

**PROJECT PROPOSAL: CONSERVATION & MAINTENANCE ACTIVITIES AT THE COOPERS'S CAVE
NATIONAL HERITAGE SITE, CRADLE OF HUMANKIND WORLD HERITAGE SITE, GAUTENG PROVINCE**

Introduction:

The Cradle of Humankind World Heritage Site (COH WHS), situated in the north western quadrant of the Gauteng Province, is home to 14 palaeontological and archaeological sites proclaimed as National Heritage Sites in terms of the National Heritage Resources Act, 1999.

As with every one of the 14 National Heritage Sites in the COH WHS, the Cooper's Cave Palaeoanthropological Site (SAHRIS reference **9/3/233/0024**), is privately owned. The site is currently being excavated by Dr Christine Steininger of the Evolutionary Studies Institute, University of the Witwatersrand, under permit number **80/10/03/010/51**.

Over the past few years, the monitoring and inspection programme jointly conducted by the South African Heritage Resources Agency (SAHRA) and the Cradle of Humankind World Heritage Site Management Authority (COHWHS MA), has resulted in numerous discussions regarding the responsibilities of all of the parties associated with a National Heritage Site, including landowners, scientific researchers, SAHRA and the COH WHS MA. In particular, the overall or "general" conservation and maintenance of a privately National Heritage Site in a World Heritage Site is an area in which there is extensive overlap of mandates and duties between SAHRA, the landowner and the Management Authority.

The COH WHS MA and SAHRA are currently in the process of establishing an MOU aimed at streamlining and clarifying areas of responsibilities. However, whilst this MOU is pending, there are maintenance and conservation activities at several of the National Heritage Sites that require attention from an authority. The general lack of willingness of landowners to undertake site management maintenance without financial support from government, or without any apparent benefit to themselves, further means that one of government parties associated with the COH WHS must take responsibility for site maintenance. Pending the finalisation of the MOU, the COH WHS MA and SAHRA have informally agreed that the COH WHS MA is better placed to undertake site conservation and maintenance activities at the National Heritage Sites within the COH WHS primarily due to SAHRA's distance from the sites.

There are conservation and maintenance challenges at the majority of the National Heritage Sites, including the need to burn firebreaks, removal of alien vegetation (particularly *pyrocantha* and *opuntia*) from many of the sinkholes and excavations, and the general clearing of the sites. The focus of this particular application is on the conservation and maintenance challenges at the Cooper's Cave National Heritage Site.

Cooper's Cave Conservation & Maintenance Issues

There have been longstanding maintenance issues at Cooper's Cave, most notably regarding the protective fence around the localities known as "Cooper's A", "Cooper's C" and "Cooper's D" and the presence of alien vegetation within the boundaries of the NHS, specifically *pyracantha* and *opuntia* around Cooper's C & A and Cooper's B.

The 2012 Fossil Site Safety Inspection of Cooper's Cave further indicated a need for management intervention in relation to the hazards presented by the proposed excavations in the Cooper's B cavern (a separate permit application for this particular management activity has been submitted to SAHRA by the COH WHS MA).

However, in order for the COH WHS MA to install the necessary site safety infrastructure, it has been agreed with the landowner that other maintenance issues must also be addressed.

A site visit was held on 26 June 2013 by officials from the COH WHS MA, Dr Christine Steininger and Mr Riaan Lotz to discuss site safety infrastructure as well as site maintenance issues. At this site visit, there was an agreement between the parties that the COH WHS MA should apply to SAHRA for a permit to address following maintenance issues:

- Repair and maintenance of protective fence around Cooper's D;
- Removal of alien vegetation within the boundaries of the Cooper's Cave NHS;
- Trimming of grass and trees where appropriate within the boundaries of the Cooper's Cave NHS; and
- Burning of firebreaks around the perimeter of the Cooper's Cave NHS.

At this site visit, Mr Riaan Lotz signed a letter of consent, as Landowner, for the COH WHS MA to obtain a permit from SAHRA to carry out the above maintenance activities. This letter of consent will form part of this permit application.

