

The Merlin Trust

An exploration of the flora of the Valdivian Rainforests



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April 2013

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Acknowledgements

I would like to take the opportunity to thank the following persons, who without their input and advice this trip would not have been possible. Their help has been invaluable.

The Merlin Trust

The Hardy Plant Society

CONAF, Chile

Angel Lazo, Santiago

Huinay Scientific Field Station

Reinhard Fitzek, Administrator, Huinay Scientific Field Station
San Ignacio del Huinay Foundation

Royal Botanic Gardens, Kew

Noelia Alvarez, Kew horticulturalist, Tropical Nursery
David Burns, Manager, Main Gate, Hardy Display
Colin Clubbe, Head, UKOTs and Conservation Training
David Cooke, Temperate House Manager
Dr. Kate Gold, International Projects Coordinator. Seed Conservation Department, MSB
Stewart Henchie, Former Head of Hardy Display
Tony Kirkham, Head of Arboretum
Andrew Luke, Horticulturalist, Temperate Nursery
Charles Shine, Herbaceous Unit Manager
Kathleen Smith, Head of Hardy Display
Vanessa Sutcliffe, Training Specialist, Seed Conservation Department, MSB
Richard Wilford, Collections Manager, Hardy Display

Royal Botanic Gardens, Edinburgh

Martin Gardner, Head of the International Conifer Conservation Programme (ICCP)
Paulina Hechenleitner, PhD student (2010-2012) Biogeography and Systematics of South
American Vicia

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Introduction

In 2001, as part of a Raleigh International Expedition I travelled to Chile to region IV where I was lucky enough to trek through parts of the evergreen forests and high altitude areas of southern Chile. I registered the extreme beauty of the landscape but didn't look closer. Since then, horticulture has become my passion, a particular interest of mine being the Valdivian Rainforests of Chile. I am in no doubt that this is as a result of my experiences over 10 years ago.

I've not had a chance to return but what I have done is studied and researched not only the flora of Chile but its history, its literature and its folklore. In 2010 whilst undertaking a year placement at the Eden Project in Cornwall I was able to work closely with their Chilean collection, a wonderful selection of mature trees and shrubs. Looking to the future of the area I researched the propagation of existing plants as well as future additions to the understory. The following year whilst at Tresco Abbey Gardens I was once more able to work with a variety of Chilean plants.

My wish for many years now has been to travel to the Valdivian Rainforests and see first hand in their natural environment, plants I have read about and worked with in cultivation, as well as discovering new specimens and appreciating their place in their natural environment.

Fig. 1.



Fig. 2.



Fig. 1. Tropical/temperate rainforest distribution, S. America¹

Fig. 2. Distribution of Valdivian temperate rainforest²

¹ <http://www.google.com/imghp>

² <http://www.google.com/imghp>

Aims and Objectives

Aims

- To study first hand the flora of the Valdivian temperate rainforests
- To view ancient stands of 'Alerce', *Fitzroya cupressoides*.
- To appreciate fully and explore the different levels of forest as determined by altitude of the Bosque Sempervirens.
- To observe and participate in the propagation and care of hardy native trees and shrubs such as *Fitzroya cupressoides* and *Nothofagus dombeyi*.
- To learn from the conservation work carried out to preserve these endangered plants and forests and to appreciate the efforts of those involved and the enormity of their task.

Objectives

- To identify and record the flora observed in the temperate rainforests with reference to previous knowledge.
- To learn and record new species and information regarding the Valdivian rainforests from local knowledge and the expertise of my hosts.
- To study the propagation techniques of native trees and shrubs I am interested in, especially when in-situ in their native environment.
- To study specific details regarding in-situ conservation at Huinay Scientific Field Station.
- To visit Chile's national botanic garden in Vina del Mar and observe their collections and propagation techniques.

