

New Zealand - Hawai'i Conservation Exchange Programme 1998/1999: Report on visit to Hawai'i, 26-30th July - Jane Fröhlich

Introduction

This report summarises the information that was gathered when I visited Hawai'i as part of the NZ/Hawai'i conservation exchange programme operated by Landcare Research and the Secretariat for conservation biology, University of Hawai'i. The main aim of the visit was to exchange information on the biological control of weeds that cause problems in conservation areas in both Hawai'i and New Zealand (for example, mist flower (hamakua pamakani), banana passionfruit (banana poka), wild ginger, blackberry and gorse). I also used the visit to meet colleagues at the Hawai'i Department of Agriculture with whom I have been collaborating on the biological control of mist flower for two years.

Hawai'i Conservation Conference 27-28 July 1999

The conference was held at the Hilton Hawai'ian Village in Honolulu. The ca. 360 participants were seated together in one venue, apart from one concurrent panel session. The first speaker welcomed the participants and Hugh Gourlay and myself were among those singled out for a specific mention.

The first session was about the politics of conservation in Hawai'i. There was an interesting panel discussion about the importance of bringing native Hawai'ians and local communities on board early in the design of conservation programmes. I suspect that early consultation with Maori groups and local communities in New Zealand could similarly assist conservation efforts, including biological control programmes, in New Zealand.

After lunch there was a talk and a very entertaining play (by Ōhia Productions) on the importance of educating children in the necessity of conservation. The play was aimed at children and using puppets and costumes the actors brought to life a number of natural habitats in Hawai'i and the dominant native plants, animals and insects that live in them. They also demonstrated the main threats to these, including human impacts. Such a play could be a wonderful way of explaining to children how biological control works, and why it is such a good weed control strategy in some ecosystems.

After the play there was a poster session. I presented a poster titled: biological control of mist flower (*Ageratina riparia*): Transferring a successful program from Hawai'i to New Zealand. Hugh Gourlay also presented a poster, his was titled: Progress towards biological control of gorse (*Ulex europaeus*) in New Zealand. Both posters were well received and I spoke to Rob Anderson (Pacific Cooperative Studies Unit), Stephen Hight (USDA Forest Service) and Collin Basset (former head of the secretariat for conservation biology, University of Hawai'i) about the mist flower biocontrol programmes of Hawai'i and New Zealand. I also spoke to Rob about his work developing a bacteria (*Ralstonia* (= *Pseudomonas*) *solanacearum*) as a bioherbicide for wild ginger (*Hedychium gardnerianum*).

The second day of the conference started with talks on recovery plans which urged less theory and more on-the-ground effort. The conference participants were then asked to chose one of five concurrent panels and I chose "Prioritizing areas for conservation action". The panel members showed GIS maps of: the Hawai'ian vegetation, the ownership of various pieces of land, and the pests present in the various areas, all of which are used to determine

which areas were most worthy of protection and restoration. Very similar maps could easily be drawn and used to prioritize areas for conservation in New Zealand, and in fact, I would be surprised if the Department of conservation (DoC) was not already doing so.

The session after lunch was the most relevant to Hugh and myself as the topic was alien species. The first talk was by Curt Daehler (coauthor Debbie Carino) of the Department of Botany at the University of Hawai'i. His topic was "Predicting invasive plants in the Hawai'ian islands" and he summarised a neat little study in which they assessed the ability of screening systems by Pheloung and Williams (used in Australia and New Zealand), Tucker and Richardson (used in South Africa) and Reichard and Hamilton (used in North America) to predict invasive plants in the Hawai'ian islands. The researchers took a collection of plants that had been introduced to Hawai'i, some of which became weeds, and some of which didn't, and put these through each screening system to see which would have been accepted, or rejected, at the border if such a system had been used to determine their weediness. Of the three systems the Pheloung/Williams system (which is used in New Zealand) worked best, attaining over 90% accuracy in predicting invaders in Hawai'i, despite having been designed for use in the Antipodes.

