

**TRAVEL COMPLETION REPORT
CONSERVATION EXCHANGE PROGRAM
For Pat Bily, The Nature Conservancy of Hawaii**

**Sponsored and coordinated by the
Secretariat for Conservation Biology
and
Manaaki Whenua Landcare Research New Zealand Ltd.**

INTRODUCTION:

After contacting key people from various agencies in New Zealand to create an itinerary, I presented a proposal to the Secretariat for Conservation Biology in Hawaii and was accepted into the Landcare Exchange Program. The main foci in my proposal were to observe 1.) pest plant control techniques in natural areas; 2.) community based and Regional Council control strategies; 3.) biological control and other strategies in rangelands, as buffer zones for conservation areas; and to 4.) establish contacts with NZ pest plant managers. An underlying theme throughout these goals was to look for ways to improve how alien plant control is addressed in Hawaii; and more specifically, to enhance the weed control objectives for The Nature Conservancy's Maui Preserves. In November 1997, I spent 24 days on travel throughout New Zealand to research the above mentioned goals. I kept a written log of interviews and observations during my visits to numerous sites and offices, and brought back much printed information that may influence public outreach, management, or scientific approaches to weed control issues in Hawaii. In addition, I took 5 rolls of slide film to document subjects pertinent to the trip.



Much of my interaction was within two public agencies: the Department of Conservation, and Regional Councils. The Department of Conservation oversees the protection and recreational uses of specific conservation lands and national parks, administered by district Conservancies. The Regional Councils were recently created to address a wide array of environmental issues, and are broken down into particular geographical regions. A body of elected officials per Regional Office delegates these responsibilities to a staff of officers, including personnel whose duty it is to enforce the Biosecurity Act of 1993. This Act is far too complex for me to explain in this report, but it should suffice to say that in the context of invasive plant introduction, cultivation, or spread, the law provides a basis for agencies to control these pests.

ITINERARY:

AUCKLAND:

Upon arrival at Auckland International Airport, I thought to get a closer look at New Zealand's much lauded stringent border control. The occupied passenger cabin of my flight was not sprayed with insecticide before deplaning, as I remember happening when visiting this county 10 years earlier, and I guessed they had developed a better method. I talked with inspector/dog teams about their workload capacity (1,200 passengers/day) and the effectiveness of detection. They also credited routine x-raying of incoming luggage as a great way of detecting anything containing water (animals, plants). The sophisticated x-ray equipment is monitored by alert inspectors, very trained in pest interception.



In town, a walk to the Department of Conservation's small shop proved interesting. Even though it served as an information center for outdoor recreation, there was a fair bit of alien species consciousness disseminated through their displays and brochures. The 'Deadly Beauty' brochure posed a hexed kahili ginger on the front and explained 'Task Force Ginger', an exciting public campaign, sponsored and supported by the telephone company Bell South and various agencies. It focused on education and community action to greatly reduce kahili ginger populations in the Waitakere area outside Auckland.

I arranged a meeting with Dick Veitch of DOC (Department of Conservation) and Sarah Lowe (IUCN, Invasive Species Specialist Group under the United Nations) at the main DOC office. I presented them with information concerning alien plant control in Hawaii, including hardcopies. Dick gave me a copy of DOC's database Ecological weeds on conservation land in New Zealand, which provides a numerical scoring system for assessing weed threats, among other features. Besides the many other pest issues he's working on, Dick's been compiling a weed control handbook with color photos and successful control measures for the worst invasive plants. This parallels the criteria established for the Biological Success Rating in the database, which Dick says "takes away any guesswork." He felt there is also a weed recognition problem with resource managers that the handbook can help. Recognizing the need for public outreach, he cited examples of work with the ornamental landscape industry ('Forest Friendly Awards' to nurseries), but felt private sector support is limited and the general public apathetic or ignorant (NZ Post had issued a kahili ginger stamp!). Regarding agricultural alliances for invasive plant control, Dick sees farmers not doing enough and ignoring sound advice from the Federated Farmers, although they lobby for biological weed control. Sarah talked about the global focus of the Aliens newsletter she puts together and gave me some back issues. I met with Sarah again during her recent visit to Maui and discussed this topic further.