Itinerary / activities

Fri 29th March	International flight departing London Heathrow to Santiago, Chile via Madrid
Sat 30th March	Domestic flight departing Santiago to Puerto Montt Transfer to Puerto Montt bus terminal and into centre Check into accommodation
Sun 31st March	Day in Puerto Montt Picked up by Reinhard Fitzek, administrator of Huinay Scientific Research Station Travel by car to Hornopiren, boat to Huinay
Mon 1st April	Tour of site and meeting with staff Nursery work and short trip to nearby valley
Tues 2nd April	Nursery work 1 st day of trek to summit of Cerro Tambor through Valdivian rainforest
Wed 3rd April	2 nd day of trek, peak reached and walk back to base, Huinay
Thurs 4th April	1st day of trek to Sierra la Cruz to view temperate rainforest and stands of <i>Fitzroy cupressoides</i>
Fri 5th April	2 nd day of trek back to Huinay
Sat 6th April	Seed cleaning and work in the nursery
Sun 7th April	Trip to forests on opposite side of the fjord with visiting mycologists Fieldwork with Reinhard Nursery work
Mon 8th April	Collection of propagation material in valley Nursery work and construction of raised beds
Tues 9th April	Visit to Pumalin Park to see ongoing conservation efforts
Wed 10th April	Preparation of cuttings in nursery Completion of raised beds
Thurs 11th April	Final trip into nearby forest Collection of core samples from selected trees Boat from Huinay to Leptepu, ferry to Hornopiren, bus to Puerto Montt, taxi to Puerto Varas Check into accommodation

Fri 12th April	Day in Puerto Varas viewing buildings constructed from 'Alerce' Bus to Puerto Montt, flight to Santiago Check into accommodation
Sat 13th April	Bus to Vina del Mar Check into accommodation Visit to Vina del Mar botanic garden
Sun 14th April	Day in Vina del Mar Bus to Santiago, flight to Madrid
Mon 15th April	Flight from Madrid to London Heathrow

Huinay Scientific Research Station

Belonging to San Ignacio del Huinay Foundation and set up in collaboration between Endesa, Chile and the Pontificia Universidad Catolica de Valparaiso in 1998, Huinay Scientific Field Station was established in 2001. Covering 34,000 hectares Huinay is situated between the North and South parts of Park Pumalin, running from the coast to the Argentine Andes. Huinay champions scientific research and the expansion of information regarding the marine, terrestrial and atmospheric systems in and around the Comau fjord where it is situated³. The stations unique positioning and resources allow for research to be carried out by local Chilean and visiting international researchers and scientists.



Fig. 3. Location of Huinay Scientific Field Station³

Although attention is primarily focused on marine research, Huinay is an ideal location for anyone wanting to study the flora of the Valdivian rainforest, the land owned by the foundation is mostly primary temperate forest. The land found immediately close to the station is either secondary forest or has been cleared. My contact, Reinhard Fitzek the administrator of Huinay has a close interest in these forests and in particular the restoration of land which has been subject to years of intensive deforestation and clearance for agriculture. As a consequence Reinhard has set up a small nursery for native species with a long term eye to restoration work in areas close by. These activities are in addition to the administration of the field station and so the works are small scale with no permanent staff. There is though limited accommodation available for students and volunteers to work in the nursery and help Reinhard in his work. As a horticultural student with a keen interest in Chile

³ <http://www.fundacionhuinay.cl/>

and in particular the flora of the Valdivian rainforests Reinhard's invitation to visit and stay at Huinay was the perfect opportunity to see primary rainforest, conservation efforts and learn from someone who had made Chile his home and who cares deeply for it's temperate rainforests.



Fig. 4. Huinay scientific field station⁴

Valdivian Rainforest

Arrival at Huinay is by boat, an hour and a half journey from the small town of Hornopiren travelling South down the Comau fjord, navigating past a series of salmon farms dotted throughout the length of the fjord. The steep mountains emerging either side are thick with vegetation, the slopes occasionally scarred with a red gap in the forest where landslides have occurred. Larger peaks are beyond and many waterfalls, some very impressive pour down from the peaks and into the water. Along the length of the fjord and where landing by boat is possible there are small settlements and where found the forest ordinarily reaching to the water line has been cleared. Huinay is one such area navigable by boat, a point where river and valley meets the deep waters forming a small shore line, the shallower waters offering some protection for landing.