The second talk on alien species was by Chris Buddenhagen of DoC, New Zealand. His title was monitoring weed control operations: Results, outcomes and decisions. DoC is apparently developing a monitoring protocol to allow field staff to quantify the success of weed control operations. Chris emphasised that such monitoring needs to examine the recovery (or otherwise) of the native vegetation after weed control, and not just the impact on the weed. Monitoring is indeed an important part of biological weed control operations and Hugh and I urged Chris to produce a monitoring protocol flexible enough for use in our programmes.

The third and final alien species talk was about the effects of an insect egg parasitoid (*Trissolcus basalis*) introduced for the biological control of another insect, the Southern green stink bug (*Nezaria viridula*), on the endemic koa bug (*Coleotrichus blackburniae*). The speaker demonstrated that the parasitoid could, and does parasitise eggs of the Koa bug, but that parasitism levels are quite low (ca. 7%). The author's conclusion was that it is important to screen non-target hosts and understand the ecology of natural enemies before their introduction for biological control. This concept is taken as read in New Zealand, and probably also now in Hawai'i, although this paper suggested that biocontrol researchers were not always as careful as they should have been in the past.

The next session was on restoration and the importance of Mycorrhizae to the success of tree planting was emphasised. There was also a talk on the impact of axis deer on rare pockets of native dryland forests that have survived on lava flows in Hawai'i. The deer can be quite devastating when their numbers build up. New Zealand, beware! The final session of the conference was on forest birds. The Hawai'ians are having some success with captive breeding, rearing and release of at least one highly endangered (200-300 individuals left in the wild) bird species (Puaiohi, *Myadestes palmeri*). They have also been examining causes of the decline of another endangered species (Elepaio, *Chasiempis sandwichensis ibidis*). Automatically triggered cameras at artificial nest sites with quail eggs suggested that the black rat (*Rattus rattus*) was the main culprit in egg predation. News that is unlikely to surprise New Zealander's working with endangered New Zealand native birds.

Post-Conference Interactions 29-30 July 1999

After the conference Hugh and I spent two days with Eloise Killgore, Ken Teramoto and Larry Nakahara of the Hawai'i Department of Agriculture (HDOA). We were very well looked after and were invited to show our posters to the staff who are involved with biological control programmes. We visited two of the few sites where mist flower (known as hamakua pakakani in Hawai'i) can still be found after their very successful biological control programme against that weed. The few plants we saw were stunted and unhealthy. They bore galls formed by the gall fly *Procecidochares alani*, feeding damage on their leaves, which was probably caused by larvae of the moth *Oidaematophorus beneficus* and lesions and pustules characteristic of the white smut *Entyloma ageratinae*. All three of these agents were introduced to Hawai'i for the biological control of mist flower, and we saw for our own eyes how well they had cleaned up the weed. The white smut fungus was imported from Hawai'i to New Zealand last November, for the biological control of mistflower, and has established at most release sites, and appears to be spreading well. An application to introduce the gall fly (again, from Hawai'i) has been submitted to the Environmental Risk Management Authority (N.Z.).

During my last two days in Hawai'i we also discussed with HDOA staff weeds of common interest such as banana passionfruit (called banana poka in Hawai'i), blackberry and gorse. I tried to contact Dr. Eduardo Trujillo, of the University of Hawai'i, about his work on these weeds also, but unfortunately, he was out of town during my visit. We did establish contact when I returned to Auckland and he told me that the fungus (*Septoria passiflorae*) he has released to control banana poka (*Passiflora sp.*) is showing some promise. The agents the Hawai'ians are working on for these weeds could also be used in New Zealand, and much could be gained by both Countries from a collaborative effort similar to that developed for the mist flower programme. The staff of the HDOA and the University of Hawai'i have been using biological control agents very successfully for a very long time, but few Hawai'ians outside these organisations appear to appreciate this (there were no talks on biological control of weeds at the conservation conference for example). While we have much to gain from their experience with weeds that are now a problem in New Zealand, perhaps we can also offer them advice on how to sell themselves, and their work, so that they get the recognition (and continued funding) that they deserve.