SUMMARY AND ANALYSIS OF THE INVENTORY OF THE NATIONAL ESTATE

2019

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- Archaeology, Palaeontology and Meteorites
- Maritime and Underwater Cultural Heritage
- Heritage Objects
- Burial Grounds and Graves

- Built Environment
- Heritage Protection
- National Inventory
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1. Introduction

SAHRA is mandated with the compilation and maintenance of an inventory of the national estate as per section 39 of the NHRA. Part of this mandate includes the regular publication of a summary and analysis of the national estate inventory. This report provides a summarised view of the current content of heritage resources within the inventory.

With each iteration of this report, SAHRA endeavours to present up to date data about the content of the inventory of the national estate, as well as to showcase ways in which this data is operationalised.

2. Heritage Inventories

The importance of heritage inventories is a well ingrained concept within the overall framework of heritage management practise. This importance is further emphasised within most international examples of heritage legislation, international conventions and heavily emphasised within the NHRA. This importance is predicated on the concept of "you cannot protect what you do not know about", thus heritage inventories form the very basis from which all heritage management practise follows.

Inventories, as a general concept, is an ongoing record for the identification and description of heritage resources which can be used for a variety of purposes, such as;

   a) Management
   b) Protection
   c) Public appreciation

3. Reporting Period

This report makes use of cumulative data recorded on the South African Heritage Resources Information System (SAHRIS) as at the end of the 2019 calendar year. As such, this report is representative of all data on SAHRIS up to and including 31 December 2019.

4. Data Sources and Limitations

The database used to populate this summary can be accessed directly on the South African Heritage Resources Information System (SAHRIS) via: https://sahris.sahra.org.za.

The heritage resources recorded in the inventory of the national estate is extracted from a variety of sources, such as surveys, archival documents, heritage impact assessments, permit applications, and other relevant databases within the custodianship of SAHRA or otherwise provided to SAHRA. Each year SAHRA undertakes numerous projects to increase the amount and quality of data included in the inventory of the national estate, thus with each year's publication, some data may change as new information comes to light.

Annually, in preparation for this report, each Provincial Heritage Resources Authority (PHRA) is requested to verify the datasets of formally protected resources recorded within each province, and specifically the database of Provincial Heritage Sites. The purpose of this verification is to ensure the accuracy of data, and to ensure that any additional declarations and other changes that may have occurred during the reporting period are accordingly reported to SAHRA.

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At the time of finalisation of this report, through the cooperation of the PHRAs, verification was received from the following authorities:

- Heritage Western Cape (HWC)
- Heritage Free State (HFS)
- KwaZulu-Natal Amafa and Research Institute (AMAFA)

5. Recorded Resources
5.1. Immovable Resources

Whilst the phrase "immovable heritage resource" is not defined within the National Heritage Resources Act, act 25 of 1999 (NHRA), we are utilising this term as a method to subsume the definitions of "Place", "Site", "Structure", and "Heritage Site", inclusive of any place, site, structure, or heritage site covered by water, as defined in section 2 of the NHRA.

Each immovable heritage resource, or site, recorded on SAHRIS, and therefore the inventory of the national estate, is designated by a specific site type, however for the purposes of summarisation and analysis the expanded site type taxonomy has been compressed to their principal term, for example, all rock art sites have been given the designation "Archaeological", similarly all transport infrastructure has been designated "Structures". The below shows the expanded taxonomy with the principal terms;

- **Archaeological**
  - Artefacts
  - Rock Art
  - Deposit
  - Shell Midden
  - Ruin > 100 years
  - Stone walling
  - Settlement
- **Living Heritage/Sacred sites**
- **Battlefield**
- **Burial Grounds & Graves**
- **Conservation Area**
- **Cultural Landscape**
- **Geological**
- **Meteorites**

- **Monuments & Memorials**
- **Natural**
- **Palaeontological**
- **Place**
- **Structures**
  - Bridge
  - Building
  - Transport infrastructure
- **Underwater**
  - Shipwreck
  - Submerged
  - -Intertidal
  - -Partially submerged
  - -Fully submerged

It is important to note that many sites are multi component and are therefore characterised by features of many of the site types listed above. For the purposes of this summary, only the principal type used during recording was retained. Further to this, as additional information becomes available about specific resources these types are refined or corrected to better characterise the resource.

Within the inventory of the national estate there are 50 735 recorded sites as at 31/12/2019 across all categories (figure 1). This is an increase of 591 sites when compared to period ending December 2018.
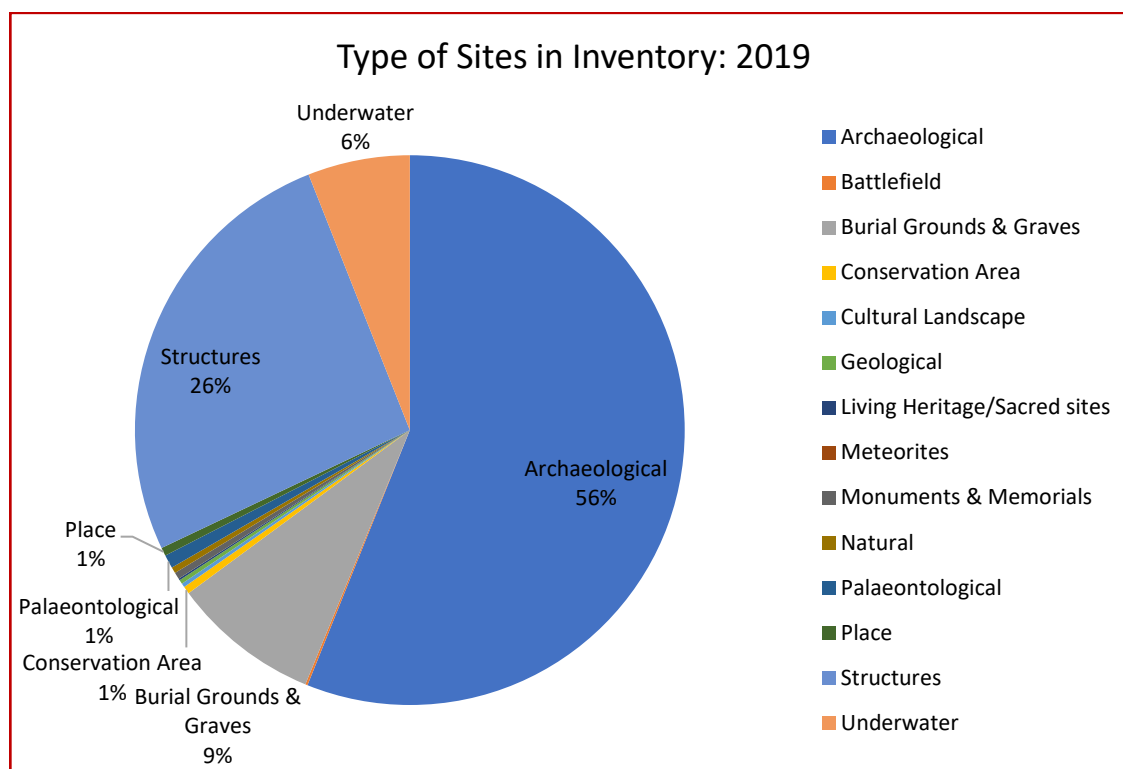
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Figure 1: Breakdown of types of sites within the inventory of the national estate

5.1.1. Shipwrecks and Maritime Heritage Resources

During the 2019/20 Operational year, SAHRA augmented its Maritime and Underwater Cultural Heritage (MUCH) Geographical Information System (GIS) with additional wreck coordinates. 829 shipwrecks in SAHRA's database (Figure 2) have been assigned coordinates in the GIS with a further 69 sites under the Reported wrecks and wreckage section having also been assigned coordinates. These records assist in the assessment of impacts to MUCH resources during offshore development and provide SAHRA with the opportunity to impose no-go areas around shipwreck sites to prevent disturbance. The MUCH GIS is now a fully functioning tool used for the assessment of development and permit applications made to the unit. This past year, the MUCH unit has also expanded its offering to include MUCH sensitivity mapping provided to developers and specialists on request.
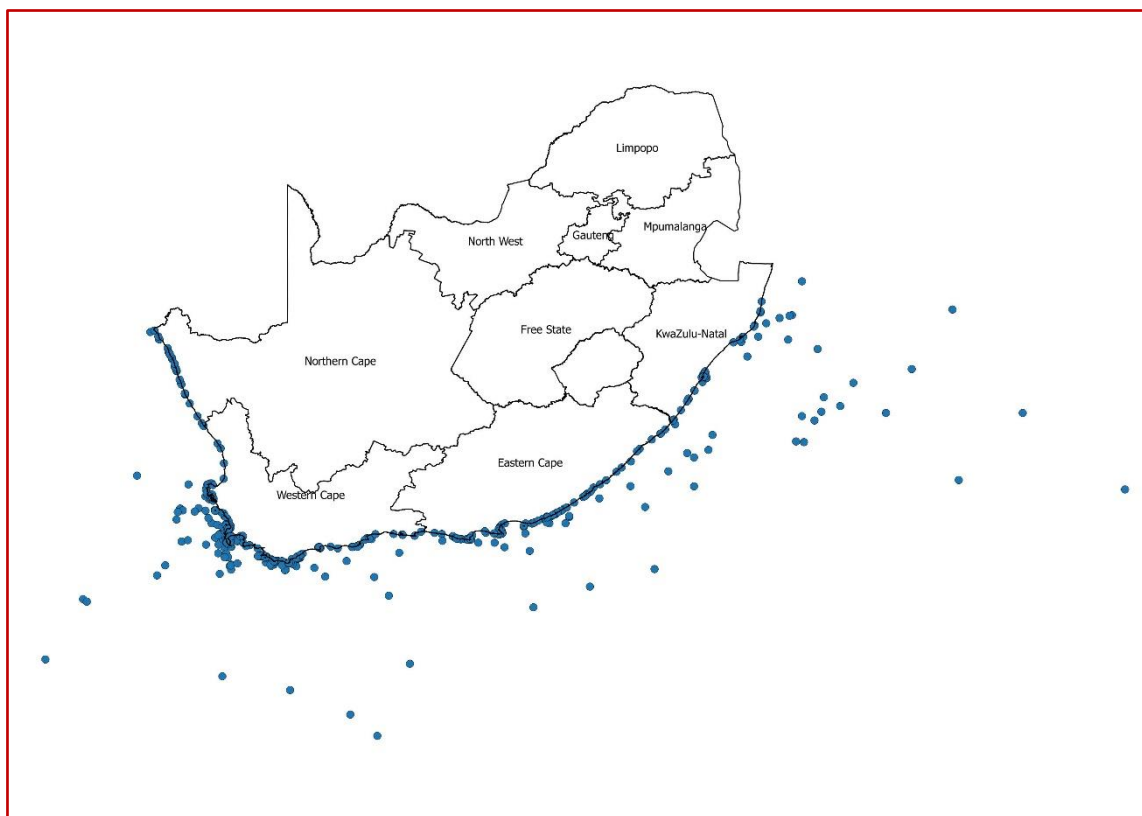
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Figure 3: Wrecks with coordinates

In June 2019, SAHRA's MUCH unit hosted its second field school through the University of Cape Town's (UCT) Archaeology Department at the Still Bay Fish Traps National Heritage Site. This year the unit employed handheld Global Positioning Systems (GPS) and managed to produce a complete map of the site through the efforts of the students and MUCH unit staff. This method was ultimately significantly faster and will allow the data to be collected more frequently, so that maps produced in future years can readily be compared to the 2019 map.