Directly behind the station are steep slopes, rich with primary rainforest, but heading east along the valley where the land is flat grass and scrub vegetation is encountered where traditionally the forest has been cleared, either felled, burnt or both. As with most clearance for agriculture non-native grass seed has been sown which has rendered regeneration of native tree species very difficult. As a result,

⁴ Photos, authors own

much of the land around Huinay is scrub, long grass areas together with very few native species in high numbers, in particular *Tepualia stipularis*, *Berberis darwinii* and *Blechnum sp.* With the loss of forest many of these areas are boggy and waterlogged, impossible conditions for native species. Further into the valley and into more low lying areas secondary forest was encountered at an age of 20-30 years and characterised by several pioneer tree species, in particular 'Canelo', *Drymis andina* and *Amomyrtus luma*. The trees within the secondary forest tended to be close growing allowing for less light penetration and as mentioned a limited variety of species. The understory was poorly developed. In the aforementioned habitats there were remnants of the old forest, namely in the form of large stumps and some lone trees which still stood and rose high above the existing canopy. One such specimen, a large 'Ulmo' or *Eucryphia cordifolia*, was approximately 25m high and was still host to a few epiphytes, these very rarely seen in the secondary forest below. Before reaching untouched primary forest in the more inaccessible areas and those at higher altitude, there were the forests that had been selectively logged, primarily for the highly prized timber of 'Alerce', *Fitzroya cupressoides*, *Eucryphia cordifolia* and *Nothofagus sp.* amongst numerous others. These were still species rich habitats but due to the high number of large trees extracted had been colonised by many plants characteristic of secondary growth forests. The selective logging created a more open environment which still contained large specimens but the large species once present would struggle to gain a foothold once more.



Fig. 5. *Nothofagus dombeyi* in primary Valdivian rainforest

Huinay experiences on average 4500mm of rain per annum but amounts can reach as high as 6000mm. These figures can fluctuate wildly within highly localised areas, dependant on weather fronts and geographical positioning of valleys and the resulting pockets of cloud. Much rain was experienced, of varying quantities on most days. On many days the forests were either shrouded in mist or cloud, either as a

result of the humid and wet forests or from incoming weather. Two main primary temperate rainforest types were encountered; Valdivian and Patagonian. Valdivian rainforest was characterised primarily by broad leaf evergreen trees such as *Eucryphia cordifolia*, *Gevuinia avellana*, *Laureliopsis philippiana* and *Weinmannia trichosperma*. Smaller trees, shrubs and understory included *Aristotelia chilensis*, *Lomatia furruginea*, *Mitraria coccinea* and numerous myrtles such as *Amomyrtus luma*. At slightly higher altitude were found the Patagonian rainforests still containing many broadleaf species such as *Drymis winteri* but also conifers such as *Podocarpus nubigenus*, *Pilgerodendron uviferum* and large trees such as *Nothofagus dombeyi*. Both habitats were rich with epiphytes, particularly *Fascicularia bicolor* and abundant with various mosses, lichens and fern species such as *Blechnum chilense* (with stem), *B. magellanicum* (without stem) and *Lophosoria quadripinnata*.



Fig. 6. Epiphytes including *Fascicularia bicolor*

The bamboo, *Chusquea quila* was found at most altitudes and formed extremely dense thickets in the forests, quickly colonising areas created through tree fall or landslide. Amongst the forests at higher altitudes where *Fitzroya cupressoides* and *Nothofagus betuloides* were found the bamboo took on a more dwarf habit though no less thick. Covering most tree trunks and scrambling throughout the undergrowth were many climbers, usually characterised by tubular or bell shaped flowers and primarily pollinated by hummingbirds. Most prevalent were both *Luzuriga radicans* (orange/red berries), *L. polyphylla* (white berries), *Philesia magellanica* and *Sarmienta repens*.

