

## Report on forest restoration and predator control volunteer work in PNCC Moonshine Valley and Tutukiwi reserves 2023 and 2024



Green hooded orchid in Tutukiwi reserve



Ruru in Moonshine Reserve winter 2024

**“It always seems impossible until it is done” – Nelson Mandela**

### Background

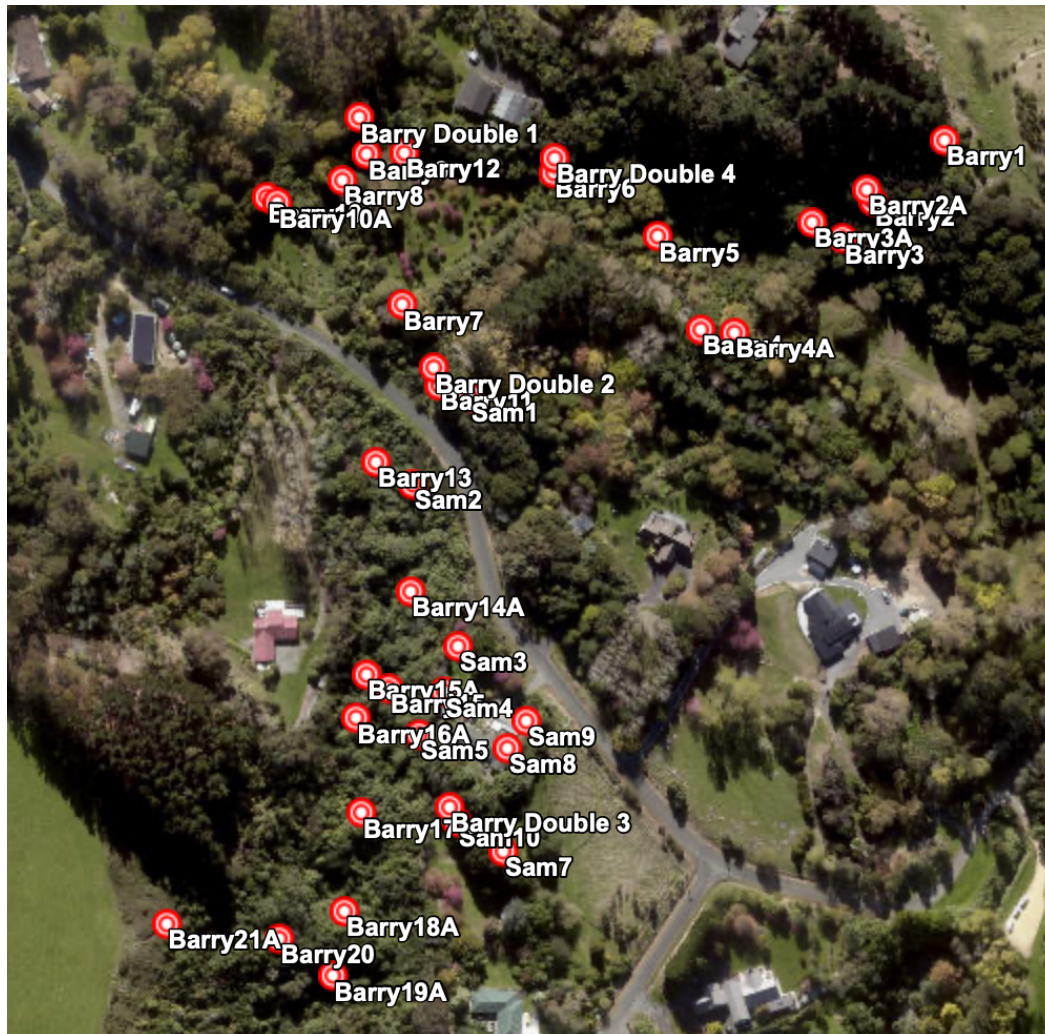
Moonshine Valley has two PNCC reserves: Moonshine (~4 Ha) and Tutukiwi (~13 Ha). Both are comprised of remnant podocarp forest which was once dominant throughout the Manawatu. The valley was farmed for many years before been subdivided in the early 90's. Moonshine Reserve is a small strip of land that runs across the valley from the East to the West and may in the future provide a walkway link between Pacific Drive and Polson Hill. Extensive weed control combined with native planting has restored most of this reserve to very healthy bush with a good ground cover of ferns and kawakawa. Tutukiwi reserve is the more significant piece of forest with some magnificent rimu, kahikatea, hīnau, totara, kānuka and tawa trees. The reserve is named after the native orchid, *Pterostylis banksia*, or tutukiwi, found along the Mangaotane / Bryants stream, which flows through this reserve. The stream has koura / freshwater crayfish, kākahi / freshwater mussels, giant kōkopu and tuna / longfin eel.

