

Initial Results from a Geological Survey of Les Dirouilles

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Since 2011 members of the Marine Biology Section have been systematically surveying and mapping Jersey's offshore reefs. The primary objective is to map the reefs' habitats and document the species but they have also been using the fieldwork as an opportunity to do some basic geological mapping.

The final reef to be surveyed was Les Dirouilles and this was accomplished over the summer by Alex Plaster and me. The reef is small, compact and poorly charted but the scatter of needle-like rocks that are exposed at low water are not completely unknown to geologists.

Father Charles Noury paid a brief visit in 1892 and described the bedrock of Les Dirouilles as being of the same '*gneiss granulitique*' as Les Pierres de Lecq and Les Écréhous (Noury, 1892). In the 1980s the local geologist Dr Mike Andrews also visited the reef as part of his geological survey of Jersey's offshore geology and found a similar rock type to Les Écréhous (Mike Andrews, pers. comm.).

Our survey of Les Dirouilles took place over two large spring tides in August 2019 and consisted of arriving by boat shortly after mid-tide and then moving from rock to rock making notes on the species and habitats while also making geological measurements and taking samples. Even at low water most of Les Dirouilles remains subtidal and is formed of a complex series of deep channels defined by around forty intertidal rocks. Of these, just two attain any size: Les Burrons, which has an area of approximately 0.125 km²; and La Noire at approximately 0.06 km².

The entire reef was surveyed either visually (bringing the boat alongside a rock) or by jumping from the boat onto a rock so that measurements and samples could be taken. La Noire and Les Burrons have anchorage areas and were surveyed on foot during the hours before and after low water. The survey took measurements from sixteen rocks and six rock samples were taken. A total of thirty rocks were described in detail; some of the rocks on the western and southern edge of the reef could not be landed on due to the swell; these were visually surveyed to check them for lithology and any obvious intrusive or technical features.

The coverage and nature of the reef's geology means that enough information has been gathered to create a basic geological map. This process will start later in the year once the data have been synthesised and the samples examined in more detail. However, the unprocessed results confirm those of Father Noury and Dr Andrews: the bedrock of Les Dirouilles is very similar to that of Les Écréhous and Les Pierres de Lecq and therefore probably also of parts of Les Minquiers and the Anquette Plateau.

Every rock visited or sampled seems to be a medium-grained biotite granodiorite rich in feldspars, quartz, biotite and muscovite. The rock is foliated and with the

minerals generally orientated NW-SE in the northern part of the reef with the orientation becoming more E-W towards the south-east corner. The dip is always steep (near but not quite vertical) to the north.

The reef is remarkably homogeneous and the only other lithologies encountered were a large dolerite on Les Burrons (orientated NE-SW) and a pegmatite intrusion on rocks called Les Faras, north-east La Noire. Although an eye was kept open for intrusive features, xenoliths and other features, the rapidity and general nature of the survey work meant that such things could have been missed or in areas not yet visited. Further visits will hopefully help to resolve this.

One further interesting discovery was made while surveying La Noire at the beginning of August. On the beach area to the east of the main rock area is a series of six large erratic rocks whose geology is unrelated to any other part of the reef. A further set of even larger erratic boulders are wedged into a gully beneath La Noire itself. Dr Ralph Nichols has (tentatively from photographs) identified the lithologies as being varieties of diorite which may possibly not originate from Jersey. Nothing similar was found on Les Burrons or anywhere else on the reef.

Following this discovery, a rereading of Noury (1892) found that he too had encountered five large erratic rocks on La Noire which he describes as being of '*blocs noire, chacun mille killogrammes*'. He supposed them to have been detached from a '*veine de diabase*' since hidden under the sediments and boulders that form the beach area.

However, the shape, arrangement and size of the stones suggests another possibility. Recent discoveries by Bob and Jill Tompkins of megalithic stones and artefacts on Jersey's south and east coasts are revealing a hidden intertidal prehistoric landscape within which rocks of great weight were being transported many miles from their nearest point of origin. Although this is just speculation, could the erratic rocks on Les Dirouilles have been placed there by humans? Whether or not this is the case, additional study of these erratic rocks to trace their probable origin would make an interesting project.

The results from the scientific surveys of all the northern reefs will be published in due course. It should be added that the geological/biological survey work on Les Minquiers reef has continued beyond the summary results publication in 2016 (Chambers, Binney and Jeffreys, 2016). The geological work has been particularly focused on the area around Les Maisons and on the southern part of the reef and has included much scuba diving work. Again, results will be published in due course.

References

- Chambers, P., Binney, F. and Jeffreys, G., 2016. *Les Minquiers: A Natural History*. Charonia Media.
- Noury, C., 1892. *BSJ*, vol. 17: pp. 77-88.



A scene typical of the geography of Les Dirouilles which consists of a network of small rocks separated by water channels.



A hand sample of the granodiorite that dominates the reef's bedrock. Note the mineral foliation.



One of the unusual diorite erratic boulders located on the beach area of La Noire.