In the DOC lobby, I was impressed with the displays, and plentiful brochures on alien plants, animals, and other organisms, which illustrates the severity with which DOC regards these pests.



I also met with Lance Vervoort, Team Leader Biosecurity Officer for the Auckland Regional Council (ARC). Lance helped compile the National Surveillance Plant Pests booklet, which outlines 110 prohibited plants by growth habit and habitat. Good color photographs with accompanying descriptions serve to alert the public about these plants. Lance mentioned that ARC consulted with the public and Landscaper's Association before making the Surveillance List, and suggested to "allow for plenty of lead in time to prepare people for species bans", as well as insuring there are alternative plants. I gave him some background on Hawaii weed issues, along with hard copies describing projects, such as Operation Miconia. Lance explained to me how the Regional Councils implement their work, through mapping targeted areas, serving legal clearance notice for removal of noxious weeds, control of weeds on public land, providing control advice, and the 'Hot line' that receives over 100 calls a week to report weeds or request information.

Through its' 12 Field Offices, ARC spends \$1.1 million (NZ) a year on addressing invasive plants. Education is a big part of this budget, with programs like 'Invading Aliens' tied into school science curriculums, as well as a constant stream of flyers and brochures that are distributed to the public. When I asked about public perceptions of herbicide use, Lance said that although there has been public outcry about other pesticides used for gypsy moth and possum control, only a very small percentage of people are overtly opposed to chemical control of these noxious plants. He did mention that there has been misinformation spread about roadside spraying with low-toxicity herbicides and that it has prompted a growing opposition, which has in turn led to some pilot programs to explore alternative controls (One of these is a high pressure hot water spray, applied from large boiler tanks to roadside weeds. Aside from the lack of true control over many roadside weeds, I had to wonder about the potential safety hazards posed to anyone in proximity, especially the applicator, were there an accident). As far as differences in the agricultural communities' view of environmental weeds, Lance said that while there may be little support, the Biosecurity Act enforces cooperation regarding buffer zones and seed contamination.

Mike Harre, ARC Biosecurity Officer, showed me some of their maps on his computer. They have a great system for tracking 'hot spot' areas, accompanied by an inventory of public contacts, property weeds, control measures, and dates of site visits. Lap top computers are taken out in the field by the officers to enter the various data on the spot. I accompanied Mike to site visits outside Auckland city. ARC's control work for tree privet, pampas grass, and evergreen buckthorn appeared successful. Injection of an Escort® solution into drilled holes was the preferred treatment method for tree privet, and may work on 'hard to kill' pest trees on TNC-Maui Preserves. I talked briefly with one property owner who, although she had controlled some noxious weeds in her yard, was informed by Mike that there were others emerging. Despite her enthusiastic

response to “get to it tomorrow”, the threat of an imposed fine was the real stimulus. This was an example of the Biosecurity Act providing a legal basis for cooperation among landowners to achieve noxious weed control objectives.



WHANGAREI:

Arriving in Whangarei on the weekend left me with no options to meet my contact, so I took a hike up to Whangarei Falls Park. There I observed Surveillance List ground cover weeds choking out native plant recruitment in an otherwise native dominant area. From the looks of it, I suspected there was an active weed control program in place, as there was some kahili ginger recruitment in an obvious control site. I spent some time familiarizing myself with the native species (I had a color book), and taking notes on plants familiar from the Surveillance List color pamphlet. Although there was an evident pride in native plant cultivation, I noticed many Surveillance List plants in peoples yards.

