

# The Caves of Portland Ridge, Jamaica

Jamaican Caves Organisation

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**GPS positions are withheld in the Public Edition of this publication in aid of site protection. Interested parties may contact the Jamaican Caves Organisation at [admin@jamaicancaves.org](mailto:admin@jamaicancaves.org) for further information.**

This study is produced to serve the scientific community and society.

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Cover photo: Cavers ascending at Fincham Sinkhole

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*Jules Verne*



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Lastly, on behalf of all who have visited and studied the caves at Portland Ridge, the JCO would like to thank the Jackson Bay Hunting and Fishing Club and the PWD Hunting and Sporting Club, for facilitating access to the ridge. We trust that this report will prove to be of value to them.



*Coastal track to the PWD Club, North Portland Ridge, bordered by dry limestone forest and mangrove wetlands*

## Executive Summary

The Portland Ridge falls within the Portland Bight Protected Area. Visitors to the Portland Ridge encounter coastal dry limestone forests and are unlikely to be aware of the numerous caves in the area unless guided to them, as their entrances are hidden in the forests and require hiking through challenging terrain to reach. Cave visitors are likely to be students, researchers or guests of the Jackson Bay Hunting and Fishing Club or the PWD Hunting and Sporting Club, which are the custodians of most of the Portland Ridge area and have managed its protection – including the protection of the cave sites – for decades. Additionally, the areas protected by the Clubs are used by local community members and others who hunt feral goats and pigs, and come to fish.

The Jamaican Caves Organisation (JCO) began carrying out site visits in 2010, with the intention of locating and inspecting all the caves listed for the area in *Jamaica Underground* (Fincham 1997), and of course also hoping to perhaps locate as yet undiscovered caves and cave entrances.

While doing so, the JCO became more and more cognizant of the importance of the caves in the overall ecology of the Portland Ridge, and of the potential both for destruction and for conservation & research. Destruction can be witnessed in caves where guano deposits have been removed, exposing the cave floor with no hope of restoring the natural history of the site; where the markings of visitors on cave walls make it difficult to identify possible Taino markings and where Taino artefacts (including human remains) have been removed – an act which is unethical and removes elements of Jamaica's early population history from the record. At the same time, the protected status of the area and its management by the Hunting Clubs combine fortuitously to ensure the best possible context for conservation. This also means that research on the biota, palaeological record, archaeological record, and palaeoecological record, can proceed in a relatively accessible and undisturbed environment.

This report summarizes ten years' work in locating and surveying the Portland Ridge caves by the volunteer members of the JCO, most notably Ronald S. Stewart and Jan Pael. It supplements the overview presented in *JU* by adding geographical coordinates and other details which enrich the *JU*'s listing. The report also sets out some of the main findings from research carried out at the Portland Ridge, under four main headings: cave fauna, archaeology & palaeontology, speleogenesis, and palaeoclimatology & palaeoecology. The brief surveys make it abundantly clear that the Portland Ridge caves are special. We conclude that rich rewards await those who pursue the opportunities for further research.

This report is a work in progress, which will be updated from time to time as more data become available.

# 1: Overview

## 1.1: About the Jamaican Caves Organisation

The Jamaican Caves Organisation (JCO), established in 2002, is an all-volunteer caving organisation devoted to the preservation, exploration and documentation of caves in Jamaica. The JCO maintains the Jamaican Cave Register (<http://www.jamaicancaves.org/jamaica-cave-register.htm>), now at over 1200 sites. Reports and data are welcome.

The membership includes most of the principal cavers active in Jamaica during the last four decades. As of 2020, the JCO remains very active, and continues to carry out regular speleological research in Jamaica island-wide, both on in-house projects and in collaboration with government agencies, local and visiting scientists. The JCO is currently the only non-profit group in Jamaica dedicated to education, research and advocacy about caves. The JCO's website <http://www.jamaicancaves.org> can be consulted for more detailed information.

## 1.2: A Brief History of Cave Exploration at Portland Ridge

The first known visitors to the caves of Portland Ridge were, of course, the Taino, with evidence of this at many sites. However, it seems that they rarely ventured beyond the twilight zone, where light still penetrates, as finds of artefacts, petroglyphs, and pictographs are almost always limited to the entrance areas. This may be explained by an interaction with the underground that is based entirely on the spiritual, caves being featured in the creation myths of the Taino.



*Petroglyphs at JBGC Entrance 2, possibly guardians of the portal*

Although little is known of Jamaican Tainos' beliefs, Pané's (1494) account of religious practices among the Tainos in Hispaniola suggests that they believed that the first humans emerged from a cave, that the moon and sun arose from caves, and that caves were a portal where one could commune with gods and ancestral spirits. It is little wonder that most Tainos were not inclined to journey far into the darkness. Indeed, their belief system may have precluded it.

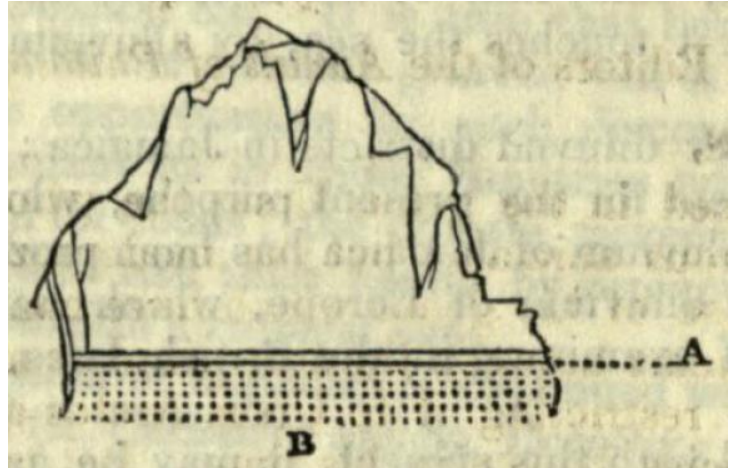
Although in 1929, Tyndale-Biscoe stated in a letter to A Clerk that he had observed an inscription, *T Mostyn 1791*, on the wall of [Jackson's Bay Great Cave](#), the earliest written record we have of cave visitation at the ridge is that of geologist and paleontologist, Thomas H De la Beche. He includes a description of a cave he refers to as "Portland Cave" in his 1825 paper on the diluvium of Jamaica in the *Annals of Philosophy*. Shaw (1997, p.19) believes this may have been [Portland Cave-1](#), but we consider it more likely [Portland Cave-2](#), which *Jamaica Underground* (Fincham 1997, henceforth *JU*) notes has dates on the walls extending back to the mid 1770's. This agrees with De la Beche's observation that it "has been visited by hundreds of persons, most of whom have written their names on almost every accessible portion of it" (1825, p.58). Cave-2 would have been higher and less claustrophobic than Cave-1, as its popularity predates the guano harvesting which lowered the floor



of Cave-1 by several meters. The popularity of the cave with visitors in his time suggests that an access road or path must have led to it; in the current environment, the cave is not so easily reached.

De la Beche provides the drawing reproduced below, which is accompanied by this description: “A stalagmitic floor (A) rests upon a fine silt clay (B), the depth of which I could not ascertain; one or two large stalagmite columns appear also to rest upon the clay; but of this I am not certain; the heat, in fact, was so oppressive (from being near the surface) during the time I visited it, that I was prevented from remaining long in the cavern” (*ibid.*). His mention of a stalagmitic floor also suggests Cave-2, since Cave-1 must have had a sediment/guano floor before it was mined.

De la Beche goes on to say that the cave “is situated on the side of a hill, and is a short distance from the sea, but sufficiently elevated above it to prevent the possibility of the clay being derived from it at its present level. The crust of stalagmite is of sufficient thickness to show that it must have taken a long time to form” (*ibid.*). This description sufficed for publication in one of the prestigious *Annals* of the day, and it serves as a reminder how very far cave exploration and documentation has come since De la Beche’s time.



*De la Beche's Portland Cave (1825 p.58)*

Anthropologist JE Duerden followed in 1895, with a brief discussion of archaeological finds at [Jackson's Bay Great Cave](#) (see [section 3.4](#) for details). In 1920, zoologist HE Anthony carried out fieldwork at the [Portland Caves](#) (Shaw 1997, p.19, 21; Koopman & Williams 1951).

The modern era of systematic cave exploration in Jamaica began in the early years of World War II, in search of phosphate deposits, under Baron RG McGrath, a surveyor to the Jamaican government's Geological Survey Department (GSD) (Fincham 1997a, p.3). Amongst the many sites visited across the island were [Jackson's Bay Great Cave](#) and [Portland Cave-1](#) & [Portland Cave-2](#).

The GSD's work was followed by the great efforts of the Jamaican Caving Club (JCC), formed in 1958, and the University Caving Club (UCC), formed at The University of the West Indies (UWI) in Kingston in 1962 (Fincham 1997a, p.3-4; Read 1997, p.15-16; Ashcroft 1969; Wiltshire 2016). The cavers began fieldwork at Jackson's Bay in 1964. The time they spent at Portland Ridge totaled hundreds of hours. The vast majority of the sites addressed in this work were found, explored, and surveyed by them. It was an extraordinary accomplishment, which anyone who has spent time in the dry coastal forest of the ridge, where many shrubs and trees are covered in thorns, and the rock underfoot is broken, jagged, and constantly trips one up, can well appreciate. Moreover, it was long before GPS, GLONASS, and other satellite systems made route-finding and recording of entrance positions a simple matter. To quote Geoff Wedge of the JCC in 1978, “after years of wandering around the Jackson's Bay area casually discovering and then losing caves, the JCC now intends to find out what's where once and for all. This can only be done by seriously surveying all the known caves and their many entrances and then tying in these entrances by a surface survey along bushed and paint-coded trails” (cited in *JU*, p.216). The work that resulted was an area map, found lower, which is included in the excellent work, *Jamaica Underground* by the late Alan G Fincham (1997). That and

other maps published in *JU* served as the locational base for explorations by the Jamaican Caves Organisation (JCO) in the 2010's.

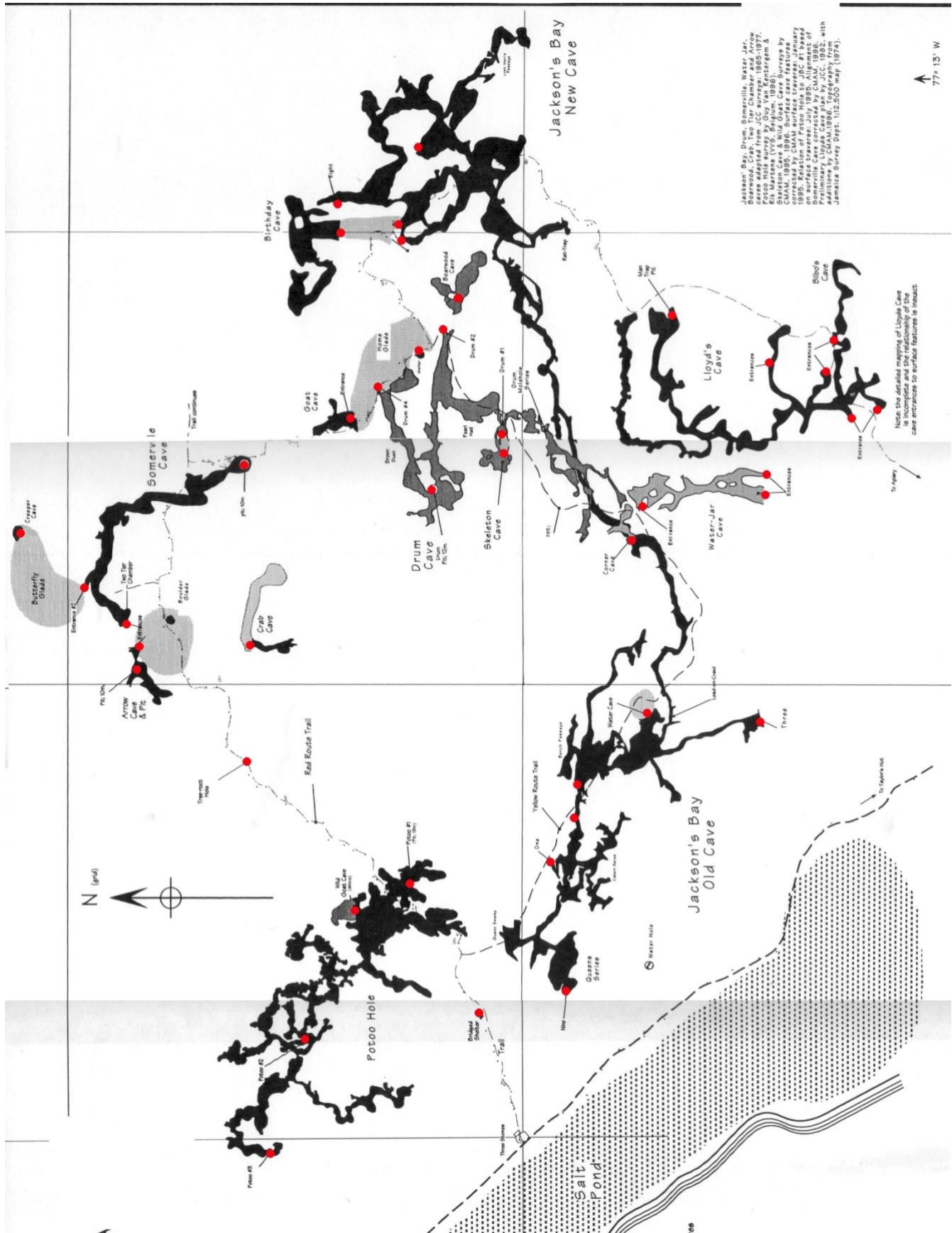
The JCO's exploration of the Portland Ridge began with Adam Hyde and Ronald S. Stewart in July 2010, with visits to [Potoo Hole](#) Entrance 1, and [Jackson's Bay Great Cave](#) Entrances 1 & 2. Stewart used the first three way points for an initial indexing of the *JU* Jackson's Bay map. Over the next few years, several trips were made to those caves assisting research scientists. In 2015, Stewart and Jan Pael began a systematic search for the rest of the caves, with occasional help from other members of the JCO, visiting researchers, and other cave enthusiasts. Between visits, the area map would be updated with more entrance positions, a new iteration generated, and new projected positions for unfound sites moved to the GPSr's. The method was very successful, and it became clear as they extended their forays deeper into the bush that there were errors in previous surface surveys. This is entirely understandable considering the ground the early cavers had had to cover, and the technological tools at their disposal, which would not have included GPS technology.

By 2017, the focus was shifted to the north side of the ridge, where there was very little data to work with – *JU*'s historical positions were rounded to the nearest 100m, and those were often more of a guesstimate than anything else (errors of 200m were common). So again, this time aided by satellite imagery, much time was spent searching the forest until all the principal sites were found. Some of the explorations can be viewed on the JCO's YouTube channel (see [Section 1.8](#) for details).

That brings us to 2020, and this paper. It summarizes the work of a great many people, over many years. Accurate positions are now available for most of the sites, and we are sharing them to aid future research, and ensure that none of the caves listed are lost again. We ask that all who receive this work treat the caves with respect, and help to protect them in whatever way they can.



*Skylight Entrance pit at Drum Cave*



Jackson's Bay Caves – JU's map, red dots marking entrances mapped by JCO



### 1.3: Warning

Cave exploration is inherently dangerous. Do not journey far into any caves discussed here unless you are experienced or are assisted by experienced cavers. The dangers include, but are not limited to: becoming terminally lost, falling to your death, suffering respiratory problems due to cave dust inhalation, contracting histoplasmosis from inhalation of spores spread in bat droppings, and losing consciousness due to bad air. The JCO assumes no responsibility for mishaps that may occur as a result of the sharing of information in this report.

### 1.4: Principal, Minor, and Lost Sites

The summary that follows in [Section 2](#) presents the current knowledge for the listed sites at Portland Ridge as received from AG Fincham in *Jamaica Underground* 2<sup>nd</sup> edition (JU), plus JCO records for all caves found during the last decade. They can be broadly grouped into three categories:

**Principal sites:** These are caves that have sizable batroosts, palaeontological importance, archaeological importance, biological importance, and/or historical importance. All but Taylor's Hut Cave-1 have been investigated by the JCO. They are:

[Jackson's Bay](#)

[Birthday Cave](#)

[Drum Cave](#)

[Lloyd's Cave](#)

[Jackson's Bay Great Cave](#)

[Potoo Hole](#)

[Somerville Cave](#)

[Taylor's Hut Cave-1](#)

[Water Jar Cave](#)

[North Portland Ridge](#)

[Daley's Cave](#)

[Fincham Sinkhole](#)

[High Dome Cave](#)

[Portland Cave-1](#)

[Portland Cave-2](#)

**Minor Sites:** These are smaller caves that may also have some of the same attributes as principal sites. Most, but not all, have been visited by the JCO. They include caves such as [Arrow Cave](#), [Creeper Cave](#), and [Goat Cave](#).

**Lost or Retired Sites:** These are caves that have uncertain positions and not enough historical detail to ascertain whether they have been re-found, or are apparent duplicate entries in the cave register. They are:

[Bone Pit Hole](#)

[Gravel Bay Caves](#)

[Mahoe Gardens Cave](#)

[Lewis Pen Cave](#)

[Portland Caves 3-8](#)

[Richmond Hill Caves](#)

### 1.5: Positional Accuracy

All given positions, except for [Blind Eye Holes](#) [extrapolated], were recorded by the JCO with two Garmin GPSr's, both WAAS enabled, unless otherwise stated. Most sites have a good horizon and thin canopy giving accuracy of generally +/- 5m or better. Lower accuracy occurred at some sites and is noted in individual positional entries. Altitude (elevations) have been rounded to the nearest 5m, reflecting reduced vertical GPS accuracy.

