Mana Island Bryophytes at the February 2011 Bioblitz

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The 217 hectare Mana Island is situated 2.5 km off the west coast of New Zealand just north of Wellington. It consists of a plateau, at about 100 metres a.s.l., surrounded by steep cliffs cut by several deep valleys. The island was farmed from the 1880s to the 1980s. Restoration started in 1989/90, with the clearance of mice and subsequent planting of locally sourced native trees and shrubs in selected sites. A wetland has been formed in the area adjacent to the landing. Much of the plateau remains in rank pasture, with some now growing into scrubland as the regeneration planting takes off. The coast has some exposed rock stacks and cliffs, whilst several valleys are well covered with shrubs and trees. The wetland is yet to fully develop. It has shrubs and pools but little in the way of marshy areas. As was noted during the planning stage of the restoration, Mana Island is relatively dry (Timmins et al. 1987), and this appears to limit the variety and quantity of bryophytes.

The Bioblitz was organised by the Wellington Forest and Bird Society. A group from the Wellington Botanical Society who have an interest in bryophytes concentrated their search on the more likely sites over three days during the Bioblitz, 8 to 10 February 2011. The group consisted of Peter Beveridge, Rodney Lewington, Pascale Michel, Darea Sherratt and Owen Spearpoint. Allison Ballance from Radio New Zealand came along for the first two days. Several areas on the adjacent mainland were visited in the following week to provide comparison with what was found on Mana Island.

During the three days on Mana Island the party covered the variety of habitats: the stone land and low shrub of the eastern coast, exposed rock faces and stacks on both sides of the island, the forested and shaded regenerating woodlands in the lower Weta Valley and upper Forest Valley, the rather eaten out lower gorge of Forest Valley as well as the sparse shrub land at the higher levels of these and other valleys. Also explored were the small wetlands in the centre of the island as well as representative areas of the open pasture.

Prior to the Bioblitz a search of Te Papa's WELT herbarium yielded just one bryophyte record—*Acrolejeunea mollis.* This is included in the

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Appendix which provides a preliminary list for Mana Island to which additions can be made in future.

MOSSES

Although much of the island lacks habitat for bryophytes, there are some locations where mosses are conspicuous. Drought-tolerant and often weedy moss species were found on track cutting and road fringe rock and bare soil at various sites. *Fissidens megalotis* was present at the start of the Tirohanga Track from Shingle Point and a suite of species including *Triquetrella papillata*, *Didymodon torquatus*, *Syntrichia antarctica*, *Trichostomum sciophilum*, *Pseudocrossidium crinitum*, *Bryum campylothecium* and *Hypnum cupressiforme* were common elsewhere, particularly the southern end of the Tirohanga Track and the lower road cutting and fringes of the Pump Track. Mosses more dependent on moist substrate and humidity were conspicuous over rock, gravel and soil in the main gullies visited, such as Forest Stream, and Weta Valley. *Fissidens* species were present along with other indicative species, such as *Achrophyllum dentatum*, *Pendulothecium punctatum* and *Philonotis tenuis*. There were few humid sites with rotting logs, a common bryophyte habitat, and epiphytes, where present, were restricted to tree bases.

Anthropogenic sites such as old concrete foundations near the boat ramp and the old farm site provided substrate for *Tortula muralis*, *Bryum argenteum* and *Syntrichia antarctica. Leptostomum macrocarpum*, usually an epiphyte, was also, unexpectedly, on concrete.

A specific search was conducted for certain mosses known to be present on the adjacent mainland at Titahi Bay. They included *Ischyrodon lepturus* and *Sematophyllum homomallum*, found commonly at Titahi Bay on coastal rock. A sample of *Ischyrodon* was found on a coastal stack at Mana Island and the *Sematopyllum* was collected on shaded back beach storm logs on the western coast. *Tortula atrovirens*, a moss common on weathered rock in cliff top wind hollows at Titahi Bay was not found in similar sites on the island. The timing of the survey did not allow a search for *Tortula maritima*, a small uncommon ephemeral moss for which Titahi Bay is the only known North Island site. It appears and fruits only in mid-winter. The island appears to have suitable habitat for it.

LIVERWORTS AND HORNWORTS

Whilst liverworts were found in sites throughout Mana Island, the moist area of Forest Valley and the forested part of Weta Valley were the main habitats both in terms of quantity and variety. Of 35 taxa recorded, 27

(77%) were from these two valleys. A similar situation exists on the adjacent mainland where the bush covered Stuart Park and the enclosed wetland and lower forested area of Whitireia Park proved to be suitable habitats for hepatics. The only hornwort, *Megaceros denticulatus*, found on Mana Island was in the moister area of Forest Valley. This species was not found on the mainland although another species of hornwort, *Phaeoceros carolinianus*, was found in a wet runnel in Whitireia Park.

Of the liverworts, the most notable collection was of the distinctive *Lejeunea* sp. "Hodgson". This had previously been recorded near Pauatahanui Inlet. It was found during the Bioblitz in Weta Valley on Mana Island and subsequently on the mainland in both Stuart Park and the area of Whitireia Park fenced to exclude cattle. Other records of this species are from Johnston Hill, Karori, and from Pitt Island in the Chatham Islands.

