Kanohina Cartography

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The braided maze of the KipukaKanohina Cave System, the second longest known lava cave, occupies a Mauna Loa flow of 750-1000 years b.p. situated on the south flank of the mountain. The earliest efforts to produce a map date from the late 60s and late 80s but nothing came of those attempts. Mapping really got started when RicElhardt and Rose Hererraopened the Kula Kai Caverns show cave in 1989 and with friends, began mapping their underground domain, including the neighboring Eli Cave. In 1999 a crew of National Speleological Society and Cave Research Foundation surveyors started mapping the many caves scattered around in the kipuka. The initial survey was primarily in Eli Cave and another large cave, Maelstrom. Late in 2000 Maelstrom was connected to Eli Cave by Joyce Hoffmaster via a tight squeeze. Soon after, Poha Cave was discovered by Don Coons and in November 2000, it was connected to Kula Kai. The following year, Poha was connected to Eli, integrating the four caves into one complex system. In 2001, New York based cavers discovered several entrances into the Cordwinder section, which connected to Maelstrom at several places. Later, Xanadu Cave, makai(down-flow) from Maelstrom, was connected to one branch of the latter via a dig.

The surveysof Eli and Maelstrom were plotted using the Compass cave survey software, but the earlier work preceded the advent of affordablecomputer drafting software. Maps of Kula Kai and Maelstrom were initially draftedin pencil on paper, and later transferred to Adobe Illustrator.

The Kanohina survey suffers from the problems with magnetic variability endemic to lave cave surveys. There is a nearly three degree difference in magnetic declination over the north-south extent of the system, and there are many localized variations. A normal protocol when running a large multi-year mapping program is to set up a compass calibration course, but this is of only limited use when the declination varies unpredictably over short distances. Localized variations result in foresight/ backsight discrepancies. This can be somewhat mitigated by keeping survey stations as far away from rock as practical, and the existence of numerous survey loops helps greatly, but the survey necessarily lacks the high precision of a typical limestone cave survey. The existence of numerous entrances has recently improved matters by using GPS locations, not dependent on the fickle magnetic field. However, this creates a serious practical problem in that the map already drafted no longer quite fits the survey line. A recent major revision of the survey net has therefore led to a great deal of cut and paste to wrestle the existing map onto the revised survey line. In recent years, a process known as round-tripping has become available. The entire map – survey line and passage detail – are imported together into the data reduction program and fitted to the revised survey. This should make further survey revisions easier to cope with.

The first and so far only completed map of the system is Bob Richards' 2003 award winning map of the Kula Kai section. Two further map sheets of about the same size as the Maelstrom sheet will be necessary to fully represent the existing system.

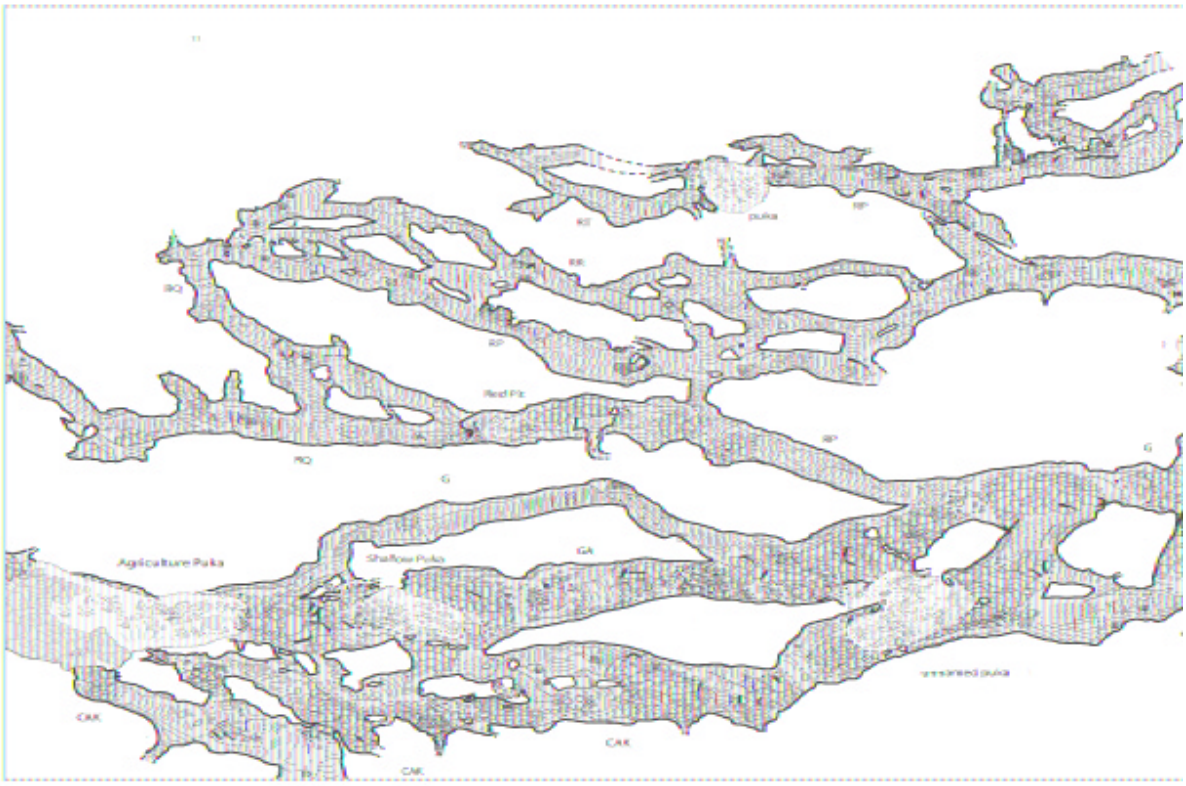

Figure 1: detail of the Maelstrom/ Cordwinder map.