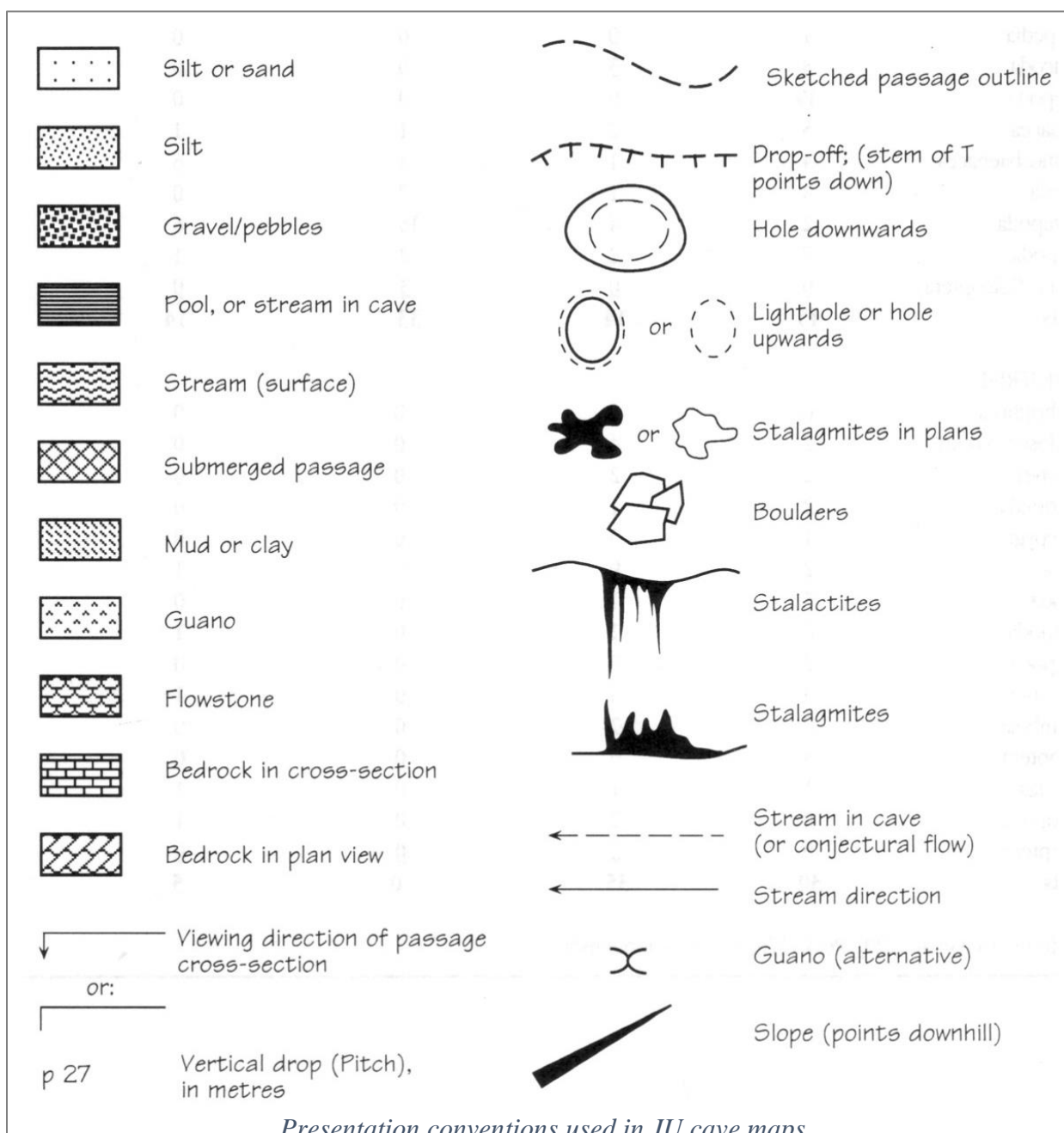


## 1.6: Maps

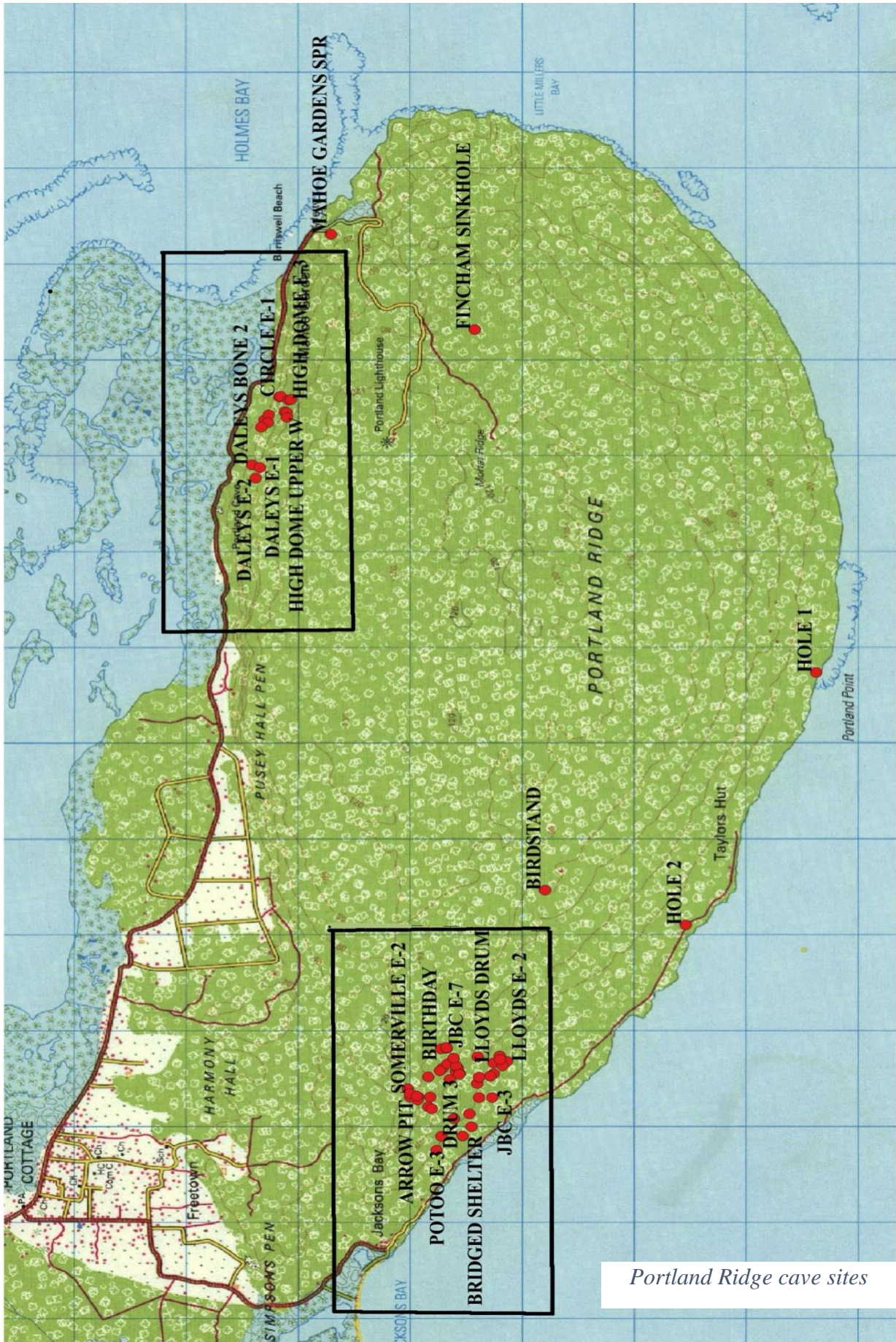
The maps included in the individual site entries were scanned from Jamaica Underground unless otherwise indicated. The presentation of the maps largely follows the *JU* conventions shown below. However, Fincham points out that maps were prepared from different sources, and that there may be inconsistencies in their presentation.

Three of the *JU* maps were large fold-out pages, the Jackson's Bay Area Map, Jackson's Bay Great Cave, and Potoo Hole, which were scanned in sections – thus variation in tones across the image.

The colour maps that immediately follow were generated by Stewart with QGIS, and plot JCO GPS data on Sheet 20 of the 1:50,000 metric topographical series. First is a map of the entire ridge, then sections for Jackson's Bay and North Portland Ridge.

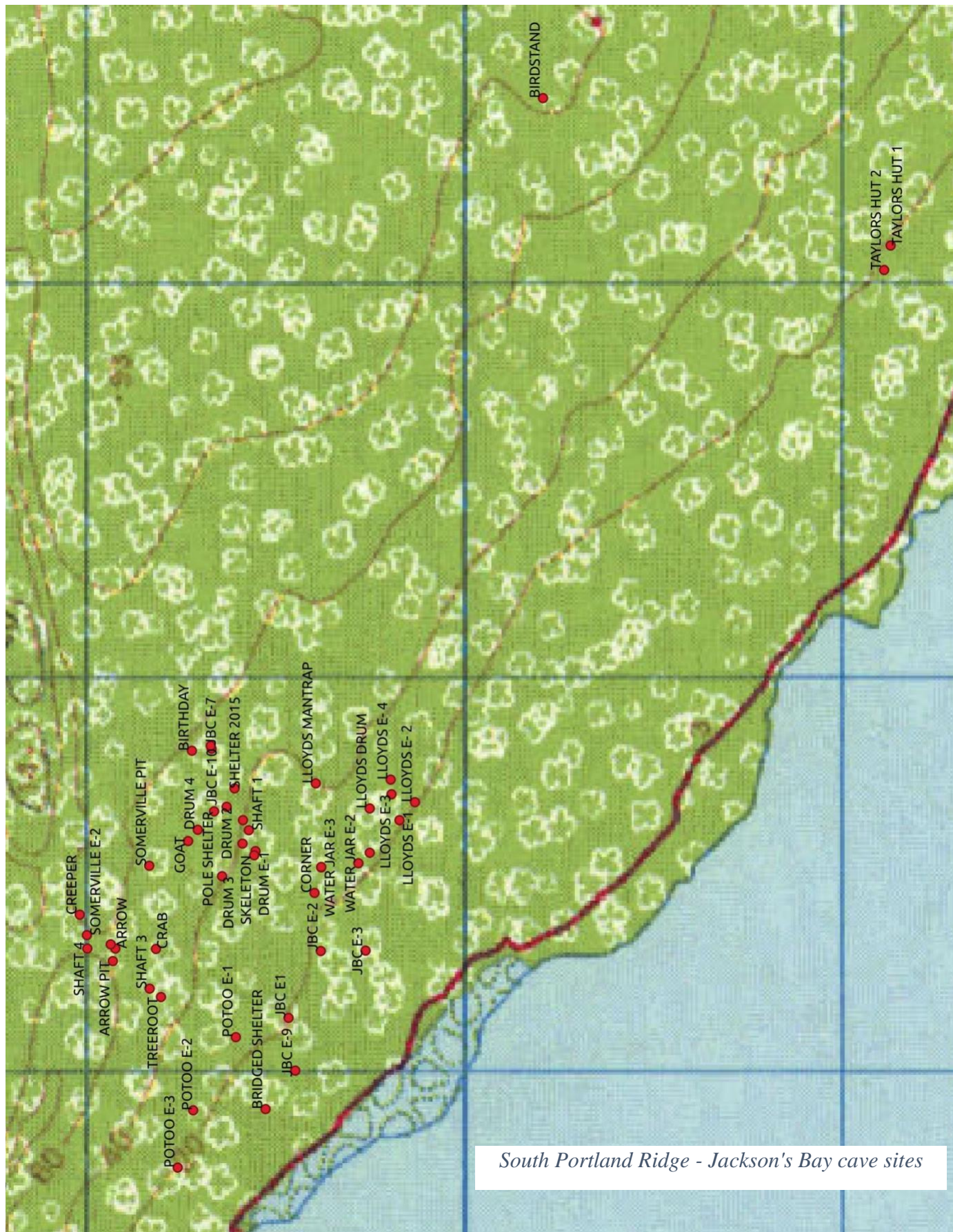






*Portland Ridge cave sites*









*North Portland Ridge cave sites*



## 1.7: Abbreviations

The following abbreviations appear in the text:

CMAM: Claremont-McKenna College – American Museum of Natural History

GSD: Geological Survey Department

IUCN: International Union for Conservation of Nature; the IUCN publishes the Red List of Threatened Species at <https://www.iucnredlist.org>

JBC: Jackson's Bay Caves

JBGC: Jackson's Bay Great Cave

JCC: Jamaican Caving Club, formed in 1958

JCO: Jamaican Caves Organisation, formed in 2002

JU: *Jamaica Underground*, by the late Alan G Fincham (2nd ed., ISBN 976-640-036-9) published in 1997 by The University of the West Indies Press, Kingston, Jamaica

UCC: University Caving Club, formed in 1962 at the University of the West Indies, Mona

VVS: Verbond van Vlaamse Speleologen (Flemish Caving Organisation, Belgium)

## 1.8: JCO videos

The JCO archives video footage of some of its explorations at <https://www.youtube.com/user/JCO2002>. Several videos of explorations carried out at Portland Ridge can be viewed there. Below we list the principal ones as at the printing of this report, with their recording dates and some details. Additional footage is added as the channel is updated from time to time.

Cave(s)	Date	URL
Arrow Pit, Two Tier Cave, Somerville Cave, Creeper Cave	20 Feb 2016	<a href="https://www.youtube.com/watch?v=h6pnOR3hK7Y">https://www.youtube.com/watch?v=h6pnOR3hK7Y</a>
Corner Cave, Water Jar Cave, Lloyd's Cave	30 Jan 2016	<a href="https://www.youtube.com/watch?v=33ZVOT2n6uU">https://www.youtube.com/watch?v=33ZVOT2n6uU</a>
Crab Cave, Arrow Cave	12 Mar 2016	<a href="https://www.youtube.com/watch?v=RYkp8laoDYg">https://www.youtube.com/watch?v=RYkp8laoDYg</a>
Drum Cave; includes footage of a yellow boa	20 Dec 2015	<a href="https://www.youtube.com/watch?v=JoVGXRadRQw">https://www.youtube.com/watch?v=JoVGXRadRQw</a>
Drum Cave; includes footage of a yellow boa, and Birthday Cave	23 Jan 2016	<a href="https://www.youtube.com/watch?v=GCw4-ZfvvNA">https://www.youtube.com/watch?v=GCw4-ZfvvNA</a>
Drum Cave, with Caribbean Coastal Area Management Foundation and European Union	08 Apr 2017	<a href="https://www.youtube.com/watch?v=wIN457YJZuo">https://www.youtube.com/watch?v=wIN457YJZuo</a>
Drum Cave, featured in German tv show (date is posting date rather than recording date)	21 Jun 2018	<a href="https://www.youtube.com/watch?v=K_XiqI6lS4Y">https://www.youtube.com/watch?v=K_XiqI6lS4Y</a>
Fincham Sinkhole	27 May 2017	<a href="https://www.youtube.com/watch?v=HJB8y1wzOMA">https://www.youtube.com/watch?v=HJB8y1wzOMA</a>
Jackson's Bay Great Cave, part 1; includes footage of the Blue Land Crab	27 May 2011	<a href="https://www.youtube.com/watch?v=2fPr9cj0hSM">https://www.youtube.com/watch?v=2fPr9cj0hSM</a>

Cave(s)	Date	URL
Jackson's Bay Great Cave, part 2; includes footage of Taino petroglyphs	27 May 2011	<a href="https://www.youtube.com/watch?v=5X7QIGJr-vI">https://www.youtube.com/watch?v=5X7QIGJr-vI</a>
Jackson's Bay Great Cave; includes footage of fish (possibly Eleotris) and Taino petroglyphs	08 Nov 2014	<a href="https://www.youtube.com/watch?v=AYpD0mbdleY">https://www.youtube.com/watch?v=AYpD0mbdleY</a>
Jackson's Bay Great Cave; footage of fish, arachnid, Blue Land Crab, documentation of previously undiscovered entrance	28 Nov 2015	<a href="https://www.youtube.com/watch?v=mwMRWTIOU74">https://www.youtube.com/watch?v=mwMRWTIOU74</a>
Jackson's Bay Great Cave, with TVJ crew	23 Apr 2016	<a href="https://www.youtube.com/watch?v=9gQiiIQExvI">https://www.youtube.com/watch?v=9gQiiIQExvI</a>
Jackson's Bay Great Cave; includes footage of bat roost	30 Oct 2016	<a href="https://www.youtube.com/watch?v=4rNv0P4BUpk">https://www.youtube.com/watch?v=4rNv0P4BUpk</a>
Lloyd's Cave; includes footage of a yellow boa	02 Apr 2016	<a href="https://www.youtube.com/watch?v=ToQOOWuLQUQ">https://www.youtube.com/watch?v=ToQOOWuLQUQ</a>
Potoo Hole; includes footage of Taino pictographs	16 Apr 2016	<a href="https://www.youtube.com/watch?v=RU8gOrcgQSc">https://www.youtube.com/watch?v=RU8gOrcgQSc</a>
Potoo Hole – the track from entrance 1 to 2, and the experience of poor air quality	120 May 2016	<a href="https://youtu.be/dpifD-B55-Y">https://youtu.be/dpifD-B55-Y</a>
Somerville Cave: locating entrances	13 Feb 2016	<a href="https://www.youtube.com/watch?v=CitrkTzQNEI">https://www.youtube.com/watch?v=CitrkTzQNEI</a>
Jackson's Bay, along the road: footage of potsherd (possibly Taino)	21 Jan 2017	<a href="https://www.youtube.com/watch?v=mxOccgL8qSU">https://www.youtube.com/watch?v=mxOccgL8qSU</a>
Other videos		
Feral pigs captured at Portland Ridge	31 Jan 2017	<a href="https://youtu.be/bx5JQqjDonw">https://youtu.be/bx5JQqjDonw</a>



*Trail camera night time shot of feral pig at Jackson's Bay*

## 2: Summary of Known Caves at Portland Ridge

The following list presents information for the caves of Portland Ridge drawn primarily from *JU* and from JCO records from 2010 to 2020.

Entries are organised as follows:

- Position: Contact the JCO for geographical coordinates using WGS84, GPS, GLONASS (accuracy +/- in meters), Altitude (in meters); “uncertain” indicates a site not yet located by JCO
- Depth: in meters
- Length: in meters
- Type: nature of the site, which includes (from least to most development) shelter, sinkhole, shaft, passage, chamber cave, complex chamber, complex cave
- Explorers: the first explorers to describe the site
- Surveyed: the originators of the site map (where available)

### 2.1: Arrow Cave & Pit

Jackson's Bay

Position: Arrow Cave – Contact JCO

Position: Arrow Pit – Contact JCO

Depth: 20

Length: 49

Type: Chamber cave

Explorers: JCC, 1978

Surveyed: JCC

JU: A low bouldery opening gives access to a sloping chamber which narrows to a squeeze leading into the bottom of the Arrow Pit; a 10m shaft open to the surface. A descent over rocks and stalagmite flows ends in a choke.

JCO: Visited on March 5, 2016. The JU entry is generally accurate, but the squeeze into Arrow Pit is not passable being only 15-20cm wide. It was looked at from each side, cave and pit, and appears to have never been passable, as it is in solid rock, so Cave and Pit ought to have been treated as separate sites. We have found other entries in JU that call narrow connections that don't allow passage a “squeeze” (e.g. Thatchfield Ent 2 to the main chambers), so it seems to be a description rather than denoting actual access.

The depth of the Pit is somewhat more than the listed 10m (~15m).

### 2.2: Bilbo's Cave

Jackson's Bay

Position: No JCO site visit, but may be found using information from JU, below.

Depth: 3

Length: 115

Type: Dry passage

Explorers: JCC, 1982

Surveyed: JCC

JU: A north-facing entrance located a few metres east of [Lloyds Cave](#). Entrances 2 and 3 in a prominent collapse feature beneath a large overhang. A wide chamber with many formations becomes

low and narrow and opens into a dry, guano-filled chamber. The cave is essentially an isolated extension of the Lloyds Cave system.

JCO: No site visit done.

### 2.3: Birdstand #3 Hole

Taylor's Hut area

Position: Contact JCO

Depth: 11

Length: N/A

Type: Simple shaft

Explorers: Claremont-McKenna College – American Museum of Natural History (CMAM), 1995

Surveyed: N/A

JU: A choked vertical shaft located just beyond birdstand #3 on the NW side of the Taylor's Hut pigeon shooters trail.

JCO: Uncertain if this is the same site, but it was the only choked shaft found in the listed area, immediately beside the lane to the existing birdstand, visited on April 2, 2016.

### 2.4: Birthday Cave

Jackson's Bay

Position: Contact JCO

Depth: 21

Length: 185

Type: Complex chamber

Explorers: JCC, 1966

Surveyed: JCC

JU: An impressive collapse-feature located at the NW end of the [Jackson's Bay Cave](#), #7 Entrance collapse-feature. A sloping descent to a complex dry boulder chamber with some good formations. Ascent of the boulders to the SW leads to a crawl over collapsed slabs and a further large complex chamber with good formations and a little guano. Contains a small bat colony.

JCO: Visited on Jan 23, 2016. The cave consists of two large, linked chambers with smaller sections adjoining. Nice formations. The batroost is not large and may have a similar species make-up to the nearby JBC eastern chambers.

There was evidence of goats (vast quantities of faeces) sheltering periodically inside the entrance on the initial talus slope, although none were seen during the visit.

The collapse between this cave and JBC Ent #7 suggests that in the distant past the two sites were linked.







*Inside Birthday Cave*

## **2.5: Blind Eye Holes**

Jackson's Bay

Position: Contact JCO

Depth: 11

Length: N/A

Type: Choked shafts

Explorers: JCC, 1977

Surveyed: N/A

JU: Located about 300m north from [JBC Entrance #7](#). Three shafts of 10m, 8m, and 6m all end in chokes. These lie beyond the known underground extent of Jackson's Bay Cave.

JCO: Not visited. Position is extrapolated.

## **2.6: Boarwood Cave**

Jackson's Bay

Position: Contact JCO

Depth: 12

Length: 122

Type: Complex cave

Explorers: JCC, 1978

Surveyed: JCC

JU: Located in a shallow tree-filled collapse about 50m ENE of [Drum Cave](#) Entrance #2. A one metre drop to a tight 3m pitch and a squeeze into a 20m long chamber with good formations. Descent of a

slope and a crawlway lead into a sediment-floored chamber with a low arched roof. A further crawl near the entry to this chamber ends at a boulder collapse lying beneath the surface depression.

JCO: A shelter cave was found 50m ESE of Drum Cave Entrance 2 on Dec 20, 2015, but we did not find the drop to the 3m pitch so are uncertain this was Boarwood Cave. The collapse was very bushed-up and travel was difficult. However, the given position will put one in the collapse, and Boarwood, if it is not the visited site, should be close by.

## 2.7: Bone Pit Hole

Jackson's Bay

Position: Uncertain

Depth: 2

Length: N/A

Type: Choked shaft

Explorers: JCC, 1978

Surveyed: N/A

JU: Located on the track leading to Jackson's Bay Cave Entrance #1. A shallow overhung pit with some animal bones on the floor.

JCO: The positions given in JU are rounded to the nearest 100m. There is currently no fixed track to JBC Ent 1. There are many 2m deep holes at Jackson's Bay. We assume the bones are goat, which are found at most caves/holes in the area. It is therefore impossible for us to know which one of them this is. However, a shaft in the general area was found and recorded on Mar 5, 2016. See [Shaft #3](#).



*Goat remains  
This one found his demise at Drum Cave*

## 2.8: Bridged Shelter Cave

Jackson's Bay

Position: Contact JCO

Depth: 2

Length: 6

Type: Choked cave

Explorers: JCC

Surveyed: N/A

JU: A small choked (collapse) cave located just beside and west of the Jackson's Bay shooters trail, some 160m from the road. Recent (1996) mapping of the Potoo Hole suggests that this site may be a choked entry to the system.

JCO: Seen multiple times while traveling to caves further inland. Looked at in detail once. A minor site notable mainly because it may be associated with [Potoo Hole](#).