Acrolejeunea mollis (Fig. 1) was found on Mana Island. This is regarded as rare although widespread (D. Glenny, unpub. compilation, New Zealand liverworts and hornworts), but we have found it elsewhere and suspect that it is one of many under-recorded liverworts.

Figure 1. *Acrolejeunea mollis*. Scale = 1 mm. Photo: Jeremy Rolfe.

The relatively dry habitat of Mana Island is demonstrated by what common liverworts are not there. Only a single species of *Balantiopsis* (the common *B. diplophylla*) and *Schistochila* (*S. repleta*) were found. No *Bazzania*, no *Telaranea* and certainly none of the pendulous liverworts or mosses were found on Mana Island. Nor was the ubiquitous *Chiloscyphus*

semiteres, although it was well represented in collections from the adjacent mainland. No doubt these and other forest hepatics will return as the re-vegetation provides a moister and less exposed habitat.

FOR THE FUTURE

The timing of the Bioblitz limited the range of species likely to be found. A follow-up survey, ideally in late winter, focussing on a number of promising sites would undoubtedly increase the tally. Further, more time could profitably be spent in areas not fully explored. These include the Shingle Point boulder field, where bryophytes grow under short *Coprosma* cover, around the upper slopes of the kānuka forest, the south end of the island which was unexplored and Tauhinu Valley which was only examined for the first ten metres or so up from the coast.

ACKNOWLEDGEMENTS

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REFERENCES

Timmins, S.M.; Atkinson, I.A.E.; Ogle, C.C. 1987. Conservation opportunities on a highly modified island: Mana Island, Wellington, New Zealand. *New Zealand Journal of Ecology* 10: 57-65.

APPENDIX: BRYOPHYTES FOUND ON MANA ISLAND DURING THE 2011 BIOBLITZ

Representative moss specimens are held in Te Papa's WELT herbarium. A selection of liverwort specimens will be deposited at Landcare Research's CHR herbarium. Fuller details of the collections made, including habitat and substrate, are available from the authors.

Mosses

Achrophyllum dentatum
Brachythecium albicans
Bryum argenteum
Bryum billardierei var. *billardierei*
Bryum campylothecium
Bryum dichotomum
Camptochaete pulvinata
Campylopus introflexus
Ceratodon purpureus
Didymodon torquatus
Eurhynchium praelongum
Fissidens asplenioides
Fissidens curvatus var. *curvatus*
Fissidens dealbatus
Fissidens leptocladus
Fissidens megalotis
Fissidens tenellus var. *tenellus*
Funaria hygrometrica
Hypnum cupressiforme var. *cupressiforme*
Hypopterygium didictyon

Ischyrodon lepturus
Leptostomum macrocarpum
Orthodontium lineare
Pendulothecium punctatum
Philonotis tenuis
Physcomitrium pyriforme
Pseudocrossidium crinitum
Ptychomnion aciculare
Racopilum sp.
Rhynchostegium laxatum
Rhynchostegium tenuifolium
Sematophyllum amoenum
Sematophyllum homomallum
Syntrichia antarctica
Syntrichia laevipila
Syntrichia papillosa
Thuidium furfurosum
Thuidium sparsum
Tortula muralis
Trichostomum sciophilum
Triquetrella papillata
Zygodon intermedius

Hornworts

Megaceros denticulatus

Liverworts

Acrolejeunea mollis
Balantiopsis diplophylla var. *diplophylla*
Chiloscyphus bispinosus
Chiloscyphus erosus
Chiloscyphus lentus
Chiloscyphus muricatus
Chiloscyphus sp. (aff. *C. anisolobus*)
Chiloscyphus subporosus (Fig. 2)
Chiloscyphus villosus
Cololejeunea cucullifolia
Frullania deplanata
Frullania monocera
Frullania patula
Frullania rostellata
Frullania rostrata
Frullania setchellii
Frullania solanderiana
Frullania spinifera
Frullania squarrosula
Heteroscyphus normalis
Heteroscyphus triacanthus
Isotachis montana
Lejeunea gracilipes
Lejeunea sp. "Hodgson"
Lepidozia laevifolia
Lunularia cruciata
Metzgeria furcata
Radula buccinifera
Radula silvosa
Riccardia aequitexta
Schistochila repleta
Siphonolejeunea nudipes
Symphyogyna undulata
Zoopsis ceratophylla

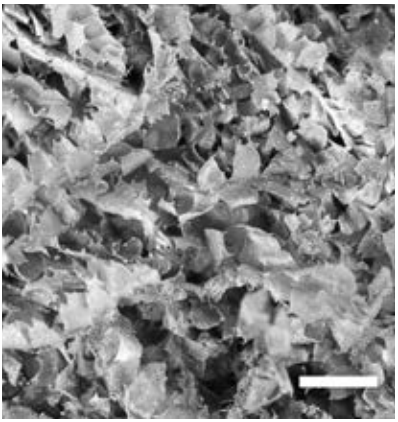

Figure 2. *Chiloscyphus subporosus*. Scale = 1 mm. Photo: Jeremy Rolfe.