PACIFIC ISLANDS ENDANGERED CULTURAL HERITAGE SURVEY:

DOCUMENTING CULTURAL HERITAGE IN NIUE AND THE COOK ISLANDS

NIUE 2023

Pilot Study

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May 2023

Acknowledgments

We would like to extend our warm thanks to Moira Enetama and all the staff at Tāoga Niue for their support and generosity, and for sharing their invaluable knowledge and expertise of the heritage of Niue. Their support and organisation of site visits, project presentations and individual meetings is integral to the project.

We are grateful to everyone who gave up their time to attend the project presentations. We greatly appreciated all the advice, feedback and support we received on the project, and our activities during this visit. Thomas Talagi and Georgina Tukiuha provided important discussions on the results of the Ridge to Reef programme and how the pilot project could continue build on this important work.

Our thanks are also extended to Richard Siataga at the Ministry of Justice for sharing his knowledge and expertise of metric survey and Lidar on Niue, and Robin Hekau from the Niue Disaster Management Organisation for inviting us to share in the meetings of the group of researchers visiting or based on the island with whom we were able to make new connections and had very productive discussions around our shared interests in climate change.

We were pleased to be able to meet and discuss our project with the Minister for Social Services the Honourable Sonya Manogitaumaife Talagi and thank her for her time and support. We thank Herman Tagaloailuga for sharing his extensive knowledge of the shells of Niue, and their role, both past and present, in the cultural life of the island.

We very much enjoyed our visit to the Niue High School and would like to thank the Year 8 students for their enthusiastic engagement in the archaeology careers session. We are delighted to have signed a Memorandum of Understanding with The University of the South Pacific and would like to thank the current Campus Director Jay Gataua and the previous Campus Director Seone Loesio for all their support in achieving this. This research was funded by Arcadia, a charitable fund of Lisbet Rausing and Peter Baldwin.

Finally, we would like to warmly thank all of the individuals, families, and communities on Niue who have so kindly shared their knowledge and expertise of the island with us, enabled access to visit their heritage sites, and been so generous in their hospitality.

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1. Introduction and Background

This report details the activities and outcomes of the 2023 Niue Pilot Study as part of The Pacific Islands Endangered Cultural Heritage Survey: Documenting Cultural Heritage in Niue and the Cook Islands. The project team consisted of Professor Kate Welham (Bournemouth University), Professor Jane Downes (University of Highlands and Islands), Professor Colin Richards (University of Highlands and Islands), Dr Lawrence Shaw (Forestry England) and Dr Andy Brown (Horizon Archaeology). The team were present on Niue from 15th – 29th May 2023. A list of activities including the sites visited by the team are included as Appendix A.

1.2 Background

The current project developed from an initial Niuean-based research programme undertaken in 2020-21[1], which focused on Niuean 'Roots and Routes' both in the wider Polynesian context of potential early and late dispersal eastwards from Tonga and Samoa and local developments centred around questions of successive waves of contact and colonisation, as well as heritage management. This research built on the surveys by Trotter (1979) (Fig. 1), and Walter and Anderson (2002), and was grounded in local heritage concerns and needs, particularly embryonic development of the island cultural heritage resource (museum and sites and monuments records), elevating community awareness of the archaeological resource in the face of infrastructure development and raising the profile of cultural heritage for a broader-based tourism model. The 2020-21 project was undertaken through virtual means due to the Covid 19 pandemic.

Through a series of on-line meetings involving Moira Enetama (Tāoga Niue), Seone Loesio (University of the South Pacific), Jane Downes (UHI), Colin Richards (UHI), Kate Welham (Bournemouth University), Siobhan Cooke (Stromness Museum/UHI) Janette Park (Stromness Museum), Lawrence Shaw (Forestry England), and Francisco Torres H. (Sebastian Englert Museum, Rapa Nui), the need for a number of heritage resources for Niue emerged. First, a complete functioning GIS-based Sites and Monuments Record for Niue, second, a record of Niuean artefacts held in British museums, third, to establish an international network, partnering Tāoga Niue and Niue Campus USP, to enable areas of heritage education and capacity building (e.g., museum collections, university courses, etc).

The outcomes of the initial 2020-21 were as follows:

- Cultural heritage record: methods and format for a record of the sites and monuments of Niue
- Study and catalogue of Niuean artefacts in Scottish museums[2]
- The development of a major 4-year programme of mapping the endangered cultural heritage resources of Niue, and of the Cook Islands (of which Niue 2023 is a pilot stage)
- A memorandum of understanding between USP and Bournemouth University (signed May 2023)

[1] Global Challenges Research Fund, University of the Highlands and Islands
[2] Siobhan Cooke 2021 'Niue Artefacts in Scottish Museums' UHI

1.3 Aims

The aims of the Niue Pilot Study in May 2023 were:

- To trial different methods of recording archaeological and historical sites (including modern and historic buildings) to explore how the results can enhance existing site records
- To identify any loss and change in sites
- To establish presence/absence of previously unrecorded sites

2. Archaeological context

The first archaeological work in Niue was small-scale. During a brief layover on the island in 1959, Lawrence and Helen Birks visited a recently destroyed mound in the grounds of Matalave School, Tuapa village (Birks and Birks 1974). The mound had been levelled for the development of the school and it was not possible to gauge the extent or former height of the site. However, the remnants of the mound, including coral fragments, shell and charcoal, were visible and led the Birks to suggest the mound was made up largely of habitation refuse. During earthworks, several small stone adzes and two shell coconut graters were recovered, no sherds of pottery were noted. Birks and Birks (1974) excavated a shell sample from "an undisturbed area near what had apparently been the western extremity of the mound" (Birks and Birks 1974: 211). This sample (NZ 729) returned a conventional radiocarbon age of 1830 ± 40 B.P.

In the summer of 1974/75, Michael Trotter (Canterbury Museum) led a large-scale archaeological survey of Niue for the Niue Government. The survey focused on areas of cleared land near roadways but made forays into deeper bush. Trotter and the survey team (1979) recorded 100 sites (Figure 1), the majority of which were burial caves (Table 1). Platforms, enclosures and mounds were also found, particularly toward the centre of the island (Trotter 1979).

Table 2: Site types recorded by Trotter (1979).

Site Type	Number
Cave/Rock shelters	59
Platforms	13
Enclosures	12
Mounds	9
Midden	3
Other	4