Problematic weeds in Tutukiwi reserve include: Tradescantia, Old Man's Beard (OMB), blackberry, willow, Japanese honeysuckle, sweet cherry, Arum lily, Agapanthus, great bindweed and horsetail. Pampas was an issue but is now locally eliminated. Willow, Tradescantia, sweet cherry, OMB and great bindweed are the main weeds in Moonshine reserve. African club moss, on the banks of the stream, and **water celery**, found within the stream, are increasingly problematic. While there has been predator and weed control in both reserves since the early nineties the effort intensified in 2017 in both reserves and on private properties due to provision of Timms and DOC200 traps to residents by PNCC and the initiation of regular monthly volunteer working bees.



Bird life in the valley has significantly increased in the last 30 years with good numbers of tūī, fantail, ruru, grey warbler, bellbird, kererū and many others. The two ponds in the publicly accessible area of Tutukiwi reserve have Grey Mallard ducks with occasional visits by Pied Shag and Dabchick. Ongoing predator control is essential for protection of these locally significant remnant native forests and our native birds.

## Predator control



Traps logged on TrapNZ in and around Moonshine Reserve





Traps logged on TrapNZ in and around Tutukiwi Reserve

In 2017 PNCC provided a good supply of traps to the Moonshine Valley community to help control pests and predators in the valley. Landscape level control is essential for forest and birds to flourish. Moonshine reserve (and the associated gully) has a trapline comprised of 16 DoC 200 (for rats and stoats) and 19 Timms (for possums) traps. There are two traplines in Tutukiwi reserve, one with 26 DoC 200 and 23 Timms and the other with 16 DoC200 and 16 Timms, respectively. All three traplines are registered with TrapNZ under the Moonshine Valley Project, for which Barry Scott is administrator (see Figures). This enables data to be entered directly on the TrapNZ app in the field and then uploaded to the TrapNZ data base once the phone is WiFi connected. Total and individual trap 'kills' are then easy to access together with a wealth of other information, including annual reports. Total catches from these trap lines for 2024 (2023) were 6 (8) hedgehogs, 21 (37) rats, 37 (39) possums and 1 (2) stoat. Importantly, these are just the catches for the two reserves and do not include the many catches on private properties in the valley.

Observation on the ground would suggest we have very good suppression of possums throughout both reserves. However, reinvasion continues so ongoing trapping is necessary, and preferably at a landscape level. The most challenging predator is the stoat. Many are trap wary and difficult to catch. Use of eggs that have a hole inserted in the top appears to be a more attractive lure (and for rats) but some are still trap shy. Kererū in particular are highly vulnerable to stoats (and feral cats) as they lay just one egg, which requires an incubation period of ~4 weeks before the chick





hatches. The chick does not leave the nest for another 30-45 days making it (and the parent) vulnerable for a total period of 60-75 days. The presence of rabbits attracts stoats so controlling their numbers in the valley would be a big help.



To try and improve control of stoats, I have purchased four DOC200 Double Set Traps which have openings at both ends, which are supposed to be more effective as the stoats can see right through from entrance to exit. These have been set up around my property as shown on the trapline Figure above. There is also one AT220 (NZ AutoTraps) self re-setting trap operating on a private property in the valley and proving very effective at controlling possums.

Another important predator in the valley is the feral cat. Given the presence of domestic cats in the valley only live traps can be used for catching feral cats. A register of all domestic cats in the valley, together with a picture of the cat, something some jurisdictions require would be helpful. But the dumping of cats in and around Moonshine Valley remains a problem.

### **Volunteer work in Tutukiwi Reserve**

Regular monthly working bees combined with individual, almost daily efforts, have continued throughout 2023 and 2024, with significant progress being made on restoration of this significant natural forest remnant. Most of the group volunteer work is close to the carpark, ponds or private roads, where there is easy access, but also because this is the area with the greatest concentration of exotic weeds. Regular (around monthly) checking of traplines provides an opportunity for removal of blackberry, OMB and other significant weeds in the main forested section of the reserve.