I met with Jack Crow, a seasoned Land Management Officer with the Northland Regional Council (NRC), and author of many booklets and publications on pest plants. Among them is a book on poisonous plants (many noxious weeds) and The Good Plant Guide, which promotes responsible landscaping and provides growers with a huge list of ‘environmentally friendly’ species. Again, I presented information on weed control issues in Hawaii, then interviewed him about pest plant topics. Jack said that (NZ)\$200 million a year is spent nationally on weed control for agriculture, forestry, etc., and that half of that is used on gorse alone. The funds used to enforce the Biosecurity Act, implemented by the Regional Councils, comes from land rates (property taxes), augmented by book sales and violation fines. Since newsletters and ‘Rate Payers Reports’ go out to the public, surveys from Regional Council auditing serve as a tool to measure public response to their performance. Jack says this and high profile publicity reflects the public believing the Regional Councils are doing a good job at weed control, particularly with kahili ginger. Among the many outreach tools he mentioned, Jack felt emphasizing the impact of these invasive plants (i.e., interruption of natural processes, documentation of kahili ginger eroding stream banks, recreational and economic loss) is a good strategy to get the public concerned and involved. He offered some specific information on the best herbicides and rates to use in controlling various weeds, many in the emergent stages in Hawaii.

On a site visit to Taphui, I accompanied NRC Noxious Plants Officers Ken Massey and Brett Miller. Up in the hills covered with a vast sea of yellow broom, I assisted them in releasing broom twig miner, one of the biological agents developed for control of this serious weed. Ken and Brett work closely with local farmers, monitoring their progress in controlling priority weeds and offering advice.

Back in Whangarei, Jack took me out to local sites, some of which had clusters of more than ten Surveillance List plants. Most of these were garden escapes initially spread by

dumping plant debris. Later Jack gave me a tour of his yard, landscaped with native species, as I familiarized myself with more New Zealand endemics. He left me with various useful publications concerning weed issues in Northland.

HAMILTON:

At the University of Waikato campus, I met with Bruce Clarkson, Exchange Program Coordinator for Landcare Research New Zealand Ltd., my sponsor for this trip. Bruce provided me with more contacts, book references and other information, and allowed me long distance access by phone to confirm dates with the remainder of my contacts.

Later, I met with Jason Roxburgh, Conservation Officer for DOC's Waikato Conservancy. Jason is quite experienced at pest plant control and offered advice on herbicides and surfactants. He told me how funds for weed control are delegated to DOC through a National Priority Poll determining the top pests. The funding (NZ \$9 million a year) and inventory are still relatively small compared to advanced operations like possum control. He gave yellow broom as an example of a link between agricultural and environmental weeds, and suggested advocacy as an approach to control weed infestations adjacent to conservation lands. He mentioned that Forestry companies work with DOC under the realm of the Biosecurity Act. In general, he felt the public was very supportive of DOC's weed control, including herbicide use in National Parks and conservation lands.

Bruce Clarkson took me out to Claudeland's Bush, where he'd done extensive research on succession. This site was a remnant podocarp forest in Hamilton, and is now protected by a fence and boardwalk for visitor use. Besides noting the many alien plant garden escapes, Bruce highlighted the diversity of native species for me. Interestingly, there were instances of endemics from other habitats in New Zealand, that were erroneously planted (wrong species of tree violet), or naturalizing from cultivation (Karakanut). Bruce refers to this kind of restoration as "promiscuous planting of the lowest common denominator." This is an important point to bear in mind with native outplanting projects in Hawaii.

I took a trip out to Waitomo Caves to observe remnant native bush in the vast agricultural lands of King Country. While many weeds appeared to take advantage of this gross fragmentation, the Japanese honeysuckle was by far the most threatening species, even growing in dense shade. Later, I had another opportunity to learn more about native plants, as Bruce showed me the restoration project he's doing along the streambank of his property. I was very influenced by his perspectives on natural succession as an important factor to consider when developing weed control strategies.

Merilyn Merrit, a plant ecologist at the Landcare office, took me on a field trip to another remnant of native bush, Pukemokemoke Reserve. She explained a lot to me about successions and impacts in this area, and showed me some weed control sites.