## 2.9: Circle Cave

North Portland Ridge

Positions:

Ent 1: Contact JCO

Ent 2: Contact JCO

Depth: N/A  
Length: ~20  
Type: Dry passage  
Explorers: JCO, 2019  
Surveyed: N/A

JCO: Suspected to be one of the Portland caves around which there is much confusion (see [Portland Caves 3-9](#)). Found after a visit to [High Dome Cave](#) while following the “Hose track” back to the road. An entrance a couple of metres high and wide in an alcove on the side of a short cliff leads into a dry passage that circles back to the cliff face to the east to a second entrance. Pottery noted by Pael.

## 2.10: Corner Cave

Jackson's Bay  
Position: Contact JCO  
Depth: 6  
Length: 60  
Type: Chamber cave  
Explorers: JCC, 1978  
Surveyed: N/A

JU: In an area of obvious breakdown some 50m WSW of [Water Jar Cave](#). Two small entrances lead down to two interconnected sediment floored chambers. Floor levels suggest possible connections with both Water Jar Cave and the Molehole series of [Drum Cave](#). Fragments of Amerindian cassava griddle noted.

JCO: Visited on Jan 30, 2016. No connections to Water Jar or Drum Caves found during a brief location visit. A return is on the JCO to-do list.

## 2.11: Crab Cave

Jackson's Bay  
Position: Contact JCO  
Depth: 6  
Length: 20  
Type: Dry passage  
Explorers: JCC, 1971  
Surveyed: JCC

JU: Located to east of the Red Route track, just before it descends into Boulder Glade. A large overhung collapse feature contains a short choked passage and a small chamber.

JCO: Visited on Mar 12, 2016. An impressive collapse-feature is skirted partway down on the west side, and then a scramble leads down into the cave. Very dry, a few bats, and many hermit crabs (*Coenobita clypeatus*).



*Hermit crab, pictured at Drum Cave*

## 2.12: Creeper Cave

Jackson's Bay

Position: Contact JCO

Depth: N/A

Length: 20

Type: Chamber cave

Explorers: JCC, 1978

Surveyed: N/A

JU: Located in the north wall of the Butterfly Glade (the exit glade for [Somerville Cave](#) Entrance #2). A large chamber open to daylight has a flat silt floor.

JCO: Visited on Feb 20, 2016. A few bats are present. No dark zone. "Creeper" is written on the wall with charcoal, which made identification easy.

## 2.13: Daley's Cave

North Portland Ridge

Positions:

Ent 1: Contact JCO

Ent 2: Contact JCO

Depth: 30

Length: 512

Type: Dry passage

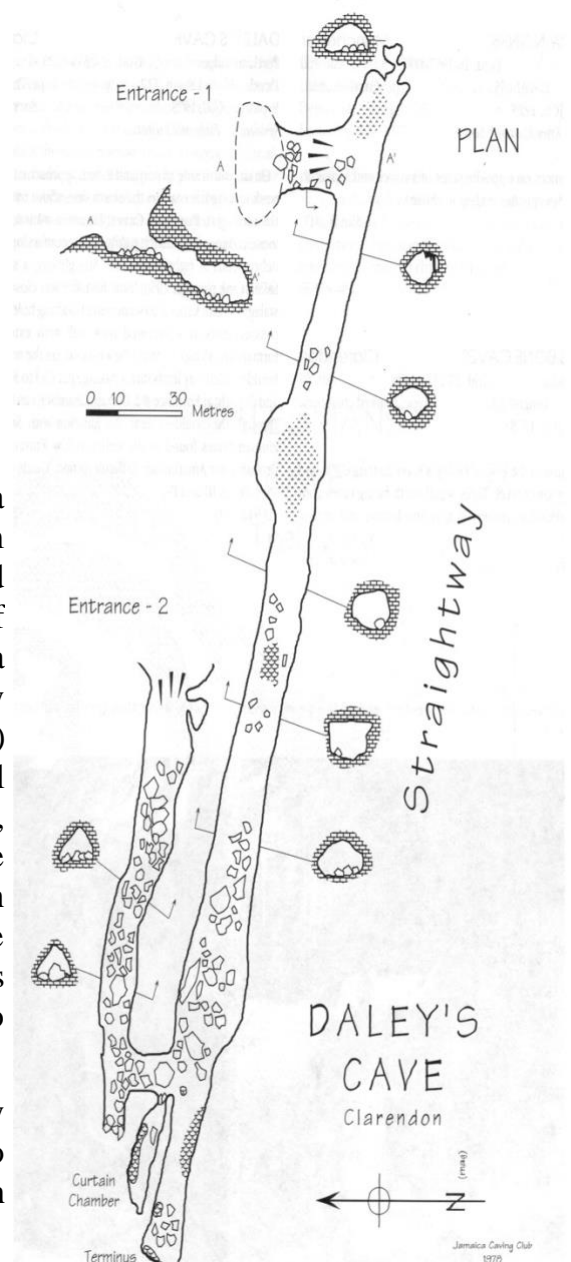
Explorers: JCC, 1978

Surveyed: JCC

*Synonym: Parson's Pulpit*

JU: On the north side of Portland Ridge, approached by a steep track leaving the road on the south side, about 680m west of the turning to [Portland Caves](#). Entrance #1 is located in a loose collapse with thatch palms. Descent of a slope of loose debris leads at right angles into Straightway; a spectacular fossil trunk passage, 295m long. East, the way closes down to stalagmite blockages at a (sometimes) drafting hole. West, the passage ends at a fractured rock wall with extensive dry formations. 45 metres from the west end, on the north side, a boulder-filled way leads into a passage parallel to Straightway and daylight at Entrance #2. Curtain Chamber can be reached through the boulders near the junction with Straightway. Human bones found in the debris below Entrance #1 are probable not Amerindian. Difficult to find. Guide advised.

JCO: First visited on May 12, 2018. Location was aided by indications of a collapse on Google Earth that turned out to be Ent 1. The southern passage, accessed via Ent 1, is much





longer than the northern parallel passage that reaches the surface at Ent 2, and is lined with impressive flowstone walls in places. Some bats were present and the roost merits investigation. Amerindian potsherds were found, and left in place, at the side of the passage below Ent 2.

On a second visit, in 2019, a goat was encountered about 200 metres inside the northern passage, well into the dark zone. We'd heard rocks tumbling somewhere ahead, which was odd (normally the only sound in a cave is dripping water or bats), and were amused to find that that's all it was, although why it was that far in, alone, on a bright, sunny day, is a complete mystery.



*Potsherds at Daley's Cave*

Of interest is the orientation and elevation of the Daley's passages with those at [High Dome Cave](#) and a linear collapse between the two. The three features appear to be associated, and extend for about a kilometre along a 70m elevation contour near the top of a steep hill. It seems an unlikely place for a river passage to form (the presumed speleogenesis), and we can only speculate that the hillside below has subsequently eroded from a wider plain.



*The Straightway passage at Daley's Cave*

## 2.14: Daley's Bone Caves

Portland Ridge

Positions:

Cave-1: Contact JCO

Cave-2: Contact JCO

Cave-3: Uncertain

Depth: 15 (Cave 1)

Length: 60 (Cave 1)

Type: Choked chambers

Explorers: JCC, 1978

Surveyed: N/A

JU: Located just to the east of [Daley's Cave](#) Entrance #1, and at a slightly lower level. Three small north-facing caves containing Amerindian pottery shards and human and animal bones.

JCO: Two of the three listed caves have been found. One was located on May 12, 2018, a small chamber (~10m wide) at the bottom of a 2.5m deep collapse on the side of a north-facing hill. Another was located on Feb 16, 2019, 70m to the east on the same north-facing hill; it being much larger, we are calling it Cave-1, and the smaller of them Cave-2. The third cave remains to be identified. We suspect the three Daley's Bone Caves are the same as [Portland Caves 6-8](#); to add to the confusion, Daley's Bone Cave-3 may be the same also as the elusive Portland Cave-9.

Cave-1 is developed in a steeply sloping fissure that penetrates into the hill, and chokes at either end of the lowest chamber where there are areas of dark zone. There are few bats present.



*Skylight Entrance pit at Drum Cave*



## 2.15: Drum Cave

Jackson's Bay

Positions:

Ent 1: Contact JCO

Ent 2: Contact JCO

Ent 3: Contact JCO

Ent 4: Contact JCO

Depth: 15

Length: 610

Type: Dry passage

Explorers: JCC, 1978

Surveyed: JCC

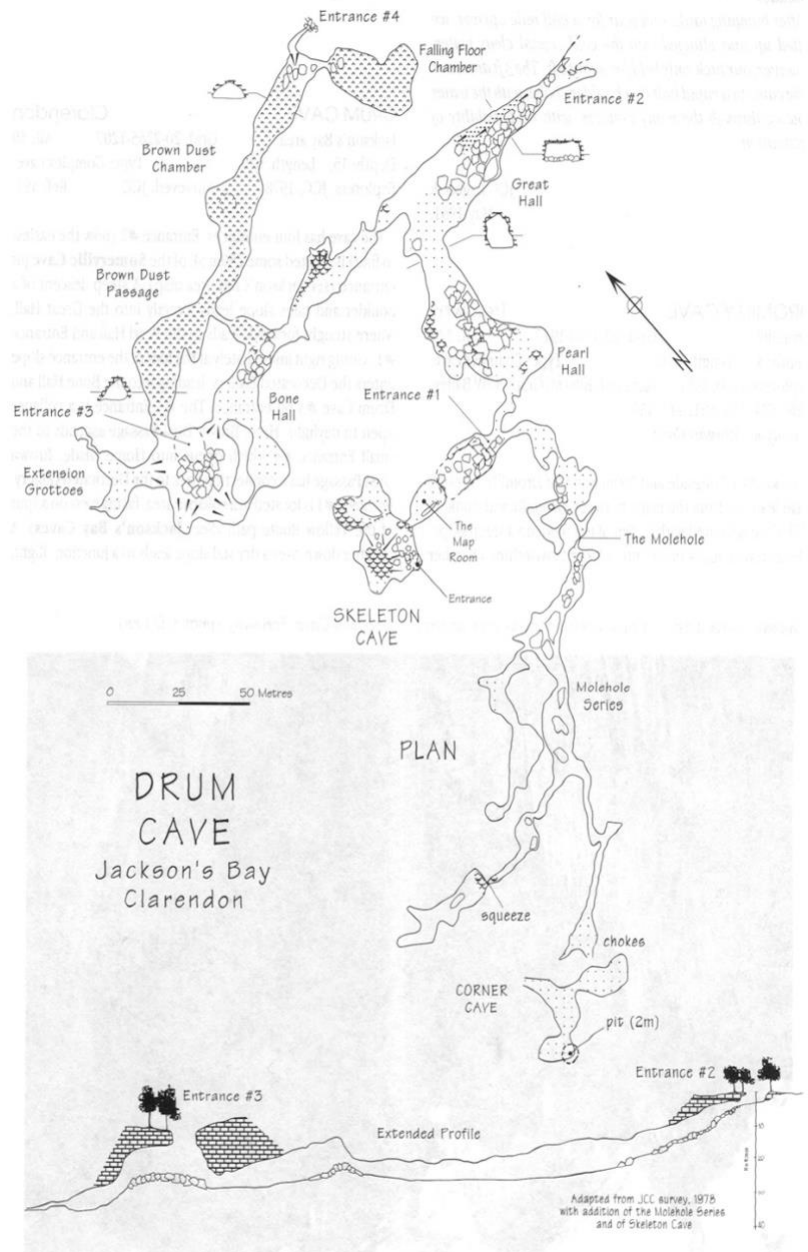
JU: Parts of Drum Cave overlie the main Jackson's Bay Cave passage, but no connection appears to exist. The Bone Hall – Brown Dust area was excavated paleontologically by the CMAM expeditions in 1993 – 1996. Recovered material is lodged at the American Museum of Natural History, NY. Fossil guano from surface deposits in the Brown Dust Passage has been C14 dated to 10,050  $\pm$  70BP (McFarlane: unpublished).

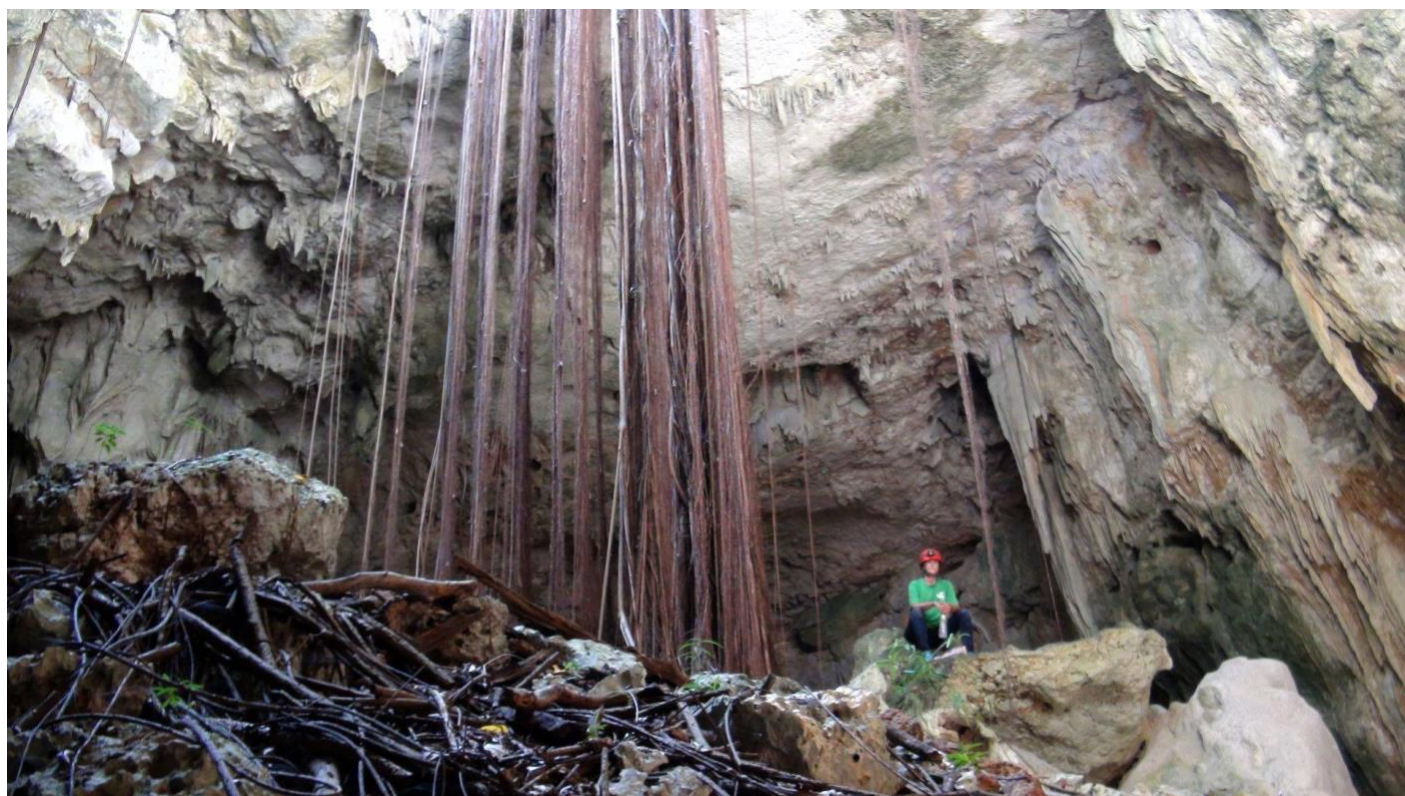
JCO: First visited on Dec 20, 2015, with subsequent visits on Jan 23 and Feb 13, 2016. All parts of the cave were explored except for the southwest extension (the Molehole Series), which requires some digging to access – it is entered via a low crawl through sediment and is currently somewhat choked. This is the section that overlies [JBGC](#), and should be checked again for possible connections.

The name is derived from the presence of a steel drum inside Ent 1. These are found at several caves in the area (e.g. [Lloyd's Cave](#)).

Bats are roosting in various chambers of the cave. The species present include insectivores evidenced by numerous insect wings on the floors of the passages. A visit for capture and release and ultrasonic recording would be of value.

A yellow boa (*Epicrates subflavus*) was seen on two occasions, in two different passages, appearing to be two different individuals, both over 1.5m long. (See JCO video listing in [Section 1.8](#) for footage.)





*Drum Cave Entrance 2*

## 2.16: Fincham Sinkhole

Portland Ridge

Position: Contact JCO

Depth: 65, +/-5

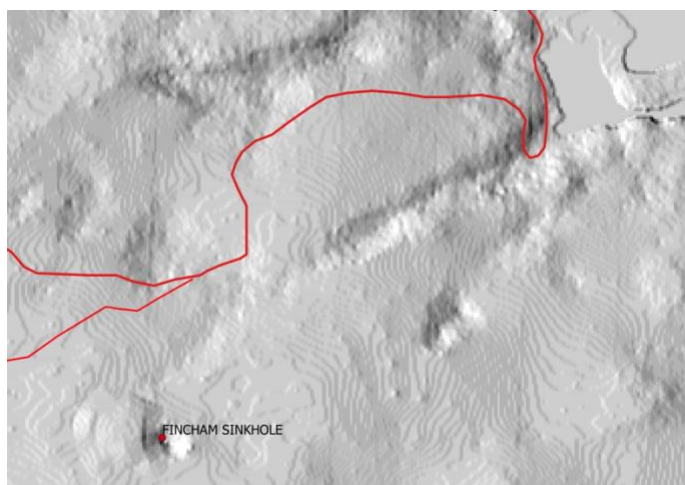
Length: N/A

Type: Sinkhole

Explorers: JCO, 2017

Surveyed: N/A

First seen by the JCO on Google Earth as a large, distinct, circular feature. A reconnaissance visit to the plotted location on May 13, 2017, revealed it to be a very large, deep sinkhole, so on May 27, 2017, armed with much rope, JCO members Hyde, Pael, and Stewart returned and descended the deepest sinkhole on the Ridge.



*Digital elevation view of Fincham Sinkhole*

The width at the top is about 15m, it widens to about 30m at the bottom, and the depth is about 65m. It's a very fine pitch, well-lit, with much exposure, and there is nothing else like it on the ridge. Apparently, the hole was known of by local people (hard to miss – it's massive and located in an enormous funnel-shaped bowl), but no one had descended it before.

Alan G Fincham, author of *Jamaica Underground*, passed away close to the time of our descent, and in all his years of caving he'd never named a cave after himself, so to honour his life in whatever small way we could it was decided to designate the site Fincham Sinkhole.



For video of the site visit, see the JCO video listing in [section 1.8](#).

### 2.17: Goat Cave

Jackson's Bay

Position: Contact JCO

Depth: 20

Length: 45

Type: Cave to a shaft

Explorers: JCC, 1977

Surveyed: JCC

JU: Two boulders form an archway entrance into a sloping chamber ending in an excavated squeeze into a horizontal gallery with a 10m deep pit in the floor. This passage chokes at both ends and the shaft floor is a choke of boulders and earth. Human bones and pottery shards present.

JCO: Visited Feb 13, 2016, on the same day as [Drum Cave](#), primarily for location; not much time was spent investigating the site. A return is planned.

### 2.18: Gravel Bay Caves

South Portland Ridge

Position: Uncertain

Depth: N/A

Length: N/A

Type: Chamber caves

Explorers: Unknown.

Surveyed: N/A

JU: Four small caves are reported [by McGrath BRG (1950)] as being, *Southeast of Sandy Bay to Gravel Bay, and then north to an old house site.*

JCO: Not visited. Locating the caves may prove difficult.

