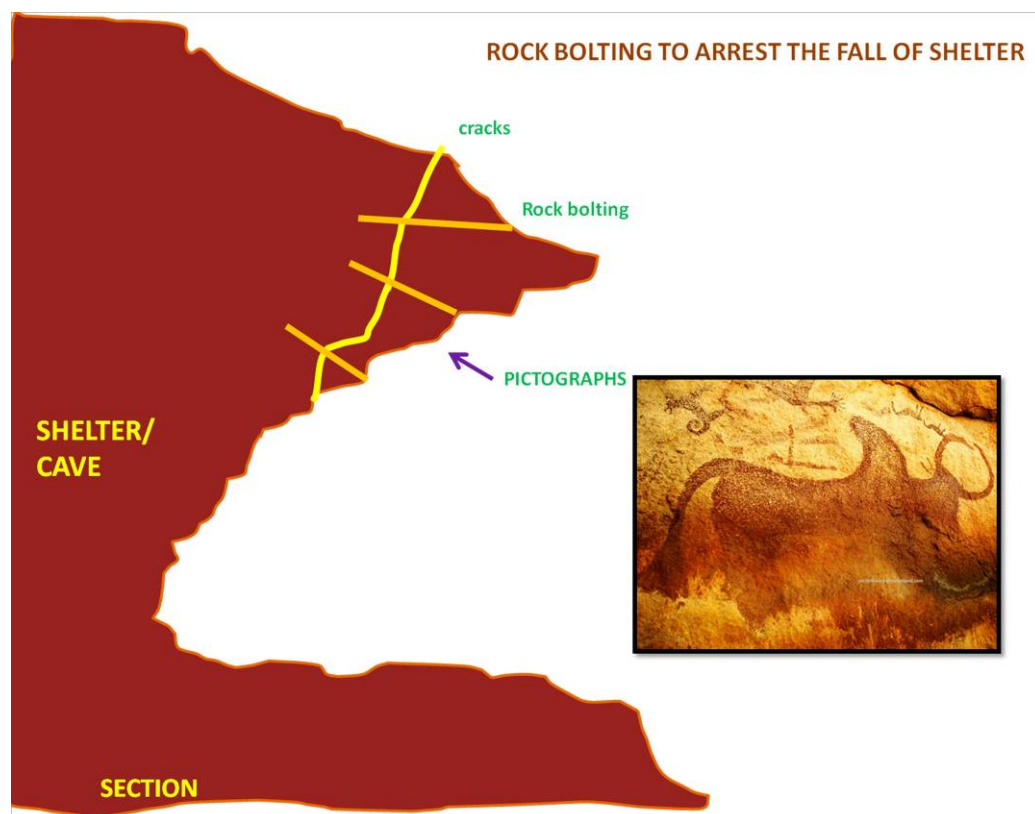


Figure 16

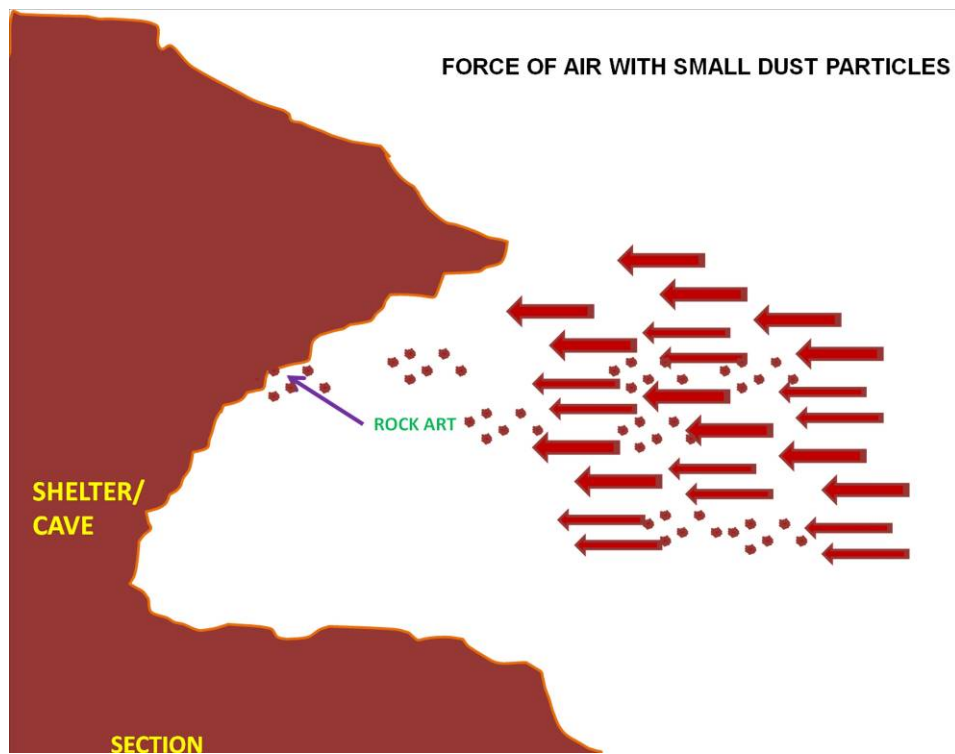


Figure 17



Figure 18



Figure 19

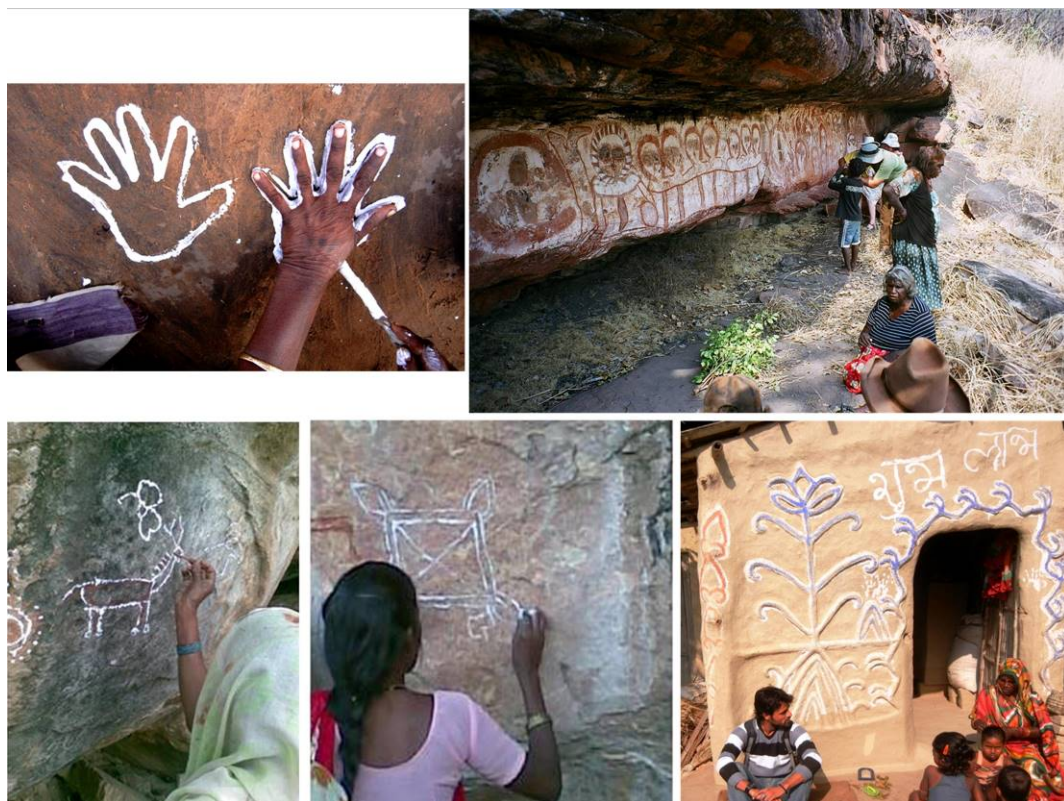


Figure 20

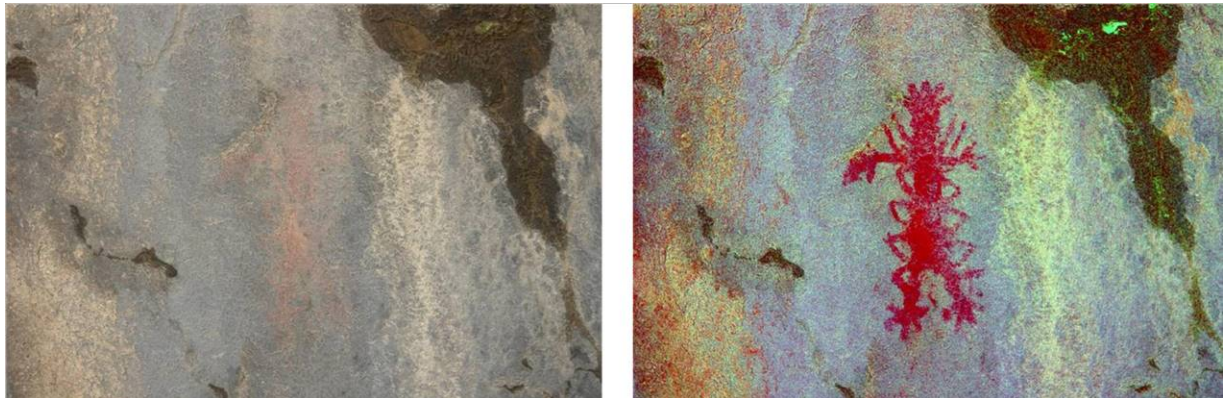



Figure 21

SIGNAGE

How to Minimize the Problem Regarding Rock Art? :



- **Warning signs** informing visitors of penalties for vandalism should be located at or near the parking area. Posting these signs at rock art sites may offer an irresistible challenge to some people and lead to more damage than would otherwise occur.
- Marking sites with signs that proclaim: *"This site is being monitored"* can go a long way toward protecting a site and reminding people that monitoring is taking place.
- **Signs posted at parking** areas should not only mention warnings and penalties but should incorporate site visiting etiquette and brief descriptions of the significance of nearby sites.
- **Be our eyes and ears.** If you observe behavior that may damage the rock art, please report it to the nearest employee immediately. (Be sure to include a phone number or other contact information).
- **Fires are not allowed** at this site. Report any fire or charcoal to the staff or nearest office so that we may clean it up.
- **Stay on the trail and avoid kicking excessive dust** into the air. Dust will damage the rock art and make it harder for everyone to see.

Figure 22



Figure 23



Figure 24