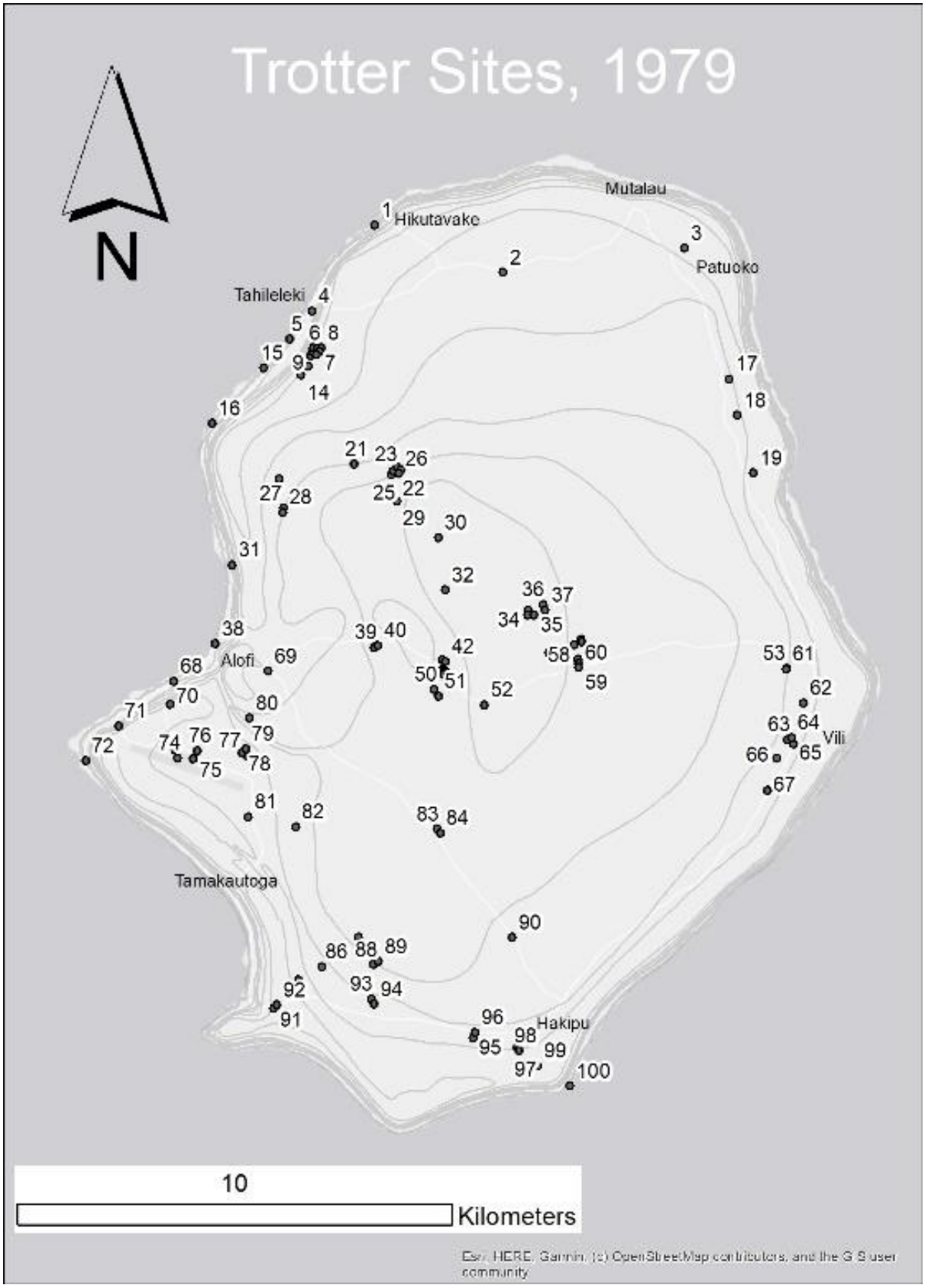


Figure 1: Location map of the archaeological sites recorded by Michael Trotter 1974-75 (after Trotter 1979). See Appendix B for site list.

Cave sites are found throughout Niue. The majority of caves recorded by Trotter have evidence of human burials, which he argues are often in prominent positions where they might be seen from outside (Trotter 1979). Burials are interred in a range of ways, including within low platforms, inside small stone enclosures or with stones stacked atop the body. Secondary internment was also evident in some caves (Trotter 1979). A number of caves also include evidence of occupation in the form of material culture and midden.

Trotter records platforms built of both raw coral and dressed slabs, consistent with the nearby Tongan tradition (Kirch 1980, 1990). Platforms were constructed by creating a stone wall, backfilling the area and then finishing it will small paving slabs or kilikili. Typically, the Niuean platforms recorded by Trotter are small relative to similar structures in Tonga and Samoa (Clarke and Martinsson-Wallin 2007). However, two sites recorded by Trotter are notably larger. The Futaua platform at Falepipi is recorded as ~30m x 23m x 2.5m and the Alalima site 11.5m x 7.5m x 3m.

Trotter also recorded earthen enclosures in a range of sizes, most notably at the Paluki and Paluki North complexes. These sites consist of a circular, oval or sub-rectangular earthen bank supported by internal stones; the inner level of the enclosures often appear to be well below the outer ground surface (Trotter 1979). These enclosures have no direct parallels in the Pacific (Anderson and Walter 2002), although Trotter records the traditional notion that they are canoes.

The Niue Archaeology Project, directed by Richard Walter (University of Otago) and Atholl Anderson (Australian National University), took place in 1994 and 1995. The project sought to understand the place of Niue in the settlement history of the Pacific and the unique development of Niuean society on the Makatea island (Walter and Anderson 2002).

The initial focus of the project was the detection of early sites. A set of landscape and environmental conditions that predict the location of such sites in the Southern Cooks Islands (e.g., near access points to the sea; Walter 1994), were used to inform initial investigations on the leeward coast. In particular, excavations were undertaken at Matapa Chasm, Avaiki and Anakula with test pitting at a further 12 caves and 35 open locations on the Alofi and Avatele terraces (Walter and Anderson 2002). These investigations found a number of caves had been frequently visited throughout Niuean history, but they, or the areas around Alofi and Avatele, had not been intensively occupied.

The windward side of Niue was regarded as an area less likely for early settlement because of its rough seas and the absence of flat land suitable for settlement close to the coast (Walter and Anderson 2002). Excavations were undertaken on the windward coast at Ulupaka I, Ulupaka II and Mata Sea Cave the results of which suggest low-level, but frequent use of the caves for activities associated with fishing and for burial. Investigations at Anatoloa revealed a deep occupation layer, which Walter and Anderson (2002) argue is indicative of permanent occupation. Both Ulupaka and Anataloa contain a layer of sediment dated to around 1100 years ago, which may have resulted from forest clearance in the area at that time.

In the absence of early sites Walter and Anderson (2002) shifted focus to the Paluki complex where they excavated a series of test pits around the largest of the '0' shaped enclosures (Trotter Site 45) and a trench through the enclosure itself. These investigations found evidence of initial land clearance, followed by a period of prolonged occupation. The resulting occupation layer was later used to form the bank of the enclosure probably in a single building event (Walter and Anderson 2002). Walter and Anderson also carried out surface collection at Ana Paluki (south of the monument complex), which, on the basis of artefact and midden diversity, they argue was a permanently occupied cave.

Walter and Anderson's (2002) excavations at Paluki and other caves produced a rich midden assemblage from which the subsistence practices of early Niueans can be inferred. Assemblages of fish bone suggest a focus on inshore and reef-edge fishing, consistent with those found on Makatea islands in the Southern Cook Islands (Walter and Anderson 2002). The bird bone assemblage contains both forest and sea-birds, but, particularly at Paluki, is dominated by chicken (Gallus gallus), perhaps suggesting specialist chicken husbandry (Walter and Anderson 2002).

A range of material culture has been collected from Niue by European visitors. Some of those that have ended up in museums have been described (e.g., Akeli and Pasene 2011). Trotter (1979) made surface collections of artefacts including a circular pendant from Foukula cave made from the top of a monomono shell and an imitation whale tooth pendant from Ana Heke, which closely resembles similar artefacts found in early East Polynesia assemblages (Duff 1956). Trotter also collected a small range of adzes, one of which was found at Ana Heke and sourced to Tonga (Trotter 1979). However, Walter and Anderson (2002) argue that this specimen may be a relatively recent import based on the limited amount of retouch. Geochemical analysis of a basalt flake found during investigations at the Ulupaka site suggest a Samoan origin, but, again, the antiquity of the artefact cannot be confirmed (Anderson and Walter 2002). Fishhooks are very rare in Niue, particularly compared to similar Makatea islands in the Southern Cook Islands. Two probable historic period fishhooks have been recovered from Anatoloa, including a shell lure and a turtle shell one-piece fishhook. No ceramics have been found on Niue.