Also included in the GIS this year are non-shipwreck maritime heritage sites which had to date not been included in the MUCH database (Figure 4). These additional non-shipwreck sites are: Fish traps (63 sites), Mendi memorials (6 memorials) rock art images depicting ships (3 sites with an additional 4th identified but not located), inland lakes and rivers (1) and ship graffiti sites (1). These entries highlight the utility of the GIS not only to plot shipwreck sites but to also map all aspects of the sites covered under the MUCH remit.
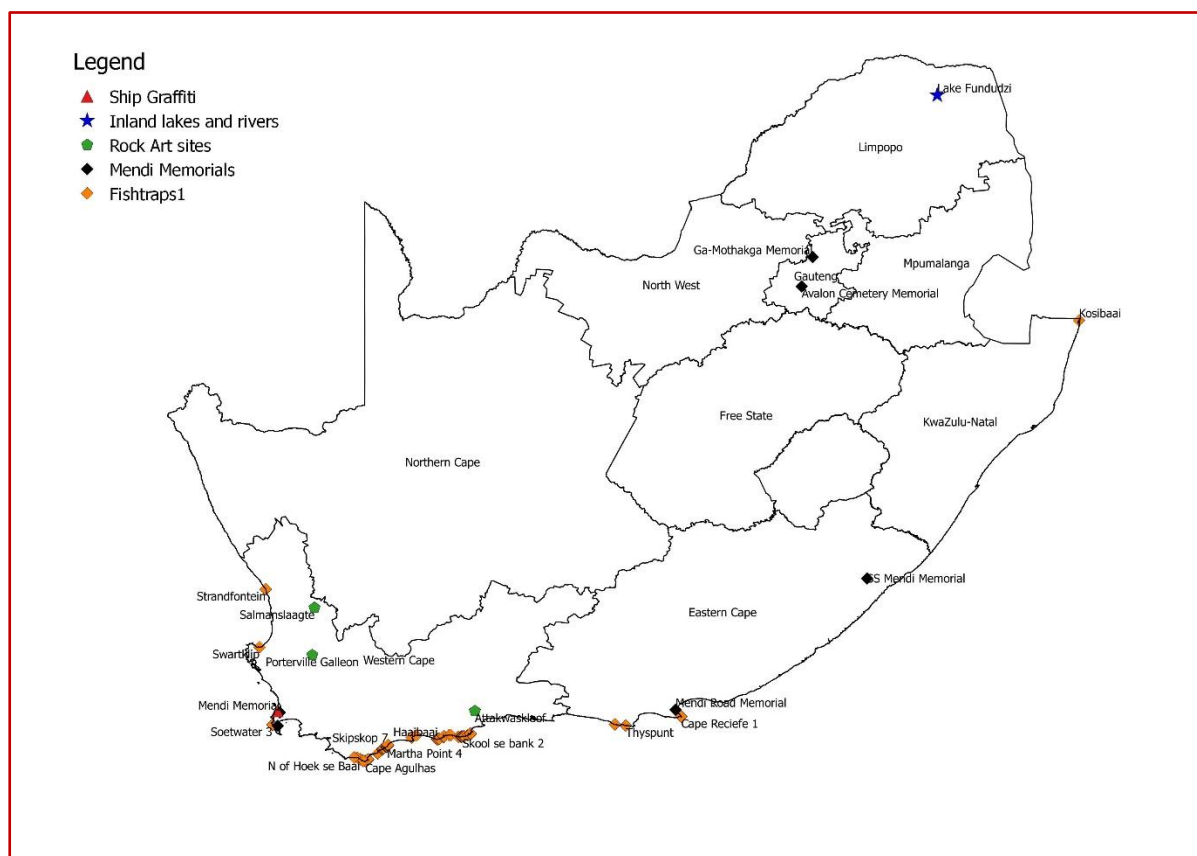
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Figure 5: Non-shipwreck maritime and underwater cultural heritage sites

In addition to work on the MUCH GIS this year significant effort was put into the Inventory of MUCH Resources through extensive database work which included the consolidation of shipwreck data with that of other types of MUCH sites, such as fish traps, rock art sites with a maritime theme, as well as a review of the categories and quality of data which allowed for substantial improvement in the utility of the database by removing duplicate and unpopulated entries that had existed since its inception. There were over 100 'unknown' wrecks which upon closer inspection yielded no useful information or were duplicates of other identified wrecks, these entries were extensively reduced.

It was noted that the database had too many columns which either duplicated information or held no relevant information. These fields were reduced in order to streamline the database which had become awkward to use. Some of the columns were also given drop down lists to populate them. Standardising the description made it easier to perform a search using a few key phrases.

The MUCH GIS is an ongoing project and plans include expansion of the existing collection of 3D photogrammetry models, and verification and further documentation of fish traps and shipwreck sites.

5.2. Movable Resources

Heritage objects are any movable objects of cultural significance which may be protected in terms of the NHRA. Heritage Objects are diverse in nature such as archaeological artefacts, beadwork, artwork, firearms, sculptures, furniture, documents and include objects associated with events and leaders in the history of South Africa.

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Heritage Objects may be publicly or privately owned, and some have financial value. For some, heritage objects are commodities to be traded with and sold to the highest bidder. It is the owner's right to sell heritage objects within South Africa. However, due to the exchange rate, owners frequently prefer to sell their objects to overseas buyers.

Heritage Objects that are protected are described on the List of Types of Objects which are incorporated into the South African Revenue Services' Prohibited and Restricted List. It is illegal to export a heritage object without a valid permit from SAHRA, and to do so is considered to be illicit trafficking, the owner is liable to a fine or imprisonment or both in terms of the Act.

There is regular online sale of South African heritage objects that were illegally exported. Provenance and information about the auction house are withheld that presents with challenges to communicate with the dealer and to report such cases to the SAPS. SAHRA is aware of this and we are working with the SAPS to investigate the illegal export of the objects. The South African Heritage Resources Information System (SAHRIS) has been enabled to serve as statistics to record stolen objects. Other heritage related crime is also reported to SAPS.

SAHRA works with both the South Africa Police Service and South African Customs to ensure that such exports are not only stopped, but that heritage objects which have left the country are returned to South Africa.

South Africa is a signatory to several Conventions, including both the UNESCO Convention on the Means of Prohibiting and Preventing the Illicit Import, Export and Transfer of Ownership of Cultural Property (14 November 1970) and the UNIDROIT Convention on Stolen or Illegally Exported Cultural Objects (24 June 1995). These are important instruments that would be used to combat illicit trafficking.

This also highlights the necessity of effective recording of heritage objects. Both the UNESCO and UNIDROIT conventions require that objects are properly described and entered an inventory, with the UNESCO convention specifically requiring that the objects are entered into a national inventory. It is to this end that all heritage objects residing with state and state supported bodies are required to provide databases on heritage resources in their control to SAHRA.

The data present in the inventory of the national estate on heritage objects is still developing as agreements are entered into with institutions for the use of SAHRIS to manage or report their collections, as well as objects loaded onto the system for the purposes of permitting.

As at the end of 2019 there are 55 543 objects recorded in the inventory of the national estate, which is an increase of 2 562 when compared to year end 2018.

As noted in the 2018 report, there is currently no mandated nomenclature through which objects are required to be classified other than the recently gazetted List of Types (LoT). The categorisation of objects according to this will need to be undertaken in future years.

Having noted the above, SAHRIS does integrate the Chenhall System of classification which does allow for the voluntary classification of objects within that schema, however, only 14% of the objects within the inventory are categorised within this framework. Whilst we have provided a breakdown of the classified objects, it should not be interpreted as representative of the types of objects present within the wider inventory as it is only presented here for informational purposes.

The Chenhall system of classification is a multi-tiered nomenclature, as such the below chart has been produced using only the first-tier classifications for ease of digestion and visualisation.

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- Maritime and Underwater Cultural Heritage
- Heritage Objects
- Burial Grounds and Graves
- Built Environment
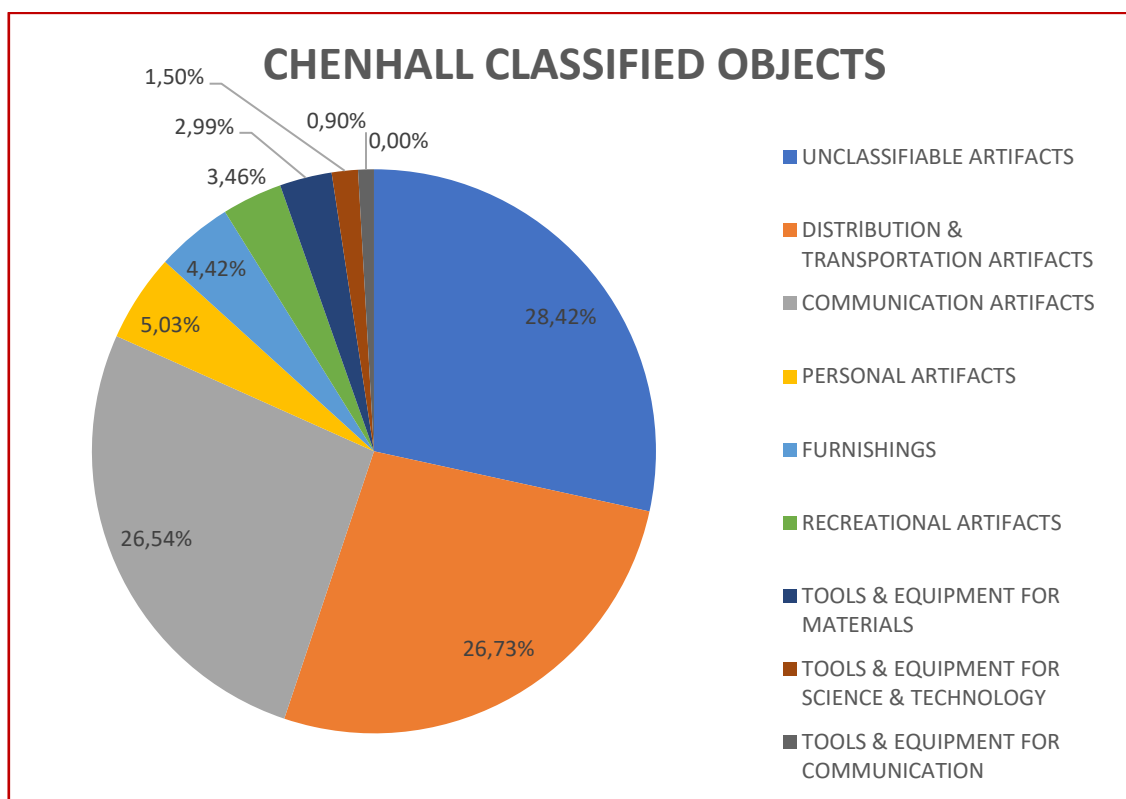- Heritage Protection
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Figure 6: Breakdown of objects classified according to the Chenhall nomenclature

6. Declared Resources

SAHRA, a PHRA, or any member of the public can identify places or objects with special significance to the nation, province or community and nominate them for declaration. The process of declaration is to provide recognition and ongoing protection of the values and qualities that provides this significance.

6.1. National Heritage Sites

SAHRA is tasked with the identification of places with qualities so exceptional that they are of special significance to the nation. Declaring these places as National Heritage Sites is a formal mechanism to recognise and protect the authenticity and integrity of nationally, and often universally, significant cultural heritage resources.