An overview of what we have done in the various sections of the reserve over 2023 and 2024 follows.

#### *Car park / paddock*

In March 2023 a number of large crack willows adjacent to the field, just beyond the carpark, were removed by contractors to PNCC. Unfortunately, a significant number of branches and debris were left behind, which had the potential to regrow, so these were removed from the bank and within the stream by our volunteers. One section (where we have our annual valley picnic) of this willow-free stream edge has now been planted out in natives provided by Totara Glen Nurseries through Green Corridors.



A cluster of kahikatea has been planted in the swampy area adjacent to the carpark to complement the small grove of kahikatea already growing from community plantings there in the early 90's. A couple of working bees were held clearing sweet cherry, ivy, Arum lily, OMB and climbing jasmine along the far bank of the stream through this section of the reserve but more work is required to restore this side of the stream. The section of stream bank between the road and the car park remains a challenge as we want to maintain visibility to the carpark where various nefarious activities have occurred over the years, yet protect the stream edge from further erosion. Over the winter of 2023 and 2024 we planted some toetoe and cabbage tree / tī kouka with most surviving the floods of 2024. The root systems of the latter are known to be excellent for stabilizing stream banks. Another working bee was devoted to digging out a large patch of Agapanthus growing on the bank below the road bridge. Apart from a significant strip of Agapanthus along the edge of the private road on the western side of the ponds, both reserves are now close to being free of this very hard-to-kill weed. Over the winter of 2024 dozens of sweet cherry (large trees as well as seedlings) were removed (by chain sawing) from the bush above the carpark and along the road edge at the entrance to the carpark. The strip of planted native bush on the left-hand side of the paddock as you approach the walking bridge is now well established and relatively weed free. Great bindweed, Tradescantia and horse tail remain the most difficult weeds to control in this section of the reserve.



#### *Around the ponds*

Apart from an ongoing effort to remove blackberry and willow seedlings from around the two ponds the greatest effort has gone into restoring two areas along the stream bank and one on the western side of the upper pond. Three working bees in 2023 were required to clear a large area of blackberry on the eastern side of the stream adjacent to the top pond using a combination of hedgecutters and secateur 'cut-and-paste' (with Vigilant). Blackberry regrowth at this site has required a combination of 'cut-and-paste' and spot spraying throughout 2023 through to present. Natives were planted at this site over the winter of 2023 and 2024 but several were lost from the two major flood events on 17<sup>th</sup> August and 19<sup>th</sup> September 2024. These were two of the biggest floods in the valley in the last 35 years with ~70 ml of rain associated with each. Many cabbage trees have been planted along the edge of the stream bank as they grow fast and the roots hold the soil well. Ongoing maintenance at this site continues with the need for some further planting in 2025 to fill in this site. Once the plants start to shade out the grass and other weeds, seed from the surrounding natives will germinate and fill in much of this area.



June 2023



Feb 2025

At the second site, just below the track at the head of the first pond, we removed *Tradescantia*, *Muehlenbeckia* vine and crack willow and then planted out in a selection of native trees. Unfortunately, about half of these were lost in the two flood events, so more selective planting (at higher sites) will be required to restore this area. The floods also brought down a very large mature hīnau on the other side of the stream. This has now been chainsawed back by one of our volunteers. Work is ongoing at this site.

The third area, on the western end of the top pond was cleared of blackberry, Japanese honeysuckle and sweet cheery over the winter of 2022. Many native trees were planted in this cleared area over the winter of 2023 and 2024 and are now well established and being enriched by local native seedling growth. Clearing grass and other weeds from around the seedlings combined with spraying and 'cut-and-paste' of blackberry, honeysuckle and OMB has been critical to get good establishment of the natives. Another year or two and this



area will be covered in native bush and require little maintenance. In addition, considerable work has continued on cutting and pasting OMB, blackberry and sweet cherry on the steep banks above this site. Most of the sweet cherry has now been removed but more work is required to eradicate the other two weeds. The same three weeds have also been targeted along the remaining steep banks on this western side of the ponds. Again, most of the sweet cherry has now been removed but further work is still required on the other two. Above monument gully is a significant stand of mature kānuka, which we are trying to protect. We are also trying to remove the highly invasive *Arum* lily from the areas around the two ponds. Initially, we were digging these out but getting every last section of the rhizomes is difficult. As an alternative treatment we are trialling 'Cut-N-Paste' MetGel (active ingredient metsulfuron).