In the absence of temporal markers like pottery, the archaeological sequence on Niue has to be determined by radiocarbon dates. The large amount of bioturbation in caves and more recent clearance and cultivation are impediments to a clear sequence. However, Walter and Anderson (2002) argue that Niue was most likely settled around 2000 years ago. This process may have occurred episodically over the course of several hundred years and, given the limitations placed on settlement and food production systems, is likely to have resulted in the whole island being integrated in a single community system (Walter and Anderson 2002). Accepting this date places settlement of Niue approximately 800-700 years after the initial Lapita settlement of Tonga (Burley et al. 2015; Petchey 2001) and c. 1200-1300 years before the settlement of the Cook Islands (Allen and Wallace 2012).

3. Methods

A mixed methodological approach was adopted to deliver the site recording aspect of the pilot project and to trial the utility of different techniques on a variety of site types. Prior to our arrival it was identified that there would be several factors may impact the ability to record sites. These included: dense vegetation and bush growth across previously known and unknown sites, detail and accuracy of previously recorded sites when integrated with modern mapping, and variable site types (e.g., mounds, enclosures, platforms, caves, complexes, and historic buildings).

Prior to visiting Niue, work was undertaken to digitally locate sites previously recorded by Trotter (1979). The location of the sites that Trotter recorded are presented in map form (Trotter 1979), but the coordinate system used to locate sites is not easily cross-referenced with current mapping grids. Trotter provided detailed plans for some site complexes such as Paluki, but many sites that consist of multiple components (e.g., caves, mounds, platforms etc.) are only recorded as a single point on his location map.

The digitisation work conducted here has relied on the georectification of Trotter's map and plans against current Land Information New Zealand (LINZ) mapping for Niue (coordinate system, UTM 2S), enabling each site location to be transcribed as a shape file within a geographical information system (GIS). Additional meta data, such as the classes of monument used by Trotter (1979) (cave, mound, enclosure etc.), have been added to the attribute table of the site shapefile, allowing for further analysis of site types and distributions to take place.

When visiting known sites, a walk over approach, comparable to that set out by Historic England Level 2 Walk Over Surveys, was undertaken which included: a photographic record, measurement recordings, a sketch plan and written observations. A central Global Positioning System (GPS) point was also taken for each feature identified within the field. Where tree cover was too dense to gain reliable satellite correctional data for the GPS, mobile GPS was used instead. Recording work was also undertaken in a manner that allowed for information to be included within the Heritage Recording Forms and database which has been developed by Tāoga Niue.

In support of fieldwork, the use of a DJI Mavic 2 drone was also implemented. The drone was equipped with both RBG and Near Infrared cameras and was used to assist in a number of ways. Firstly, high altitude imagery from 400ft were captured in the field to aid in the identification of previously recorded sites which were now hidden within bush (Fig.2).

Once sites were identified on the ground in areas which were recognised as being relatively clear of vegetation, the drone was used to record images which could be processed into a photogrammetric 3D digital surface model (DSM). With a target overlap for the images of 60%, the final data were processed with photogrammetric software RealityCapture. Outputs include mosaiced orthographic aerial photos, point clouds, digital surface models and 3D objects. An example of how these data were then integrated together is provided in Figure 3.

Figure 2: An example of the high-altitude drone image of the Paluki complex used to aid in the identification of features on the ground.

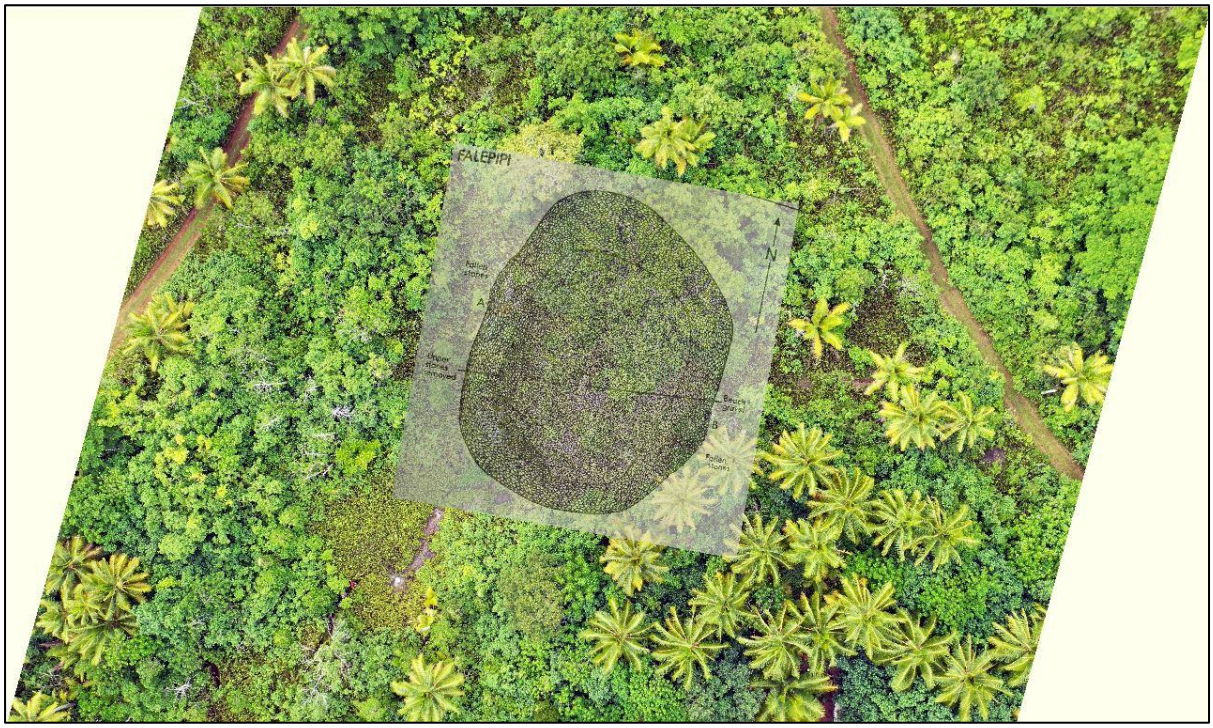


Figure 3: Plan of Falapipi produced by Trotter, georectified over a georeferenced aerial photo recorded by the project drone.

In addition to recording sites found within open areas or dense vegetation, alternative recording techniques were adopted for sites such as historic buildings and caves. Due to their more complex composition, the decision was taken to record these sites in a photogrammetric manner using a Nikon D3100 digital SLR camera. Once recorded, images were processed within RealityCapture to produced scaled, detailed, high-resolution 3D models of these sites (Figs. 4 and 5). Government restrictions on drone flying in Alofi (due to the proximity of these sites to the airport and flight path) meant that it was not possible to capture aerial images (e.g., roofs and elevated areas) to support the recording of historic buildings in these areas.