The below graph charts the declaration of National Heritage Sites since the first declaration under the NHRA in 2002. Like the discussion on the overall content of immovable heritage resources recorded in the inventory, the National Heritage Sites have been categorised and summarised according to the standard taxonomy employed within the inventory. It is important to note, that decisions regarding the accounting of the number of National Heritage Sites represented in this report are based on principals of locality rather than colloquial groupings. For example, the Barberton Makhonjwa Mountains National Heritage Site comprises of 51 individual sites, however these are centred around 4 key localities, thus in the charts below represent the inclusion of the 4 localities rather than the 51 individual sites.
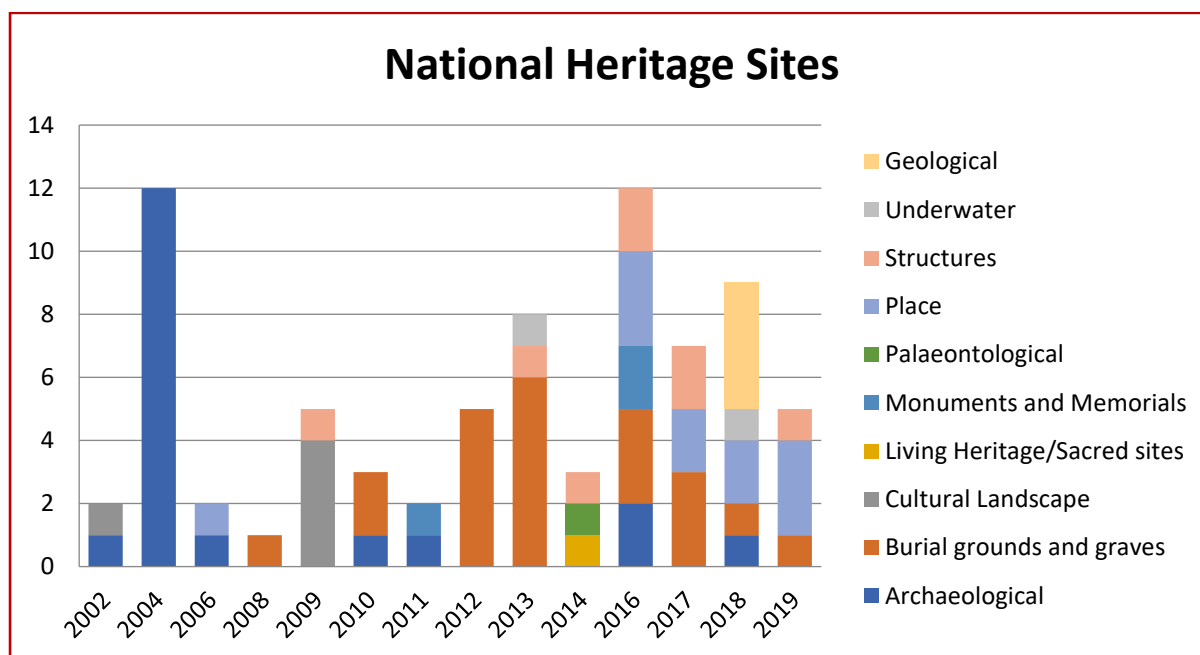
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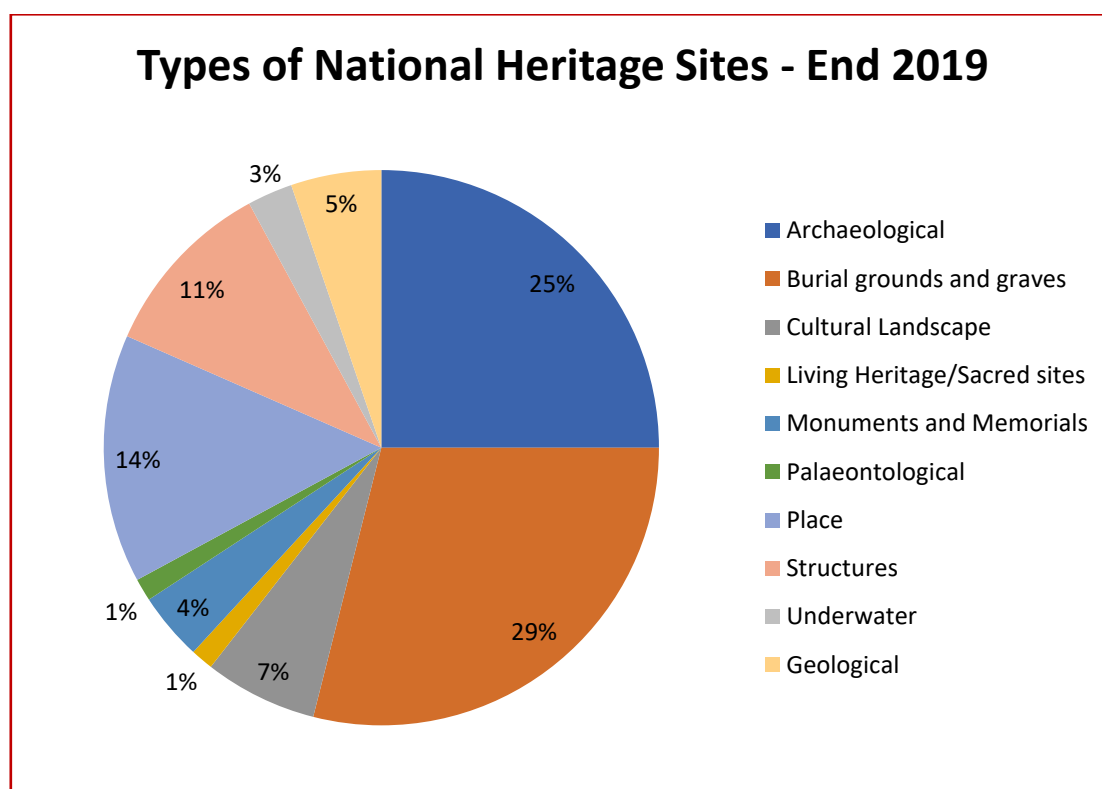*Figure 7: National Heritage Sites declared per year*

Figure 8: Types of National Heritage Sites

6.2. Specifically Declared Objects/Collections

Certain types of heritage objects or collections of heritage objects which are special, unique or endangered may be Specifically Declared. Any member of the public may nominate an object or

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collection for declaration; however, this declaration can only be carried out by SAHRA and cannot be performed at a provincial level.

Under the National Monuments Act (Act no. 28 of 1969) objects and collections could be declared as national monuments and cultural treasures. In terms of the NHRA, all previously declared movable national monuments and cultural treasures are heritage objects.

Figure 8 shows the number of objects/collections declared between 1936 and 2019. Noting that no heritage objects have been declared within the 2019 calendar year Currently, there are 45 specifically declared heritage objects/collections.
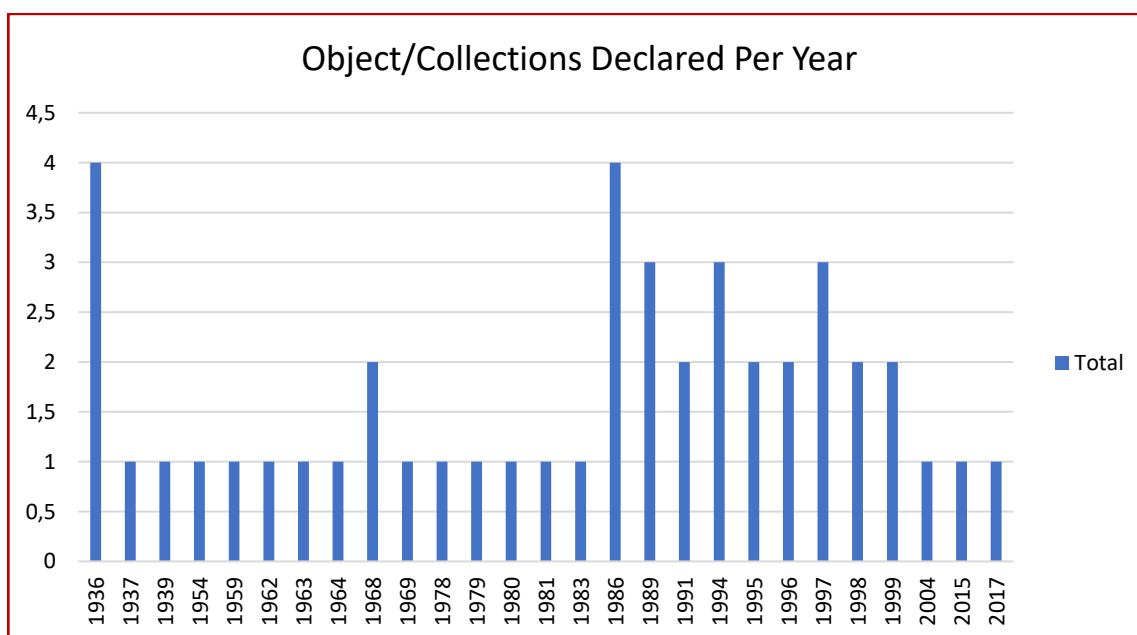

Figure 9: Objects/Collections declared per year

6.3. Provincial Heritage Sites

In order to compile this report, all Provincial Heritage Authorities were requested to verify the datasets present within the inventory of the national estate in order to ensure accuracy of data as well as the inclusion of any new sites declared within the 2019 calendar year.

As with the 2018 report, many of the provincial authorities either did not respond to the call for verification or were unable to verify the datasets supplied to them. In order to mitigate this, the National Inventory Unit has been undertaking a mapping and verification exercise, a project has already yielded results with the Free State and Mpumalanga Provinces. This project will be discussed in greater detail later in this document.

Variations within the data may occur year on year due to several factors such as corrections established through the verifications, ongoing moderation projects and the declaring of Provincial Heritage Sites as National Heritage Sites.

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6.3.1. Western Cape

Heritage Western Cape have provided verification on the supplied dataset of Provincial Heritage Sites within the Western Cape recorded in the inventory.

Figure 10 (below) presents the types of sites declared per year since the earliest phase of formal protections imparted in 1936 through to present day, providing a total of 1 286 Provincial Heritage Sites, the largest sum of PHS's in the country.
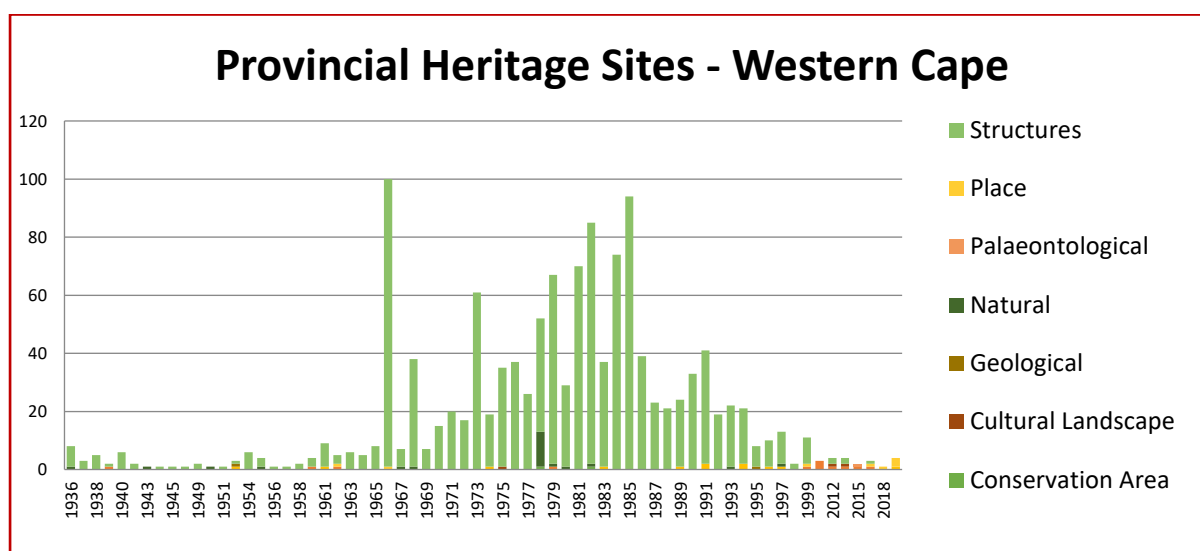