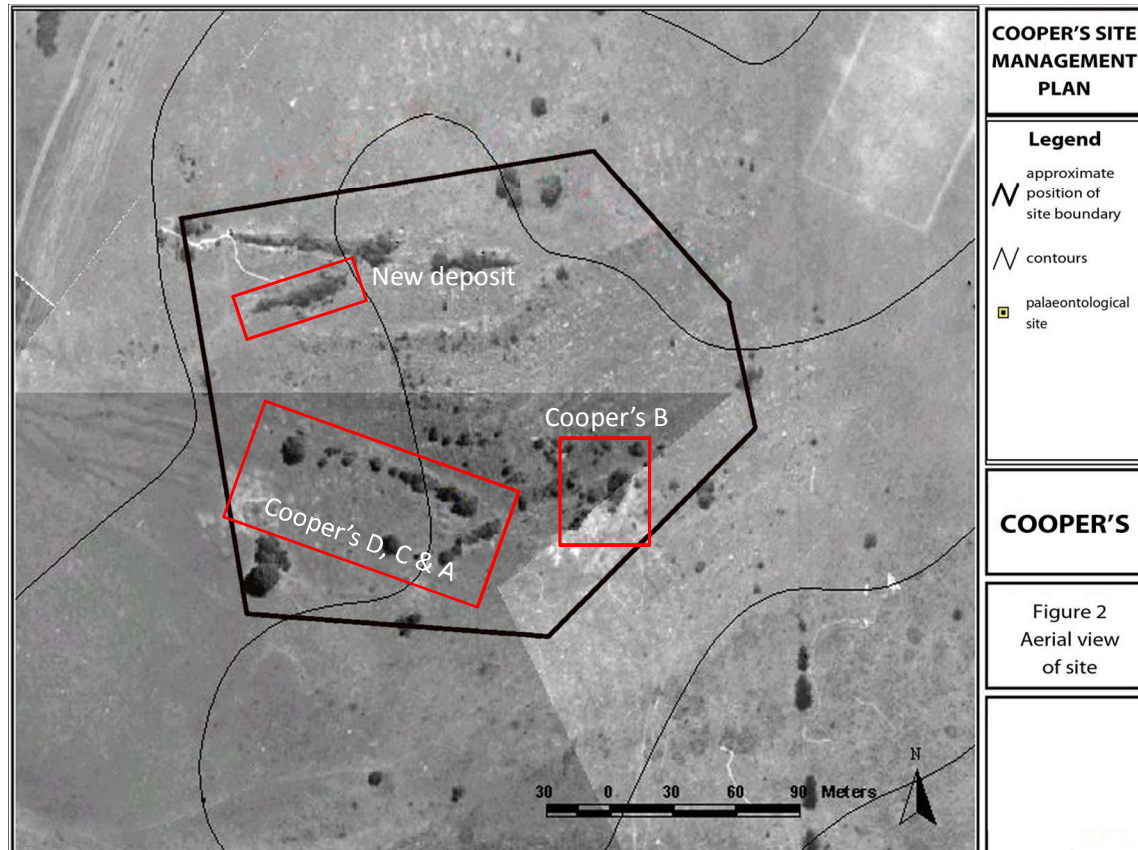
However, at an additional site inspection on 12 July 2013 by officials from SAHRA, the COH WHS MA, Dr Christine Steininger, Mr Riaan Lotz and officials from the Working on Fire programme appointed by the COH WHS MA, the following was discussed in addition to the above maintenance issues:

- The very recent discovery of a new potentially fossiliferous deposit within the boundaries of the NHS will possibly result in the creation of an area of excavation. In anticipation of the possible danger posed by a new excavation area to his cattle, the landowner would like to have a protective barrier erected around the new deposit. It was agreed that the most appropriate method would be installation of a series of low gabions (walls of stone enclosed in wire mesh).
- The landowner no longer would like firebreaks to be burnt around the NHS, for fear of the fire spreading. The Working on Fire team indicated that the fuel load within the NHS boundaries and in the near vicinity is relatively low, and thus the chances of a fire are small, so firebreaks are currently not necessary at this stage.

Therefore, this permit proposal will address the following maintenance activities at the Cooper's Cave NHS:

- The repair and maintenance of the protective fence around a portion of the Cooper's Cave NHS;
- The removal of alien vegetation within the Cooper's Cave NHS;
- The trimming of trees and grass within the Cooper's Cave NHS;
- The erection and maintenance of a series of protective gabions around the as yet unnamed deposit within the Cooper's Cave NHS.