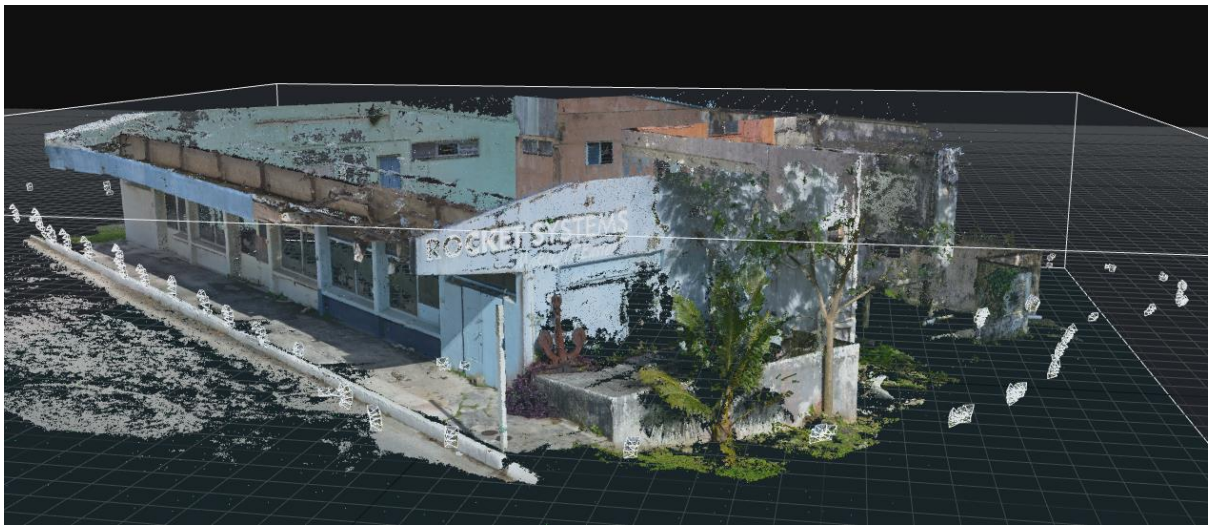


Figure 4: An example of a 3D record created via photogrammetric recording – the Rocket Systems building, Alofi, which was damaged by Cyclone Heta.

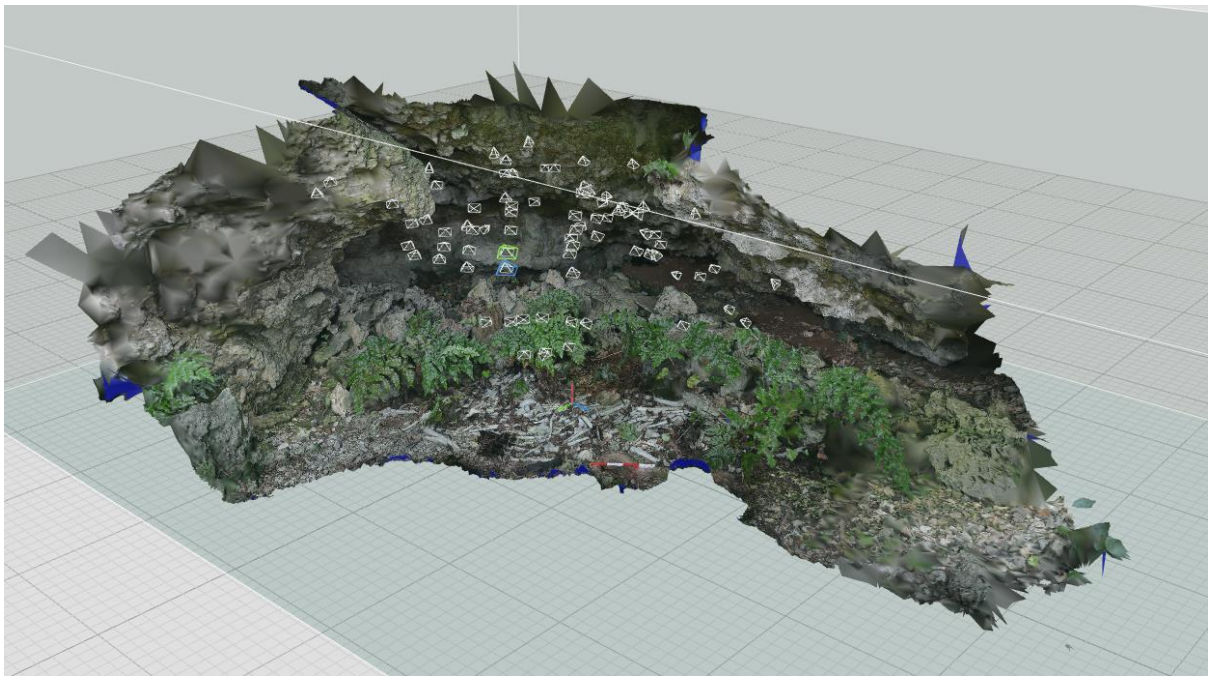
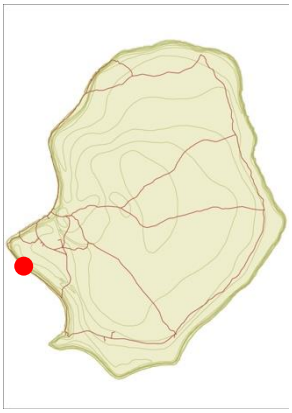


Figure 5: An example of a 3D record created via photogrammetric recording - screen capture of 3D record produced of Ana Ana cave with camera positions included.

All data including drone images, 3D models, photographic records, and electronic copies of this report and our introductory and results presentations have been deposited with Tāoga Niue.

4. Results

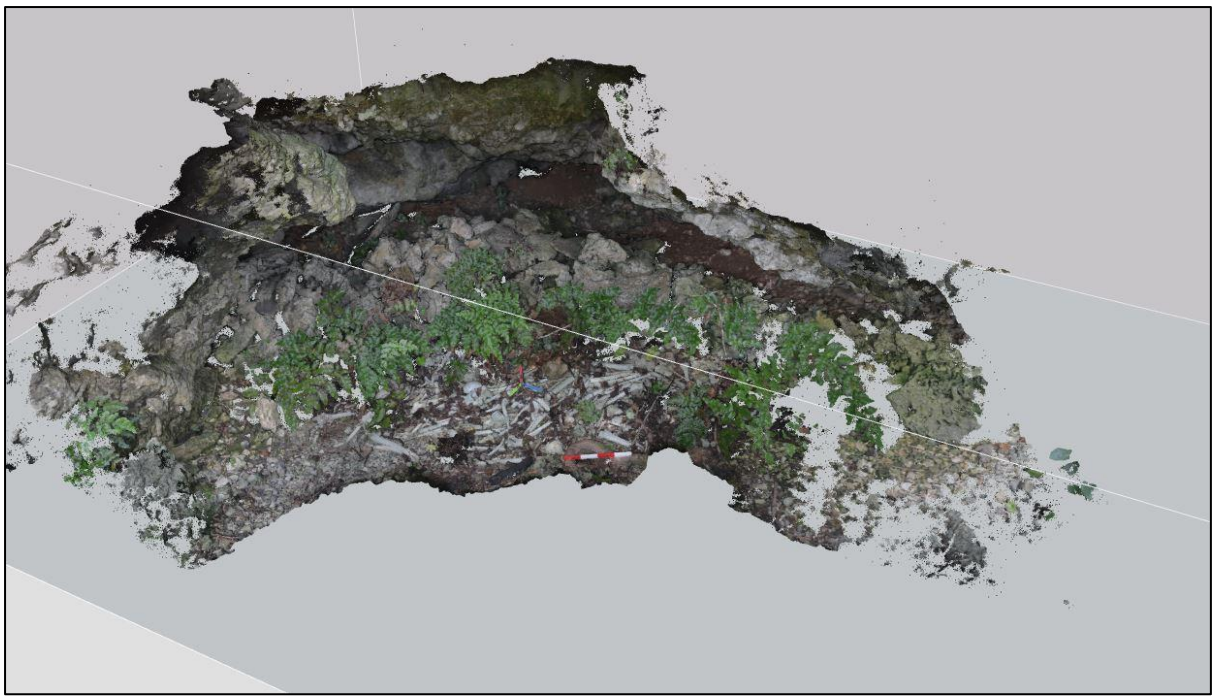
A total of 18 sites were visited by the project. A further site, Alalima platform, was searched for but not found. Details and photographs of each site are provided below.

