Livestock and Pest Management

INTRODUCTION

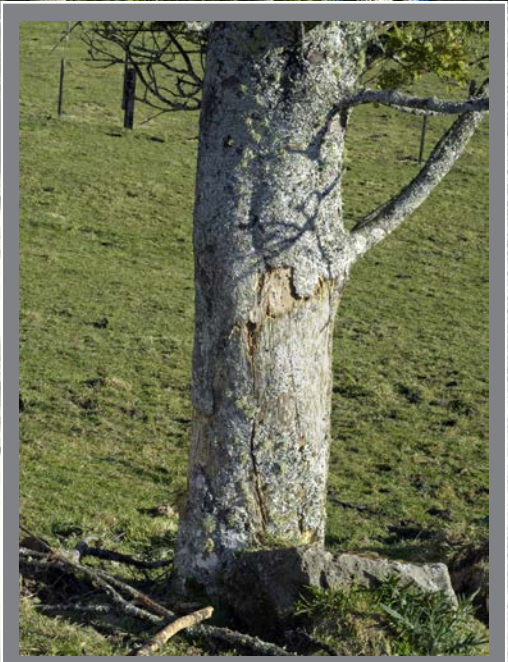
Farm livestock, many animal pests including deer, goats, pigs, possums, hares and rabbits, and even some native birds such as the pukeko can cause extensive damage to existing native forest and scrub and newly planted areas of native trees and shrubs. Effort should be put into controlling those animals that pose a risk to newly planted natives prior to planting, and on-going control is likely to be necessary until the planted trees are well established.

PROTECTION FROM FARM LIVESTOCK

While the role of mammalian herbivores in primeval New Zealand was at least partly filled by the moa (Wardle 1991), nevertheless New Zealand's flora evolved in the absence of intensive grazing. As a consequence most of New Zealand's tree and shrub species are highly palatable to introduced grazing animals. In addition, under intensive agricultural systems, our soils and plants cannot cope with the trampling and waste from stock.

When stock get into areas of native forest, scrub or new plantings they can:

- increase soil compaction and erosion;
- browse and trample native seedlings;
- reduce or prevent natural regeneration;
- damage established shrubs and saplings within understorey layers;
- damage bark of semi-mature and mature trees and shrubs;
- trample root systems of trees;
- change the forest environment by creating gaps and opening the understorey;
- introduce weeds by depositing seeds through their hooves and dung;
- increase soil fertility which may favour introduced weeds rather than native plant growth; and
- increase soil disturbance creating bare sites for weed invasion.



Debarking caused by livestock

Root damage

Soil compaction, lack of regenerating native trees and shrubs, and damage to trees are typical of grazed remnants on farms.

Fencing forest remnants

Unfenced areas of native forest on farms, whether newly established, well established or remnants from previous wider forest cover, can suffer significant damage from livestock. Cattle, goats, deer and, to a lesser degree sheep, with free access to natives will heavily graze nursery-raised seedlings of virtually all species of native trees and shrubs. In just half an hour, grazing stock can cause substantial damage. Even relatively unpalatable nursery-raised native species such as totara *(Podocarpus totara)*, manuka *(Leptospermum scoparium)* and kanuka *(Kunzea ericoides)* are vulnerable to grazing after planting, possibly due to the increased nutrient loads in newly planted nursery stock.

Well-established seedlings and saplings of most native species can also be severely affected by domestic stock. Foliage can be stripped off lower branches and stems broken to access upper crowns. Livestock can also weaken, and sometimes kill larger poles and trees by rubbing against trunks and trampling roots.

Fencing stock out of forest fragments not only reduces soil erosion and compaction and prevents damage to existing trees and shrubs, but it allows infilling of the remnant with understorey vegetation reducing forest edge effects and providing a cool, shady forest interior. Fencing out domestic stock allows regeneration processes thereby ensuring an ongoing natural succession of forest species.

Browsing of even well-established natives by domestic stock can be severe.

