

Impact of the New Zealand flatworm on Scotland's biodiversity

Brian Boag & Roy Neilson

The James Hutton Institute, Invergowrie, Dundee, DD2 5DA E-mail: Brian.Boag@hutton.ac.uk

The detrimental impact of the New Zealand flatworm (*Arthurdendyus triangulatus*) on both Scotland's above and below ground biodiversity, could in certain parts of the country be considerable. Below ground earthworms play a crucial role in the ecology of many soils as they have a beneficial impact on nutrient cycling, drainage and soil structure while above ground they are a major constituent of the diet of many birds and mammals.

In much of Scotland, earthworm populations are likely to be missing or low in Scotland as many of the soils have a low pH (below that tolerated by earthworms) or the soils are intensively cultivated especially in the east of Scotland (Boag *et al.*, 1998). However, in fields where grass is the main crop, then earthworm numbers can be high (Boag *et al.*, 1997). Jones *et al.*, (2001) studied the impact of the New Zealand flatworm on the composition of the earthworm community in two New Zealand flatworm infested sites and compared these with flatworm free sites in western Scotland and found the numbers of both endogeic and anecic earthworm species were significantly reduced. Experimental research in Northern Ireland has confirmed that the numbers of the anecic species *Lumbricus terrestris* were significantly reduced as was the total biomass of earthworms (Murchie & Gordon, 2013). The indirect impact of reduced earthworm numbers on the size and composition of the populations of other creatures which inhabit soil e.g. collembola, nematodes, enchytraeids and fungi and bacteria have never been investigated.

Alford *et al.*, (1985) did a comprehensive inventory of the above ground animals which feed of earthworms and concluded that where the New Zealand flatworm became established it may lead to the extinction of moles (*Talpa europaea*), and possible local extinction of common shrew (*Sorex araneus*), badger (*Meles meles*), hedgehog (*Erinaceus europaeus*) stoat (*Mustela erminea*) but that foxes (*Vulpes vulpes*) would probably be unaffected. What little evidence we have so far suggests these predictions may be true since in fields in the west of Scotland where moles were once plentiful but have become infested with the New Zealand flatworms moles have been eradicated (Boag & Yeates, 2001).

Alford *et al.* (1995) also predicted that there would be a detrimental impact on a number of bird species. At present no research is being undertaken to ascertain the direct or indirect impact of the New Zealand flatworm on Scotland's above or below ground biodiversity.

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