The areas requiring site maintenance are highlighted on the site plan below:



1.1 Fencing of a portion of the Cooper's Site:

The Cooper's Cave NHS is located on a piece of land that is actively used by the landowner for cattle farming. A protective fence was erected in 2004, by the current permit holder (Dr Steininger) who was then in collaboration with Prof Lee Berger (University of the Witwatersrand). Please note that this fence does not follow the designated boundary of the NHS, but was rather erected around the area where the greatest research and excavation activities were taking place at the time, most notably Cooper's D, Cooper's C and Cooper's A localities. Please see the site diagram above indicating the fence line around Cooper's D, C and A.

The purpose of this fence was to prevent the landowner's cattle from entering the research areas and injuring themselves, as well as to prevent the cattle from damaging the excavated areas. Access to the research area was through a gate that was kept locked at all times. Over time, there have been several issues with the fence:

- At one stage, there was a build up of grass within the fenced area, due to lack of grazing. This build up was not only a fire hazard, but also led to the landowner's cattle breaking through the fence to access the grass for grazing.

- Since the initial destruction of the fence, it has been further damaged not only by the cattle, but also by the labourers of the landowner who attempt to access the enclosed area for the purposes of collecting firewood.
- This means that there are several places along the fence line where the fence is completely flattened along the ground, but is still erect in other places, rendering the fence ineffective as a protective barrier.

Below are two photographs of the current fence taken in 2009, (please note the extensive fuel buildup within the fenced area), both showing the damage to the fence. A further photograph of the fence was taken in 2012, during the site safety inspections, showing the almost complete destruction of the fence, but also showing a significantly reduced fuel build up.



Cooper's D Fence circa May 2009



Cooper's D fence circa November 2009



Cooper's D fence circa July 2012

1.2 Proposed Maintenance Intervention and Activities:

It is proposed that the existing fence is removed, and a new, more secure fence is to be erected, using the same placement as the current fence, and that more regular inspection and maintenance of the fence, and the fenced off area, take place.

The new fence will most likely be a standard three strand wire fence, with metal posts that will possibly be embedded in concrete to prevent their being stolen, and to increase the strength of the fence. A new standard wire mesh entrance gate will also be installed at the same position as the current entrance gate.

This work will be undertaken by the COH WHS Working on Fire team who have been appointed by the COH WHS MA. The following activities will be carried out:

- Taking of measurements and identification of appropriate materials for new protective fence around Cooper's D and A;
- Removal and disposal of the current protective fence by the COH WHS Working on Fire Team;
- Site preparation for installation of new protective fence, such as digging of holes for installation of poles, trimming of grass within area to be fenced etc;
- Installation of new fence poles, wire strands and entrance gate; and
- Weekly inspection of fence by Working on Fire team members together with the landowner's farm manager, including maintenance and repair of fence as and when necessary.

All materials for the new fence will be brought on to the Cooper's site, as and when necessary, and will be located in an area determined by the permitted scientist, away from any excavations, dumps, sensitive areas, etc.

All waste material and left over equipment will be removed from the site once the installation has been completed, and the site will be left in the manner it was found (save for the new installation).

1.3 Monitoring of fence maintenance activities:

At this stage, it is unclear how long the proposed fencing activities will take, but it is anticipated that at least 4 days will be required by the Working on Fire team. The Working on Fire team will be managed by Vusi Nkosi, the head of the COH WHS Working on Fire team, and will also work under the direction of the landowner's farm manager, Bongi. An official from the COH WHS MA and Dr Steininger will be present on the first day of the fencing activities to ensure that all parties are informed as to where to store equipment, identification of no go areas, identification of access points, and confirmation of the fence maintenance activities. After this initial first day, it is expected that during the fence maintenance process, an official of the COH WHS MA or a representative of the Cooper's Cave research team (most likely Dr Christine Steininger) will undertake periodic site visits.

The COH WHS MA will photograph the affected area prior to the commencement of the maintenance activities, and again after the fencing has been completed. These photographs, together with a report on the activities, will be provided to SAHRA, should it be required.

2.1 Removal of alien vegetation within NHS:

As per many of the previous inspection reports and management plans, the Cooper's Cave NHS is heavily infested with alien vegetation and to a certain extent with weeds. Partially choked avens and the shaft-like entrances to subterranean systems are the most heavily affected. The presence of the prickly fire-thorn, *Pyracantha*, makes inspection and exploration of these areas difficult if not impossible, as well as negatively impacting on the biodiversity of the site. Therefore, the removal of alien invasive vegetation is an important management activity at Cooper's aimed at securing the integrity of the NHS.