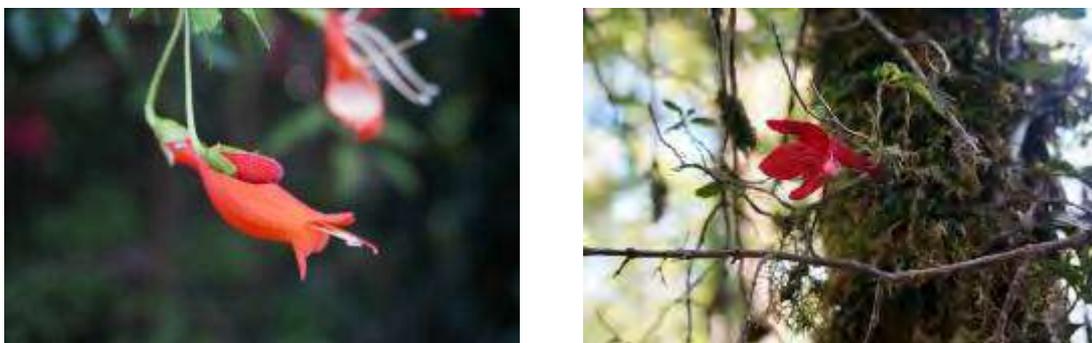


Fig. 7. *Mitraria coccinea* and *Asteranthera ovata*

Hummingbirds were consistently observed, particularly in areas where *Desfontainia spinosa* and *Fuchsia magellanica* were present. Few birds however were seen in the forests themselves except for several ground foraging species, 'Chucao Tapaculo', the Chilean Robin and the black-throated 'Huet-huet' which followed the disturbance we created. No glimpses of the fabled Puma were caught, though we did come across its faeces which we collected for analysis at the University of Valdivia to learn of its diet. Also encountered was a fallen trunk of *Drymis winteri* lying by the side of the trail we were following heavily scarred by grooves where a Puma had been sharpening its claws. There were many leeches in the damp forests as well as one sighted Darwin frog amongst the leaf litter though disappearing before all had a chance to observe. Other fauna included a huge specimen of a land snail endemic to Chile, *Macrocyclus peruvianus* as well as finding the nest amongst *Chusquea quila* of *Dromiciops gliroides* a small marsupial a resident of the Valdivian rainforests and endemic to Chile and Argentina.



Fig. 8. *Philesia magellanica* and *Azara serrata*

Alerce

Up above Huinay on the steep hillsides the white silhouettes of tall dead trees can be seen amongst the rich green of the surrounding vegetation. These are Alerce, *Fitzroya cupressoides* which in decades previous had their bark stripped to line the cracks in boats preventing water from entering. With the bark removed so was the cambium and a slow death ensued. On the steep hillsides these specimens were simply left, too large and the terrain too inhospitable for the timber to be removed. However in low lying areas Alerce was felled extensively, the wood highly prized due to its hardness, longevity and disease resistance. Logging of Alerce began shortly after the mid 1600's near Valdivia and felling proliferated through the south culminating in an explosion of logging in the 1800's. This continued until in 1976 it was declared a national monument by the Chilean government preventing the felling of live trees. However, dead wood can still be collected, leaving to ambiguity in the law and further illegal logging. *Fitzroya* is also protected under the Convention on International Trade in Endangered Species (CITES, Appendix 1).

The main threats today remain illegal felling, habitat loss and that of associated species. Alerce is extremely slow growing and regeneration is poor, restricting

further distribution of the species. The largest populations are now found in three distinct habitats in the region of Valdivia, the coastal mountains, amongst the Chilean and Argentine Andes and in a region termed the central depression. *Fitzroya* is believed to be the second longest lived tree in the world behind the Bristlecone Pine, *Pinus longaeva* and specimens have been estimated at close or upwards of 5000 years old. Individuals can grow up to 70m in height with a trunk diameter of 5m and although most of the largest specimens have been felled there may be ones larger in the more inaccessible valleys of the Andes.

A main aim of the trip was to view ancient stands of these trees and luckily Huinay was well situated to achieve this. There are no Alerce remaining in low lying areas, a few stumps amongst the undergrowth the only indicators of their previous existence. With Reinhard and two other student volunteers at the nursery we undertook a two day trek to the peak Sierra la Cruz where there was such a population. Following the river we headed into the valley before trekking into the mountains gaining altitude fast. In amongst many of the forests of the region are remnants of centuries of logging activities mainly in the form of trails and occasionally ruins of huts or shelters where the men lived, slept and prepared the timber. Many of these trails are all but gone now but Reinhard knew of one which he has endeavoured to keep accessible by foot, mainly achieved by returning annually with a machete. The forest is impenetrable and without a trail almost impossible to navigate, the terrain extremely demanding, rocky, uneven and steep with streams and fallen trees throughout.