Arum lilies



Arum lilies treated

### *Eastern section of Tutukiwi*

Three working bees were held in the bush adjacent to the private road on the eastern side of the reserve hand removing Tradescantia and a few other invasive weeds including a few Arum lilies, some Darwin's barberry, sweet cherry, blackberry, a few plants of climbing Asparagus (only found in this area of the reserve), OMB and pampas. Two additional working bees were required to remove a number of large sweet cherry in this section of the reserve. A huge pile of logs have still to be removed for firewood. This section of the reserve is close to being free of all these invasive weeds with the exception of the Tradescantia. A goal over the next five years is to systematically remove Tradescantia from its source in the far eastern section of the reserve, down to the bridge by the Tutukiwi carpark; an ambitious goal but potentially achievable through judicious use of herbicide, combined with hand weeding in ecologically sensitive areas close to the stream and where there are already natives. A pilot trial to eliminate this weed from the source to the private bridge was started in 2024 and will be ongoing throughout 2025. We are grateful to the landowners at the back of this block for access to the forest along their private road. Again, the impact of the 2024 floods on this section of the stream is stark with several large slips and some very large trees, including a huge tawa, fallen over.



Treated pampas



Sweet cherry removed

### *Main forest*

With so much effort going into the weedy one hectare of Tutukiwi reserve it is easy to forget about the remaining 12 hectares, which is relatively weed free and a very significant area of remnant native podocarp forest close to the city. While there are pockets of OMB and blackberry throughout this section of the reserve, these are rapidly disappearing by 'cut-and-paste' while clearing the rat / possum trap lines. Several pampas clumps have been removed by glyphosate (Ken Up Dry) treatment. All willows in the tributaries above the two ponds have now been treated with glyphosate and are dead. In addition, a significant infestation of *Tradescantia* in the upper catchment was removed to prevent spread to the banks of the upper tributaries, which remain free of this horrible weed down to the junction with the eastern tributary adjacent to the upper pond. What now remains for this section of the reserve is removal of blackberry along the far SE boundary of the reserve with the adjacent farmland. Access to this remote section of the reserve is difficult, so some assistance in spraying/removing this infestation from PNCC would be welcome.

In summary, three large areas have been cleared of blackberry and other weeds and planted in natives. While some ongoing maintenance of each of these sites is required they will slowly completely fill in from the trees planted and from germination of seeds from the surrounding native bush. Several weeds including Darwin's barberry, Japanese honeysuckle, climbing asparagus, and pampas have been eliminated from the reserve but ongoing surveillance will continue. The floods in the winter of 2024 caused a number of slips and loss of large sections of stream bank throughout the reserve. A significant infestation of *Tradescantia* in the upper SE section of Tutukiwi has been removed thereby preventing infestation of the western tributary. Most of the reserve is free of OMB with the exception of the steep banks above the private road on the western side of the reserve.

### **Volunteer work in Moonshine Reserve**

Restoration work in this reserve has focused on removal of pest weeds, predator control, some enrichment and primary native tree planting. A major effort was made to remove dozens of sweet cherry from the western section of this reserve over the winter of 2024. Primary native planting has occurred at two sites: immediately adjacent to the valley road and at the top of the hill on the far eastern side. In summary:

- This reserve is now close to being free of sweet cherry, OMB and pampas. Surveillance continues for these and other weeds. *Tradescantia* and African club moss remain the two most problematic weeds on the banks of the main stream through this reserve.
- The flood events of 2024 resulted in some major slips adjacent to the main stream and some very significant loss of soft silt banks along the main stream and in the side stream that drains the western catchment. Access up the valley on the western side is now very difficult given how much the banks have eroded – see Figure
- Primary native planting on an open grass area on the eastern boundary of this reserve continues and will be the focus of new planting in 2025. Just a few adventitious plants of blackberry spring up in this area, which was first cleared during lockdown in 2020. There is a significant patch of *Melicope simplex* on the edge of the forest.
- Primary planting, mainly kahikatea, has occurred immediately next to the Moonshine Valley Road, where *Tradescantia*, blackberry and crack willow have been removed.
- Enrichment of this remnant native forest reserve has continued with plantings of totara, kahikatea, and pigeon wood (privately propagated). Kahikatea planted by the author around





20 years ago are now topping out above all the other native plants with girths of 30 cm or more. Although the tawa planted at the same time are tall the stems are still very small. The contrast between the eastern edge of this reserve and the private land over the fence, where there are very significant infestations of OMB, sweet cherry and blackberry, is dramatic.