ROTORUA:

I met with Dr. Jerzy Zabkiewicz, a brilliant weed scientist who has worked for the Forest Research Institute (FRI) for 20 years. Weeds of particular interest that he and his staff

have researched are pines and pampas grass. He provided advice on increasing surfactants to enhance herbicide efficacy on difficult species, as well as seasonal considerations that may help uptake. Besides numerous management practices, he showed me some interesting application devices that might help control specific priority weeds on TNC's Maui Preserves. Later, he took me to FRI's huge library and allowed me to take fact sheets on numerous pest species, as well as various reports on their control.

Dr. Zabkiewicz introduced me to John Ray, who shared with me a paper on trials to control lodgepole pines by aerial application. This information will be very useful for TNC-Maui Preserves to develop a strategy for pine control on inaccessible cliffs.

I met briefly with Richard Mallinson, Plant Pest Officer with the Regional Council in Rotorua, and discussed local weed issues. Richard had lots of experience with control of 'Old Man's Beard', a noxious vine for which I remember seeing a huge public outreach and control campaign during my visit 10 years before. While he felt the campaign was initially successful, this vine is still quite a problem in many parts of the country. Richard mentioned that aerial treatment of this vine was tried, but it was difficult to get good coverage through the non-target canopy. We talked about public perception of herbicide use and he said there was room for misunderstanding due to sloppy application by City Council road crews. He sees their use of 'skull and crossbones' warning signs, and references to 'poison' when spraying low-toxicity herbicides, as detrimental to an unbiased public view of weed control.

TURANGI:

Upon arrival in Turangi, I was met by Chris Buddenhagen, a weed ecologist with DOC. Chris formerly was at DOC's Tongariro/Taupo Conservancy, but is now in Wellington where he works on DOC's environmental weeds database. Because he lived in Hawaii at one time, he had some perspective on the altered landscape. We drove to the DOC office and met Harry Keys, Advisory Scientist for the Tongariro/Taupo Conservancy. Again, I presented information on weed issues in Hawaii, explaining some of the projects going on regarding action committees, potential control handbooks, and the Hawaii Ecosystems At Risk project; HEAR's database is similar to what Chris is working on in Wellington, and I suggested he contact Philip Thomas at Haleakala National Park to continue that dialogue.

We visited various weed control sites on conservation lands in sub-alpine, and riparian habitat. While Chris and Harry explained prior and current impacts to the areas, they did not feel feral animal control was the first step to weed control, as assumed by many Hawaii resource managers. Harry talked about a new herbicide tool that may help with their control of honeysuckle, as current methods are too labor intensive. This lopper system for applying herbicide gels (being developed by HortResearch) could also help in controlling some of Hawaii's vine pests.

Concerning partnerships with other agencies and landowners, Harry felt the New Zealand Department of Defense to be a good ally with invasive pine control. He viewed farmers as supportive because it enhances 'good neighbor' boundary control policy. I asked

Harry about public perception of herbicide use on conservation lands, and he said that although there is a small growing movement to condemn such management, most people accept it as a means to preserve the native bush. A strategy he suggested for use in gaining public support is to “focus on the value of the protected area, not the weed species.”



Chris distinguished between DOC’s weed control strategies for ‘weed-led control’ (proactive, early containment/eradication) and ‘site-led control’ (isolated control of widespread pests in natural areas, similar to Hawaii’s Special Ecological Area approach). He took me to some control sites at Tongariro/Taupo National Park.

There in the sub-alpine tussock fields, their biggest weed problem was scotch heather, which is dominant on the ground layer. Broom is also a problem, and Chris talked about detection gaps during treatment of expanding satellite populations being a pitfall. We will continue to be in touch about methods to improve technique, strategy, and monitoring.

A hike along high elevation trails at the National Park gave me a better perspective of exactly how these habitats are threatened by such a widespread weed like scotch heather, as well as the enormity of the job to control it. This reinforced DOC’s strategy in site focused control for new infestations, anticipating that over time the larger populations will be displaced by competition of native canopy species, like manuka.