Figure 10: PHS's in the Western Cape by year and type

As Heritage Western Cape has been actively engaged in a process of assessment and declaration, the diversity of sites declared is more diverse than that of the years preceding the formation of the provincial authority. Figure 11 shows more clearly the focus on sites within the built environment prior to the formation of Heritage Western Cape. Figure 12 shows the diversity of declarations that have occurred since the promulgation of the NHRA and the formation of the provincial authority.
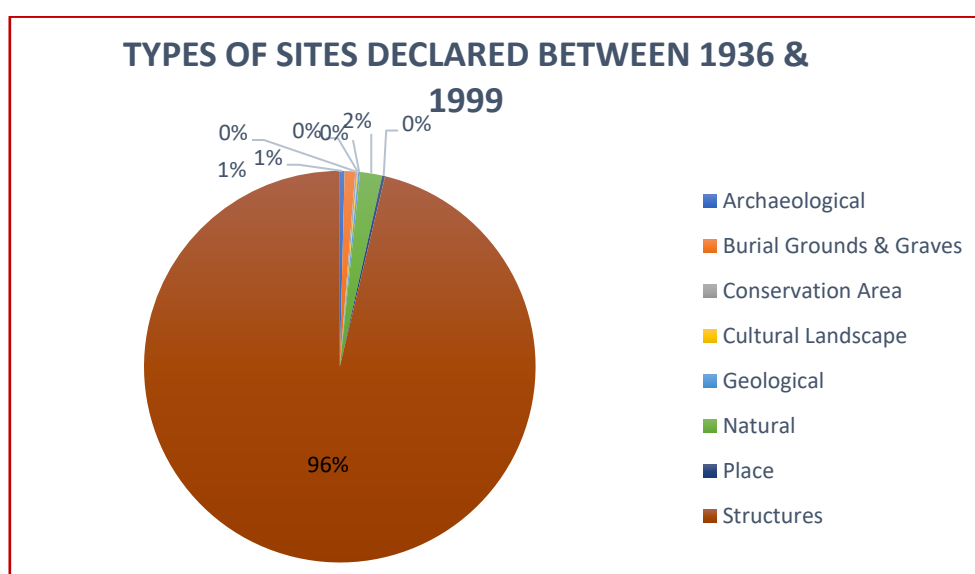

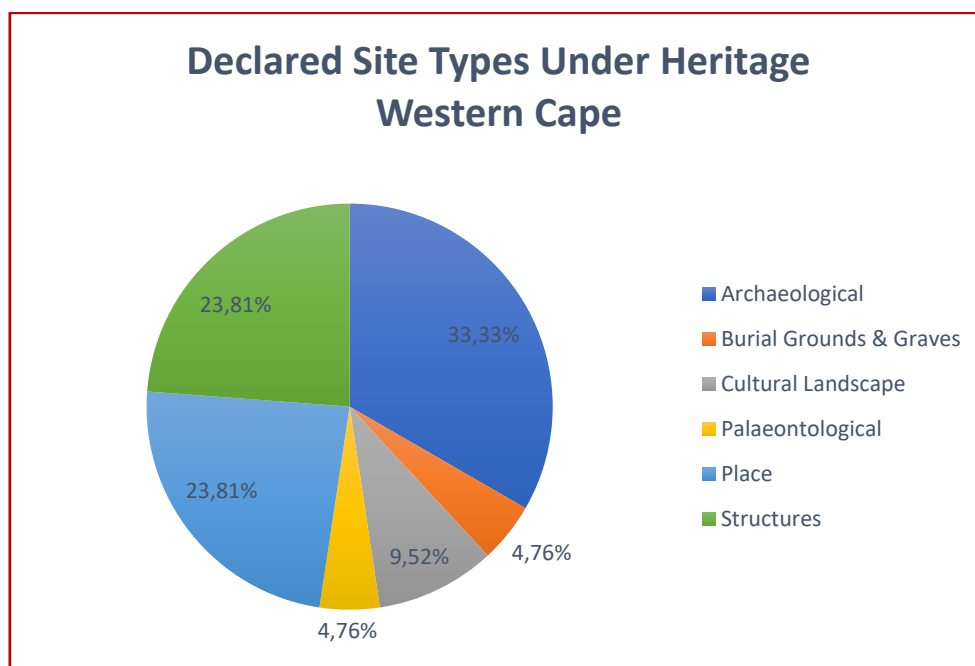*Figure 11: PHS site types declared prior to the National Heritage Resources Act*

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Declared Site Types Under Heritage Western Cape

Figure 12: PHS site types declared post promulgation of the National Heritage Resources Act

6.3.2. Free State

Heritage Free State has provided verification of the dataset supplied to them; we have also been informed of an intended physical verification of all Provincial Heritage Sites within the coming financial year. This endeavour is invaluable for ensuring accuracy of data as well as the ongoing monitoring of the condition of the sites.

The chart below shows the breakdown of all 158 Provincial Heritage Sites in the Free State, inclusive of those declared under previous legislation.
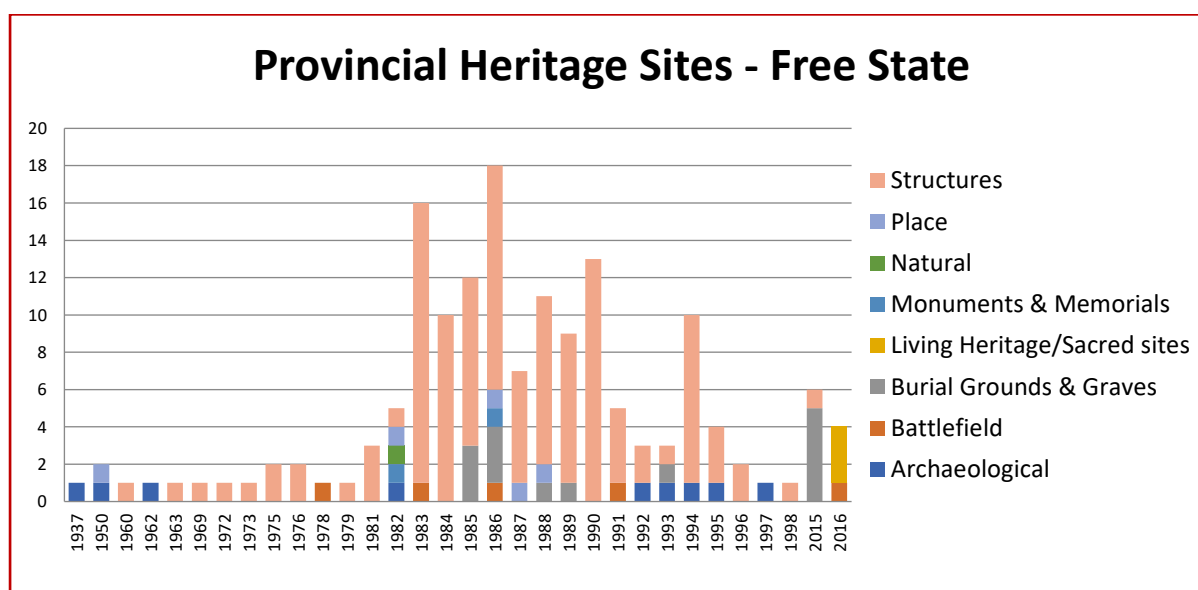
Provincial Heritage Sites - Free State

Figure 13: PHS's in Free State by year and type

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As Heritage Free State has actively engaged in a process of declaration under the National Heritage Resources Act, Act 25 of 1999, the types of sites shown above are not reflective of the shift of sites types declared under the National Monuments Council and its predecessors (Figure 11), and those declared under Heritage Free State (Figure 12). From these figures, a distinct shift in terms of diversity of sites can be seen through the shift in focus from structures to burial grounds and sites relating to living heritage/sacred sites.
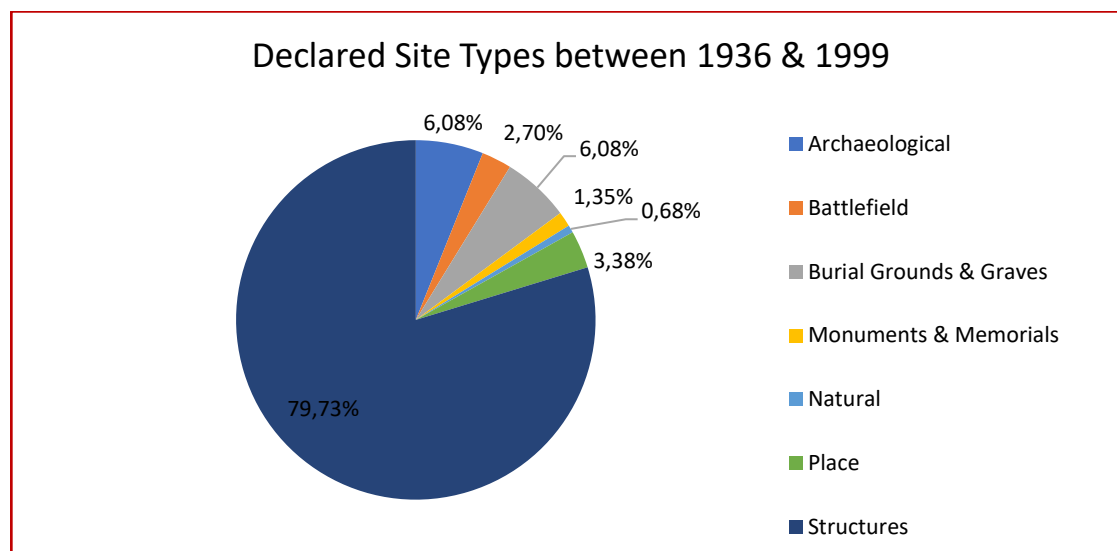

Figure 14: PHS site types declared prior to the National Heritage Resources Act in the Free State
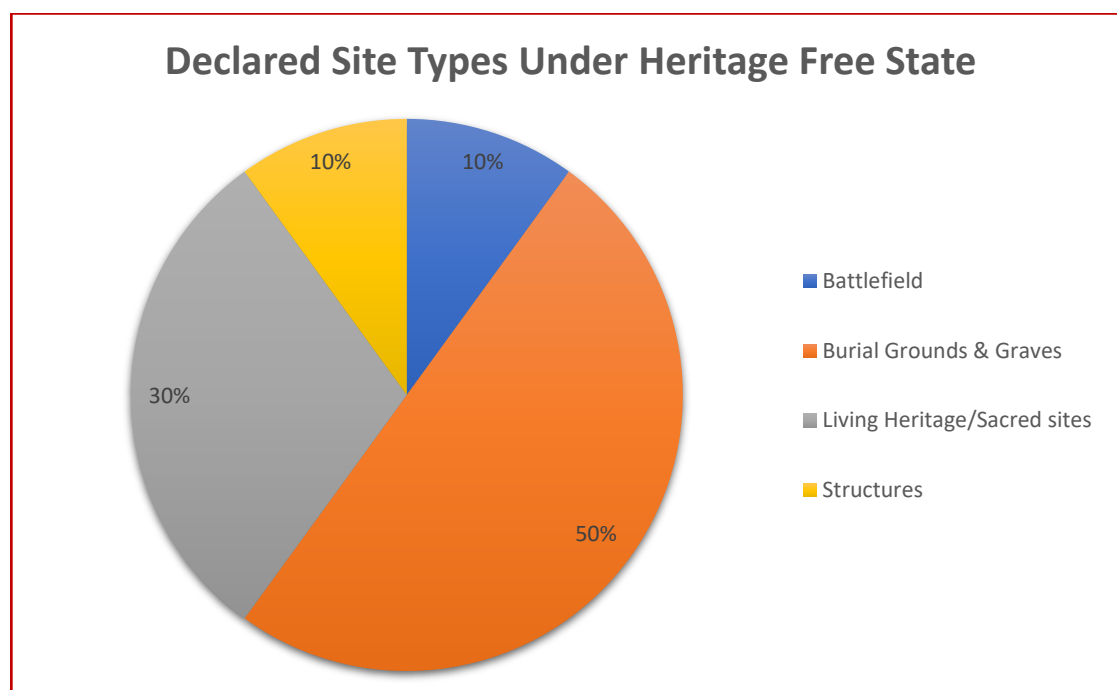