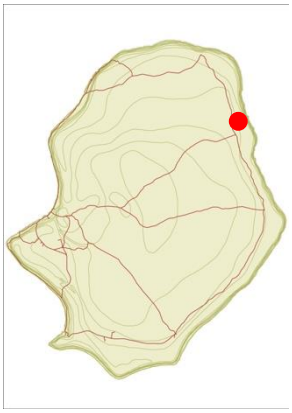


4.1 Ana ana

Trotter Site 72 E611903 N7888836

Cave site located on the southwest coast. The cave contains a number of human burials both loosely scattered and in association with small stone mounds. The site was in good condition, features were consistent with those reported by Trotter.
A detailed record of the site was made using photogrammetry



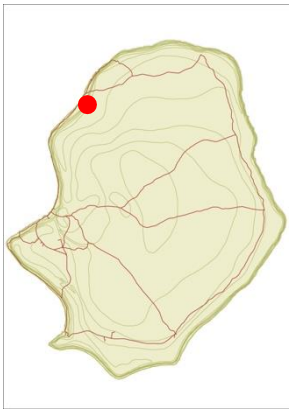


4.2 Anatoloa

Trotter Site 54 E 62543364 N78999002
E 625430 N7899037
E 625464 N7899042

Cave system with three portals. One large open area accessed from smaller opening to the north. Human remains found in wall niches and on cave surface. Midden found on surface. Third cave found to the west with human remains. Sites in fair condition, bioturbation likely to impact midden and bones.

Photographic survey made of the cave system.

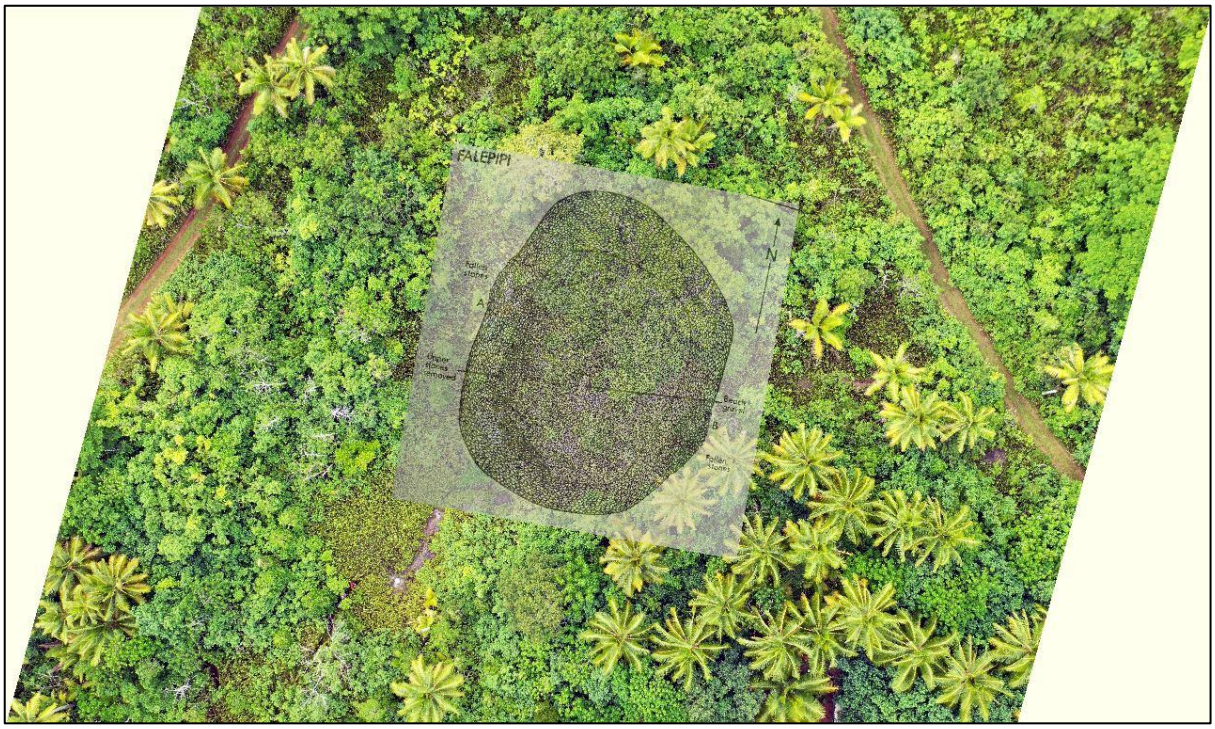


4.3 Futaua (Falepipi)

Trotter Site 77 E 615992 N7899813

Fair condition with 90% bracken coverage. Mature trees observed growing to the north of the oval mound with some smaller tree re-generation seen across the site. Some stone seats had been removed from site.

Photographic record made of site, including drone-based photogrammetry.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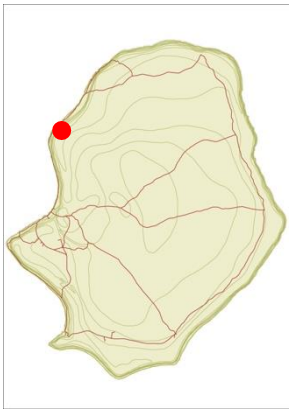
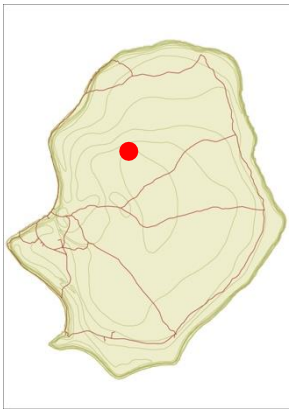


4.4 Makatea

Trotter Site 68 E 615407 N7899965

Only the entrance observed. Dense vegetation across the entrance with a large amount of rubbish waste also visible.

Photographic record made of entrance to site.

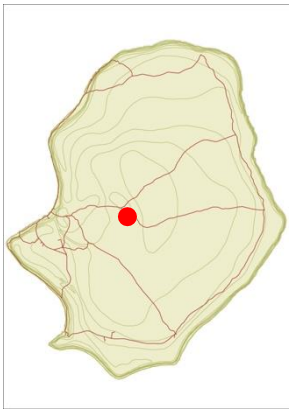


4.5 Segisegi

Trotter Site 79, 80, 81 or 82 E 617795 N7896894

Area now covered in dense regenerated fernland. Only one of the four mounds noted by Trotter could be located although it was un-clear which this was. The site is a low mound with possible stone wall and cobbled upper surface unfortunately it appeared to have been damaged by bush clearance.

A sketch map and photographic record were made of the site.

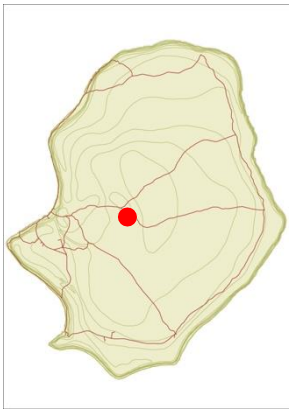


4.6 Paluki

Trotter Site 48 E 618935 N7892251

Oval enclosure to the east of the modern track. Currently covered in dense re-generated bracken and medium sized trees. Some 'rounding off' of features from clearance and cultivation has occurred, but features remain in fair condition.