Trekking from Huinay we travelled through completely deforested areas to Valdivian rainforest and all the variations in between. The stand of Alerce we were aiming for was at an approximate elevation of 700-900m on a south-west facing slope and was positioned above primary Valdivian rainforest and below the forest at the summit mainly consisting of *Nothofagus betuloides*. The logging trails we followed were estimated at 200 years old, the widest parts were on the lower slopes where oxen would have been used to drag the timber down. The higher trails were smaller and in this case the logs would have been dragged down by people. After trekking through both Patagonian and Valdivian rainforest at around 700m the forest changed, becoming more open, partly because of the change in vegetation but mainly because so many trees had been felled. This was where Alerce in large numbers were present and all around were stumps of varying size, some clean cut and some uneven and jagged following fires lit at their base to deliberately bring them down. A small hut was still standing and at points the trail widened to form circular areas in which the ground was littered with shingles, off-cuts from the felled Alerce. It was this area that culminated in the end of the trail and thus as far as the logging had been able to continue.



Fig. 9. *Fitzroya* shingles and remaining stump

Further up the hillside the slope became steeper and so rendered felling too difficult, although had it not been for the measures taken to protect *Alerce* the trail would have continued, albeit slowly. At a higher elevation of 100m or so were untouched stands of *Alerce*. All the trees were of similar age, a typical feature of *Fitzroya* forest, the larger specimens were around 50m tall and the trunks measuring up to 3.5m. The trees were huge, completely bare of climbers except for the very bases and the tops gnarled with uneven outcrops of foliage. The stands were all the more striking for the lack of understory compared to the forests at lower elevations. Vegetation primarily consisted of low growing *Tepualia stipularis*, *Myrteola nummularia*, ferns including *Blechnum sp.*, *Lophosora quadripinnata* and the prostrate conifer *Lepidothamnus fonkii*.



Fig. 10. Stands of *Fitzroya cupressoides*

After a night spent above the *Fitzroya* forest camping amongst *Nothofagus betuloides* we started the trek back down back to Huinay and travelling through the area where logging of Alerce had reached its highest we located a stump known to Reinhard. Hidden in thick undergrowth was the oldest as yet found by our host. Logged in the sixties, this specimen was still healthy when felled and apparently the second oldest found in Chile. Nearly 4m in diameter it was massive, the centre was foul but either side the wood still remained a brilliant resinous red. A core sample previously taken by Reinhard of the existing outer wood counted well over 3000 rings. It can only be conjecture now as to just how old this tree may actually have been when felled. If the centre still remained then perhaps in the region of 5-6000 years old, a true giant.



Fig. 11. Reinhard within the core of the ancient *Fitzroya*

Nursery and Field Work

The nursery at Huinay is a small scale operation with one small glasshouse and four adjoining wooden framed houses with clear polythene sides and roofs. In addition there is a small shade area and outside space and benches. The area is protected well by trees and shrubs, in contrast to six large raised beds situated on an open grassy area on the edge of the fjord, all enclosed by protective wire mesh. These are designated for larger plants, their penultimate planting before finding a home in the final restoration site. In the polythene houses the majority of plants are seedlings in modular trays. These are then potted up before then being planted in the raised beds. Space is at a premium but then so are resources and staff and so many of the plants are moved from the modules straight into the soil and all seem to do well. All plants were in extremely good condition with no pests and disease evident.



Fig. 12. Huinay's nursery and planting out beds

Daily tasks were to open up the glasshouses, increasing air movement and to water all plants where required. There was a persistent issue of moss building up on the surface of each module and so a task always needing attention was to carefully remove the top layer aiding the seedlings in several ways. Firstly it meant the plants had less competition for water and nutrients and secondly it minimised the risk of disease potentially harboured by the moss. Thirdly, by removing the uppermost layer the lower stem was exposed meaning that the seedling wasn't planted too deep, a common cause of ill health and death in plants.

During my time in the nursery myself and two other students removed the mesh shading from the roofs of all the glasshouses in preparation for winter and the lower light levels. It was autumn when I arrived but in the preceding summer months this provided much needed protection to the nursery plants from the potentially damaging strong solar rays. Towards the end of my stay I also began an inventory of all plants in the nursery.