Figure 15: PHS site types declared post promulgation of the National Heritage Resources Act in the Free State

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6.3.3. Limpopo

The Limpopo Heritage Resources Authority did not provide verification of data sets available within the inventory of the national estate, thus the status quo concerning the validity of the database of 24 declared Provincial Heritage Sites remains as is. This dataset will however be subjected to the same programme of mapping and verification as noted in section 6.2 of this report.
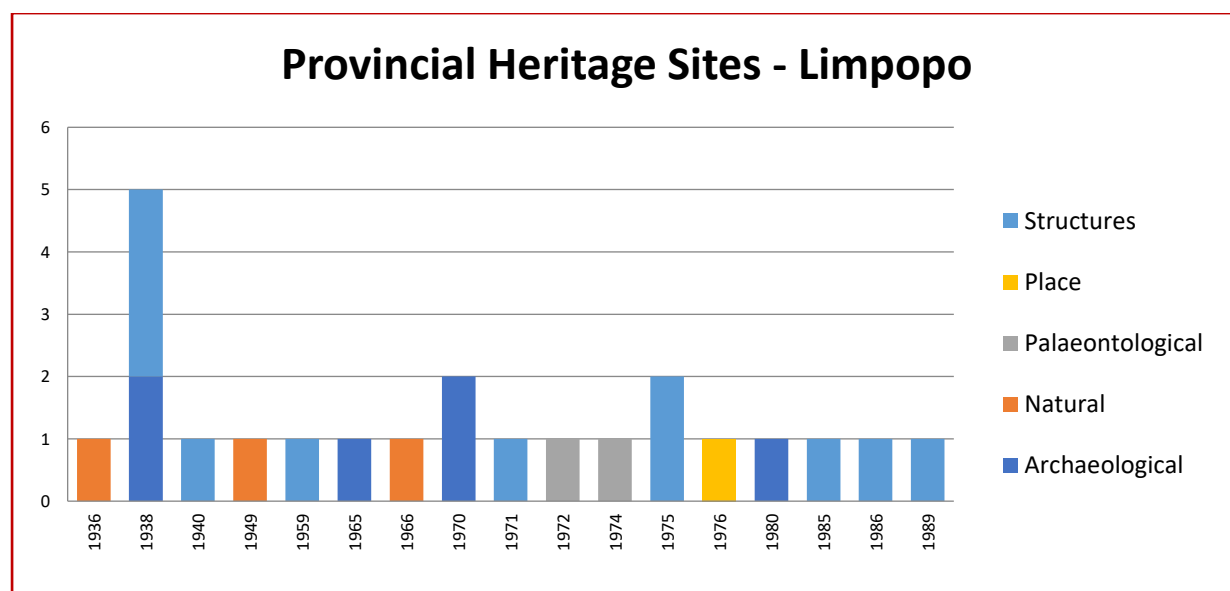

Figure 16: PHS's in Limpopo by year and type

6.3.4. North West

The North West Provincial Heritage Resources Authority did not provide a verification of the database of declared resources in their province, however a verification was supplied in the in respect to the 2018 summary and analysis report. As no new declarations have been reported to SAHRA, the status quo of 51 declared sites remains as per figure 14.
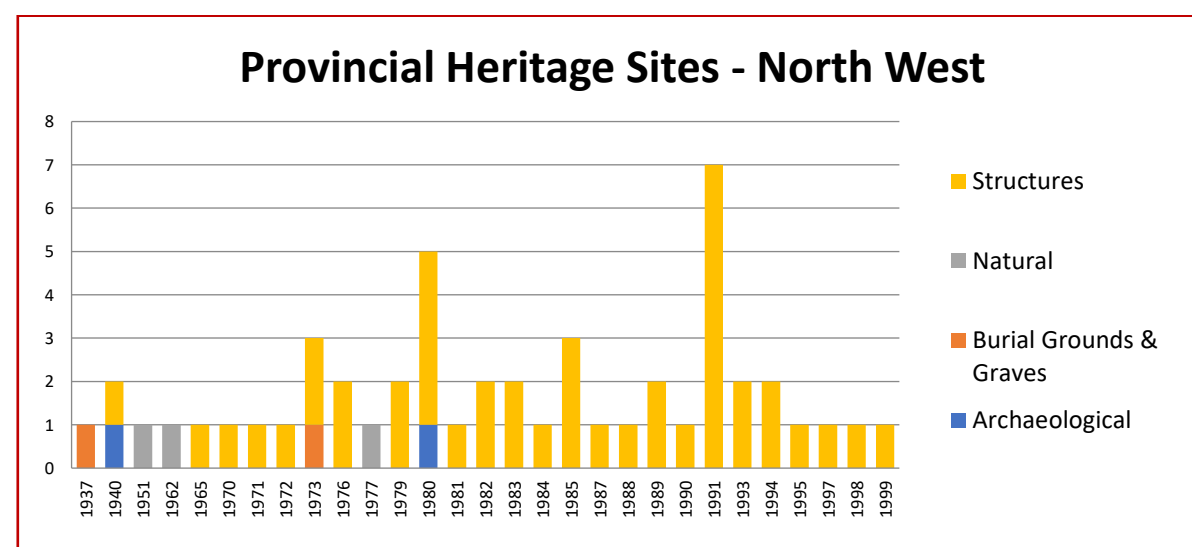

Figure 17:PHS's in the North West by year and type

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6.3.5. KwaZulu Natal

KwaZulu Natal presents a different mode of operation to that of the rest of South Africa in that they operate under their own provincial legislation for the management of heritage resources, namely, the KwaZulu-Natal AMAFA and Research Institute Act, Act No. 5 of 2018 (KZNARIA). Due to this, the KwaZulu-Natal Amafa and Research Institute (AMAFA) do not engage in a practice of formal declaration as per section 27 of the NHRA, rather, the KZNARIA makes provision for the designation of Heritage or Provincial Landmark status on sites depending on the ownership of the property.

Heritage and Provincial Landmarks are recorded within the provincial schedule of specially protected sites as required under section 43 of the KZNARIA. According to the schedule published in KwaZulu Natal Provincial Gazette 2029 (14/12/2018). There are 289 sites listed within the schedule, of which 271 were under formal protection as a Provincial Heritage Site or other recognition such as a Heritage Register.

When we examine the sites that are declared Provincial Heritage Sites (84% of the total population) a clear bias is shown towards the built environment
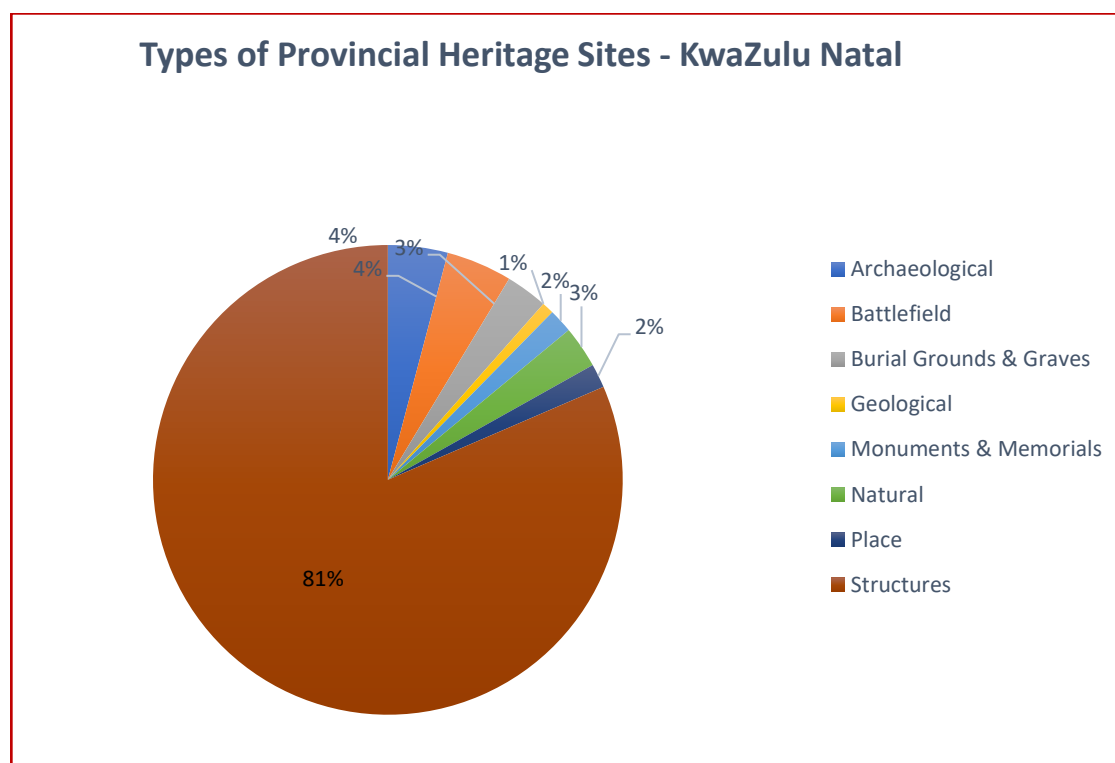

Figure 18: PHS's in KZN schedule of protected sites

In comparison to figure 18 above, the sites included in the schedule that were not formally declared as Provincial Heritage Sites (former National Monuments) are far more diverse in their nature
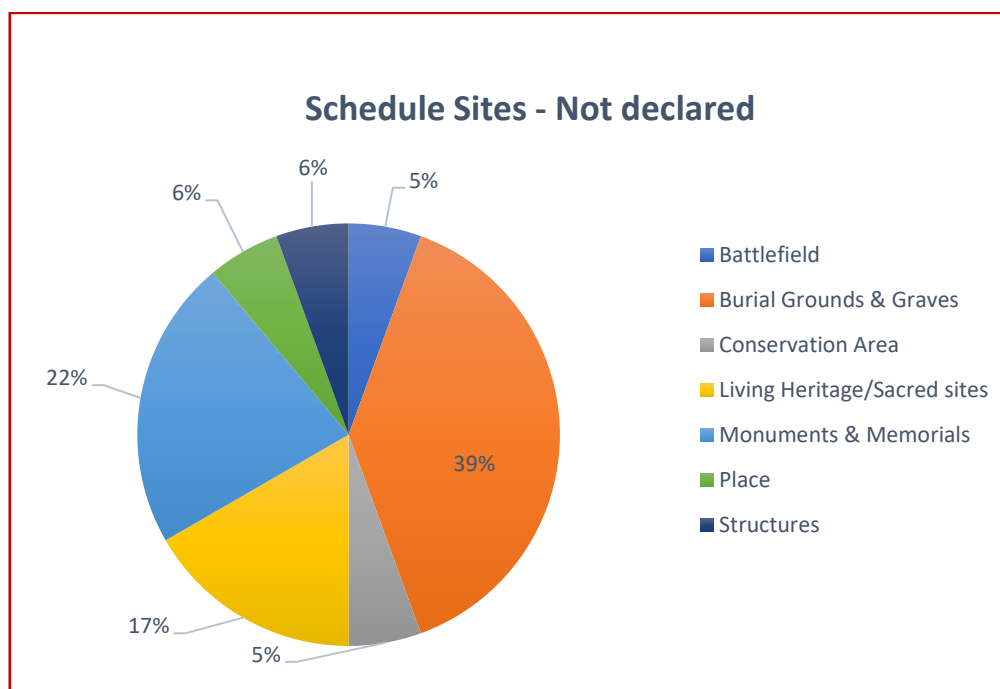
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Schedule Sites - Not declared

Figure 19: Schedule sites not formally declared

6.3.6. Northern Cape

The Northern Cape Provincial Heritage Resources Authority, also known as Ngwao-Boswa Jwa Kapa Bokone (NBKB), have not supplied a verification of datasets. Without further verification or notification of additions, the baseline of 173 Provincial Heritage Sites remains.

