Present geographical occurrence of the giant African snail (*Achatina fulica* Bowdich) in Samoa

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ABSTRACT

Field surveys were conducted on the Samoan Islands of Upolu and Savaii, between December 2011 and April 2012, to assess the present geographical occurrence of the giant African snail. A total of forty locations (20 locations each) along the main access roads on Upolu and Savaii were surveyed. The findings showed that the snail is currently more widely dispersed on Upolu compared to the situation in 1997 as shown in Hunter (2009). The snail is also present at several locations on Savaii. The survey also revealed that not only has the snail spread further, but infestation at most locations surveyed was readily observable. The findings of this research provide current information for government and other interest groups in Samoa.

Key words: Geographical occurrence, giant African snail, Upolu, Savaii, Samoa.

INTRODUCTION

Production of horticultural crops in Samoa is often constrained by a complex of factors including high costs of inputs, unfavourable weather conditions, marketing difficulties, diseases, and pests. Based on a region-wide survey, Waterhouse (1997) listed slugs and snails (Mollusca: Gastropoda) among the four major invertebrate pests of crops in Samoa. Pest slugs and snails attack crops primarily by rasping plant tissues which may result in symptoms such as rasping marks on leaves, stems and fruits; shredding; partial or total defoliation; and severing of tender stems. Attack on seedlings and young plants may result in death. Apart from direct agricultural significance, some species of snails and slugs are reported to pose a health risk as intermediate hosts of the rat lungworm parasite, *Angiostrongylus cantonensis*, a nematode which can infect humans and cause potentially lethal meningitis. People may be infected with this parasite through eating contaminated, especially raw, fruits and vegetables (Robinson & Hollingsworth, 2006; Australian Quarantine and Inspection Service— AQIS, 2007).

Based on a survey conducted in 2005, Robinson & Hollingsworth (2006) reported that the African slug [*Laevicaulis alte* (Férussac)], and the Fijian semi-slug (*Parmella planata* H. Adams) are the important slug pests on subsistence and garden crops in Samoa. In the same report, the giant African snail (*Achatina fulica*), and the Asian tramp snail [*Bradybaena similaris* (Rang)] are mentioned as the main pest snail species.

The giant African snail in Samoa

A native of East Africa, the giant African snail is reported as one of the world's most destructive pests of fruit and vegetables (AQIS, 2007). Known locally in Samoa as '*sisi aferika',* the giant African snail is reported to have arrived in Samoa in 1990 (Cowie, 2003; Invasive Species Specialist Group, 2010). However, Pouno (2002) and Hunter (2009) both noted that the giant African snail had arrived in Samoa earlier in 1982 but was successfully eradicated before becoming re-introduced. Hunter (2009) stated that the species was re-introduced in 1991. Regardless of the exact year that this invasive species arrived and got established in the country, it is evident that the snail has since spread. Figure 1 shows the spread of the giant African snail on Upolu between 1991 and 1997. Presumably, the snail was still restricted to Upolu as of 1997. The giant African snail is the most recent mollusc pest to establish in Samoa (Robinson & Hollingsworth, 2006).

Since its re-introduction, the Samoa Quarantine Service (SQS) has been implement -ting post-entry quarantine measures, as well as public awareness campaigns, in an effort to