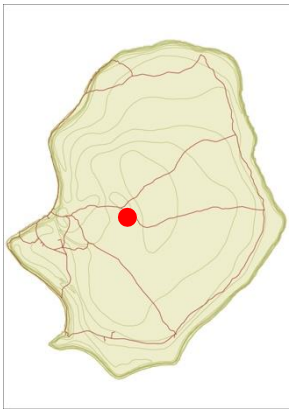
Photographic record made of site.



4.7 Paluki

Trotter Site 45 E 618892 N7892265

Sub-rectangular enclosure 4m west of the modern track. The track has migrated slightly closer to the site since Trotter mapped it. Current cover is dense re-generation with bracken and medium sized trees. Some 'rounding off' of features from clearance and cultivation has occurred, but features remain in fair condition.



4.8 Paluki

Trotter Site 47 E 618933 N7892278

Circular enclosure to the east of the modern track and north of site 45. Currently covered in dense re-generated bracken.

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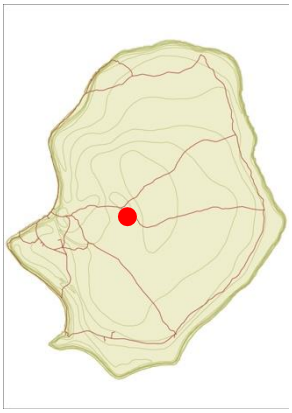
Some 'rounding off' of features from clearance and cultivation has occurred, but features remain in fair condition.

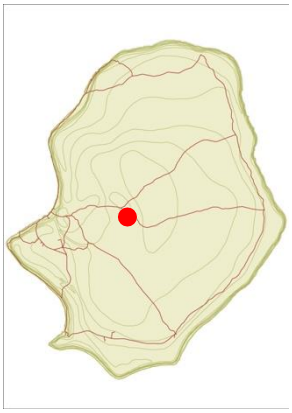


4.9 Paluki

Trotter Site 44 E 618871 N7892305

Rectangular stone platform (Trotter calls site a mound). Dense tree cover, including one large tree growing immediately atop feature. Some stones of the margins of the feature have tumbled away.

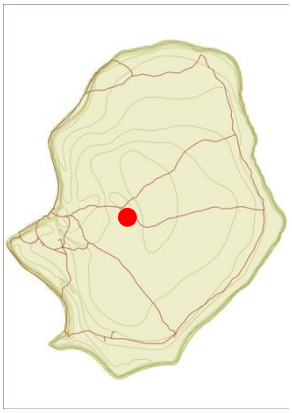
Sketch plan and photographic record made of site



4.10 Paluki

Trotter Site 43 E 618874 N789331

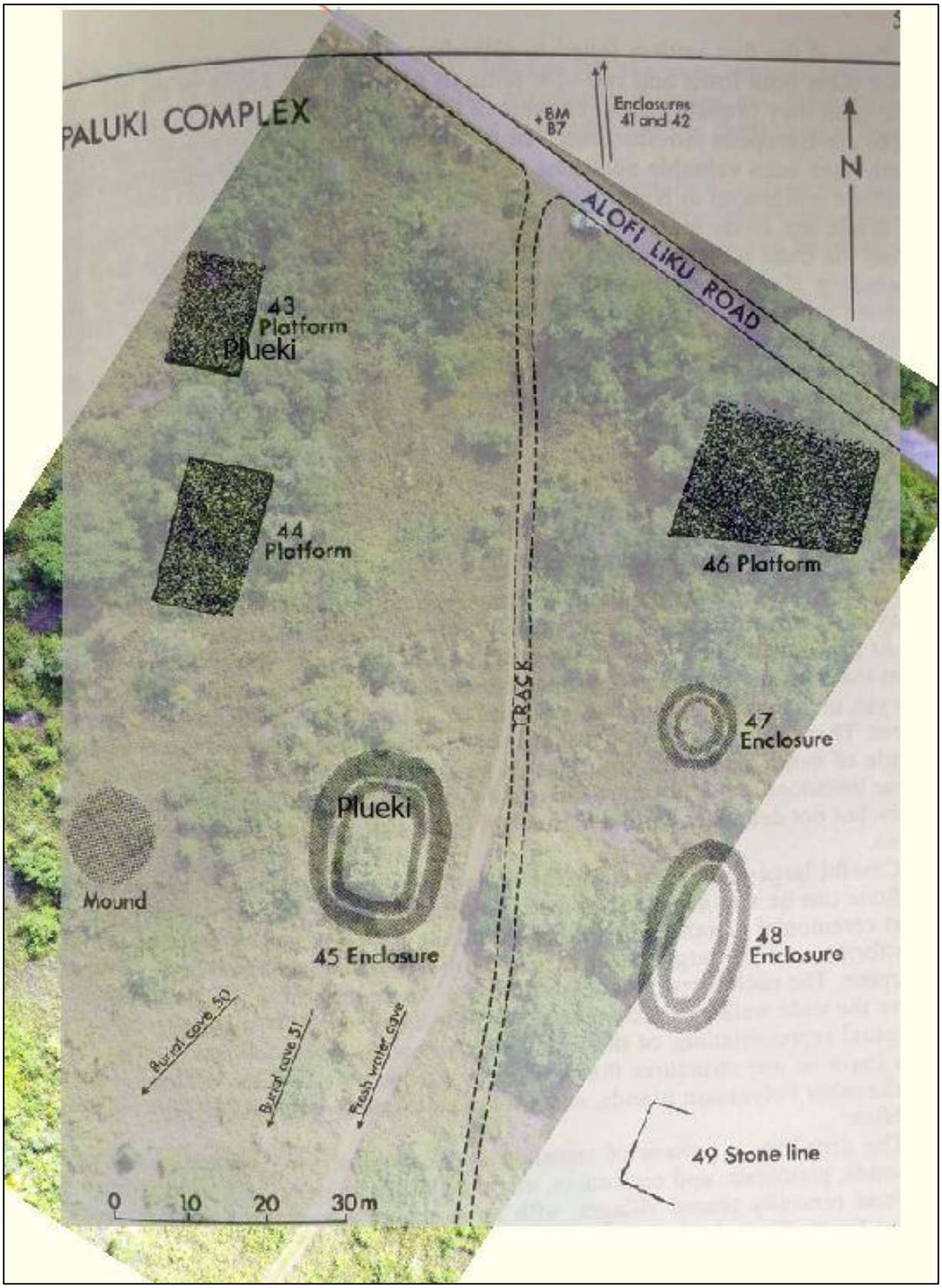
Rectangular stone platform (Trotter calls site a mound). Largely lost to bulldozer, hard to identify what survives as vegetation growth was too dense.

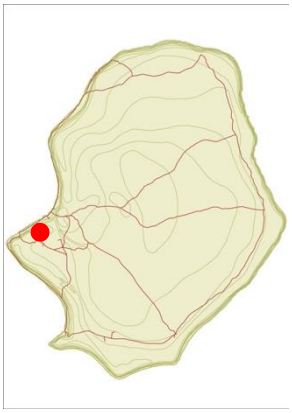


4.11 Paluki

Trotter Site 46 E 619006 N7892309

Rectangular stone platform (Trotter calls site a mound) east of Paluki Bush Road and main road junction. Dense tree cover across the whole feature. Some possible damage to the north of the feature may have been caused by roading works.