MT. MAUNGANUI:

At the Bay Of Plenty Regional Council office, also known as Environment Bay of Plenty (BOP), I met with Plant Pest Officer Walter Stahel. For the last 6 years, Walter has been heavily involved in BOP’s containment program for woolly nightshade. This campaign reminded me of what Operation Miconia may evolve into, and, although largely successful with containment, the process of localized eradication is ongoing. Walter pointed out the difficulties of trying to focus on one pest: while the campaign is mustering support and action, other priority species are gaining ground. By the same token, the momentum to successfully complete true control of woolly nightshade was diluted by shifting effort towards those other pests. As Walter took me out to large property sites, he explained the combination of control measures that have successfully reduced this weed from monotypic hillsides to spotty reoccurrences; this included the use of mechanical chopping, grazing, competition from pasture grasses, and herbicide spot treatment. I was impressed with the various chemical control options used on their top weeds.

Later, I talked with Environment BOP land resources manager Tony Hall, who was pursuing a landmark prosecution of land occupants who have ignored Environment BOP’s legal notices to control woolly nightshade on their land. This is one of many stubborn situations, but he felt this particular case may set precedence to stimulate action by other land owners.

Walter introduced me to fellow Plant Pest Officers Wendy Baker and John Mather, and we talked about the local public image of herbicide use. They indicated that the public's view is not favorable (mainly stemming from people's reaction to sloppy roadside spraying), and that there is a trend to push alternative methods (salt water, fatty acids, hot water types of spraying), regardless of costs or ineffectiveness.

An interesting dilemma that BOP will be facing is the recent invasion into native bush by Chinese gooseberry, commonly known as Kiwi fruit. As the crop is a strong economic base in the area, it will be a challenge to educate the public about its' potential weediness because of the implications of its' marketing name.

An effective tool that Walter uses for public outreach is to display potted invasive plants at public events, shopping centers, and garden shops. He claims when people actually see and touch weedy vines crawling all over a familiar native plant, both in pots, they better understand the threat of environmental weeds.

On the way towards Whakatane, Walter showed a consequence of non-action. Because a species of pampas grass (*Cortaderia selloana*) was not listed as a noxious weed, no work was done to control it. What started out as only 10 pampas grass plants, 10 years ago, was now a continuous patch over 3 hectares. Being next to a railroad track, this strip has fueled brush fires from a simple spark from the track; unfortunately the pampas just grew thicker after every fire.

We met with Plant Pest Officer Des Pooley who took me to different sites out in the dairyland district. Des focuses on agricultural weeds for Environment BOP, and says interaction with farmers is positive with a unified approach to control through grazing, herbicides, cultural practices, and biological control. Different biological agents are becoming increasingly more effective on some of the top weeds, and Des mentioned that New Zealand looks toward Hawaii as testing ground to develop these tools. I apologized for not being very well versed in biological control, and explained that other agencies in Hawaii assume that research. I was impressed with the successful containment of a few high priority weeds, including Johnson grass, that Des managed in cooperation with local farmers. Some of the chemical control techniques for aquatic weeds he showed me were interesting, and could be useful for limited situations in Hawaii, such as water hyacinth. We stopped by Environment BOP's main office in Whakatane, where I got to talk with legal and public relations personnel about weed issues.

Des drove me back to meet Peter Ingram, Plant Pests Coordinator for Environment BOP. Peter was my original contact for BOP and arranged for my reception and excellent field trips by his team. Among all the informative invasive plant materials the Environment BOP folks left with me were charts and indices for biological control agents.

RANGITOTO ISLAND:

Back in Auckland, I took a tip from Alan Holt to visit Rangitoto Island for a comparative view of pioneer vegetation on a recent lava flow. This was especially interesting for me in terms of observing alien plant invasions and was very reminiscent of lower elevation sites of Hawaii Volcanoes National Park. I talked with a DOC crew performing weed control for evergreen buckthorn, using frill and cut stump treatments of Escort applied with surgical squirt bottles. I introduced myself to DOC manager John Wotherspoon, and talked about different herbicides and application types for various species.