With space at a premium and so many plants undercover the real focus of attention was the creation of more raised nursery beds by the fjord especially with winter approaching, the autumn months were ideal for the plants to become sufficiently hardy to cope with the drop in temperatures. In preparation, the thick grass was cleared from the meadow in strips, posts driven in and the raised bed built by interweaving lengths of *Luma apiculata* in amongst them. Soil brought in from the valley was sieved by hand removing stones so as to provide a fine tilth and this was mixed with manure and compost. The beds were trodden in, levelled and a final layer of sieved soil was added to the top for planting.



Fig. 13. Construction of outdoor beds and tray of *Fitzroya* seedlings

On several of the trips into the forest we collected seed, from *Embothrium coccineum* and *Gevuina avellana*. The former were separated from their pods, cleaned, dried, weighed and counted ready for storage and sowing. The latter, *Gevuina* or Chilean Hazel were collected from the forest floor in Huinay and being recalcitrant stored in water for sowing in the near future. On two occasions at Huinay and Park Pumalin cuttings were collected of *Saxegothaea conspicua* a conifer in the family Podocarpaceae. Material was taken from a number of different specimens and in the nursery approximately 1000 semi-ripe tip and heel cuttings were prepared. These were 5-10cm long, dipped in rooting hormone and planted in a mixture of sand and sphagnum moss.

All of the sites in Huinay where Reinhard planned to carry out restoration work were visited over the course of the two weeks. At one in particular we recorded ground water levels as part of the ongoing recording of information to study how groundwater levels fluctuated and how they were affected by different vegetation types. This meant that decisions could be made as to suitable plants for different habitats as well as how the plantings themselves would affect water levels in the soil. Some areas of the sites studied were slowly returning to bog after all the *Fitzroya cupressoides* had been felled. The method was very simple. Approximately thirty perforated pipes with caps and markers for identification were buried with the rims at ground level. The basic data was then collected through lowering a measuring stick into each one and taking a reading.

In addition to necessary nursery and field work a particular interest of my host was dendrochronology in which core samples are taken from trees allowing the tree rings to be studied and the age of the tree determined. Reinhard has spent much time carrying out such surveys collecting valuable data on the age of trees and in turn forests as well as gaining an understanding of climatic conditions and changes over the years. Unable to take samples from specimens of *Fitzroya cupressoides* on one day due to adverse weather conditions we were able to core several large and ancient specimens of Arrayan, *Luma apiculata*. To take the cores a very thin borer was screwed clockwise into the trunk at about chest height until the centre was reached. The borer was then removed turning anticlockwise taking care to keep the metal straight until clean out of the tree. The core was removed and stored in a plastic tube. Although not being able to fully complete the process on this occasion the core is then dried and sanded so the rings can be counted and studied.



Fig. 14. Cleaning and drying *Embothrium coccineum* seeds / Coring large *Luma apiculata*

Pumalin Park

Set up by former clothing entrepreneur Doug Tompkins in 1991, Pumalin Park now covers close to 800,000 acres, much of it primary evergreen temperate rainforest. This area consists of land purchased by Tompkins, a subscriber to the philosophy of 'deep ecology' as well as through land added by the Conservation Land Trust. The park is recognised as a nature sanctuary by the Chilean government giving environmental and non-developmental protection. Pumalin is a landmark in environmental philanthropy in Chile, a private initiative on a grand scale whilst still allowing public access. Met by some opposition initially the initiative has slowly gained the trust of the government and the Chilean people. Visitors are encouraged through walking trails, activities and education is provided. Local Chileans are involved and jobs have been provided through agriculture, eco-tourism and conservation efforts. The objectives of the park are to create a sustainable operation for the future and to encourage visitors to enjoy and learn from the environment that Pumalin works to protect. In addition the park serves as a model for private conservation throughout the world.



Fig. 15. Pumalin Park in relation to Huinay⁵

Just an hour and a half south from Huinay is 'Vodudahue', a part of the park where Pumalin's native tree nursery is found as well as the largest of several of Pumalin's restoration sites. Huinay and Pumalin have close links, being geographically close but as their conservation efforts are very similar they historically have a good relationship in terms of actively meeting, exchanging knowledge and information. We were lucky enough to be invited to Pumalin to view their nursery, meet with their staff and have a tour around a restoration site courtesy of one of the parks rangers and conservation team, Jose Alfonso Suarez Bolanos.