Of particular concern is the extensive infestation of *pyracantha* in the vicinity of Cooper's D, C and Cooper's A (see photographs below) and the infestation of *opuntia* around the entrance to Cooper's B.



***Pyracantha* infestation at Cooper's C / Cooper's A**



Pyracantha at Cooper's C



Opuntia at Cooper's B entrance (cactus-like plant to the left of picture)

2.2 Proposed Maintenance Intervention and Activities:

It is proposed that the current permitted researcher (Dr Steininger) together with the Working on Fire team identify the areas at Cooper's A, C and B where the invasive *pyracantha* and *opuntia* are of particular concern to the permitted researcher. In particular at Cooper's B, care will be taken to ensure that proposed removal of the *opuntia* will not result in the destabilisation of the slope at the cave entrance at Cooper's B.

The proposed method for the removal of the alien vegetation will constitute both mechanical and chemical treatment of the alien vegetation. The identified vegetation will be trimmed of all branches and cut down to an appropriate height. Once this has been done, the remaining stem / trunk will be treated with an appropriate herbicide, which will ultimately kill the invasive plant. The remnant of the invasive plant can be left *in situ*, or it can be removed at a later stage.

This work will be undertaken by the COH WHS Working on Fire team who have been appointed by the COH WHS MA, together with the permitted researcher. The following activities will be carried out:

- Joint identification and marking of alien vegetation by Working on Fire team and researcher;
- Trimming and cutting of vegetation;
- Application of herbicide; and
- Appropriate disposal of cuttings to prevent re-infestation.

As mentioned above, care will be taken to ensure that the removal of the *opuntia* at the entrance to cave at Cooper's B will not increase the likelihood of erosion or destabilisation of the slope. A possible solution may be the slight terracing of the upper portion of the slope using small wooden poles.

All materials for the removal of the alien invasive vegetation will be brought on to the Cooper's site, as and when necessary, and will be located in an area determined by the permitted scientist, away from any excavations, dumps, sensitive areas, etc.

All waste material and left over equipment will be removed from the site once the maintenance activities have been completed, and the site will be left in the manner it was found.

2.3 Monitoring of alien invasive vegetation maintenance activities:

At this stage, it is unclear how long the proposed removal of alien invasive vegetation will take, but it is anticipated that at least one week will be required by the Working on Fire team. The Working on Fire team will be managed by Vusi Nkosi, the head of the COH WHS Working on Fire team, who will also report to the COH WHS MA. An official from the COH WHS MA and Dr Steininger will be present on the first day of the maintenance activities to ensure that all parties are informed as to where to store equipment, identification of no go areas, identification of access points, identification of plants to be removed and treated, and an overall confirmation of the maintenance activities. After this initial first day, it is expected that an official of the COH WHS MA or a representative of the Cooper's Cave research team (most likely Dr Christine Steininger) will undertake periodic site visits.

The COH WHS MA will photograph the affected areas prior to the commencement of the maintenance activities, and again after the alien invasive vegetation has been cleared and treated. These photographs, together with a report on the activities, will be provided to SAHRA, should it be required.

3.1 The trimming of trees and grass within the Cooper's Cave NHS

As mentioned above in discussing the protective fence around the Cooper's D, A and C localities, the failure to adequately maintain the grassland within the fenced area was a definite factor that led to the initial destruction of the fence by the landowner's cattle.

Furthermore, there are numerous trees within the NHS that require trimming, particularly around the Cooper's D excavation, the Cooper's A & C localities, the kiln area, and the recently discovered fossil deposit at an as yet unnamed locality; primarily as the branches prevent access to parts of the site for scientific exploration. Care will be taken to ensure that the trimming of the trees and grass does not negatively impact on the significance of the NHS.

3.2 Proposed Maintenance Intervention and Activities:

It is proposed that the current permitted researcher (Dr Steininger) together with the Working on Fire team identify the areas at the Cooper's Cave NHS where the trees and grass requires trimming.

This work will be undertaken by the COH WHS Working on Fire team who have been appointed by the COH WHS MA, together with the permitted researcher. The following activities will be carried out:

- Joint identification and marking of trees and areas requiring trimming;
- Trimming and cutting of vegetation; and
- Appropriate disposal of cuttings to prevent re-infestation.