The Northern Cape has been targeted by SAHRA as one of the targets for the 2020/2021 leg of the Provincial Heritage Site mapping project. Through this SAHRA will engage with the inventory and provide accurate mapping.

NBKB has previously engaged in a process of declaration under the NHRA, this resulted in the declaration of one archaeological site in 2008, namely, the Wildebeest Kuil Rock Engraving site.
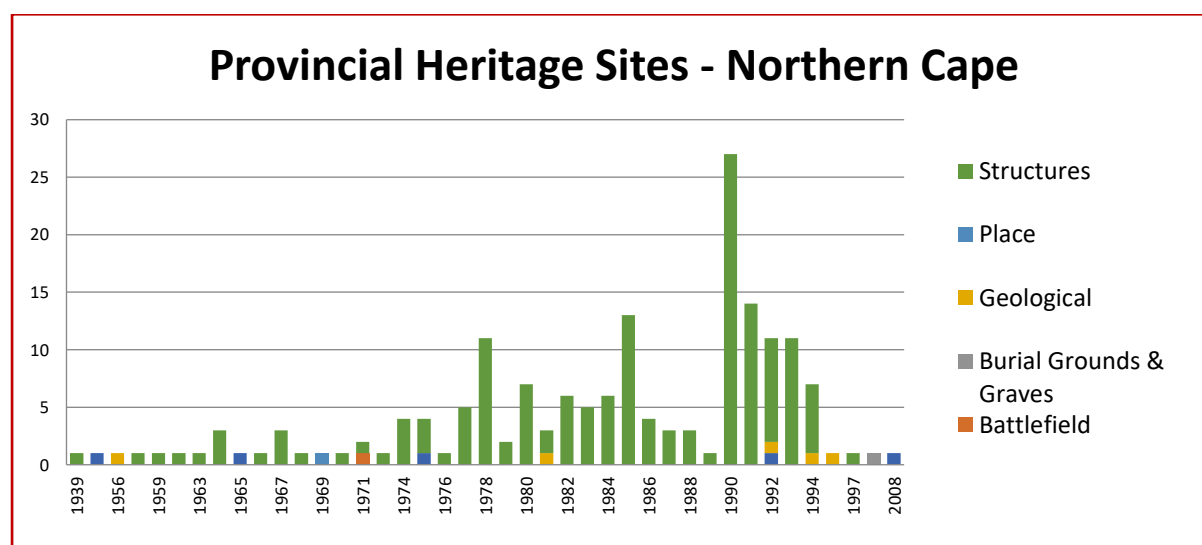
Provincial Heritage Sites - Northern Cape

Figure 20: PHS's in the Northern Cape by year and type

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6.3.7. Eastern Cape

The Eastern Cape Provincial Heritage Resources Authority (ECPHRA) have not supplied a verification of datasets supplied to them, nor has there been any additional data supplied to SAHRA for inclusion in the inventory of the national estate, thus the status quo of 587 Provincial Heritage Sites remains.

To rectify identified issues in the available location data present in the inventory, SAHRA will be engaging in a process of location and boundary mapping within the 2020/2021 financial year.
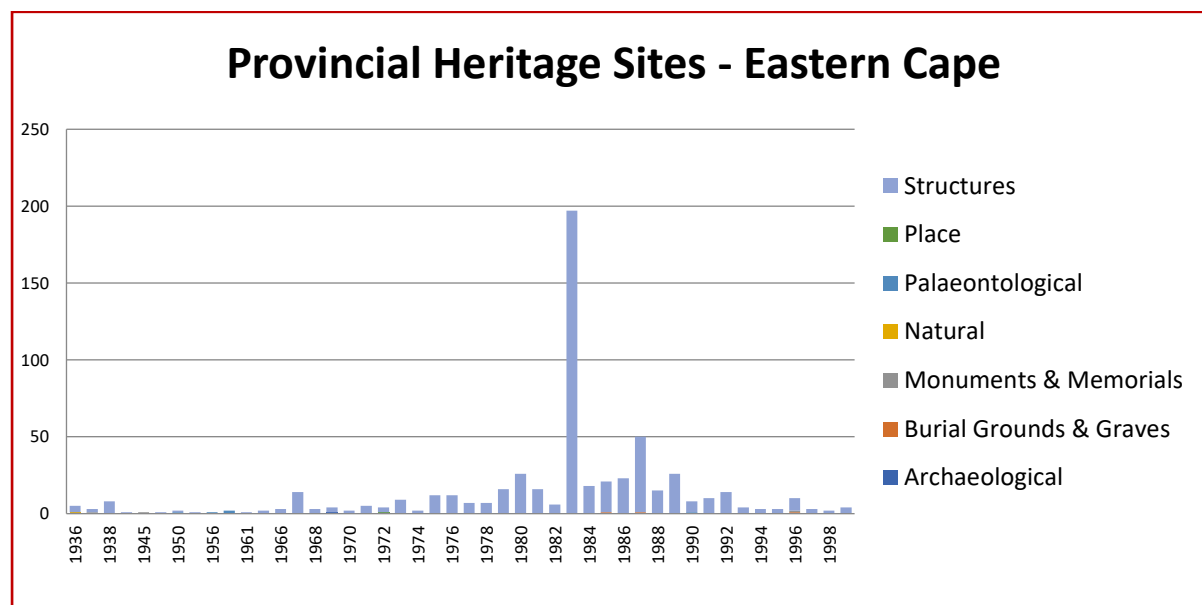

Figure 21: PHS's in the Eastern Cape by year and type

6.3.8. Mpumalanga

The datasets supplied to the Mpumalanga were not verified, however SAHRA, through the National Inventory Unit have undertaken a process of examining the Mpumalanga datasets and providing more accurate mapping and boundary data to aid in further management. However, without a full verification or notification of additional declaration, the previously reported 52 PHS's remain (figure 15).
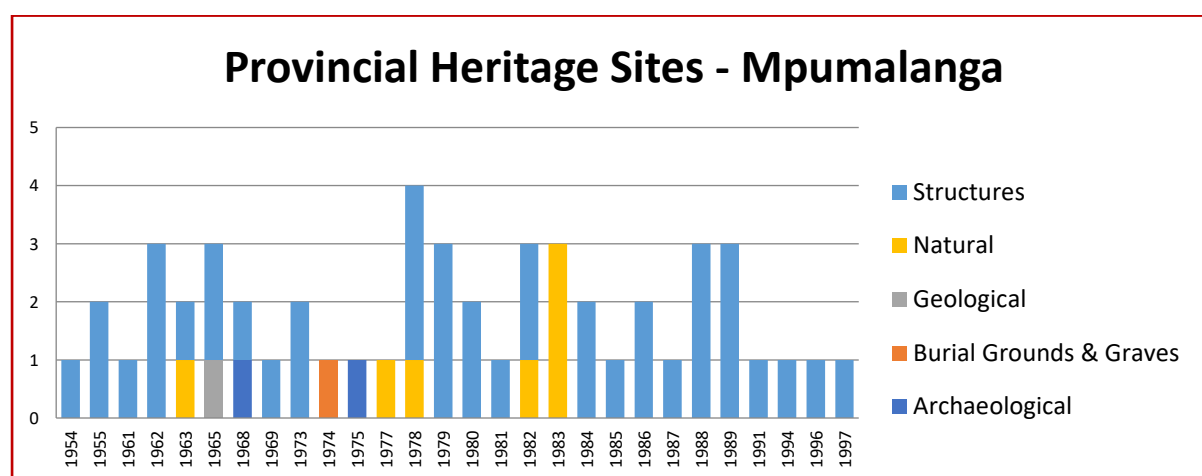

Figure 22: PHS's in Mpumalanga by year and type

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6.3.9. Gauteng

The Gauteng datasets have not been verified, thus the baseline of 181 Provincial Heritage Sites remains as stated in the 2017 report. A wider verification and categorisation exercise will need to be undertaken in regards to the inventory of formally protected resources in Gauteng prior to the provision of a post 2000 breakdown, as has been provided for the previous provinces discussed. As the post 2000 gazette notices declaring the resources do not provide a statement of significance, this raises a concern as to the categorisation of the declared sites.
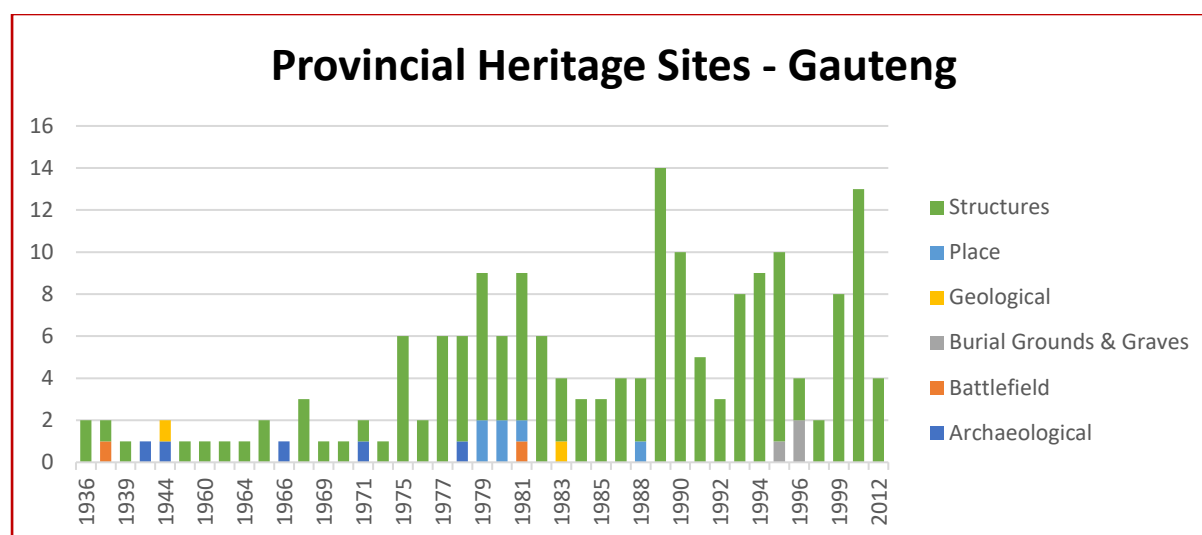

Figure 23: PHS's in Gauteng by year and type

7.   Projects to Populate the Inventory of the National Estate
7.1. Heritage Impact Assessment Extraction Project

The population of the Inventory of the National Estate can be achieved through a variety of means, including short term projects such as the existing Heritage Impact Assessment Extraction Project.