### 2.19: High Dome Cave

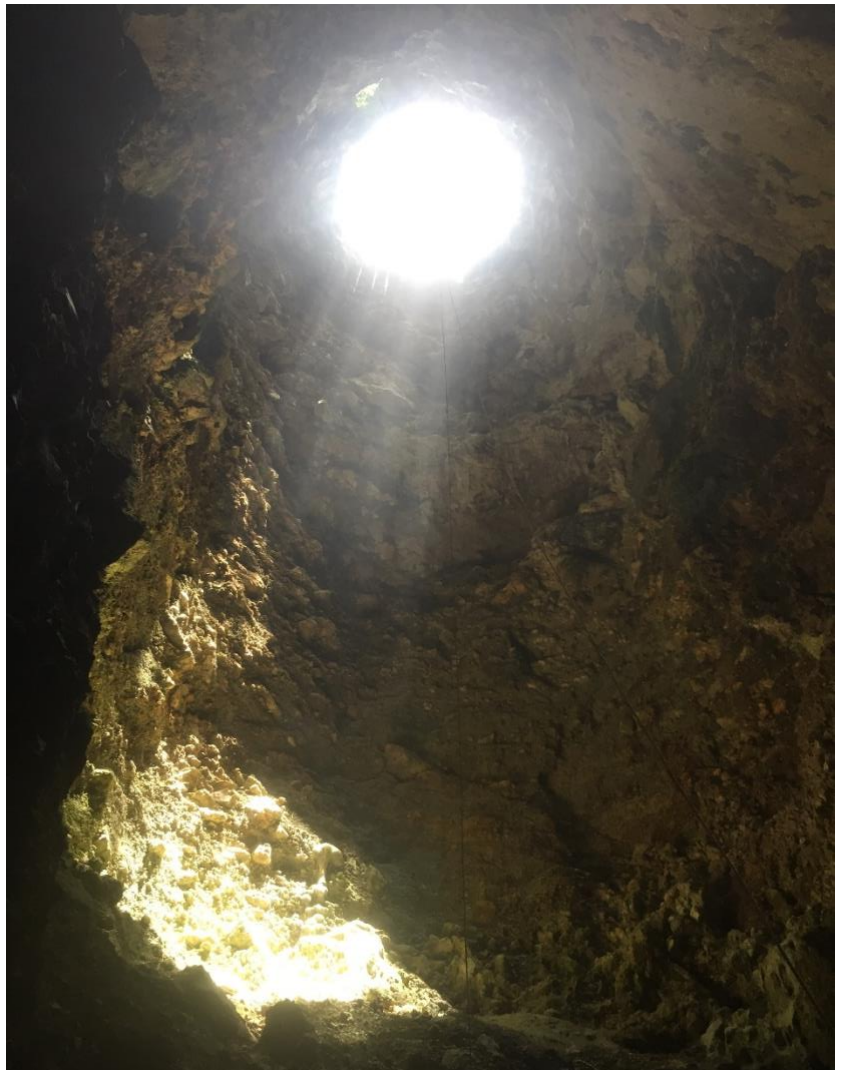
North Portland Ridge

Positions:

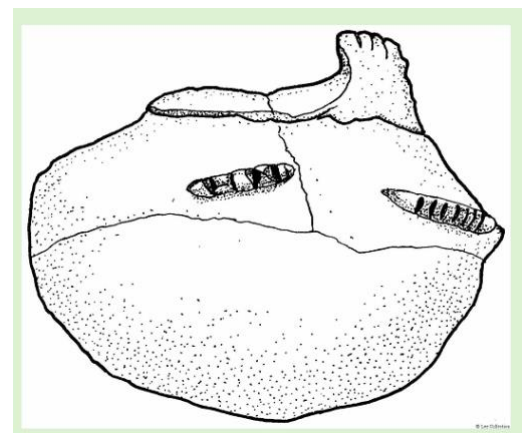
Ent 1 (NW): Contact JCO

Ent 2 (NE): Contact JCO

Ent 3 (SE): Contact JCO



*Fincham Sinkhole, deepest sinkhole on the Portland Ridge*



*Taino decorated rim sherd collected at High Dome Cave (Allsworth-Jones 2008:CD).*

Ent 4 (SW): Contact JCO  
High Dome Upper - West: Contact JCO  
Depth: 37  
Length: 200  
Type: Chamber caves  
Explorers: Unknown  
Surveyed: AH Edwards, 1942  
*Synonyms: Portland Caves 3-5*

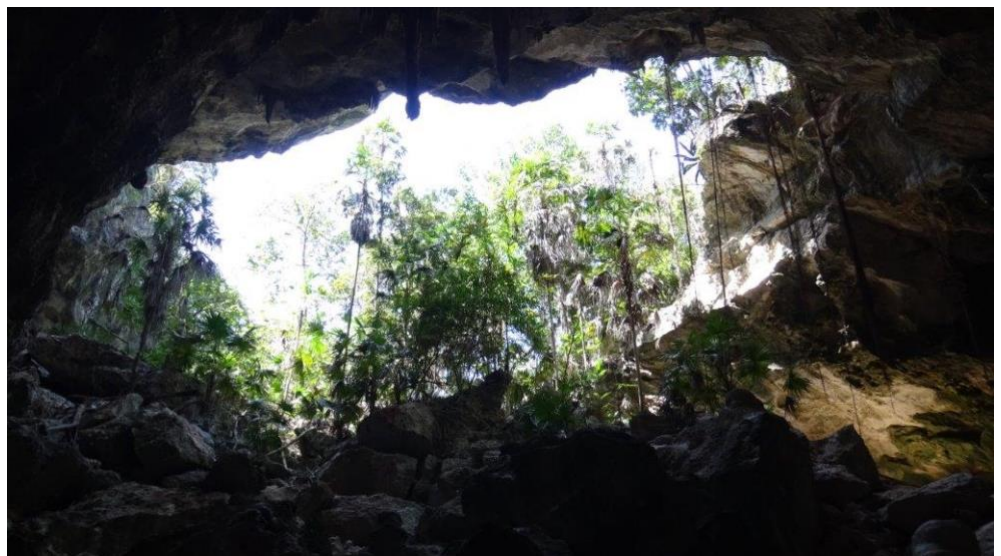
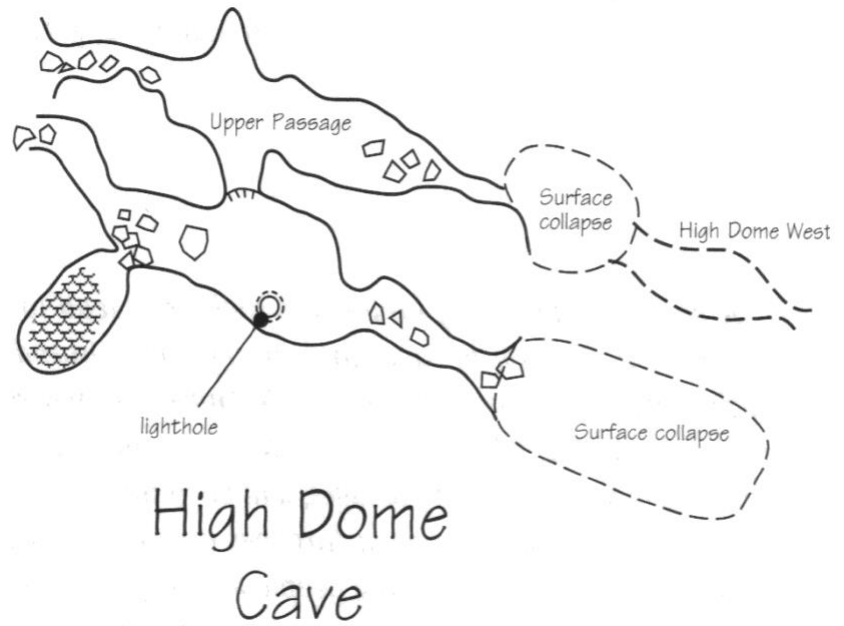
JU: A large dry domed chamber has two lightholes in the roof and a second, steeper, collapse-feature entrance to the east. Two small grottoes, on the north and south sides, the former with extensive concretations. A higher level series of passages (High Dome Upper) open in the south wall, and can be reached by a further upper entrance. A separate large through passage (High Dome Upper –West) exists just to the west of the entrance to the upper cave.

JCO: First visited Jul 8, 2017, with subsequent visits on Mar 10 and May 19, 2018. The lower, northern passage consists mostly of one very high, very large chamber, with a small, well-decorated chamber low on the southeast side, and a grotto on the north. Entrance 1, on the western side, is in a very large, deep collapse, which slopes steeply below the drip-line to a level, sedimented floor that has potential for a palaeontological dig. At the east end, a scramble leads up to entrance 2.

The upper, southern passage, between entrances 3 & 4, is substantial, but with a more linear morphology and lower roof. Partway along, a large opening looks down on the northern passage, with access requiring vertical gear. The western end, entrance 4, is high on the side of the entrance 1 collapse.

Some bats are present, more in the southern passage, and a visit for capture and release and ultrasonic recording would be of value.

See entry for [Daley's Cave](#) regarding a suspected association with High Dome.



*High Dome Cave Entrance 1*

## 2.20: Jackson's Bay Great Cave

Jackson's Bay

Positions:

Ent 1: Contact JCO

Ent 2: Contact JCO (Water Entrance)

Ent 3: Contact JCO

Ent 4: Contact JCO

Ent 5: Contact JCO

Ent 6: (No JCO surface visit)

Ent 7: Contact JCO

Ent 8: (No JCO surface visit)

Ent 9: Contact JCO

Ent 10: Contact JCO (Previously unlisted, near Ent 7)

Depth: 60

Length: >3,360

Type: Complex cave

Explorers: JCC, 1964-77

Surveyed: JCC

JU cites the following description of the larger Jackson's Bay system, comprising Jackson's Bay Great Cave, Potoo Hole, Arrow Cave, Somerville Cave, Birthday Cave, Lloyd's Cave, Bilbo's Cave, Water-Jar Cave, Skeleton Cave, Drum Cave, and several smaller caves, from Fincham (1993): In total these caves comprise somewhat over 7,000m of fossil phreatic caverns mostly located less than 50m above present sea level. Speleothem dates for the Main Cave suggest a minimum age for its formation of 250,000 years BP (Wadge et al., 1979). (...) This whole system is remarkable for its extensive phreatic caverns, complex morphology, unique situation and splendid speleothem displays.

JU provides a detailed description of the routes to the different caves in the general Jackson's Bay system before turning to Jackson's Bay Great Cave, which is described in JU as consisting of Jackson's Bay Old Cave and Jackson's Bay New Cave. Below follow excerpts from the description.

JU: This complex system has nine entrances, all of which are located in thick bush in the low hills behind the salt pond to the immediate east of Jackson Bay [Hunting and Fishing Club's] Club house.

Descending at JC Entrance #1, a wide muddy chamber is entered where routes forward enter deep water and the aqueous *Cistern Series* complex. (...) Turning immediately left below #1 entrance the way leads through *Camp*, a flat-floored area and eventually into water and out to daylight again at the *Water Cave Entrance* chamber. A system of passages opening to the west between Camp and the Water Chamber leads to *Bench Passage* and JB Entrance Holes #4 and #5. From the back of the Water Chamber a section of low wet passages can be entered which lead out again (JB Entrance #3) at a point not far from the roadway.

The Queens Series – This series of passages and chambers was first entered (by JCC) from the *Old Cave* through the restricted *Geriatric's Delight*, but graffiti in the main chamber indicated it had previously been visited by others, presumably via the main entrance. From this entrance (JB Entrance #9), one enters a large dry chamber with an extensive deposit of ancient guano extending to the east.

Note: a marine shell sample recovered from below two metres of the *Queens Series* guano deposit was dated as being 759BP. (McFarlane, unpublished).



From the *Water Chamber* entrance, the *Lead-on Crawl* is entered from a low opening from a ledge on the SE side of the chamber. The crawlway extends for some 100m to open into a substantial passage with shallow pools of water. The water deepens and *The Little People*, a fine stalagmite display, is passed on the right. The way ascends into a long breakdown room which ends at a drop (2m) into *Shamrock Passage* (...). Shamrock Passage extends for some 220 m through deepening water. *The Hand* stalagmite is passed on the left, and a low exit from the deep water is made to junction with *Peach Passage* on the left. Peach Passage contains some fine formations and becomes too tight. Beyond the Peach Passage junction pools and stal flows extend to a circular breakdown room, *Roundabout Chamber* to *Rockfall Chamber* where the passage divides. A tight descending hole on the right leads into low wet passages which rejoin the main passage (left at Rockfall) through a canal at *Crossroads*. This area of the cave generally supports a small bat colony. A complex of phreatic passages (showing some evidence of vadose entrenchment) enters *The Coliseum*, the first of the *Far Chambers*. A complex passage opening on the south side of The Coliseum ends at a rubbly choke, *Mouse Trap*, and a low wet crawl can be entered through boulders on the south east side.

The Coliseum is a roughly circular chamber, 30m wide, floored with boulders and guano. A steep descent from the NE side enters the flat-floored *Theatre*. An ascent over boulders and stalagmite flows to the NW gives access to JB Entrance #7, some 30m above (...). Farther to the north, below JB #7, a route over boulder slabs enters a substantial chamber containing a massive stalagmite flow and the opening (*Arch Bishop's Pulpit*) of JB Entrance #8. Exiting to the NE, a short drop enters *Twin Rudders Chamber* which leads back to *The Pit*, a 20m drop back into the Theatre. Beyond the Theatre a complex of large caverns with boulder falls and galleries on several levels terminates in a southeasterly extension *Lost Man's Passage*.

JCO: The period of exploration began in 2010. Jackson's Bay Great Cave is large, complex and confusing in places, and after several visits to the site, as of 2020, we have covered about 95% of the system as mapped by the JCC. Fincham points out that the length recorded for the Jackson's Bay complex "almost certainly excludes substantial lengths of minor passages" (JU p. 14). Inexperienced visitors should beware that in this type of system, it is possible to wander in circles for hours while vainly searching for a way out.



*Taino petroglyphs at JBGC Entrance 2*

With regard to GPS positions of the entrances: Entrances 6 and 8 are vertical shafts into the east end of the cave – we found them from the inside, but haven't done a surface search to GPS record them. Entrance 10 was previously unlisted and discovered during the JCO's first internal traverse to the eastern end of the cave in 2015. We agree with Ashcroft's (1969:36) assessment that "[t]he finest of the dry caves, and perhaps the finest of all caves in Jamaica, is Jackson's Bay Cave." The site is of great importance and merits much further research, and protection.



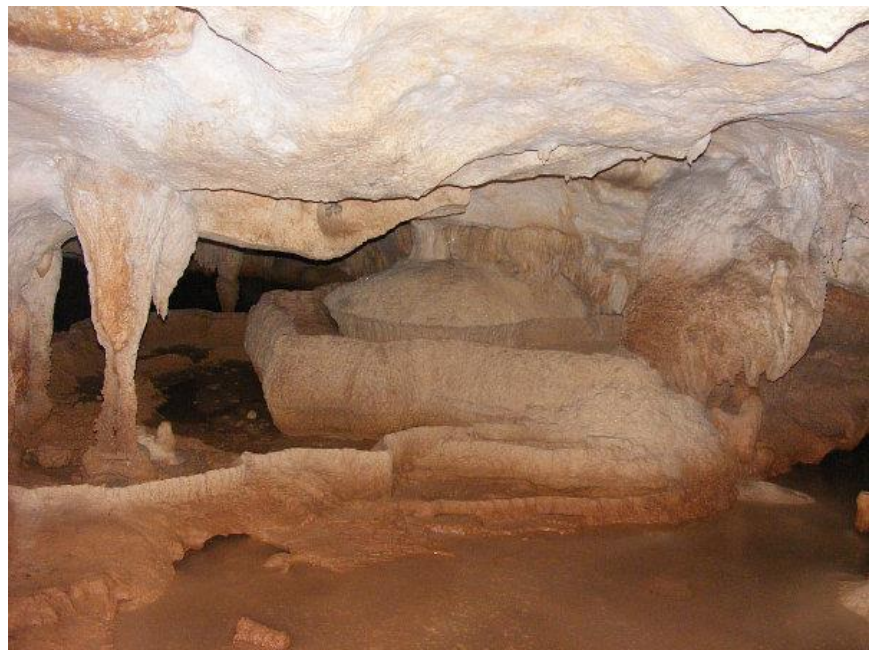


*Approaching The Little People, Jackson's Bay Great Cave*

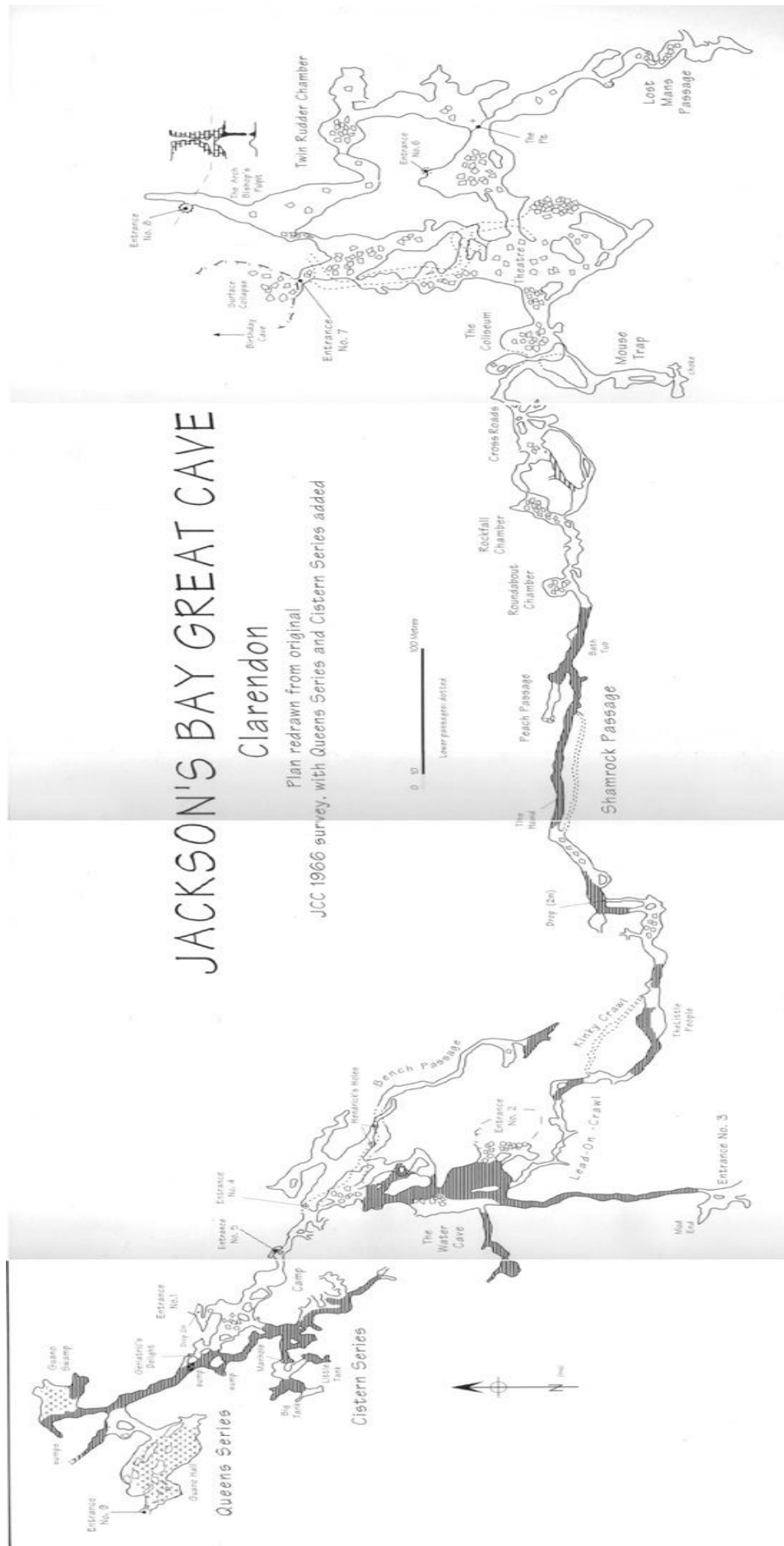
The Hendricks Holes on the map do not extend to the surface and are vertical connections between the two levels of the cave in the west-central area.

Total bat numbers are estimated at well over 10,000 with the greatest density at the eastern end of the system, and another concentration at the western end, inside of entrance 9. Lesser, but substantial numbers are also found between entrances 1 and 2, and a section to the south. Thick deposits of guano are found in several parts of the site making the system a candidate for palaeoclimatic studies, as elaborated in [Section 3.2](#).

Invertebrates consist primarily of guano-loving troglophiles, although troglobites may occur in low energy parts of the system beyond the lead-on crawl. In this section, in pools of standing water, a fish identified as being cave-obligate (eyeless) was found in 1965 (Turner 2016-2018). The rare and threatened endemic cave frog *Eleutherodactylus cavernicola* is present (Holmes, McLaren & Wilson 2014). (See [Section 3.3](#) for further discussion of cave fauna.)



*Dry rimstone pool at Jackson's Bay Great Cave*



Taino petroglyphs are located inside Entrance 2. JBGC is CC2 in Lee's system of cave classification. Allsworth-Jones (2008: CD) reports on Lee's 1971 site visit: That year a number of petroglyphs were observed near the mouth of the "water cave" entrance, though some had been mutilated. Fragments of pottery were collected from the mud at the edge of the lake at this point. Another opening of the same "cave system" was designated separately by Lee as CC14. The two together appear to be the same as the "burial cave" described by MacCormack and Duerden. According to MacCormack, the cave in question had "two entrances" and was "lofty and well lighted, about a mile from the sea." This description was echoed by Duerden. One "very perfect, flattened, human skull" and fragments of a second, as well as "numerous limb and other bones", were recovered at that time. It is evident from work done subsequently by speleologists that the "water cave" (as well as CC6 and CC14) are only part of a far larger complex which has now been mapped in detail by Fincham and his colleagues (Fincham, 1997). Thanks to them, the human occupation of the area has also been dated. D.A. McFarlane reported two radiocarbon dates obtained on (1) a human bone fragment,  $710 \pm 60$  BP (1240  $\pm$  60 AD) and (2) a marine shell,  $795 \pm 70$  BP (1155  $\pm$  70 AD). The latter is said to have been excavated from below a 2 metre deep deposit of fossil bat guano in an entrance chamber.