All materials for the trimming and cutting of the identified trees and grass areas will be brought on to the Cooper's site, and will be located in an area determined by the permitted scientist, away from any excavations, dumps, sensitive areas, etc.

All waste material and left over equipment will be removed from the site once the maintenance activities have been completed, and the site will be left in the manner it was found.

3.3 Monitoring of grass and tree trimming maintenance activities:

At this stage, it is unclear how long the proposed trimming of grass and trees will take, but it is anticipated that at least 3 days will be required by the Working on Fire team. The Working on Fire team will be managed by Vusi Nkosi, the head of the COH WHS Working on Fire team, who will also report to the COH WHS MA. An official from the COH WHS MA and Dr Steininger will be present on the first day of the maintenance activities to ensure that all parties are informed as to where to store equipment, identification of no go areas, identification of access points, identification of plants to be removed and treated, and an overall confirmation of the maintenance activities. After this initial first day, it is expected that an official of the COH WHS MA or a representative of the Cooper's Cave research team (most likely Dr Christine Steininger) will undertake periodic site visits.

The COH WHS MA will photograph the affected areas prior to the commencement of the maintenance activities, and again after the identified vegetation has been trimmed. These photographs, together with a report on the activities, will be provided to SAHRA, should it be required.

4.1 The erection of a protective gabion around the new fossil deposit at the Cooper's Cave NHS

As mentioned above, Dr Christine Steininger has very recently discovered a new fossil deposit slightly north-west of the Cooper's D excavations. This location has been marked on the locality plan above.

As with the fencing around Cooper's D, the landowner is concerned for the safety of his cattle should excavations commence in this area. Therefore, it has been agreed that a protective barrier should be erected around the deposit prior to the permitted scientist commencing with excavations.

The landowner has expressed his unhappiness previously with the use of a fence, and so it is suggested for this particular protective barrier that a gabion be utilised. A gabion is a retaining wall comprising of stones encased in a wire mesh "cage". A few examples are provided below.



4.2 Proposed Maintenance Intervention and Activities:

As the time of writing this proposal, the exact measurements (height, length and breadth) of the proposed gabion have not been established. However, it is proposed that the wall will be approximately a metre high and a metre wide, forming an enclosed wall around the potential excavation area. It is likely that a small gap will be left between the walls to act as an entrance to the excavation area. The height / breadth should be of sufficient size so as to act as a deterrent to the cattle.

It is proposed that the stones to fill the wire mesh be sourced from the surrounding area, including old mining rubble that the permitted scientist has sorted and assessed, as well as sterile site material from the excavations at Cooper's D.

This work will be undertaken by the COH WHS Working on Fire team who have been appointed by the COH WHS MA. The following activities will be carried out:

- Taking of measurements and identification of appropriate materials for gabions around the new fossil deposit area;
- Site preparation for installation of gabions;
- Installation of gabions; and
- Weekly inspection of gabion by Working on Fire team members together with the landowner's farm manager, including maintenance and repair of gabions as and when necessary.

All materials for the gabions will be brought on to the Cooper's site (save for the rubble from the old mining dumps), as and when necessary, and will be located in an area determined by the permitted scientist, away from any excavations, dumps, sensitive areas, etc.

All waste material and left over equipment will be removed from the site once the installation has been completed, and the site will be left in the manner it was found (save for the new installation).

1.3 Monitoring of gabion installation activities:

At this stage, it is unclear how long the proposed gabion activities will take, but it is anticipated that at least one week will be required by the Working on Fire team. The Working on Fire team will be managed by Vusi Nkosi, the head of the COH WHS Working on Fire team, and will also work under the direction of the landowner's farm manager, Bongzi. An official from the COH WHS MA and Dr Steininger will be present on the first day of the gabion installation activities to ensure that all parties are informed as to where to store equipment, identification of no go areas, identification of mining rubble that can be used for the gabions, and confirmation of the gabion erection activities. After this initial first day, it is expected that during the gabion installation process, an official of the COH WHS MA or a representative of the Cooper's Cave research team (most likely Dr Christine Steininger) will undertake periodic site visits.

The COH WHS MA will photograph the affected area prior to the commencement of the maintenance activities, and again after the gabions have been erected. These photographs, together with a report on the activities, will be provided to SAHRA, should it be required.