The information required by SAHRA to populate areas of the inventory with sparse coverage can be extracted from the Heritage Impact Assessments that are part of the Section 38 process, as well as other documents such as heritage resources management plans that are submitted to SAHRA. The identified resources are however still "locked" within the documents and require extraction onto SAHRIS in order to be usable for the purposes of populating the inventory of the national estate. We estimate that the data contained within these reports has the potential to increase the number of sites recorded in the inventory by over 400%.

SAHRA's National Inventory Unit has been undertaking a programme to extract this data into the inventory of the national estate. A project which has thus far has resulted in 3 internship opportunities and the capture of 576 sites into the inventory of the national estate.
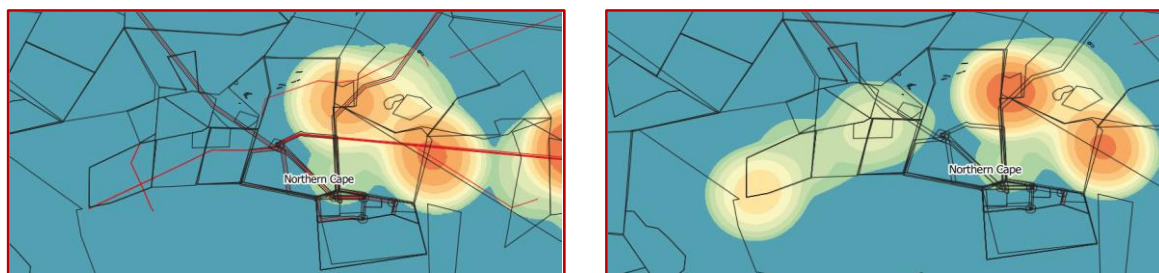
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Figure 24: Density of heritage resources before extraction (left) compared to after extraction (right)

7.2. Provincial Heritage Site Mapping Project

Having noted the challenges regarding the verification of data sets supplied to Provincial Authorities. SAHRA has undertaken a project to re-examine all Provincial Heritage Site records within the inventory in order to verify location data as well as record the boundaries of those sites as per the declaration.

This process has entailed the comparison of historical property boundaries with modern erven, digitisation of surveyor diagrams, and archival research. This has led to the demarcation of numerous declared heritage sites, as well as the rectification of declarations that may have been incorrectly categorised in the historical data bases that were used to populate the modern national inventory database.
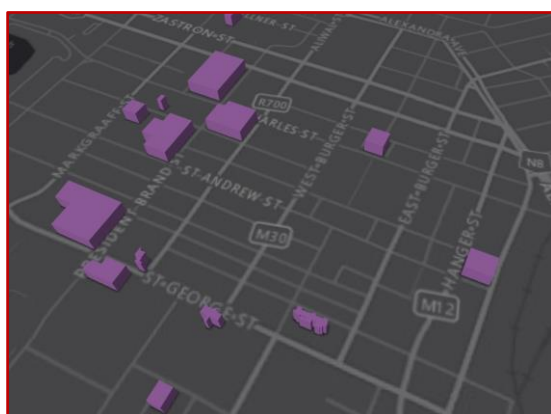

Figure 25: Selected Provincial Heritage Sites mapped in Bloemfontein – Free State
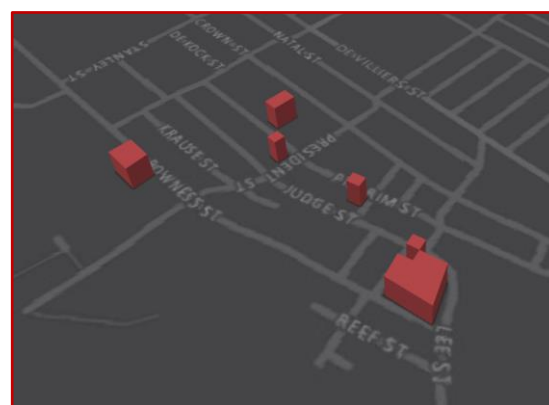

Figure 26: Selected Provincial Heritage Sites mapped in Barberton – Mpumalanga

As at the end of 2019, Free State and Mpumalanga provinces have been undertaken. Currently the mapped sites are undergoing a process of quality control and will become available on SAHRIS as this is completed.

7.3. 3D modelling Project

In order to supplement the documentation available on resources held within the inventory of the national estate, SAHRA has begun a process of generating 3D photogrammetric models of selected resources. These models form a baseline for the assessment of condition going forward, in addition these models can be used to provide public access to resources that are not readily assessible due to access limitations or conservation concerns, as well as serving as a permanent record of a resource should it be damaged, destroyed, or otherwise altered.

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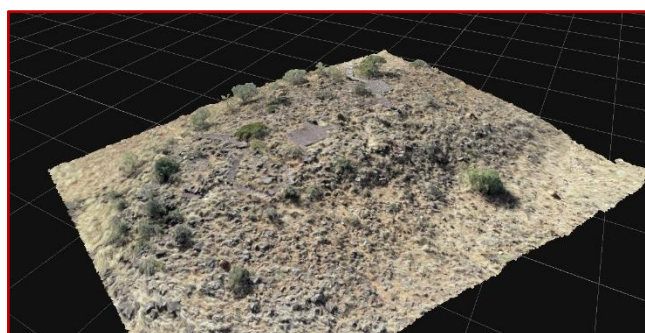HERITAGE
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Figure 27: 3D model of Wildebeest Kuil PHS - Northern Cape
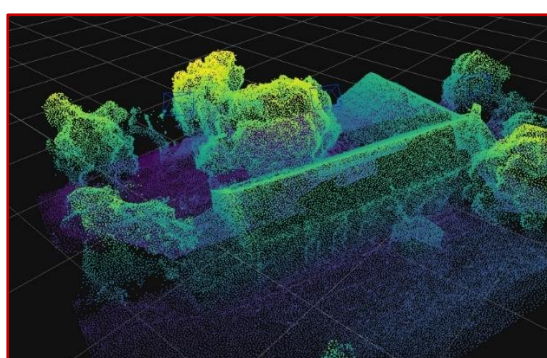

Figure 28: 3D model of Onderdal School PHS – Western Cape (Point cloud left, textured model right).

Figure 29: 3D model of heritage object housed at Onderdal School PHS

8. Heritage Inventories and Risk Management

Within the 2018 Summary and Analysis of the National Estate, we used the data present within the inventory of the national estate to compile models identifying heritage resources existing with areas that are susceptible to a variety of hazards such as Veld fire, flooding and uncontrolled development.

The purpose of this exercise was to illustrate the importance of heritage inventories as an effective tool for risk management, a concept which is well understood within heritage inventory discourse (Meyers, 2016). However, these models did not however take an integrated approach that encompassed the acknowledgement of how these hazards may impact on the movable heritage that

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may be stored within and around these spaces. In order to address this, the following discussion will cover the integration of movable heritage within the risk management framework.

It is important to note that very little data currently exists concerning the placement of movable heritage within formally declared spaces. Due to this paucity of data we have elected to use data on identified museums in South Africa as provided to us by the South African Museums Association (SAMA). An important consideration in the use of this data is the accuracy of location provided. Much of the data was not georeferenced, with only street addresses or rough descriptions applied. In order to counter this limitation, the dataset was subjected to an automated process of geocoding through the Google Maps API. Whilst this did produce a series of usable coordinates for each of the identified museums, we do not guarantee the pin-point accuracy of the location, especially where an exact street address in a machine-readable format was not available. Ultimately, the total population used in the analyses that follow is 461 identified museums.

8.1. An Integrated Approach to Risk Management for Heritage Resources

As with the 2018 report, the population of identified museums were overlaid against risk map products produced by the Council for Scientific and Industrial Research (CSIR) and South African National Space Agency (SANSA) in order to identify potential hazard factors.

Whilst it is imperative that these hazards are acknowledged, the identification and management of risk requires that the unique situation for each of these museums is properly understood, as the compilation of risk analyses requires that the interplay between the hazard and the affected resource's vulnerability and exposure to that hazard are understood.

The ISO 31000 standard on Risk Management Principals and Guidelines identifies essentially five steps within the integrated risk management process, these being; identification of hazards and threats, assessment of the vulnerability that critical components have to the threat, determination of the risk, identification of risk reduction methods, and the prioritisation of risk reduction measures (ISO, 2019; Chmutina, 2019).

Figures 27 and 28 below show an initial mapping analysis to understand hazards that have a potential to impact on the identified museums. These mapping exercises, whilst useful for the identification of hazards, do not however present sufficient data elements to sufficiently understand the potential risk to the heritage resources contained within, are more specifically, the impact a potential hazard may have on the values associated with the heritage resource. In order to properly assess the risk facing these institutions a more nuanced approach is required.

Having noted that a nuanced approach to risk identification is required, the initial hazard identification is a vital first step in the risk management process.

Figure 27 below is based on the South African National Space Agency (SANSA) potential flood map which utilises river channels as a zero point for elevation (SANSA, 2015). This shows that 6.7% of the identified museums fall within the modelled 5-meter flood region. An important note to this dataset is that this excludes potential flooding events that occur in urban areas such as those that occurred within Johannesburg in 2016 (see Mkhulisa, 2017).

The risk imposed by flooding is both direct and indirect in nature. This means that heritage objects housed within affected spaces may be subjected to water-based degradation through both direct

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physical means as well as secondary impacts associated with moist conditions and the impact of potential flooding on the affected structure in which the museum resides (Stovel, 1998).
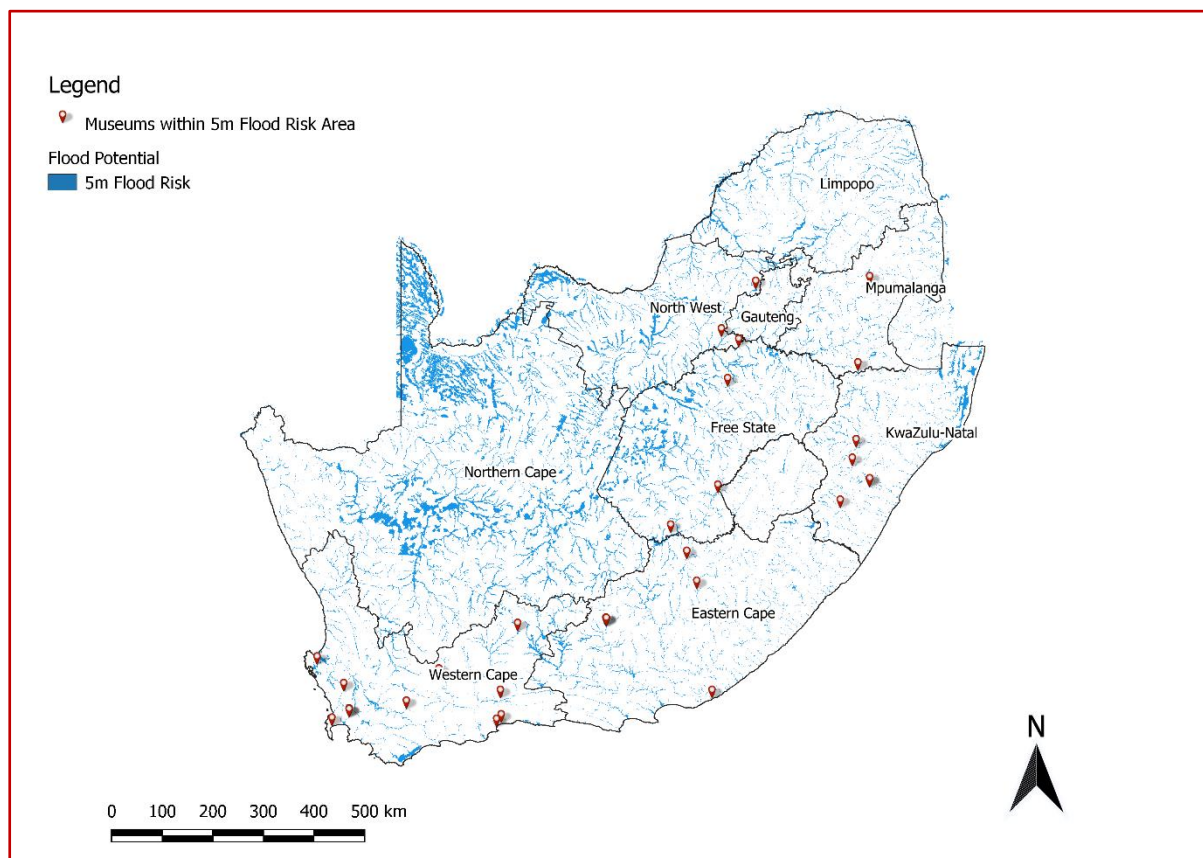

Figure 30: Flood hazard analysis

Figure 28 shows the identified museums as compared to the national veld fire risk report for South Africa produced by the CSIR (Forsyth et al, 2010).