### **2.21: Jaw Bone Hole**

Taylor's Hut area

Position: Uncertain

Depth: 3

Length: N/A

Type: Choked passage

Explorers: JCC, 1982

Surveyed: N/A

JU: A short, choked hole near [Taylor's Hut Cave](#), where a human jaw bone was found. Presumably an Amerindian site.

JCO: Not yet located.

### **2.22: Lewis Pen Cave**

Jackson's Bay

Position: Uncertain

Depth: N/A

Length: N/A

Type: Shelter cave

Explorers: Unknown

Surveyed: N/A

JU: Location of site uncertain, but a shelter cave containing bones, reported to the north of Jackson's Bay village.

Also: Lewis Pen Cave (1897) *Journal of the Institute of Jamaica*, 2 (5). Location of this archeological (bone cave), now lost, but apparently somewhere near Jackson's Bay village. [JU/271]

JCO: JU's attribution is to Duerden (1897), but no reference is made to Lewis Pen Cave there or in Duerden (1895). Residents did not know of a Lewis Pen. This site is essentially lost – if it ever existed. It is listed here solely for historical reasons.



## 2.23: Lloyd's Cave

Jackson's Bay

Positions:

Ent 1: Contact JCO

Ent 2: Contact JCO

Ent 3: Contact JCO

Ent 4: Contact JCO

Ent 5 (Drum Entrance): Contact JCO

Ent 6 (Mantrap entrance): Contact JCO

Depth: 8

Length: 1,884

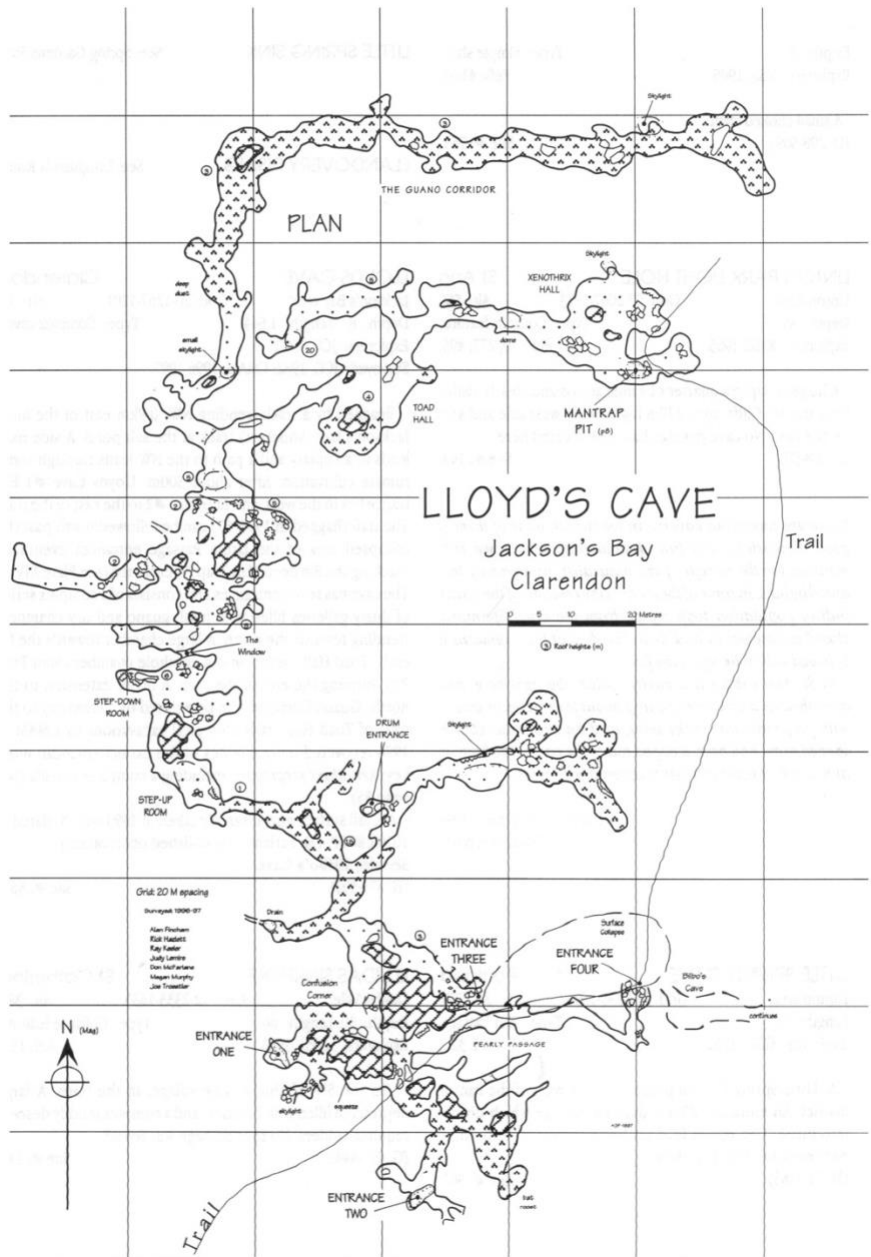
Type: Complex cave

Explorers: JCC, 1982

Surveyed: JCC 1982; CMAM, 1996, 1997

JU: The cave has seven entrances and consists of a complex series of dusty galleries filled with fossil guano and dry chambers trending towards the north. A large chamber towards the far end – Toad Hall – leads into a lighthouse chamber (Mantrap Pit), forming the end of the cave. A major extension to the north (Guano Corridor) can be entered by a crawlway to the west of Toad Hall. Paleontological excavations by CMAM in 1996 recovered unique bones of the extinct Jamaican monkey, *Xenothrix mcgregori*, including a complete maxilla. A fossil surface guano sample taken in 1993 was C14 dated to 1079+/-80BP (McFarlane, unpublished observation).

JCO: Located after visits to [Corner Cave](#) and [Water Jar Cave](#) on Jan 30, 2016, with several subsequent visits including April 2, 2016. Entrances 1-4 are low scrambles, all fairly close to each other. Beyond there, the cave is complex and confusing, and exploration is aided by use of the map included in this document. The position for Mantrap Pit was taken at the bottom of the lighthouse, so accuracy is reduced, but it should be easily found from the surface using the given coordinates. The Drum Entrance is a narrow, climbable shaft with a steel drum near the bottom. Overall, the cave is very dry





and dusty, and explorers are advised to use dust masks. Equipment used during excavations by CMAM at Mantrap is still in place.



*Demonstration at Lloyd's Cave:*

*A cutlass is easily pushed into the cave floor*



*CMAM equipment at Lloyd's Cave*

Bats in low numbers occupy most of the passages, with greater numbers in some of the larger chambers. Capture and release and ultrasonic recording would be of value, with use of a harp trap possible in constricted areas. A yellow boa was observed inside the cave on one occasion.

Potsherds were found near the southern entrances, which have been left in place by the JCO. We urge future visitors to do the same.

## **2.24: Mahoe Gardens Cave**

Portland Ridge

Position: Uncertain

Depth: N/A

Length: N/A

Type: Shelter cave

Explorers: GSD

Surveyed: N/A

JU: An open shelter cave with many animal bones, noted by McGrath BRG (1950), but not since located.

JCO: There are many sites on Portland Ridge that are open shelter caves, most of which are not listed because of relative unimportance – they are barely caves, often just large overhangs. The complete lack of detail other than animal bones, which most caves on the ridge have (goats), leaves us with no way to determine which shelter cave was the one McGrath visited. We therefore recommend this site currently be regarded as lost.

## **2.25: Mahoe Gardens Spring**

Portland Ridge

Positional accuracy: Contact JCO

Depth: 4

Length: N/A

Type: Shaft to a pool

Explorers: GSD, 1962

Surveyed: N/A

JU: A 1mx1.5m shaft to a pool, located about 50m west of the road. A pumphouse installed.

JCO: Currently used by the PWD Hunting and Sporting Club to supply water to their facilities. The pumphouse was visited on Jun 9, 2018, and we saw that we could easily descend to the pool to look for accessible upstream continuation. This remains to be done.

## **2.26: Mystery Shelter**

Jackson's Bay

Position: Uncertain

Depth: N/A

Length: N/A

Type: Shelter cave

Explorers: JCC, 1978

Surveyed: N/A

JU: A deep defile which runs SW from just west of [Arrow Cave](#), ends in an overhung cliff with a very small, unexplored hole in the face. May contain bees!

JCO: Not yet located, although it seems to be in an extension of the short cliff that [Arrow Cave](#) is in.

## **2.27: Pole Shelter**

Jackson's Bay

Position: Contact JCO

Depth: N/A

Length: N/A

Type: Shelter cave

Explorers: JCO, March 2016

Surveyed: N/A

JCO: A shelter cave found during a visit to locate entrances for [Drum Cave](#). Nothing important noted during a brief search, but included to prevent confusion with other sites. Named Pole Shelter because someone had piled poles in it.

## **2.28: Portland Cave-1**

North Portland Ridge

Position:

Ent 1: Contact JCO

Ent 2: Contact JCO

Ent 3: Contact JCO

Depth: N/A

Length: 153

Type: Dry passage

Explorers: Unknown

Surveyed: Lands Department, 1942

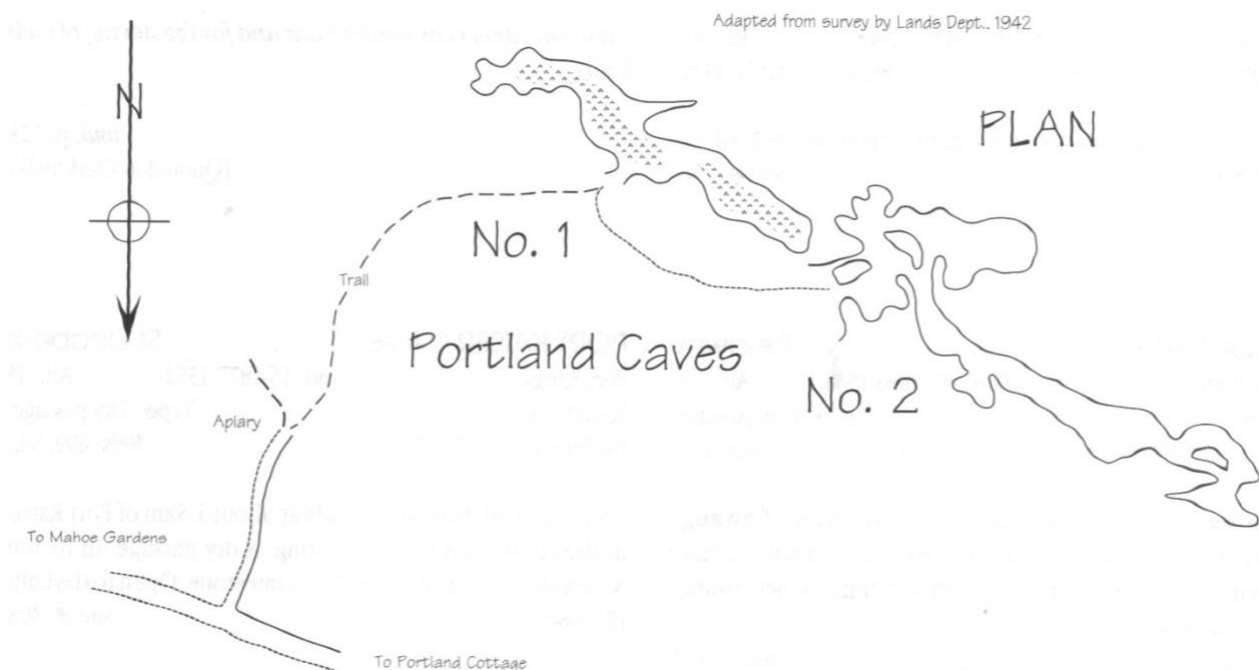
Synonym: *Fourmile Caves*

JU: Entrance, facing NE, leads to an arched tunnel extending for about 75m to the WNW and ESE. Two lightholes in the roof. A well known cave from which most of the guano was excavated in the 1940's.

JCO: Visited on Feb 3, 2018. The most notable thing about the cave is the complete removal of guano-saturated sediment, some 3m deep, that took place in the 1940's, which has exposed lower sections that had been previously hidden. One often knows that there is much sediment below the surface one walks on in a cave, but to actually see what lies beneath is illuminating.

However, the removal of the sediment also removed any palaeontological material, Amerindian pottery and human remains (bones) that might have existed there, stripping the site of all archival value it might have had. It serves as a very good example of why guano mining in caves should never take place.

Allsworth-Jones (2008: CD): Also known as Portland Ridge Cave and Portland Cave No. 1. Mapped by Lee in 1964. He recovered "a handful of potsherds" and "a pair of human upper leg bones" sufficient for him to classify it as a burial site. Described by Fincham as "a well known cave from which most of the guano was excavated in the 1940's." Howard visited what he called Portland Ridge Cave No. 1 in 1948 with C.B. Lewis, and from his description there seems little doubt that the same cave is being referred to. Both he and Lewis recovered "large amounts" of human skeletal material, "all heavily broken and widely scattered." Howard also found shells and pottery fragments. He concluded that the cave "had been used at some time as a habitation site and perhaps later as a burial chamber." [Note: Portland Cave-1 is CC4 in Lee's system of cave classification.]





## 2.29: Portland Cave-2

Portland Ridge

Position: Position: Contact JCO

Depth: N/A

Length: 300

Type: Dry passage

Explorers: Unknown

Surveyed: Lands Department, 1942

JU: Two entrances face east. Complex entrance chambers with level floors interconnect and lead to a low earth-floored passage extending for over 185m to the WNW to end in two small exits. Many dry formations. Dates on the walls here extend back to the mid 1770's. Entrance area sometimes used as a habitation (*Captain Busha*: 1990).

JCO: Visited on Feb 3, 2013, after Portland Cave-1. The entrance area is easily found low on a hill 80m WNW of Cave-1.

Like Portland Cave-1, it has been greatly affected by human activity; nevertheless, it has retained a much larger batroost than Portland Cave-1. For many years, it was the base of a local man named Busha. The regular human occupation that occurred over an extended period may well have had an impact on species diversity (kerosene lamps, cooking fires, etc), but it would be of interest to compare it to the nearby [High Dome](#) and [Daley's Caves](#) to see if this is actually the case. Because of the long history of visitation, it is unlikely that artefacts or remains of the Taino or Redware cultures are still present.

## 2.30: Portland Caves 3-9

Portland Ridge

Positions:

Caves 3-5: As for High Dome Cave

Caves 6-8: As for Daley's Bone Caves

Cave 9: Contact JCO (Possibly Daley's Bone Cave 3)

Depth: N/A

Length: 30

Type: Dry passage/chamber

Explorers: Lands Dept, JCC

Surveyed: Lands Dept, 1942

JU: Much confusion exists regarding the exact number and locations of the Portland Caves. The original 1942 survey shows some sites which have not been relocated. A short and narrow through cave with two entrances exists just north of Portland Caves #3-5 (see [High Dome Cave](#)), and it appears that there may be others in the area.

JCO: The confusion that exists regarding the numbered Portland Caves other than 1&2 is easily resolved by eliminating them, which we recommend be the case from hereon forward. Caves 6-8 are probably the 3 [Daley's Bone Caves](#). Caves 3-5 are [High Dome Cave](#). The short and narrow cave with two entrances, which we found in 2019, is now called [Circle Cave](#). Davalos & Eriksson (2003) list a

Cave-9 with geographical coordinates that plot between Portland Caves 1&2 and the Daley's Bone Caves. We suspect it to be Daley's Bone Cave 3, but this remains to be determined.

In conclusion, Portland Caves 3-8 should be removed from future listings.

### **2.31: Portland Light Sink**

Portland Ridge

Position: Uncertain

Depth: 9

Length: N/A

Type: Choked shaft

Explorers: JCC, 1971

Surveyed: N/A

JU: Located to the SE of Portland Light. A choked vertical shaft.

JCO: Not yet located.

### **2.32: Pot Hole**

Portland Ridge

Position: Uncertain

Depth: 6

Length: 20

Type: Choked shaft

Explorers: JCC, 1976

Surveyed: N/A

JU: A small vertical opening with a tree growing in it leads to descent over stalagmited boulders to a low silted choke. Numerous pot shards present.

JCO: Not yet located. However, the description resembles one of the [Daley's Bone Caves](#), and may be a duplicate entry in JU.

### **2.33: Potoo Hole**



#### **CAUTION!**

Jackson's Bay

Positions:

Ent 1: Contact JCO

Ent 2: Contact JCO

Ent 3: Contact JCO

Depth: 24

Length: 2,170

Type: Complex cave

Explorers: CMAM, 1993, JCC, 1995, VVS (Belgium), 1996

Surveyed: CMAM, 1995, VVS (Guy van Rentergem & Rik Martens), 1996

JU: The main cave is reached by a 20m deep vertical overhung pit at the cave entrance. A large cavern with a huge boulder and massive deposits of dusty guano extends to the north and leads to a further

[Return to top of document](#) 36

passage and a second entrance. Further explorations and mapping by VVS revealed a third entrance. From Entrance #1, the cave extends generally to the west with a complex of passages and chambers on several levels. Four southward extensions all end in lakes or sumps which appear to be at, or close to, sea level. Surface fossil guano from this cave has been C14 dated to 950 +/- 50 BP (DA McFarlane,



unpublished observation). **Note: The survey party in 1996 reported several parts of the cave appeared to have high carbon dioxide concentrations!**

JCO: Numerous Amerindian pictographs are located on the walls inside of the main (collapse) entrance. Some bats are present. Deep guano deposits are extant in the “Big Chamber”, and possibly suitable for palaeoclimatic studies. A yellow boa (*E. subflavus*)

*Zoomorphic and geometric pictographs at Potoo Hole*

>1.5m long, was seen inside entrance #2 on Jan 12, 2013, and a galliwasp (*Anguidae, celestus sp.*) was seen inside the main entrance on the same date.

A human femur was found several metres below entrance 2 during a site visit with Canadian archaeologist Mirjana Roksandic (University of Winnipeg), presumably Amerindian, and left in place.

The cave is large, complex, and confusing. For this reason, and the issues addressed below, it should be considered very dangerous for visitors who do not have extensive caving experience.

During an exploration on May 20, 2016, to familiarize ourselves with the route from entrance 1 to 2, very poor air was encountered in the chambers below entrance 2. This was surprising, as during a visit in 2013, Stewart had led several researchers along the same route (albeit with much searching, thus the return visit) with no appreciable degradation of air quality in any part of it. But this time, it was bad to the point that he genuinely feared for his life, and the scramble up to the complex passages that lead to entrance 2 was difficult in the extreme. We cannot even speculate on why the air changes so much, but we advise extreme caution when exploring the cave anywhere beyond the pictograph chamber, below entrance 1.