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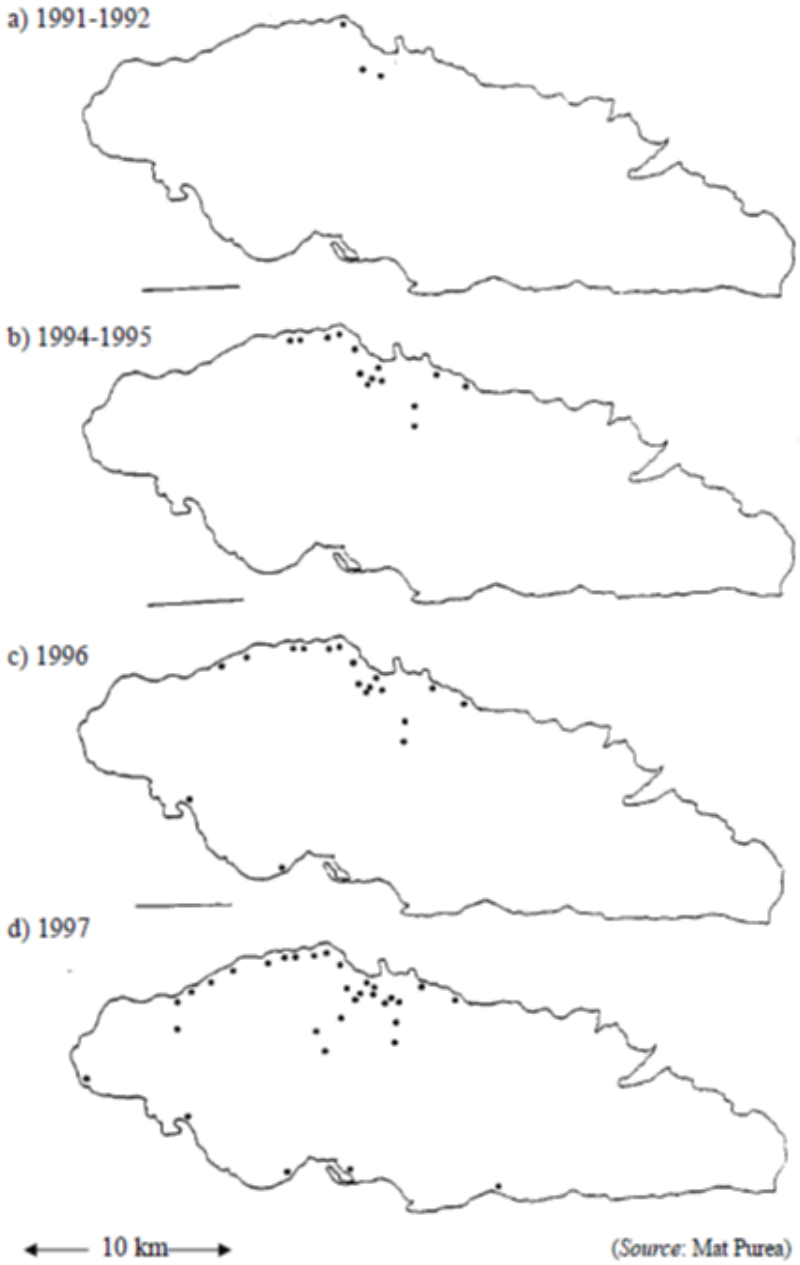

Figure 1. Map showing the spread of the giant African snail on Upolu Island from 1991-1997. Source: Hunter, 2009, p5.15.

curtail the spread of the giant African snail to other parts of the country (SQS Staff oral communication, 29 May 2012). Despite the efforts, the snail is known to have spread to other parts of the country, although the extent of the spread was unclear. However, the two other inhabited islands of Manono and Apolima are believed to still be free from it (SQS Staff, 29 May 2012).

Although the giant African snail is now a common sight in Samoa, especially on Upolu, the map presented as Figure 1 is the most recent published information regarding the species' geographical distribu-tion in the country; that is until this present survey. Perceiving a need for more current information, the authors of this paper were prompted to carry out an investigation, with the objective of determining the present geographical spread of this species in the country. This paper presents the findings.

METHODOLOGY

The geographical occurrence of the giant African snail was investigated through field surveys of the islands of Savaii and Upolu. In selecting sites for the surveys, a total

of 20 locations were randomly marked on a map of each of the islands prior to the actual survey exercise. The sites were spread out along the main access roads on each island. During the actual survey exercise, we visited a village at each marked location and requested access to a crop farm/garden. Positioning ourselves side by side, the researchers and field assistants walked through each targeted garden and its immediate surroundings, searching thoroughly and exhaustively for any sign of the giant African snail. Observations were made on plants, under debris, under rocks, logs, empty containers, and in/on any place that could possibly harbour the snail. Whenever possible, the garden owners were also interviewed (informally) regarding their knowledge of any occurrence of the giant African snail in their area. Based on visual observations, the presence/absence of the species was recorded, and apparent abundance was also noted.

RESULTS AND DISCUSSION

Twenty gardens were surveyed on Upolu and the same number on Savaii. Garden sizes ranged between 0.1 - 1.0 ha. The findings revealed that the giant African snail is well established on Upolu, and it is slowly finding its way around Savaii (Figure 2). As expected, the snail is more widespread on Upolu than on Savaii.

On Upolu, 19 (95 %) of the 20 locations surveyed had live giant African snail present, being readily observable to abundant at the locations. Most property owners spoken to indicated that the snail had been in their area for quite a few years.

On Savaii, live giant African snail was present at 7 (35 %) of the 20 locations surveyed, and the presence of empty shells at an eighth location (Satoalepai village) strongly suggests that the snail is present around this area also. When asked, the property owner at Satoalepai was positive that live snails were present in the area and the empty shells we observed were the remains of snails he and his family had killed earlier. The owner of the property surveyed at Neaifu village indicated that he first noticed the snail in his garden in 2011, and he suspected that it was inadvertently introduced on taro planting material he had acquired from Upolu. The snail was observed to be abundant at this location. The owners of the property surveyed at Satupaitea village indicated that the snail had been in their area for about two years, and they suspected that it was introduced through building construction materials brought in from Upolu. The snail was observed to be abundant here also. Strikingly heavy infestations of the giant African snail were observed at Salelologa and Salelavalu.