Future objectives for this reserve are to complete the restoration of the far eastern and close-to-road sections of this reserve with more plantings, continue to enrich this reserve with selective plantings, and maintain surveillance for OMB, sweet cherry and other weeds.

### **iNaturalist project**

A botanical survey of the native plants found in Tutukiwi reserve was carried out by the Manawatu Botanical Society back in 1995. I have that list and have been checking for the presence of all these species in the valley and adding additional ones, like the lemon flowered *Clematis foetisma* found in 2022. A significant recent find has been a single clump of New Zealand blueberry (*Dianella nigra*) on the boundary of the reserve with the farm. Berries have been collected to propagate and plant at other sites within the reserve. I have also propagated a large batch of pigeon wood grown from seed harvested in the valley as well as some *Coprosma rhamnoides* which is currently restricted to a small section of the Moonshine reserve adjacent to the road.



*Dianella nigra*



*Coprosma rhamnoides*

In order to share with everyone a record of what we have in the valley I have set up an iNaturalist project (*Natural World of Moonshine Valley*) with the goal of loading up high quality images of as many native plants, fungi, insects, birds and other critters that can be found in the valley. iNaturalist is a citizen's science project to share and have verified any species you want to record. If you would like to see what species are currently loaded go to:

<https://inaturalist.nz/projects/natural-world-of-moonshine-valley>

This should serve as a pocket guide to anyone wanting to know what is growing or living in the valley. It uses a Google Earth polygon selection of the boundaries of the valley. Any posts that fall within the polygon will automatically appear within this project thereby offering a comprehensive

list, together with photos, to help with ID of the many plants and animals we have. Just 43 observations so far but as I (and hopefully some of you) capture more images it will quickly grow.

ID within iNaturalist has now become very sophisticated using AI tools to give you a pretty good idea of what the organism is once you load your photographs – if they are reasonable quality – and show key taxonomic features. If you are unfamiliar with iNaturalist the ID requires confirmation by two experts before it is recorded to be of ‘research grade’.

If you would like to join iNaturalist and contribute to this project please get in contact. It is important that quality and informative images are loaded so that the specific species can be readily identified.

### **Other issues**

After a relatively quiet 2023, the winter of 2024 brought two major floods (17<sup>th</sup> Aug and 19<sup>th</sup> Sept), with the highest reach seen by residents in the last 30 years. Significant flooding damage has occurred along the main stream and in the tributaries, especially in the Moonshine Reserve gully, around the carpark in Tutukiwi and at several other sites further upstream. Probably the most significant impact is the volume of sediment being deposited in the stream and tributaries as this will severely impact on the fish and invertebrates that live in the stream. After the September flood I saw a large number of kākahi / freshwater mussels ripped from their beds and deposited on the side of the stream. While much of this is out of our control it is important the community keep a watch on what is happening to ‘our’ stream and work with Council to ensure that developments above and around the valley comply with resource consents that are supposed to mitigate excess release of sediment and the like.



### **Acknowledgments**

I would like to thank the community volunteers who help out on a regular basis with weed and pest control in Moonshine and Tutukiwi reserves. I acknowledge this type of work does not appeal to everyone and some are just too busy but many thanks to everyone in the valley for general support for what we are doing and for the efforts of individuals on their own properties to make Moonshine Valley such a special place. A special thanks to valley residents who have allowed us access to the reserve across private roads and access to the stream that flows through their properties. I would also like to thank PNCC for provision of traps and GreenCorridors (Totara Glen Nurseries) for the native plants.

**By Barry Scott**  
**March 2025**



## Appendix: Weed control

The following is an overview of weed control in the two reserves.