*Human femur at Potoo Hole Entrance 2  
(Mirjana Roksandic, University of Winnipeg)*



Allsworth-Jones (20089: CD): Discovered in 1993. The "Arawak Gallery" lies immediately below entrance # 1, at the eastern end of an extensive cave system. Potoo Hole forms part of the Jackson's Bay cave complex. The pictographs are situated at the base of a vertical pit which is 20 metres deep. A preliminary analysis has revealed the presence of at least 46 images: 18 zoomorphic, 7



*Inside Potoo Hole*

anthropomorphic, 8 geometric, and 13 undefined. The zoomorphic images include probable turtles, crocodiles, iguanas, and fish. For the most part, the pictographs were executed in a red ochre and/or blackish pigment (possibly charcoal-based). "Surface fossil guano" from the cave has been radiocarbon dated to  $950 \pm 50$  BP, but of course it is not known what relationship this material bears to the pictographs. [Note: Potoo Hole is CC22 in Lee's classification of caves]

### **2.34: Richmond Hill Caves**

Portland Ridge

Position: Uncertain

Depth: N/A

Length: N/A

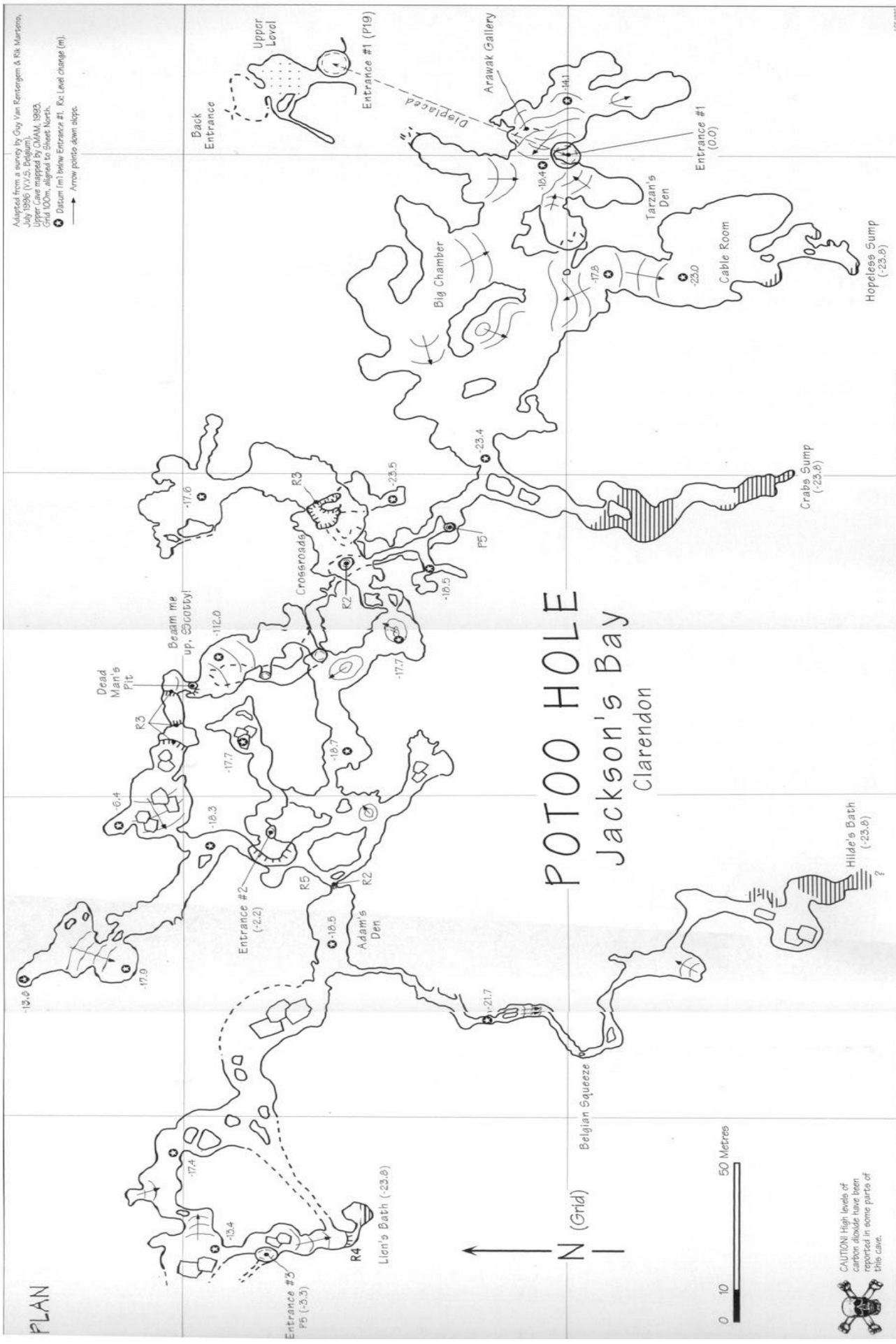
Type: Unknown

Explorers: Unknown

Surveyed: N/A

JU: Caves are reported in the area of Portland Lighthouse, but not located in search by a JCC party in 1982.

JCO: Not yet located.



### **2.35: Shaft #1**

Jackson's Bay

Position: Contact JCO

Depth: >3

Length: N/A

Type: Shaft

Explorers: Not descended

Survey: N/A

Noted on Dec 20, 2015, during a visit to the area of [Drum Cave](#), with which it was suspected to be associated. Not descended.

### **2.36: Shaft #2**

Jackson's Bay

Position: Contact JCO

Depth: >3

Length: N/A

Type: Shaft

Explorers: Not descended

Survey: N/A

Noted on Dec 20, 2015, during a visit to the area of [Drum Cave](#), with which it was suspected to be associated. Not descended.

### **2.37: Shaft #3**

Jackson's Bay

Position: Contact JCO

Depth: >2m

Length: N/A

Type: Choked shaft

Explorers: Not descended

Survey: N/A

Found on Mar 5, 2016. Not descended, but appeared to choke. See [Bone Pit Hole](#).

### **2.38: Shaft #4**

Jackson's Bay

Position: Contact JCO

Depth: >3

Length: N/A

Type: Shaft

Explorers: Not descended

Survey: N/A

Found on Mar 5, 2016, in the vicinity of [Somerville Cave](#) Ent 2. Not descended.



### 2.39: Skeleton Cave

Jackson's Bay

Position: Contact JCO

Depth: 9

Length: 35

Type: Chamber cave

Explorers: JCC, 1978

Surveyed: DA McFarlane, 1995

Synonym: *Goat Bone Hole*

JU: Located to the west of [Drum Cave](#) #1 Entrance collapse. A hole in boulders gives access to a bouldery chamber with dry formations and recent bones. This cave was excavated paleontologically by CMAM personnel in 1995/96, with the recovery of fossil remains of the extinct Jamaican monkey, *Xenothrix mcgregori*.

JCO: Found on Jan 23, 2016, but excavations in the entrance area appear to have blocked access to most of the cave. Needs another look.



### 2.40: Somerville Cave

Jackson's Bay

Positions:

Ent 1: Contact JCO (Pit)

Ent 2: Contact JCO

Depth: 18

Length: 275

Type: Chamber cave

Explorers: JCC, 1964

Surveyed: JCC

Synonym: *Swan Lake Cave*,  
*Roland's Cave*

JU: A descent of 10m leads to a high dome with a chamber with a lighthole. A large gallery with dry formations can be followed to a sloping ascent to a small exit hole and a high second entrance

in the side of a deep glade (Butterfly Glade). Entry to Somerville can also be gained via a very tight descent from the lowest point of Two Tier Chamber Cave. This cave named after Mr. Roland Somerville of Jackson's Bay.



*Caver descending Somerville Cave Pit Entrance*

JCO: First located on Feb 13, 2016. The cave is developed on two levels connected by collapses, with the through route on the lower level. The easiest access is via entrance 2, to the northwest, with entrance 1 requiring vertical gear. Some bats are present, and investigations of species make-up would be of value.

The connection to [Two Tier Chamber Cave](#) mentioned in JU is rather baffling. We found only a tiny hole between the two. Perhaps a larger opening has been blocked by fallen rocks, or did we find the wrong connection? A return visit to figure this out is necessary.

#### 2.41: Taylor's Hut Cave-1

Taylor's Hut

Position: Contact JCO

Depth: 4

Length: 65

Type: Dry passage

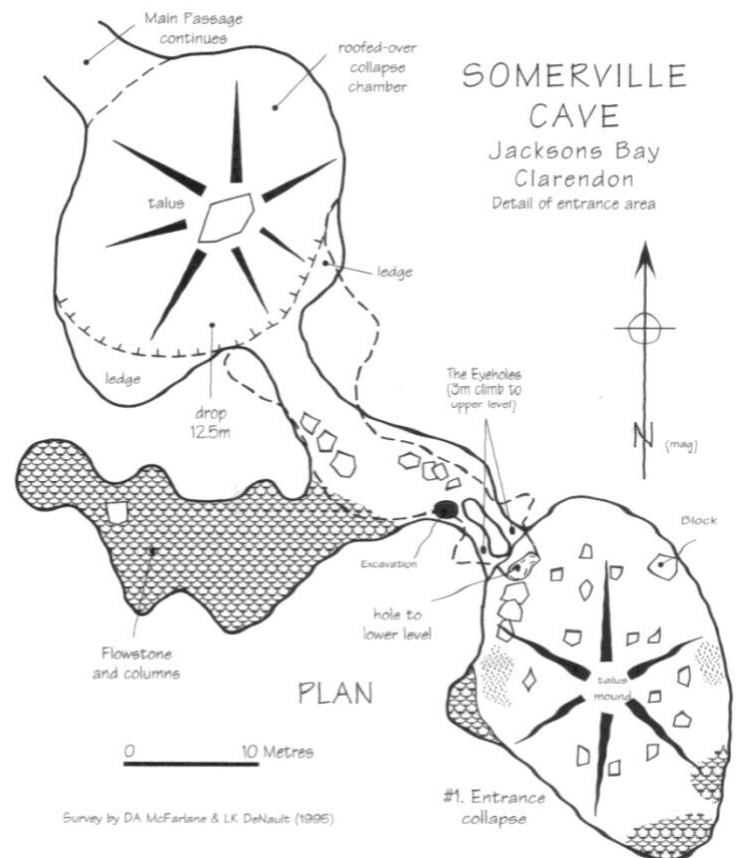
Explorers: GSD, JCC

Surveyed: J. Lee

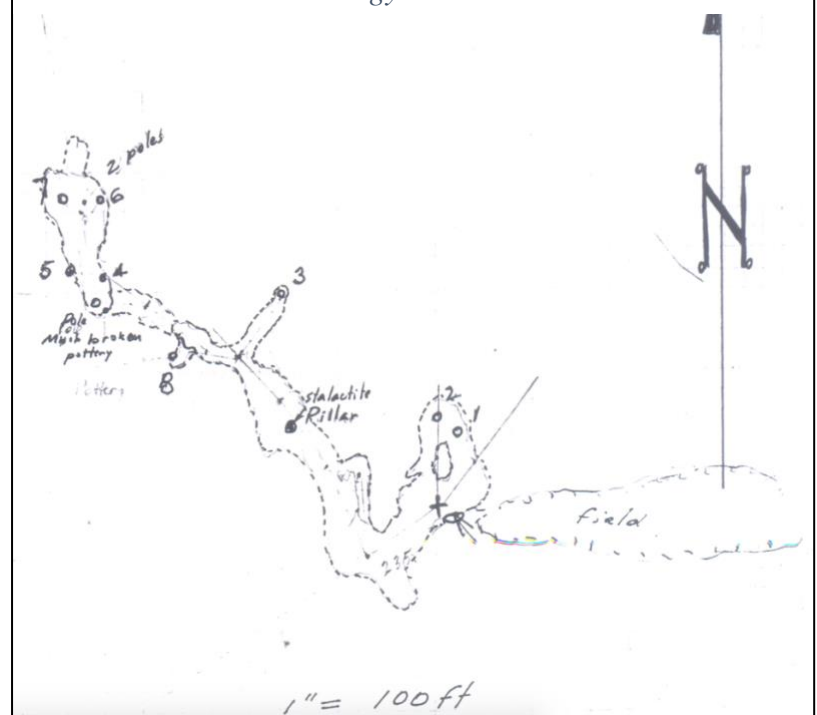
JU: Entrance down a boulder slope in a small collapse. An arched passage with chambers and a large deposit of dry dusty guano leads to a terminal chamber with a lighthouse above. Amerindian petroglyph noted near the entrance.

JCO: Located Feb 20, 2021. Cave is extremely dusty throughout. Poles were observed with twine around some of the ends, and some pottery sherds remain. Scattered human bones were observed. Petroglyph was confirmed.

Allsworth-Jones (2008: CD): Mapped by Lee in 1971. He described the site as "an essentially undisturbed burial cave of major importance". According to his description, three systems of passageways which are easily traversed made this cave especially attractive to the Arawaks. At about 8 prominent



*James Lee's map of Taylor's Hut Cave-1, made available by the Archaeology Laboratory in the Department of History and Archaeology at The UWI Mona*



positions, and in several other places, large pottery fragments and/or skeletal remains occurred on the cave floors of two of the major passageways. There seem to have been at least 6 burials, but there were only 3 skulls, one in a good condition and two in a poor state of preservation. The presence of some wooden poles in the immediate vicinity of the pottery and skeletal remains suggested to Lee that they had been used to carry the dead persons into the cave. The poles were 2-3 inches thick and 8-10 feet long. Other evidence suggested to him that some of the burials were definitely secondary. One intact bowl containing a skull was interpreted in this way, and its photograph was reproduced in "Archaeology Jamaica" (71-3: 6). According to Lee, any disturbance that had subsequently taken place inside the cave could be attributed mainly or entirely to numerous large crabs which lived there, and to one stray goat which died there. After consultation with C.B. Lewis, and in order to safeguard the material from damage, the decision was taken to remove it from the cave and to reconstruct the broken pottery vessels. Before this was done, the material was photographed in situ. On first entering the cave, Lee ascertained that more than 12 vessels were associated with the burials. After reconstruction, he described 11 of them as follows: "three pots are round, six are boat shaped, one is teardrop shaped, and one is a squat bottle". 5 or 6 large griddle fragments occurred at a point over 300 feet inside the cave. The fragments were found to be parts of three buren, one of which was squarish with rounded corners, about 50 cm long on each side. [Note: Taylor's Hut Cave-1 is CC15 in Lee's system of cave classification.]

## 2.42: Taylor's Hut Cave-2

Taylor's Hut  
Position: Contact JCO  
Depth: 3  
Length: 10  
Type: Chamber cave  
Explorers: JCC  
Surveyed: N/A

JU: A hole 3m across in a limestone terrace drops into a chamber with a gravel and snail shell floor. Pottery shards noted. The cave appears to be a collapsed extension of cave #1.



*Taino artefacts collected at Taylor's Hut Cave-1:  
Skull in vessel (image made available by Allsworth-Jones)  
Water jar (Allsworth-Jones 2008:CD)*

JCO: Located Feb 20, 2021. A single chamber with no dark area. Contains a large amount of potsherds. A John Crow (turkey vulture) was found nesting inside the cave. The chamber is over 10 meters across, appearing to match that of Taylor's Pit and lending credence to the view that it may be the same.

Allsworth-Jones (2008: CD): Located by Lee in 1973, said to contain "sparse pottery and abundant bat guano". [Note: Taylor's Hut Cave-2 is CC17 in Lee's system of cave classification.]

## 2.43: Taylor's Pit

Jackson's Bay  
Position: Uncertain  
Depth: 4  
Length: 22  
Type: Chamber cave  
Explorers: CMAM, 1996



Surveyed: CMAM, 1996

JU: A 4m drop into a low chamber contains rocks and shells. See also Taylor's Hut Cave-2. May be same site.

JCO: See Taylor's Hut Cave-2. May be same site. The sketch survey certainly resembles what we saw of Taylor's Hut Cave-2.

#### 2.44: Tree Root Hole

Jackson's Bay

Position: Contact JCO

Depth: 4

Length: 10

Type: Choked passage

Explorers: JCC, 1978

Surveyed: N/A

JU: A small hole between the roots of a tree in the middle of the path opens into a descending horizontal slot which becomes too tight. Hole appears to blow air at times.

JCO: Seen multiple times while traveling to other sites in the area, but not yet descended. JU makes it clear that there is no accessible continuation. The source of the air that appears to blow from the hole at times is a mystery – the nearest other site is a small shaft we noted, [Shaft #3](#), 35m to the northeast.

#### 2.45: Two Tier Chamber Cave

Jackson's Bay

Position: Contact JCO

Depth: 28

Length: 30

Type: Complex chamber

Explorers: JCC, 1965

Surveyed: JCC

JU: A vertical drop leads to two shattered vertical chambers. A tight hole in the floor of lowest chamber enters the far end of **Somerville Cave**.

JCO: Found and descended on Feb 20, 2016. The tight hole in the floor of the lower chamber that connects to [Somerville Cave](#) was found, but it was far too small to get through – about 15cm across.

#### 2.46: Water Jar Cave

Jackson's Bay

Positions:

Ent 1: Contact JCO

Ent 2: Contact JCO (Collapse entrance)

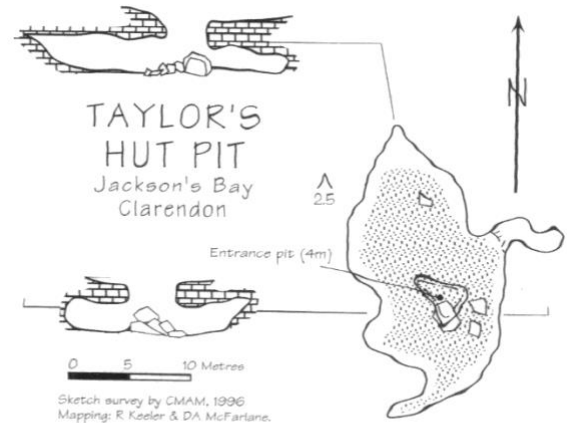
Ent 3: Contact JCO

Ent 4: Contact JCO (Lightholes)

Depth: 3

Length: 320

Type: Complex cave



Explorers: JCC, 1978

Surveyed: JCC

JU: A lighthole entrance opens into a complex of silt-floored dry passages and chambers extending to the east through a crawlway to reach the Main Entrance, a rectangular collapse feature, opening to the SW. A low passage leads further SE for 30m to the Water Jar Entrances where there is evidence of now dried up pools being used as a water source by Amerindian peoples. Human bones and pottery shards of Arawak origin are present.

JCO: Two entrances and the lightholes georeferenced on August 8, 2010; a return visit took place Jan 30, 2016. There is a bat population. The dried-up pools mentioned in JU associated with Taino and perhaps Redware use were probably fed by seasonal percolation of rainwater. Water Jar has clean rocky floors in places, unlike the nearby [Lloyd's Cave](#), which also had Amerindian visitation, which has deep deposits of water-absorbing sediment in much of it.

The northwest section of the cave is very close to [Corner Cave](#), and above [Jackson's Bay Great Cave](#). A low entrance, Ent 3, faces west and immediately to the east, above, are a couple of small lightholes.



*Insect remains - evidence of the presence of insectivorous bats in Waterjar Cave*



*Fossils at Water Jar Cave*



## 2.47: Wild Goat Cave

Jackson's Bay

Position: Uncertain

Depth: 5

Length: 45

Type: Chamber cave

Explorers: JCC, 1977

Surveyed: CMAM, 1996

*Synonyms: Black Goat Cave, Fudu Cave, Loop Cave*

JU: An open entrance chamber leads into two further chambers to the left, which loop around to return to the entrance chamber via a crawlway.

JCO: Located, but for some reason no position was recorded, so another visit is needed. Essentially a shelter cave. It did smell very strongly of goats.



*Goat encountered deep inside Daley's Cave*



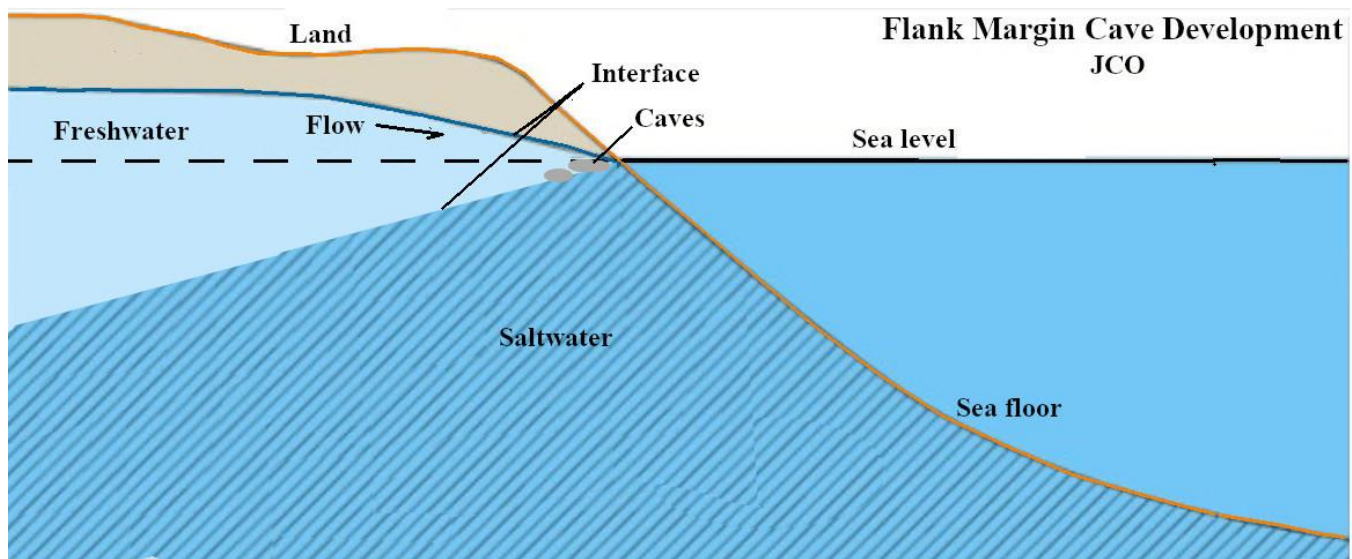
### 3: Research and Site Preservation

#### 3.1: Speleogenesis

Limestone caves, such as those at Portland Ridge, form in two general ways, both involving water, and are therefore grouped into two broad categories, epigenic and hypogenic. Some sites may form from both processes taking place at different times.

##### Epigenic and hypogenic development:

Epigenic development occurs when water enters cracks, joints, or faults directly from the surface, and then removes rock through mechanical erosion (abrasion by surface material) and chemical erosion (an acid-base reaction between slightly acidic rainwater and calcium carbonate). Therefore, from the beginning, there are openings at the surface.



Hypogenic development occurs entirely within the local water table, primarily through chemical erosion, and creates voids that only become accessible when a chamber is intersected by surface erosion. The chemical reaction that takes place in the mixing zone of fresh and salt water immediately inland of the coast produces **flank margin** caves (as described by Labourdette et al. 2007, Mylroie & Mylroie 2007). Thus, they are an indicator of local sea level during the time of their formation.