Comparing Figure 1 and Figure 2, it appears quite obvious that the giant African snail has gained substantial ground in terms of establishing itself in Samoa during the past 15 years (since 1997). According to Figure 1, the snail was recorded within the western half of Upolu as of 1997, and as noted earlier in this paper, the snail is presumed to be absent from Savaii at that time. Figure 2 shows that the situation has changed significantly. It is worthy of mention, also, that with the exception of Satoalepai and Puapua, the giant African snail was easy to find at all other locations where it was present on both islands.

CONCLUSION

This paper has provided an update of the current distribution of the giant African snail in Samoa. This information should be useful to government and other agencies that are concerned with environmental issues. It also enriches the information base for future studies and other actions related to this species in Samoa.

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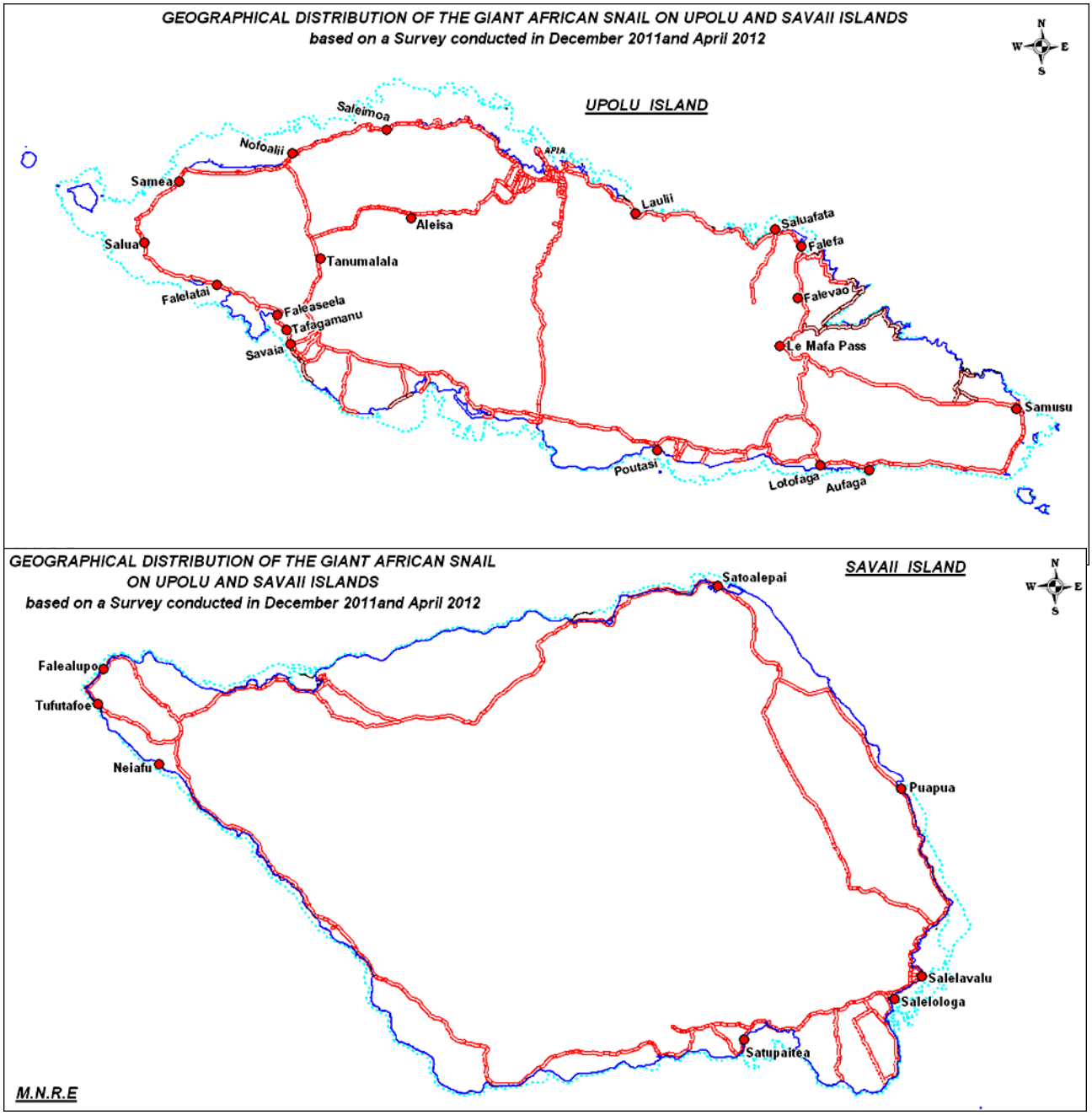

Figure 2: Survey sites (villages) where the giant African snail was found on Upolu and Savaii Islands of Samoa, as of April 2012.

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