- **Pampas grass.** This weed has now been eliminated from both reserves and most private properties in Moonshine Valley. Cooperation from everyone highlights how local elimination of a highly invasive weed is possible even if it is not listed on the Horizons Pest Management Plan.
- **Blackberry, OMB and Japanese cherry** have been removed throughout Moonshine reserve. Some remain on the boundaries of the reserve with private properties so will require ongoing control, especially on the western edge where the extension of the gully is a mass of blackberry and OMB.
- Removal of **African clubmoss** from the edges and banks of the Mangaotane / Bryants stream. This is a relatively new weed that is confined to the stream banks below the valley bridge, although a couple of patches have been observed in the upper Tutukiwi reserve. With the support of private landowners much of this weed has been removed by hand from the banks of the stream where it competes with native ferns and mosses. In areas away from the stream where there is just grass and weeds the use of glyphosate combined with 'Pulse' has been shown to be very effective in killing this weed. These combined approaches make it feasible to eliminate this weed from the stream if the source can be treated.
- Control of **Old Man's Beard**. There has been ongoing removal of this vine throughout both reserves by cutting and pasting the stem with 'Vigilant'. Although there will be re-invasion from adjacent properties, especially from the weed infested gullies on the farmland to the west of the reserves, we are well on the way to elimination of this serious weed from both reserves.
- **Blackberry** control. As outlined above two major infestations of blackberry in Tutukiwi have now been cleared and the areas replanted in natives. Some ongoing maintenance is still required but both areas should have extensive bush cover within two years. The major problem areas for blackberry are high on the slopes west of the ponds and along the relatively remote SE edge of the reserve, adjacent to farm. Permission to access the latter through private property will be required as it will be very difficult to carry tools to this site. This is a strip where some help from PNCC would be welcome. This is another weed that is well on the way to being controlled in both reserves.
- **Agapanthus** control. As pretty as this plant is when it flowers, it is a serious weedy species that invades the understorey of native bush. Nearly all of us in the valley have at some time planted this plant so it is now very widespread in the valley and challenging to remove. Apart from a strip of plants along the western side of the lower pond this weed is close to being eliminated in both reserves.
- **Crack willow** control. PNCC removed a number of large willows along the banks of Mangataone stream in March 2023. Regrowth has been controlled by cutting and pasting, and one section of the stream bank has been planted out in natives. Work continues controlling regrowth around the ponds with just three small deeply embedded clumps to be removed from the western side of the lower pond. All willows in the main reserve upstream of the two ponds have been treated with herbicide and are now dead. Small infestations of willow around both ponds have been removed by cutting and pasting with herbicide. Fallen willow is a major cause of blockage of the stream.
- **Horsetail** control. This is a weed that appears to have been brought into the valley with gravel used for the road and the carpark. There is now a major infestation around the Tutukiwi reserve public carpark. This is one of the more difficult weeds to control but annual spraying is carried out to prevent it invading the banks of the stream where it will readily spread and outcompete most natives. Disappointingly, it has been found on the banks of the

stream that flow from the farm into the reserve on the SE boundary. It is unclear how it was introduced to this area.

- **Tradescantia** control. This is probably the most challenging weed in the valley. It started as a small infestation in the upper reaches of the eastern tributary of the stream and then spread with flooding down the entire stream to the Manawatu. However, it is still absent from the western tributaries of the stream beyond the junction near the ponds. As discussed above an infestation in one of the western tributaries has been eliminated and a pilot is underway to try and eliminate it from its source in the eastern tributary down to the private bridge. If this is successful further work will be carried out to eliminate it further downstream with the long-term goal of totally clearing it from Tutukiwi reserve.
- **Sweet Cherry**. Dozens of these have been removed from both reserves with just one section on the western bank above the ponds remaining to be cleared. Once that is done we will be well along a pathway of elimination of this highly invasive tree if ongoing surveillance is continued.
- Other weeds that are being targeted for removal are **Arum lily**, **Japanese honeysuckle**, **Darwin's barberry** and **climbing Asparagus**. Small infestations of these have been removed from various sites throughout Tutukiwi reserve. The identification of the latter in a remote section of the reserve highlights the value of good surveillance followed up by prompt removal/treatment on detection. Two other emerging weeds, **Yellow Archangel** / *Lamium galeobdolon* and **Licorice plant** / *Helichrysum petiolare*, currently present in small patches, are still to be removed.