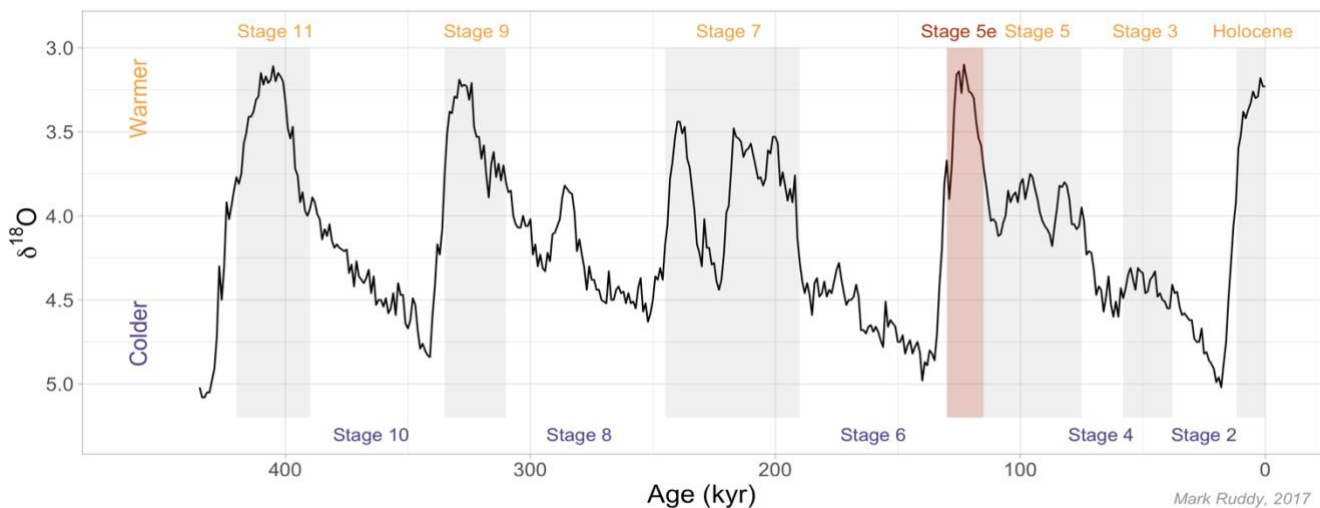
##### Cave development at Portland Ridge:

An example of epigenic development at the ridge is [Daley's Cave](#), which is a now-dry trunk passage (collector) of a former river cave. Another is [Fincham Sinkhole](#), which began as a fissure allowing rainwater to enter that pooled above a less-porous bedding plane, which caused a gradual dissolution of material to form a void that then expanded upwards through breakdown processes.

At Portland Ridge, the principal process appears to have been hypogenic, forming flank margin caves. On the other hand, McFarlane, Lundberg & Fincham (2002) argue that “[a]lthough the Portland Ridge Peninsula behaves geomorphologically as a carbonate island, it is of interest that these caves do not appear to follow the flank-margin model described by Mylroie and Carew (2000) for carbonate islands”, and that “it is possible that, at low sea levels, allogenic groundwater may have reached the peninsula from further north” (p. 117). In this context, it should be noted that Portland Ridge has sunk somewhat over the last 100,000 years due to tectonic factors (Simon Mitchell, UWI, personal communication; Draper & Fincham 1997, p.30, Mitchell 2004), which would mimic formation at a

lower sea level if speleogenesis took place prior to 100 ka. The morphology of the dry chambers at Potoo Hole, [Lloyd's Cave](#), and [Water Jar Cave](#) is very specific, and is characterized by low, wide, rounded, intersecting chambers, often on more than one level and maze-like, with no wall scalloping or fluvial deposits; this suggests flank margin or a similar hypogenic speleogenesis. Because of this, we suspect that that is how they formed in combination with later epigenic development. Certainly, at [JBGC](#), there are sections that appear to be stream passages, such as Shamrock, and Bench passage, on a lower level, but these may have formed from surface input after older, overlying flank margin chambers had become connected to the outside by erosional denudation.

Mitchell points out that “the caves have developed through several inter-glacials and are not simply a case of one time formation. The different levels may well relate to different high stands of sea levels at different times in conjunction of progressive uplift of the host limestones” (p.c., 26/08/2020). Sea level has changed greatly many times at Portland Ridge during the last several million years, principally because of glaciation. During glacials, sea level is low as a result of water locked up in ice sheets; during interglacials, it is higher. The chart below illustrates the change with the ratios of the stable oxygen isotopes  $^{18}\text{O}$  and  $^{16}\text{O}$  serving as a proxy for temperature and the low points representing sea levels about 120m below present day (Ruddy 2017). As can be seen, the youngest flank margin caves can be in Jamaica is approximately 120,000 years before present during Stage 5e. Since then, other than the last 11,000 years of the current interglacial (the Holocene, which did not supply enough time for the caves to form), sea level was far too low.



There is, unfortunately, no real method to date exposed native rock in the interior of a cave. Instead, dating must rely on the calcite deposits that formed as speleothems, which captured atmospheric uranium via percolating rainwater, which slowly decayed to thorium at a consistent rate allowing us to determine age by comparing the ratio of the two. This gives us a minimum age, that is, when the oldest speleothems began to form. However, that could be some time after the formation of the chambers and passages that preceded them. Also, the U-Th process is limited to a maximum of about 500,000 years before present, at which point decay of thorium achieves equilibrium with the decay of uranium.

McFarlane, Lundberg & Fincham (2002) obtained a U-Th date of a speleothem from the lower level Shamrock passage at JBGC of  $278 \pm 57,000-37,000$ . The speleothem, of course, formed after the passage had formed, which puts the time of speleogenesis in Stage 9 or earlier. Indeed, as they note,

the upper levels of JBC predate Shamrock passage, which may put their formation as early as the late Pliocene, 2.5 million years ago. However, this is an open question.

### **3.2: Palaeoclimatology & palaeoecology**

Much of what we know of the past is based on material laid down chronologically in successive layers. This can be sedimentary rock, aquatic sediment, ice, tree rings, coral, and in the case of caves, guano deposits and speleothems. The make-up of the layers serve as proxies for the local climate when they formed, and can also supply direct evidence of past flora and fauna. Portland Ridge caves offer potential for these areas of research.

#### **Guano:**

McFarlane, Lundberg & Fincham (2002) collected vertebrate remains and guano samples from [Drum Cave](#), [Lloyd's Cave](#), [Skeleton Cave](#), and [Potoo Hole](#). They recorded dates of basal deposits of guano 16,000 years BP at Lloyd's Cave, and surface deposits of guano at Potoo Hole of 1,000 years BP. As the authors note, and we can confirm, the deposits of guano at Potoo Hole are very large, and deep; there may be potential to supply a record of ridge flora and invertebrate fauna extending back to the early Holocene, or over 10 millennia before humans first set foot on the island.

Guano also retains evidence of past climate through isotopic variation. Mizutani, McFarlane & Kabaya (1992) compared subfossil guano in [Jackson's Bay Great Cave](#) which accumulated about 800 years ago with other guano deposits collected from caves in Jamaica. They argue that the Jackson's Bay environment sustained a much larger bat population than is now possible given the arid conditions of the Portland Ridge. The carbon and nitrogen isotope ratios support the claim that conditions then were similar to those of caves in wetter environments today. McFarlane, Lundberg & Fincham (2002) trace changes in the bat guano deposits to climatic changes with wetter conditions at around 250-1300AD, followed by a trend to current arid conditions. This supports Fincham & Fincham's (1997) argument that "some 700 to 1,000 years ago, Amerindian peoples populated the southern Portland Ridge area, using the caves for water supply, burial and possibly other socio-ritual purposes" (p.5).

While guano provides us with a window on the relatively recent past, speleothems can extend the record back much further.

#### **Speleothems:**

Stalactites, stalagmites, and other speleothems, grow layer by layer from rainwater that travels down fissures or through porous limestone. Rainwater is slightly acidic because of atmospheric CO<sub>2</sub>, and then can become more so passing through leaf litter. As it passes through the native limestone in which the caves are formed, it dissolves some of the rock (acid-base reaction), which then reforms as speleothems. A record of atmospheric conditions of when the rain fell is then locked into the formation. A common tracer of climate is the ratio of the isotopes of oxygen, <sup>16</sup>O and <sup>18</sup>O (i.e. oxygen with 8 protons and 8 neutrons, and oxygen with 8 protons and 10 neutrons). <sup>16</sup>O is far more abundant (99.76% versus .20% for <sup>18</sup>O), but there is always some <sup>18</sup>O in the air. The key is that <sup>18</sup>O has a slightly higher evaporation temperature than <sup>16</sup>O, so more is present in the speleothem when it is warmer outside because it is enriched in the rainwater. By taking a cross-section of a speleothem, and determining the isotopic make-up of different layers, then combining it with U-Th dating of the layers, a time-line of variation in external temperature can be derived.



## Conclusion:

As researchers are looking for clues for the future of the planet, they draw on the evidence of the past. Palaeoclimatic research considers past relationships between climate, sea levels, and the conditions for life (including extinctions). In the nearer past, palaeoecological research traces anthropogenic impacts on diets and health of local fauna, such as bat species. Palaeoclimatology and palaeoecology constitute new, topical and growing research terrains, and Portland Ridge caves have already been shown to be rich sites of research materials. It is hoped that this work will continue and expand to include more of the Portland Ridge caves.



*Speleothems at Drum Cave*

### 3.3: Cave fauna

The animal species found in caves at the ridge can be subdivided according to their life form (mammals, amphibians, and so on). They can also be subdivided according to the nature of their reliance on caves:

- *Trogloxenes* or *subtroglophiles* are cave visitors which rely on caves for specific life functions, for instance roosting, giving birth and raising young ones.
  - Many Jamaican bat species are troglloxenes and to the extent that they rely on caves exclusively for these life functions they are considered *obligate* cave dwellers; however, not all bat species are cave obligates.
  - Some frogs are also in this category.
- *Troglophiles* are strictly speaking not dependent on caves, as they are capable of living outside of caves, but may prefer the cave environment to other options; trogllophiles may even spend their entire lives inside a cave.
  - Many invertebrates found in the Portland Ridge caves are in this category.

- *Troglobites* are life forms which depend on caves for life and may be so adapted to the cave environment that they lack the capacity for sight or even the observation of light, relying instead on hearing, touch, and smell; cave-adapted species may also be depigmented, appearing white or translucent.
  - Some invertebrates found in Portland Ridge caves are troglobites, and even a troglobitic fish was captured there.

Before we turn to the various taxa and their relationships to the cave environment below, it is worth quoting Peck (1999), who notes that cave fauna constitute “relictual members of much earlier biotas that should be informative in reconstructing Jamaica’s biogeographic history” (p.368). The study of cave fauna thus plays a special role in solving the “puzzle” that Jamaica is, as “both its geology and fauna are significantly different from those of the other islands of the Greater Antilles” (*ibid.*).

### Bats:

Jamaica has the greatest diversity of cave bats in the Caribbean, a region which is richly endowed with 56 extant species of cave bats, and high levels of endemism (Rodríguez-Durán & Kunz 2001). Of the 21 species in Jamaica, 11 are obligate cave dwellers, and 4 more roost in caves occasionally; of these, McFarlane (1986, 1997) identifies 2 as endemic species and 7 as endemic subspecies.

Bats’ foraging habits illustrate their important functions in the larger ecology of the Portland Ridge:

- Insectivorous bats feed largely or exclusively on flying insects.
  - These bats thus assist in controlling insect populations.
  - Emrich et al. (2014) show evidence of resource partitioning, meaning that different species have different foraging niches.
- Frugivorous bats feed largely or exclusively on fruits.
  - They are responsible for seed dispersal of fruit-bearing trees and shrubs by dropping seeds and fruits and by excreting seeds.
  - Frugivorous bats thus assist with forest maintenance, spread and regrowth.
- Nectivorous bats feed largely on nectar and pollen.
  - These bats are pollinators for night-blooming plants, sometimes over large distances, thus contributing not only to plants’ reproduction but also to their diversity and resistance to pests.
  - Many tropical plant species are chiropterophilous, meaning their pollination relies on nectar- and pollen-eating bats; these include both cultivated plants and wild plants, such as guavas, bananas, cocoa trees, mangos, figs, cashews, and night-blooming cactuses, succulents, bromeliads, and so on.



*Ariteus flavescens*, endemic Jamaican fig eating bat

- The piscivorous *Noctilio leporinus mastivus* feeds on small fish and invertebrates.
  - This bat's foraging habits help to bring protein sources onto land, either directly by dropping prey or through its excrements.

We have records for 13 species found at the Portland Ridge:

	<b>Scientific name, Common name</b>	<b>Portland Ridge location</b>	<b>Ecological status</b>	<b>Endemism &amp; Conservation status</b>
1.	<i>Noctilio leporinus mastivus</i> , Greater fishing bat	Portland Cave-1	tree-roosting cave visitor; piscivore	occurs throughout the tropical Americas
2.	<i>Pteronotus parnellii parnellii</i> , Parnell's mustached bat	Jackson's Bay Cave	obligate cave-dweller; insectivore	occurs in much of the tropical Americas
3.	<i>Pteronotus quadridens fuliginosus</i> , Sooty mustached bat	Portland Point Lighthouse	obligate cave-dweller; insectivore	<b>endemic subspecies</b> of Jamaica, Hispaniola and Puerto Rico; species restricted to the Greater Antilles
4.	<i>Mormoops blainvillii</i> , Antillean ghost-faced bat	Jackson's Bay Cave, Portland Cave-1	obligate cave-dweller; insectivore	Greater Antillean species
5.	<i>Macrotus waterhousii jamaicensis</i> , Waterhouse's leaf-nosed bat	Jackson's Bay Cave, Portland Cave-1, -2, -9	likely obligate cave-dweller; insectivore	<b>endemic subspecies</b> ; species ranges from southern Mexico to Greater Antilles and Bahamas
6.	<i>Glossophaga soricina</i> , Pallas' long-tongued bat	Portland Cave-1, -9	obligate cave-dweller; largely nectivorous but also takes insects	Jamaica is the only island in the West Indies where the species occurs; <b>possibly endemic subspecies antillarum</b>
7.	<i>Monophyllus redmani redmani</i> , Leach's long-tongued bat	Jackson's Bay Cave, Portland Cave-?	obligate cave-dweller; largely nectivorous?	<b>endemic subspecies</b> ; genus confined to the Antilles and Bahamas
8.	<i>Erophylla sezekorni syops</i> , Buffy flower bat	Jackson's Bay Cave, Portland Cave-?, -9	obligate cave-dweller; frugivore, but also pollen and nectar feeding	<b>rare endemic subspecies</b> ; genus restricted to Greater Antilles and Bahamas
9.	<i>Ariteus flavescens</i> , Jamaican fig-eating bat	Jackson's Bay, Portland Cave-9 entrance	tree-roosting; frugivore	<b>endemic species and genus</b> ; considered vulnerable by Sherwin & Gannon (2005) because of a decline in natural habitat



	Scientific name, Common name	Portland Ridge location	Ecological status	Endemism & Conservation status
10.	<i>Artibeus jamaicensis</i> <i>jamaicensis</i> , Jamaican fruit-eating bat	Portland Ridge, Drum Cave, Jackson's Bay Cave, Portland Cave-1, -2	not obligate, roosts in caves and trees; frugivore	<b>endemic subspecies</b> of the Caribbean island chain
11.	<i>Chilonatalus micropus</i> <i>micropus</i> , Cuban funnel-eared bat	near end Jackson's Bay Cave	obligate cave- dweller; insectivore	<b>endemic subspecies</b> of Jamaica and Hispaniola; species restricted to the Greater Antilles; conservation status listed as <b>Vulnerable</b>
12.	<i>Natalus stramineus</i> <i>jamaicensis</i> , Mexican Funnel-eared Bat	Portland Cave-1	obligate cave- dweller; insectivore	<b>endemic subspecies</b> ; species is found in Central America and the Caribbean
13.	<i>Eptesicus lynni</i> , Lynn's brown bat / Jamaican brown bat	Portland Point Lighthouse, Jackson's Bay	cave-dwelling status unclear; likely insectivorous	<b>endemic species</b>
<b>Sources:</b> Genoways et al. (2005); McFarlane (1986, 1997); Dávalos & Eriksson (2003); Fincham (1997b); Rodríguez-Durán & Kunz (2001); Sherwin & Gannon (2005).				



*Artibeus jamaicensis*, Jamaican fruit bat



Pollen-covered *Monophyllus redmani redmani*,  
*Leach's long-tongued bat*

The small number of locations listed here merely indicates that the research has been limited to few caves. However, not all caves host bat colonies; McFarlane (1986) points out that those caves that do, are typically occupied by several species of bat. So while one should not expect to find bat roosts in every cave, there are bat roosts in more caves than documented to date, and the presence of particular bat species needs to be assessed for each cave containing bat roosts. Importantly, different (sub)species of bat have different diets, so the functions performed by each are unique to a certain extent and not easily substituted by another.



*Bat roost, Jackson's Bay Great Cave, Guano Swamp*

### **Other mammals:**

The only other live mammals found in caves at Portland Ridge, apart from humans, are goats and feral pigs which may shelter in entrance chambers. Additionally, rats are present in the wider environment as confirmed by the study of owl-pellet deposits at the site of [Arrow Pit](#) and at [Somerville Cave Entrance 1](#), where an estimated 90% of the total prey items were black rat; remaining prey items consisted for about two thirds of bat species (McFarlane & Garrett 1989).

### **Amphibians:**

Jamaican frogs are “one of the most threatened amphibian fauna in the world” (Holmes, McLaren & Wilson 2014, p.219). At least two species of frogs lay their eggs in caves in Jamaica (*ibid.*), making them troglomen: the relatively common *Eleutherodactylus cundalli* (Cundall’s Robber Frog), which is usually found not far inside of entrances in the northwest half of the island, and the very rare *Eleutherodactylus cavernicola* (Portland Ridge Frog), first described in Lynn (1954), which is known only from Jackson's Bay and central Hellshire. Both are included in the IUCN Red List ([www.iucnredlist.org](http://www.iucnredlist.org)). *Eleutherodactylus cundalli* is considered **Near Threatened**, because it is known mainly from threat-defined locations, while *Eleutherodactylus cavernicola*, which is known only from one cave at Jackson’s Bay, and sites at Hellshire, is listed as **Critically Endangered**.

*Eleutherodactylus* are described as “direct developers”, which “lay their egg under rocks, logs, or in caves” (Holmes, McLaren & Wilson 2014, p.219). It is likely that the two species identified to date are not alone, and that perhaps more of the 17 *Eleutherodactylus* species of Jamaica might be found in Portland Ridge caves. Given their threatened conservation status, proper documentation is vital.

*Rhinella marina*, the **invasive** cane toad, is common in caves on the ridge, and constitutes a severe threat to cave biota; as with other pests, it should be eliminated.





*Eleutherodactylus cavernicola* at JBGC



*Rhinella marina*, the invasive cane toad

### Reptiles:

The Jamaican boa, *Epicrates subflavus* (also *Chilabothrus subflavus*), is seen often in caves at Jackson's Bay where it is apparently foraging on bats and possibly rats. (See the video listing in [Section 1.8](#) for examples.) These non-venomous snakes pose no danger to humans and are listed as **Vulnerable** by the IUCN, and protected by Jamaican law.

A galliwasp, *Celestus* sp., was seen in the collapse chamber of Potoo Hole by the JCO, presumably an accidental.

### Invertebrates:

Invertebrate studies at the ridge have taken place only at [Jackson's Bay Great Cave](#), and two of the caves on the north side (locational details uncertain), largely on the basis of collections resulting from site visits by Dr Stewart Peck and collaborators (see Peck 1975, p.312ff; Peck 1999, p.370ff).

Peck (1975) describes fauna at the north side caves that he visited as scarce, possibly due to much visitation and guano mining.

In contrast, at JBGC, a variety of troglophiles and troglobites are present. Troglophiles include arachnids, diptera (mosquitoes, gnats, flies), and hymenoptera (ants). There are also two crustaceans, seen in many caves in the area, Hermit Crabs (*Coenobita clypeatus*), and Blue Land Crabs (*Cardisoma guanhumi*; one can be seen in a [JCO video](#)). The former are responsible for much disturbance (bioturbation) of surface dust and sediment in caves such as Lloyd's and quickly eliminate all trace of previous footsteps.

Peck (1975) points out that the amblypygid *Phrynos* occurs in virtually every cave with crickets, which it preys on (p.307), and that



*Blue Land Crab (Cardisoma guanhumi)*, pictured at Jackson's Bay Great Cave



virtually every cave contains the gryllid cricket *Uvaroviella cavicola* (p.310); we have observed both in Portland Ridge caves.