PALUKI COMPLEX
+BM B7
Enclosures 41 and 42
N
ALOFI LIKU ROAD
43 Platform Plueki
44 Platform
46 Platform
TRACK
47 Enclosure
Plueki
Mound
45 Enclosure
48 Enclosure
Burial cave 50
Burial cave 51
Fresh water cave
49 Stone line
0 10 20 30 m

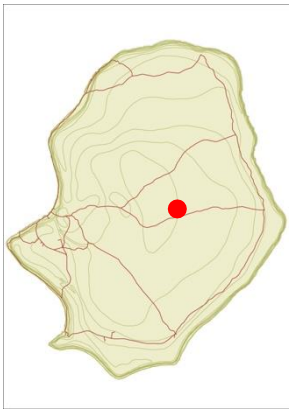


4.12 New Zealand High Commission

Trotter Site 70 E 612542 N7891539

Sub-rectangular mound made of coral cobbles. 12m SW-NE and 10m NW – SE with a flat rectangular top measuring 4 x 5m. 2m high at its lowest point and 3 meters high at its highest. Large trees growing across the top of the mound, material appears to have been recently deposited on surface.

Sketch plan and photographic record made of site.

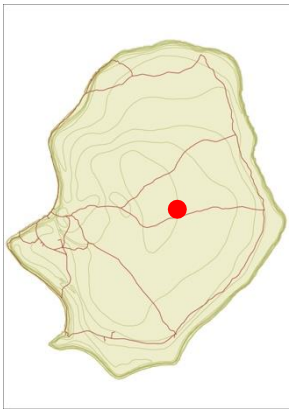


4.13 Hago

Trotter Site N/A E 621098 N7892190

Circular earthen mound, 25m in diameter. 2m in height. Previously un-recorded. Currently used to grow taro. Land owner stated this was a settlement site previously.

Aerial photographic record and sketch plan made of site.

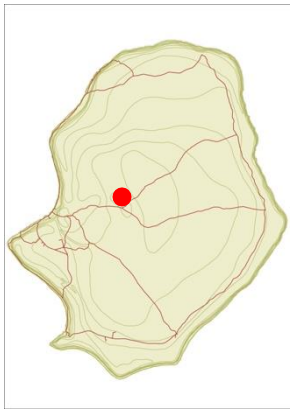


4.14 Hago

Trotter Site N/A E 621048 N78921149

Rectangular mound made of coral stones. 4m x 1.5m x 0.4m high. Previously un-recorded. Recent bulldozer and burning activity damaged the site.

Sketch plan made of site.

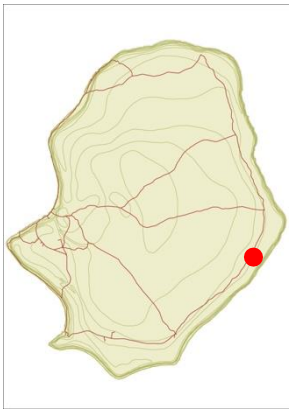


4.15 Mana

Trotter Site N/A E 618058 N7892893

Rectangular mound N-S orientated. Constructed of coble coral on N, E and W sides and dressed coral slabs on southern face. Located on western site of T junction. 5m x 4m x 0.5m.

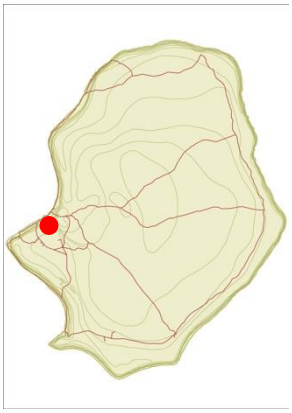
Aerial photographic record and sketch plan made of site.



4.16 Umu Ti Ha Laufoli

Trotter Site N/A E 6226268 N7889186

Circular earthen mound, 25m in diameter. 2m in height. Previously un-recorded. Currently used to grow taro. Land owner stated this was a settlement site previously.

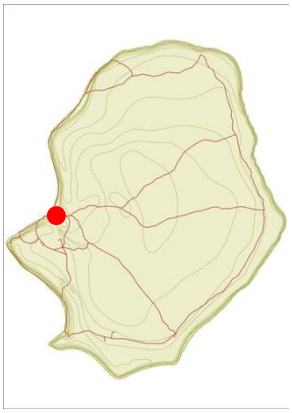


4.17 Centennial Hall

Trotter Site N/A E 613707 N7893047

Centennial Hall building.

Photogrammetry record made of the site.



4.18 Rocket Systems Building

Trotter Site N/A E 613554 N7892743

Rocket Systems building, damaged in Cyclone Heta, walls standing, no roof.

Photogrammetry record made of the site.

5. Conclusions and Future Work

The pilot project has been proved successful in two ways. First, through an engagement with local communities and organisations it has been possible to identify key areas of cultural heritage that may be developed and enhanced by future work. This includes Tāoga Niue Heritage Records, data collected as part of the Ridge to Reef programme and the future Niue Electronic Management System. Furthermore, discussions with members of the community highlighted aspects of their heritage, for instance buildings damaged or destroyed by Cyclone Heta and earlier extreme weather events, that will now be integrated into any future work.

Secondly, we have been able to test the previous site records and trial a range of recording techniques and establish appropriate methodologies for future work. Sites visits conducted on Niue (see Appendix A) identified that, while the maps derived from Trotter (1979) provide a good indication of where sites can be located, the granularity of the data is not sufficient to identify all the sites. In some cases, it was impossible to locate sites recorded by Trotter despite extensive coverage of the prospective area on foot.

The combination of walk over and drone-based survey has proved to be a productive approach to recording sites. The use of aerial imagery obtained by drone has proved a valuable addition to the field methodology, especially when attempting to geolocate detailed plans previously produced by Trotter (1979). However, in some instances, even the lower-level vegetation growth proved challenging for the photogrammetric software, resulting in variable output quality. Photogrammetric recording proved to be an extremely successful approach in cave and building recording, importantly enabling a record without the need for invasive techniques.

The location of three sites which have not been noted previously during the pilot study indicates the potential of further survey to identify more sites to add to the cultural heritage record for Niue. Future site survey on Niue will utilise drone-based methods and former site records but will rely heavily on systematic pedestrian survey supported by Tāoga Niue. This may be augmented by use of Lidar data (0.5m resolution) captured as part of the Ridge to Reef Project. These data were briefly viewed at the office of Mr Richard Siataga and appeared to have significant potential to support heritage surveys. The Lidar data have a good coverage of the island, with the laser penetrating well through the dense vegetation enabling the creation of detailed digital terrain and surface models. Further analysis of the Lidar dataset would help identify previously recorded sites and improve the spatial accuracy with which they are recorded. Moreover, Lidar data may facilitate easier assessment of the composition of previously recorded sites and the threats that they face and enable the identification of previously unknown archaeological sites. It is our ambition that the project will be able to make better use of these data during future visits through an established memorandum of understanding with the Niuean Government.

Damage was apparent at two of the monument complexes visited. At Paluki, Platform 43 has been lost through bulldozing, a common technique used for clearing land for planting. At Segisegi only one of the four platforms was relocated, and it was not clear which of the four it was due to damage from land clearance. This is an important observation as just a modest increase in agricultural, or infrastructural or housing development (for instance driven by increasing tourism), would have a significant detrimental effect on the survival of archaeological sites. In this respect, it should not be forgotten that the current record is biased towards conspicuous sites and therefore less visible remains which may represent important aspect of Niue's early history are likely to remain to date unrecorded.

Survey work was only possible with the assistance of Tāoga Niue, both themselves and through contacts with landowners, for permissions for access and most particularly in being able to locate sites that had become overgrown either by scrub or dense woodland. It is important to plan future parts of the survey to suit Tāoga Niue and with the aims of supporting capacity development and aligning with Tāoga Niue's strategic aims.