It was interesting to see two New Zealand species considered pests in Hawaii (karakanut and manuka) growing in their natural habitat of mixed scrub under a *Metrosideros* canopy.



SUMMARY AND DISCUSSION

New Zealand's strong focus on invasive plant control provides a great example for other countries to follow, especially now that negative repercussions from the 'alien species' crisis are being experienced on a world-wide level. Furthermore, that country's progress in addressing 'environmental weeds' offers Hawaii the advantage to project that same possibility towards protection of our threatened natural areas. Hawaii is somewhat a microcosm of New Zealand, not only similar in its' vulnerable endemic species, but in many of the invasive plants as well. Although the scale of management of these pests is much larger in New Zealand, it is virtually the same battle being waged.

However encouraging it is to realize that Hawaii's weed managers share much in common with New Zealand, I wish to exploit the differences observed during my research visit. Why are their prevention and control programs more effective than ours? Two main differences were apparent to me: the enactment of the Biosecurity Act, including the responsible development of an enforcement means; and the relative pride many Kiwis have for their 'native bush'.

Compared to Hawaii's people, I found that in my interactions with lay people, many in New Zealand knew their native plants and attached an intrinsic 'value' to their native forests. Therefore, when a case is presented as threatening to the native bush, e.g. possums, wild ginger, there is not such a hard sell to convince the populous that control of these pests is justified.

The pride in native plants is reflected by their widespread use in landscaping, whether it be backyards or urban parks. Municipal projects promoting native plant landscaping help to influence the choice of these plants for private cultivation, and discourage the use of potential invasive plants. I feel developing and instilling this same type of pride for Hawaii's residents with their native plants is critical, and needs to be implemented at an elementary education level as well as with other targeted groups. This educational

emphasis for youth may not only bear future protection values for our natural areas, but deter the continued cultivation of currently established invasive species and allow for them to phase out.

The Kiwi's values on native bush and recognition of the threat of pest plants is further echoed in popular media, such as newspaper and television topics. Roadside signs encourage the public to "end woolly nightshade!" or become a "gorsebuster."

Although the Maori view reflected by many iwi is mostly focused on gathering issues, there is increasing effort by these indigenous groups to share a role in implementing the Resource Management Act of 1991, which includes control of noxious weeds in native bush and agricultural lands. Generally, New Zealand has a 'tradition' of taking pride in natural areas, fostered by a comparatively insular society.

In contrast, Hawaii's values reflect a population with a constant flow of transients and transplants, appearing as a bridge between east and west. Values for native bush are often replaced by a perspective that 'gaps' in Hawaiian biota (snakes, parrots, mammals, showy tropical flowers) should be filled. This homogenization value is an ongoing hurdle for environmental educators in Hawaii to overcome.

While Hawaii is making progress involving large land owners' participation in weed control, a nagging theme persists when compared with New Zealand: the basic legal premise to require this cooperation is not present, save an unenforced Noxious Weed Act. Hawaii's only acting authority being a severely understaffed Department of Agriculture leaves us without a regulating body, even if we had a mandate like New Zealand's Biosecurity Act. This is key to basing any realistic strategies and actions; without this bottom line established and executed by a designated government branch, stemming the tide of noxious weeds in Hawaii may be a futile battle. While improvements are being made to 'border control' issues to stop new introductions, many of the incipient and established environmental weeds are being dealt with at the 'border' of our natural areas. Groups like the Maui Invasive Species Committee are attempting to involve diverse participation from landowners, business, and government, but ultimately are left with no means of administering Hawaii's Noxious Weed Act without proper jurisdiction.

Differences in weed control techniques between New Zealand and Hawaii land managers were not that pronounced, from what I observed at various sites. While the Kiwi in general favor the use of certain herbicide products and stress surfactants to enhance uptake, many of the application methods are similar to Hawaii. Their environmental weed control, just as in Hawaii, is looking for more target specificity and less labor intensive controls. The use of volunteers is encouraged and sometimes seems to make the difference of keeping a certain weed control project viable in the public eye, as in Hawaii. DOC has a well organized volunteer program that is oriented towards protection, including weed control. If the potential for using volunteers to remove weeds in Hawaii can be recognized as a realistic means to control invasive plants, agency resources will need to respond appropriately to create a focused infrastructure.