Troglobites recorded by Peck (1975) at the JBGC include an amphipod (*Hadzia jamaieae*), an isopod (*Clavigeroniseus*), two cave water dwelling mysidaceans (*Stygiomysis* and *Antromysis*) (Bowman 1976), a roach (*Nelipophygus*), an undescribed blind cixiid bug, and two carabid



*Arachnid species at Jackson's Bay Great Cave*

beetles (*Ardistomis*), as well as two troglobitic pseudoscorpion species (*Tyrannochthonius* and *Ideoroncidae*) (p.308f, 321). He predicted that many more species would be found as his fieldwork collections were still being studied – a prediction which has come true as several more species were later described from Peck's collection:

*Proteinus peckorum* Frank (Frank & Thomas 1983), an additional pseudoscorpion *Troglobochica jamaicensis* (Muchmore 1984), eyeless spiders *Anopsicus clarus*, *Anopsicus pecki*, *Metagonia jamaica*, a harvestman *Stynomma fiskei*, a Shizomida *Stewpeckius troglobius*, the hexapods *Metasinella* sp. and *Troglopedetes jamaicanus*, the planthoppers *Oeclidius antricola*, *Oeclidius minos* (all cited in Peck 1999, p.372), as well as several crustaceans (p.373).

At the time of Peck's (1975) overview, his field work had revealed some 150 species of invertebrate cave fauna in Jamaica, including many troglobites. His (1999) survey lists 25 terrestrial troglobites for Jamaica – the largest density of terrestrial troglobites on an island in the American tropics (1975, p.312) – as well as 16 known aquatic invertebrate cave obligates (eyeless, or with small vestigial eyes). Peck's fieldwork at the Portland Ridge had effectively been limited to a single cave at Jackson's Bay, leaving us to wonder what more may be found if research were to be done at other caves at the Ridge. Peck lists many more invertebrates occurring in other caves in Jamaica, including many that are associated specifically with cave guano deposits; their distribution may well include Portland Ridge caves.

### **Fish:**

*Eleotris* (Gabiidae), an accidental, has been recorded by both Peck and the JCO at [Jackson's Bay Great Cave](#).

A cave-obligate blind fish was caught by the cavers in 1965. Based on its external morphology, Turner (2016-18) suggests it to be similar to *Eleotris*. However, with characteristics which differentiate it from other *Eleotris* species, he



*Eleotris, at JBGC*

concludes that the Jamaican blind fish is an undescribed species (p.7). This represents the only modern record of a blind fish in Jamaica.

### **Fossil and palaeontological finds:**

McFarlane, Lundberg & Fincham (2002) report on fossil finds from four Jackson's Bay sites: Brown Dust Passage in [Drum Cave](#), Bone Hall Chamber in Drum Cave, [Lloyds Cave](#), and Map Room in [Skeleton Cave](#). They collected vertebrate remains "from the red cave fill, from the dry gour pools, from the owl vomitus, and occasionally from the fossil bat guano" (p.118). Their findings are summarized here:

endemic species, extinct:	<i>?Milvago</i> sp (caracara) <i>Xenicibis xympithecus</i> (flightless ibis) <i>Oryzomys antillarum</i> (Jamaican rice rat) <i>Xenothrix mcgregori</i> (primate) Undescribed rodent
endemic species, extant:	<i>Geocapromys brownii</i> (hutia) <i>Ariteus flavescens</i> (naseberry bat) <i>Monophyllus redmani</i> (Redman's flower bat) <i>Eptesicus lynni</i> (Lynn's brown bat)
extinct:	<i>Brachyphylla nana</i> (brown flower bat)
extant:	<i>Tyto alba</i> (barn owl) <i>Leptotila jamaicensis</i> (White Belly) <i>Pelicanus occidentalis</i> (brown pelican) <i>Cathartes aura</i> (John crow) <i>Amazona cf. agilis</i> (Amazon parrot) <i>Rattus rattus</i> (black rat) <i>Homo sapiens</i> (man) <i>Herpestes auropunctatus</i> (mongoose) <i>Artibeus jamaicensis</i> (Jamaican fruit bat) <i>Erophylla sezekorni</i> (buffy flower bat) <i>Macrotus waterhousii</i> (leaf-nosed bat)
Adapted from McFarlane, Lundberg & Fincham's table 1. Birds and mammals from the fossil and subfossil record, Jacksons Bay Caves (domesticated species omitted) (2002, p.117)	

This by no means exhausts the extent of the fossil record at the Portland Ridge caves. Thus, Etheridge (1966-67) describes fossil finds of *Leiocephalus*, an extinct lizard, from [Portland Cave-1](#) and [High Dome Cave](#) (designated Portland Cave-3 by Etheridge) obtained in the 1950s.

MacPhee & Flemming (2003) discusses "three intriguing but problematic" Quaternary land mammals found in Jamaican cave deposits, one of which, *Xaymaca fulvopulvis*, a new extinct genus and species of rodent, was recovered from the Brown Dust Passage near Entrance 3 of [Drum Cave](#) (presumably the "undescribed rodent" in McFarlane, Lundberg & Fincham's list). They point out that "the rodent fauna of the West Indies is now virtually defunct owing to modern-era extinctions" (p.2), which means that the evolutionary history can only be reconstructed from the palaeontological record. They go on to say that "[i]ts late discovery underlines how little we know about even the recent biotic past of this island" (p.38).

Bones of the extinct Jamaican monkey, *Xenothrix mcgregori*, were found at [Lloyd's Cave](#) and [Skeleton Cave](#), by the CMAM expedition in the 1990's. Work resulting from these finds has focused on its genetic status (MacPhee & Horowitz 2004; Wood et al 2018) and on the possibility that its extinction was anthropogenically driven (Cooke et al. 2017). Since then, there has been no palaeontological research at the ridge. The JCO has seen the digs, and is convinced that further discoveries await at those and other sites. Olson's (1978) overview of the fossil record of West Indian birds and mammals, with emphasis on the Greater Antilles, notes that "Jamaica still remains very poorly known" (p.101). Not enough has been done to remedy that situation.

## Conclusion:

There are high levels of endemism in Jamaica in all taxa; Rodríguez-Durán & Kunz (2001, p.355) estimate it at 50% for Jamaican bats (see also Hedges 2001); possibly even higher levels obtain for the invertebrates. More generally, Peck & Perez-Gelabert (2012) identify the Caribbean islands as "one of the leading global biodiversity hot spots" (p.1).

Using the IUCN Red List categories for classifying species according to their risk of global extinction, we note that Portland Ridge cave fauna includes one endemic frog species (*Eleutherodactylus cavernicola*) which is listed as Critically Endangered, one endemic subspecies of bat (*Chilonatalus micropus micropus*) which is considered Vulnerable, and the cave-visiting Jamaican



*Yellow Boa (Epicrates subflavus) at Drum Cave*

boa (*Epicrates subflavus*), which is also listed as Vulnerable. Additionally, Sherwin & Gannon (2005) consider *Ariteus flavescens* vulnerable. In fact, most other bats observed on the Portland Ridge are subspecies which are endemic to Jamaica (*Pteronotus parnellii parnellii*, *Macrotus waterhousii jamaicensis*, *Glossophaga soricina*, *Monophyllus redmani redmani*, *Erophylla sezekorni syops*, *Artibeus jamaicensis jamaicensis*, *Natalus stramineus jamaicensis*) or endemic species (*Ariteus flavescens*, *Eptesicus lynni*) and need to be assessed in terms of their risk status. Even if the caves are left undisturbed, any disturbance in the environment will affect the bats as they are foragers, dependent on the cave-external environment. Understanding an endemic species' ecology is critical, since its possible extinction in one location may mean its global extinction. This is a clear priority area for research, therefore.

Cave fauna lives and functions in interaction with the larger environment of the Portland Ridge. This means that the health and well being of cave life and cave-external life are closely interconnected. The case of the North Portland Ridge caves that Peck visited and where he found invertebrate fauna to be scarce is an example of the detrimental impact of human intervention on cave fauna. This presents a strong argument in favour of limiting human access to caves and human intervention in the area of which the caves form a part.

The study both of living and extinct cave fauna has been largely carried out by visiting scholars, with little continuity in the research efforts. As MacPhee & Fleming (2003) point out, "much still remains

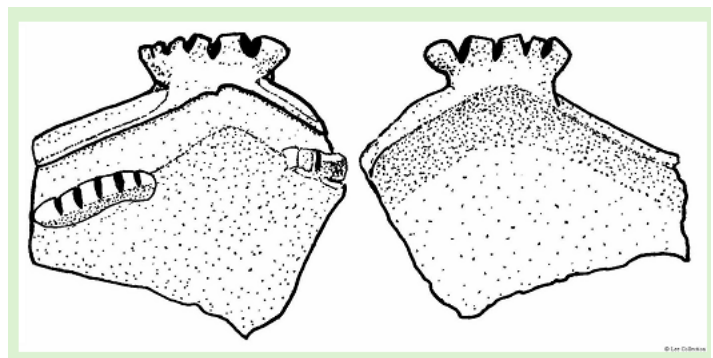
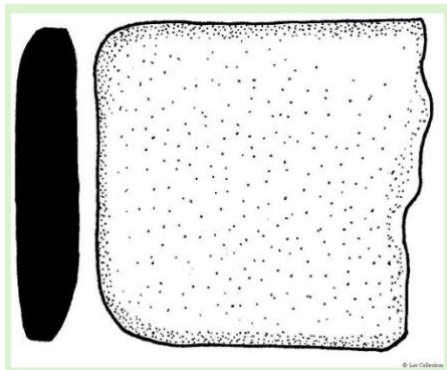


to be learned about the origin and history of the land mammal fauna of Jamaica” (p.1). A similar point can surely be made for work on extant fauna. There is a great need for local research capacity to be strengthened, and for past research efforts to be followed up and updated, in collaboration between local and external researchers.

### 3.4: Archaeology and palaeontology

#### Archaeological and human palaeontological finds:

The earliest attempt at a somewhat systematic discussion of cave finds in Jamaica is Duerden (1897). He notes that Jackson Bay Cave “contained the very perfect, flattened human skull of some aged person, and fragments of another skull; along with numerous limb and other bones, turtle bones, pottery, and shells” (reprinted in Allsworth-Jones 2008, p.248). These finds, he says, were added to the Museum collections of the Institute of Jamaica, where they presumably remain to this day.



*Taino artefacts collected at Portland Ridge (unnamed site):  
grinding stone and decorated rim sherd (Allsworth-Jones 2008:CD)*

After Duerden, more than a century passes before another such attempt is made, in the form of the publication of *Pre-Columbian Jamaica*, by Allsworth-Jones (2008). This work is a substantial summary of the prehistoric evidence from Jamaica, based on the James W. Lee collection, which is held at the University of the West Indies, Mona. Among other finds, Lee discovered the site of [Taylor's Hut](#), where one intact bowl containing a skull was found in situ, along with two other skulls, and abundant archaeological material (*ibid.*, p.21).

[Somerville Cave](#) is the site of excavations of human remains carried out in the late 1990's. Unfortunately, the results of this work have not been published. Allsworth-Jones summarizes the findings as follows, based on unpublished abstracts (Rega, Michaelson & TenEyck 1999; Rega 2006):

The excavations took place in the Entrance Pit on the east, where the deposits are 10 m below an opening on the present ground surface. There is a degree of bioturbation, largely due to the activities of land crabs, leading to some sorting of bone fragments by size, but nonetheless two apparently satisfactory radiocarbon dates were obtained, as follows:  $940 \pm 40$  B.P. (Beta-170212) and  $620 \pm 40$  B.P. (Beta-170213). The calibrated age ranges for these dates work out at A.D. 1010-1195 and 1290-1410 respectively. Entirely consonant with this is the discovery of several White Marl style pottery fragments in the deposits. Altogether a minimum number of 12 human individuals have been identified: one neonate, one infant, four juvenile, five adult, and one possible senescent. This mixture of ages is somewhat similar to that detected at other Jamaican caves in the past. Spiral fractures on the femora of one of the juveniles suggest that

in this case he met his death through high velocity antemortem impact. (Allsworth-Jones 2008, p.130-131)

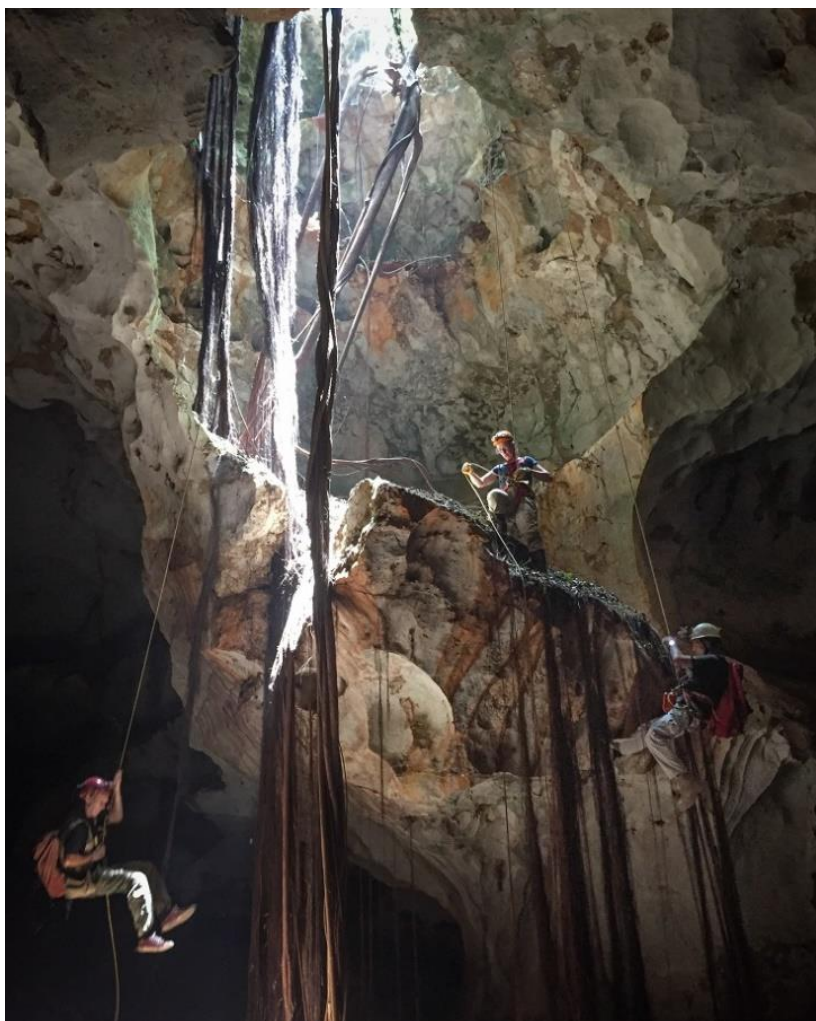
On JCO explorations with visiting researchers, human remains, presumed to be Taino, have been found below [Potoo Hole](#)'s Entrance 2. In 2018, JCO found a potsherd that appeared to possibly be Redware, on rocks just inland of the coast near the end of the road at Jackson's Bay, which seems to be a first. It can be seen in a JCO video (see listing in [Section 1.8](#)).

In sum, there have been several discoveries of human remains and pottery in caves at the ridge. However, with few exceptions, careful documentation and publication has been lacking. Also, except for Rega's work, which has not led to publication, only surface collection has been carried out.

These lacunae have to be seen within the larger context of the paucity of work on the early human habitation of Jamaica. Nägele et al. (2020) present genetic evidence supporting "the notion that the Caribbean was settled and resettled by successive population dispersals that originated on the American mainland", and that "the Caribbean Sea functioned as an "aquatic motorway" that people crossed frequently" (p.3), with successive dispersals possibly emanating from North America, Central America, and finally South America. Jamaican data is absent from the research, which relies on samples from sites in Cuba, Puerto Rico, the Bahamas, Guadeloupe and St. Lucia. Given Jamaica's location between possible radiation sites in Central America and dispersal destinations such as Cuba, Hispaniola, and beyond, it stands to reason that Jamaican data could help answer questions regarding the possible link between Caribbean and Central American archaic age peoples.

### **Pictographs and petroglyphs:**

So far, one cave of the Portland Ridge has yielded pictographs ([Potoo Hole](#)) and two are known to have petroglyphs ([Jackson's Bay Great Cave](#) and [Taylor's Hut Cave-1](#)). Atkinson's (2009) discussion leads us to believe that these sites are unusual in several respects: their coastal location is not common, as most Taino rock art is found in locations in the interior of Jamaica; shelter caves appear to have been much preferred, with complex caves such as Potoo Hole and Jackson's Bay Great Cave in a minority of Taino rock art sites; of 26 known rock art sites, the majority have petroglyphs



*Potoo Hole's vertical Entrance 1  
The Taino artist(s) who created the Arawak gallery must have  
relied on tree roots to facilitate access to the cave  
(Photo: B.Simandan)*

only, Potoo Hole being one of only 4 pictograph sites; finally, Taino rock art is usually located at the cave entrance, making Potoo Hole, where pictographs are located at the base of the pit entrance, requiring what must have been a hazardous climb down, rather exceptional.

In other ways, the sites and the art conform to patterns found broadly across Jamaica, such as proximity to water (petroglyphs at JBGC are found at the Water Entrance) and their motifs (a mix of zoomorphic, anthropomorphic, and geometric / abstract motifs). An analysis of the Jackson's Bay petroglyphs is yet to be carried out, but given their location at the entrance of the cave, they may be interpreted similarly to Allsworth-Jones' (2017) analysis of petroglyphs at Warminster Rock Shelter as having boundary marking functions, possibly acting as guardians (p.228).

Fincham & Fincham (1997) provides a preliminary analysis of the "Arawak Gallery" of pictographs at Potoo Hole; the authors count 46 pictographs, including 18 zoomorphic images (turtles, crocodiles, iguanas, fish), 7 anthropomorphic, 8 geometric, and 13 undefined images, mostly executed in a red ocher and/or blackish pigment (possibly charcoal based) (p.3).



### **Conclusion:**

*Taino pictographs at Potoo Hole*

Allsworth-Jones (2008) points out that "Jamaica lacks neither interesting sites nor archaeological material equal to that found elsewhere in the Greater Antilles" (p.31) – an observation which is certainly applicable to the Portland Ridge sites. The findings to date show that Portland Ridge caves represent an area of great untapped potential for palaeontological research and for research on the precolonial habitation of Jamaica and its connections to Caribbean population dispersals. A systematic archaeological and palaeontological survey of the Portland Ridge caves is long overdue.

### **3.5: Site preservation**

The two main factors in cave preservation are land-use changes, and frequency of visitation. Land use affects caves because caves are not self-contained systems: they are an integral part of the larger ecology. Changes in land use affect the foraging opportunities for troglodytes which depend entirely (bats) or to some degree (cave frogs, cave crickets, etc.) on external food sources, and which are themselves the primary sources for nutrient input inside the caves. Such changes also affect access for opportunistic cave visitors such as land crabs, hermit crabs, yellow boas, spiders, and so on. The ecology of the cave-external environment in turn cannot remain stable without the services performed by the cave-dependent fauna, which manage insect populations, provide seed and pollen dispersal, and constitute prey for other predators. Thus, the fate of cave dwellers and cave visitors is interdependent with that of the external environment. Since cave health is intimately connected with



that of the area of the caves, careful management and conservation of the external environment is as important as the protection of the caves themselves.

Cave visitation has a direct impact on cave conditions, creating disturbance of bat colonies and other cave populations which may cause reduction in colony sizes – with its attendant impacts on the beneficial functions performed by different species. Furthermore, there is sufficient evidence that visitors have performed acts of vandalism and removal of Amerindian artefacts in the past; there is little doubt but that more access will mean more of this.

The Portland Ridge and the caves therein fall within the Portland Bight Protected Area. As an invaluable part of the complex ecology of the Portland Ridge, the conservation of the caves must be paramount. This requires the continuation of the current practice of restricting and monitoring access to the caves. Also, invasives that roam the area are destructive and prey on vulnerable populations. To reduce this impact, a management programme for the area would be helpful.

As seen in the preceding sections, research in and around caves of the Portland Ridge has yielded rich results contributing to the local archaeological record, the documentation of extant and extinct species in Jamaica, and our understanding of the geology of Jamaica. These findings contribute to larger research questions regarding pre-colonial human populations of the Caribbean, fauna of the Americas both in the past and present, and the impacts of geological events and climatic changes in the Americas. This geographically small area indeed makes for rich pickings! It is clear that there is scope for much more research.

The Jackson Bay Hunting and Fishing Club and the PWD Hunting and Sporting Club, which control the land that holds the caves described in this report, have been instrumental in protecting them. We hope that this report helps to make the case for the need to continue to protect the caves of the Portland Ridge, to manage the ecologies of which they form a part, and to develop the area's research potential.





*Common dry limestone vegetation at the Portland Ridge*



*Aerial view of North Portland Ridge*



## 4: Bibliography

Where references are identical to those cited in *Jamaica Underground*, the *JU* reference number is included. *JU*'s bibliography is comprehensive and is likely to have been as complete as possible up to the time of its publication; it also includes short annotations for many of the publications. We refer the interested reader to *JU* for those details.

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*The JCO at Jackson's Bay*