Fire causes both direct and indirect damage to heritage resources. This may be through the destruction of sites or objects, or secondary damage from smoke, heat or water damage from firefighting efforts (Stovel, 1998).

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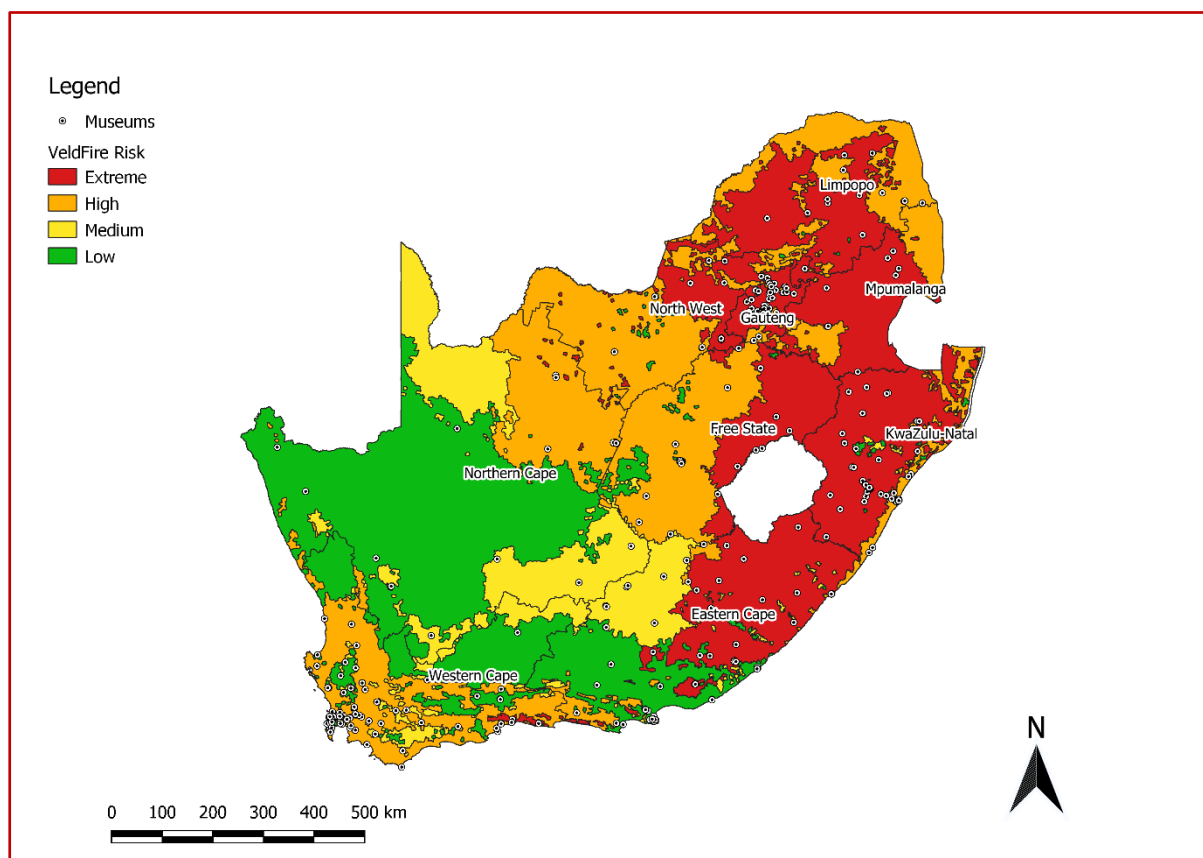**SOUTH AFRICAN**
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Figure 31: Fire hazard analysis

The seismic hazard analysis (figure 29) presents the locations of known museums within the seismic intensities map produced by the Council for GeoScience (CGS).

Comparatively speaking, South Africa is rated low to moderate in terms of global seismicity due to the relative stability of the African crust. Though seismic occurrences are still known to occur due to natural geomorphological processes as well as anthropogenic activity such as mining (Brandt, 2011).

This does however present an interesting case for museums and the protection of heritage objects. In terms of distribution, the largest percentage (37%) of identified museums are located within areas categorised as level VI on the Modified Mercalli Scale (MMS), meaning that should an occurrence occur at this level then structural movement and damage to unsecure objects can occur (USGS, 2019).

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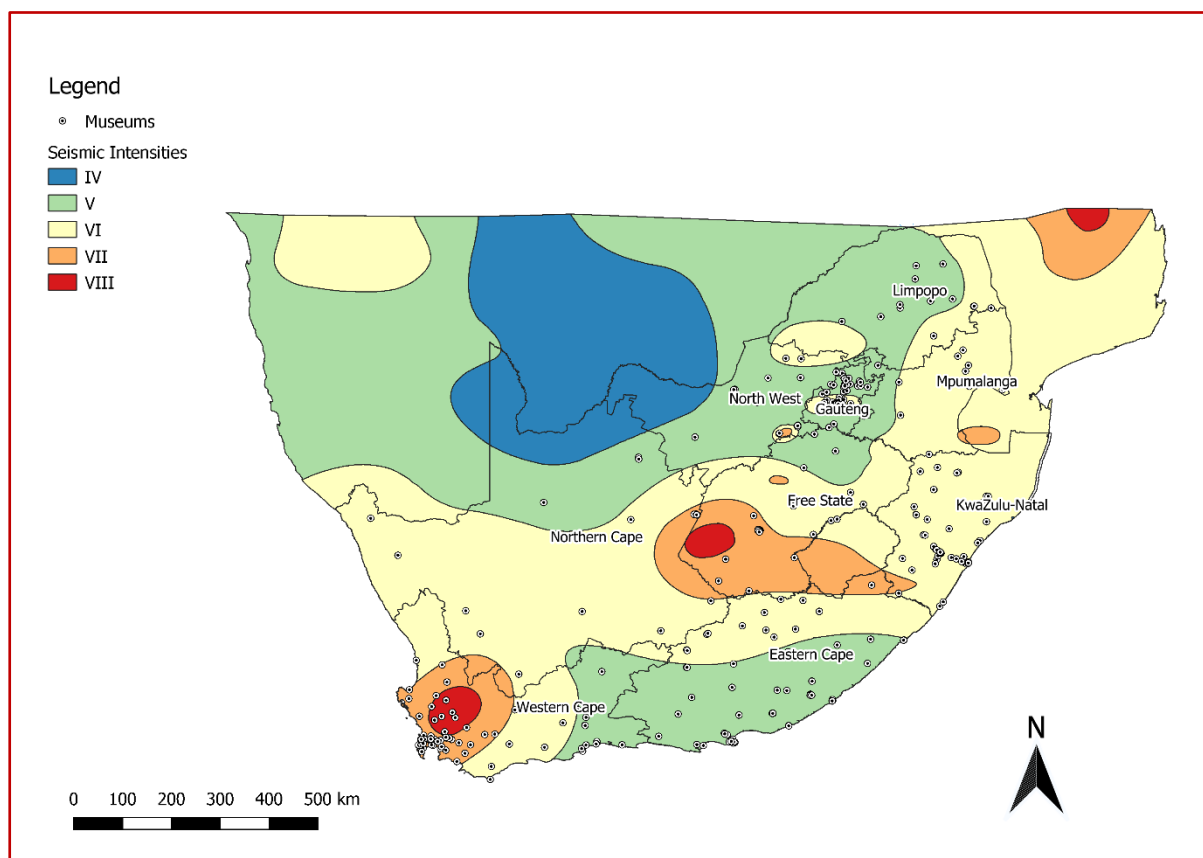**SOUTH AFRICAN**
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Figure 32: Seismic Intensities analysis

Whilst the above hazard identification mapping exercise presents potential hazards that may affect museums and their collections, each museum is a unique case in terms of their vulnerability to identified hazards and mitigation measures best suited to the risk and financial means.

Using the above exploratory hazard analysis professionals within the museum environment can engage. The below process chart presents a basic example of the utilisation of a hazard analysis to further interrogate the vulnerability of the space in conjunction with the potential impact an occurrence of the hazard may have. This process requires a clear understanding on the economic, natural, political environment and nature of the collection under which the museum operates.
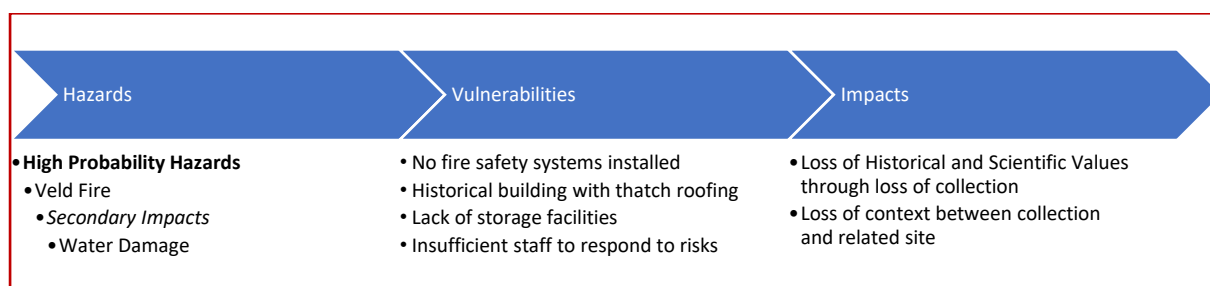

Figure 33: Basic example of hazard and vulnerability analysis

This further underpins the necessity for comprehensive inventories of collections in order to properly understand the nature of the collection as well as the physical location in which they are stored.

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9. Conclusion

Inventories are an evolving resource. New information should be recorded against existing records and the advent of new technologies should be incorporated to ensure that the information held within inventories is accurate and reflects new developments and standards.

10. Acknowledgements

SAHRA wishes to thank all of the contributors that have made this report possible; The South African National Space Agency and Council for Geoscience, for the supply of the flood risk and seismic intensities data. The staff of Heritage Western Cape, Heritage Free State and the KwaZulu-Natal Amafa and Research Institute who provided verification of datasets.

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