A much larger scale approach to noxious weed control, especially with the advantage of agricultural management, was apparent throughout New Zealand. I noticed a resignation to biological control concurrent with most managers' response to widespread weeds. The

lobby from numerous agencies to support biological control is very strong, and the financial backing for such programs is easily rationalized, compared to Hawaii's status.

Because of the many similarities between Hawaii and New Zealand in programs to control noxious weeds, it is evident that interaction among land managers is important. More so, when these contacts are established personally at site visits, they become far more valuable than interaction through electronic or other media. I was fortunate enough to have had that opportunity, and the observations and insights provided through that experience can only influence my ideas about alien plant management in Hawaii. By the same token, some of the information offered by me (warnings of Melastome family plants, remote area treatments) may help New Zealand managers. I have continued interaction with some of my New Zealand hosts since my return to Hawaii, and hope the exchanges will prove beneficial.



RECOMMENDATIONS:

Information that I gained from my exchange trip to New Zealand will certainly assist TNC's Maui Preserves with specific projects, such as using surfactants to enhance herbicide injection on difficult pest trees and aerial control of invasive pines. I will keep abreast of the development of new control methods, like the herbicide lopper.

More influential for me were the various perspectives to which I was exposed. I feel I now see the 'big picture' approach when dealing with Hawaii's weed issues, and this will aid in my involvement with groups like the Melastome Action Committee or Maui Invasive Species Committee. Improvements are needed to better rank our pest plants to determine strategies and actions, especially with limited resource management. Also important is improving public outreach regarding the perception of invasive plants and controversies over herbicide use to control them

New Zealand's invasive plants that originate from escaped cultivars seem to follow the same distribution patterns as in Hawaii; some of our most threatening weeds pose problems simply because of their initial cultivation near vulnerable natural areas. Prioritization and control strategies for the plethora of invasive plants in Hawaii needs to be based on the current or future land use where these infestations occur. We also need to look at invasions in New Zealand as well as other places, to determine which species to keep from being introduced here in the first place, or potential 'time bombs' sitting dormant in Hawaii. Examples of this are *Cortaderia selloana* (a species of pampas grass

currently not invasive in Hawaii, but of major concern in New Zealand and California), privet, and honeysuckle.

I've shared some of the information I gained from my New Zealand trip with the Agriculture Department at Maui Community College, for dispersal to students of weed science, as well as Haleakala Ranch Company, one of our allies in the East Maui Watershed Partnership. I also met with Research personnel at Haleakala National Park to share and discuss this information. Some is being forwarded to the Secretariat for Conservation Biology with this trip report, in hopes it is useful for their projects. In the future, I intend to disperse pertinent information to The Nature Conservancy Honolulu Office and DLNR's Division of Forestry and Wildlife.

Relatively speaking, New Zealand is still in the early stages of developing and implementing a National Weed Control Strategy (only five years for environmental weeds on the mainland, although island reserves have a longer track record, according to Dick Veitch of DOC). However, they have laid the groundwork for others interested in following a comprehensive program that considers invasive plants on such a grand scale.

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MAHALO!!!:

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PHOTO CAPTIONS;

Page 1. Surveillance List, the NZ 'Bible' to identify pest plants.

Page 2. 'Deadly Beauty', one of the many brochures contributing to NZ's excellent public outreach program for weed awareness.

Page 3. Pampas grass successfully treated by a property owner in a residential area.

Page 4. Biological control agents being released on wild broom.

Page 7. Scotch heather, a dominant cover competing with native manuka in Tongariro/ Taupo National Park (Mt. Ngauruhoe in background).

Page 8. Pampas grass burn area outside Whakatane.

Page 9. Rengarenga, a native plant used extensively in urban landscaping.

Page 11. German ivy, an invasive vine also found in Hawaii, taking over NZ tree ferns.

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