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Appendix A: List of activities conducted by the project team

Date	Activity
16th May 2023	Careers talk on Archaeology with 15 Year 8 students at the Niue High School
16th May 2023	Public Presentation at Tāoga Niue to introduce the project team and planned work. Attendees from Niue Government, Village Councils and members of the public Interview with Sariah Magaoa for BCN
17th May 2023	Visit to Tāoga Niue to view the museum and archives
17th May 2023	Meeting with Richard Siataga, Senior Surveyor, Ministry of Justice to discuss the Ridge to Reef programme, LiDAR data and previous survey work conducted with Tāoga Niue at Vaiea in 2012.
18th May 2023	Participation at the Climate Change Researcher meeting organized by Mr Robin Hekau at the Niue Police Station
18th May 2023	Visit to heritage sites around Niue with Tāoga Niue
19th May 2023	Visit to Ana Ana and Fatuaua to trial 3D recording of these site.
20th May 2023	Initial visit to Plueki to assess the site for 3D recording.
20th May 2023	Attendance at the Tāoga Niue cultural event to celebrate the UNESCO diversity
22nd May 2023	3D metric recording of the Centennial Hall and Rocket Systems buildings in Alofi.
23rd May 2023	Meeting with the Minister of Social Services, the Honourable Sonya Manogitaumaife Talagi
23rd May 2023	Visit to Tāoga Niue to view the archives of Michael Trotter's 1970's archaeological expedition.
23rd May 2023	Visit to Hago to view and record two mounds uncovered in an area of recent taro plantation. Return visit to Plueki to conduct 3D recording.
23rd May 2023	Meeting with Jay Gataua at the University of the South Pacific to discuss the project and Memorandum of Understanding between the University of the South Pacific and Bournemouth University.
24th May 2023	Recording visit to Segisegi, Fatuaua (Falepipi), Laofoli Umu Ti
25th May 2023	Public Presentation at Tāoga Niue to present the findings of the pilot project and future planned work. Attendees from Niue Government, Village Councils, NGOs, and members of the public Interview with Sariah Magaoa for BCN
26th May 2023	Visit with Tāoga Niue to the mound situated behind the New Zealand and Australian High Commission. Noted as the Residency and Site 70 in Totter 1979. Afternoon visit with Tāoga Niue to the Anatoloa cave complex, the Makatea cave Tuapa. Meeting with Mr Herman Tagaloailuga to view and discuss his Niue shell collection.
27th May 2023	Visit with Tāoga Niue to locate Alalima, the mound identified by Totter in 1979. Despite extensive searching of the area the mound could not be located.

Appendix B: List of Sites recorded by Trotter (1979)

Id	Description	Site_Type	Site_Name	Shape_1	Orient_deg	Size_m
1		cave	Hikutavake		0	
2		cave	Tuagamau		0	
3		cave	Faofao		0	
4		midden	Matalave		0	
5		cave	Makatea		0	
6		platform	Falepipi	sub-rectangular	13	10x8x0.5
7		platform	Coconut Grove	sub-rectangular	10	11x11x0.5
8		mound	Falepipi	rectangular	13	8x6x1.3
9		platform	Falepipi	sub-rectangular	16	4.5x4x0.3
10		midden	Falepipi		0	
11		mound	Falepipi	sub-circular	12	29.5x23x2.5
12		platform	Falepipi	sub-rectangular	120	6.5x5x0.6
13	adze head	find spot	Misileki's		0	
14		mound	Mataika	rectangular	10	23x17x2
15		cave	Anaheke		0	
16		cave	Vaifutu		0	
17		cave	Anatoloa		0	
18		cave	Fafa		0	
19		cave	Ulupaka		0	
20		cave	Makefu		0	
21		platform	Alalima	sub-rectangular	36	11.5x7.5x3
22		platform	Segisegi	rectangular	7	11x8x0.5
23		platform	Segisegi	rectangular	8	14x12x0.6
24		platform	Segisegi	rectangular	11	14.4x12.4x1
25		enclosure	Segisegi	oval	357	16x10x0.5
26		platform	Segisegi	sub-circular	0	10x10x0.3
27		mound	Fakahili	sub-circular	0	2.5x2x1.5
28		cave	Fakahili		0	
29		cave	Lou		0	
30		enclosure	Muileva	circular	0	30x30x1
31		cave	Vailoa		0	
32		enclosure	Foulua	complex	40	48x27x1.5
33		mound	Pupuia III	rectangular	88	13.6x11.6x1
34		mound	Pupuia II	irregular	100	22.5x20x1.5
35		mound	Pupuia I	oval	100	8.5x7.5x2.3
36		wall	Pupuia		0	
37		cave	Pupuia		0	
38		midden	Alofi		0	

Appendix B: List of Sites recorded by Trotter (1979) continued

Id	Description	Site_Type	Site_Name	Shape_1	Orient_deg	Size_m
39		cave	Keleola II		0	
40		cave	Keleola I		0	
41		enclosure	Plueki North	oval	348	57x27x0.8
42		enclosure	Plueki North	oval	350	16x11x0.8
43		platform	Plueki	quadrangular	15	14x10x0.2
44		platform	Plueki	sub-rectangular	17	18x11x1
45		enclosure	Plueki	rectangular	10	23x18x0.7
46		platform	Plueki	quadrangular	15	24x16x0.5
47		enclosure	Plueki	circular	0	11x11x0.4
48		enclosure	Plueki	oval	15	24x13x1.1
49		outline	Plueki	rectangular	20	10.8x8x0.05
50		cave	Plueki		0	
51		cave	Plueki		0	
52		cave	Tumupua		0	
53		cave	Foukula		0	
54		cave	Vaono		0	
55		cave	Tukuofe I		0	
56		cave	Tukuofe II		0	
57		cave	Tukuofe III		0	
58		platform	Toloa	irregular	8	12x8x0.3
59		cave	Toloa		0	
60		platform	Toloa	rectangle	78	12.7x8.7x0.6
61		cave	Fetau		0	
62		cave	Aokura		0	
63		cave	Mati		0	
64		cave	Antoga		0	
65		cave	Hikuragi		0	
66		cave	Fuvaka		0	
67		cave	Lalovi		0	
68		cave	Vaiolama		0	
69		cave	Paliati		0	
70		mound	Residencey	oval	0	
71		cave	Anokula		0	
72		cave	Anna		0	
73		cave	Fualahi		0	
74		cave	Airport II		0	
75		cave	Airport I		0	
76		cave	Sisi's		0	
77		cave	Kaimiti II		0	
78		cave	Kaimiti I		0	
79		cave	Kaimiti III		0	
80		cave	Tuila		0	

Appendix B: List of Sites recorded by Trotter (1979) continued

Id	Description	Site_Type	Site_Name	Shape_1	Orient_deg	Size_m
81		cave	Kulatiale		0	
82		cave	Anapulotu		0	
83		enclosure	Foa	oval	12	13x9.5x0.5
84		cave	Foa		0	
85		cave	Pago I		0	
86		cave	Pago III		0	
87		cave	Popo		0	
88		enclosure	Vaiea	oval	83	10x7x0.4
89		enclosure	Vaiea	oval	21	24x12x0.5
90		cave	Makiekula		0	
91		cave	Matakuhifi I		0	
92		cave	Matakuhifi II		0	
93		mound	Vaiea	oval	118	30x15x1
94		cave	Vaiea		0	
95		cave	Tualiku		0	
96		occupation	Tamahamua		0	
97		cave	Vao		0	
98		cave	Makatea II		0	
99		cave	Sela		0	
100		cave	Mata		0	