⁵ <http://www.google.com/imghp>

The restoration of the particular plot we visited began relatively recently in 2011 in a flat valley, sheltered from the open shore of the fjord. Predominantly thick grassland, scrub and boggy areas the area had traditionally been primary rainforest before being cleared for pasture, a process undertaken over the last 150 years, ever encroaching inland. Being a new site it was interesting for myself and Reinhard to see how the process of restoration had been approached. With 1200 species of native plants available from the nearby nursery the site was mapped out in transects and a process of ecological planting was executed whereby on a meter by meter basis the plants deemed most suitable for that particular area based on a rough assessment of humidity, soil moisture levels and existing vegetation were planted. With so many plants available, the size of the area and the limited resources to hand this educated yet fairly random approach to planting seemed like a sensible course of action. The plants we observed ranged from shrubs such as *Azara serrata*, *Buddleja globosa*, flowering trees such as *Drymis winteri*, *Eucryphia cordifolia*, *Nothofagus nitida*, *Embothrium coccineum*, *Weinmannia trichosperma* and conifers such as *Fitzroya cupressoides* and *Pilgerodendron uviferum*.



Fig. 16. Pumalin's restoration site

Once planted most of the plants were left alone, the scale of the site really making too much intervention unsustainable. However, in some areas, mostly in more waterlogged areas where vigorous *Blechnum* and *Juncus* species grew some frequent cutting back was necessary to prevent new plantings from being engulfed. Most plants were healthy and doing well except for the odd individuals which it was thought had suffered from the previous hot summer, the strong UV radiation in Chile can be intense. It was also interesting to see individual cases of companion planting. For instance Tepu, *Laureliopsis philippiana* requires shade and is planted either later once a canopy has developed or at the base of a larger quicker growing plant.



Fig. 17. New plantings facing competition from non-natives and Pumalin's nursery

The work on this particular site is at present a rolling programme of planting. The initial plants are in the ground but many more from the nursery are to follow. Once a canopy has developed then thoughts can turn to an understory. Other smaller and harder to reach restoration sites have since been started but the one at Vodudahue is where most observations will be made, to experiment, record and to learn. It seems through discussion with Jose and Reinhard that most of these restoration programmes in Chile are all of a similar age and each of them pioneer projects. The greatest challenge is that of sharing information and knowledge, the techniques, successes and failures and that communication is key.

Conclusions

This was a trip which exceeded all expectations and a first in terms of studying plants I was familiar with in cultivation in their natural environment. It would have been a different story had I not had Reinhard, the administrator of Huinay as my guide. With an unparalleled knowledge and enthusiasm for the Valdivian rainforests as well as an acute awareness of just how short my time was at Huinay he ensured we made the most of it. In addition, due to the unique positioning of Huinay I was able to learn from visiting scientists, mycologists, and marine biologists as to the wider environment of the Valdivian rainforests and the Comau fjord. This was fascinating and meant I gained a greater understanding of not solely the flora of the region but of wider environmental and cultural knowledge.

My original itinerary included visiting Hornopiren National Park on my way back further north from Huinay to view stands of *Fitzroya cupressoides*. However, having experienced these in an altogether more wild setting this seemed far less important. Once back in Santiago I travelled to Chile's national botanic garden in Vina del Mar, the initial intention to meet with staff and view the work they did in the propagation of native plants. However contact was never made and although I visited the garden I feel this was sufficient, they were disappointing and I felt I had learned and experienced enough from spending the day there.

The Valdivian rainforests however were my home for two weeks and having the opportunity to spend so much time there meant I saw the forests in their natural environment, the range of flora, the various growth habits and how the vegetation changed in relation to geographical position, climate and altitude. This experience, not only in terms of seeing primary rainforest which was incredibly special, but also forest which had undergone varying degrees of degradation and human intervention meant for a unique perspective. Combined with observing, recording and participating in both conservation initiatives meant tangible links could be made between the forests as they are and as they have been since time immemorial as well as in the cases of habitats lost how they might be preserved and restored.