Fencing to exclude grazing stock is essential for newly-planted areas of natives; fencing stock out of forest fragments will reduce erosion and compaction, prevent damage to existing trees, and allow regeneration of an understorey.

Livestock fencing options

Erection and maintenance of good quality and appropriate fencing can successfully exclude farm livestock from areas of native trees and shrubs. There are a range of fencing options for areas to be planted with natives. Standard deer netting fences (1.8 to 2 metres high) will exclude farm livestock including sheep, cattle, horses, goats and most deer, as well as feral deer and goats. A gate will enable any rogue stags to be removed quickly.

Eight wire post and batten fencing provides an effective barrier to sheep. With the use of "box" stays instead of "angle" stays, and the close spacing of battens, an eight-wire fence can also be made goat proof.

A well maintained two or three wire electric fence will exclude cattle as long as the fence is kept "live" at all times. However, permanent eight-wire post and batten fencing is recommended even for cattle - a few cattle can cause a large amount of damage to native seedlings in as little as thirty minutes. An additional electric outrigger may be necessary on a permanent fence to prevent horses and cattle leaning against the fence and especially where bulls are farmed. A gate is also suggested so that any stock breaking through the fence can be removed quickly, but ensure it is well latched or locked so that it cannot be easily or inadvertently opened.

The first row of planted seedlings should be located out of reach of livestock that may reach over the fence. In a mixed tree and shrub/small tree planting on an open site it is recommended that hardy coloniser species be planted along the outer edges of the planting. These species will provide a weather buffer for tree species growing internally and will generally be more tolerant of lateral grazing by livestock as they spread towards the fence. Hardy multi-stemmed species, such as kohuhu *(Pittosporum tenuifolium)* and karamu *(Coprosma robusta)*, will fill the gap quite quickly between the first line of planting and the fence and so reduce the possibility of weed species establishing in this zone.

Planting seedlings too close to the fence leaves them vulnerable to browsing!

Electric fences will exclude cattle but must be maintained and kept 'live'.

Eight wire battenless fence protecting a recently retired area next to forest remnant.

Low-maintenance post and batten 8-9 wire fences provide protection for natives for many years.

One to three-wire electric fencing will range in cost from $2 to $4 plus GST per lineal metre and 8 wire post and batten fencing is likely to cost $12 plus GST or more per metre if fencing contractors are used. Be sure to seek several quotes for materials and from contractors before proceeding.

MANAGEMENT OF FERAL ANIMAL PESTS

Feral deer, goats, pigs, possums, hares and rabbits can all cause damage to native trees of various ages (Porteous 1993). Possums are more likely to cause significant damage to older saplings and seedlings planted into scrub and on forest margins, while deer and goats will, if present, chew the tops of newly planted seedlings. Hares and rabbits will often cause the greatest damage to freshly planted seedlings, especially when the planted area is adjacent to farm land. Feral pigs are most likely to cause damage on forest margins, usually as a result of their habit of rooting up the ground.

Typical hare damage - a clean angle cut removing the top (arrow)..

Pest control programme

Where existing farm fencing is not effective at excluding feral deer, goats and pigs periodic hunting may be necessary in surrounding forestland to prevent damage to planted native trees. Be sure to gain the approval of the landowner before undertaking this control.

Possums and rabbits can be controlled by shooting or poison bait, and possums also by trapping, whereas hares are less inclined to take posion bait and so are best controlled by shooting. Where one or more of these species is present, a concerted control programme is recommended immediately prior to planting. Regular follow-up control efforts may be necessary until seedlings exceed one metre in height. Monitor the planting site regularly for pest damage and be prepared to enact control quickly if new damage is detected. The presence of rabbits, hares or possums can ususally be differentiated by the damage they cause. Rabbits generally leave tell-tale diggings; hares typically slice through seedling stems leaving a clean 45° angle cut; and possums characteristically chew at accessible and new-growth leaves and flowers.

Rabbit browsing to foliage and stems.

Carefully planned wild animal control programmes such as use of poisons (left) and trapping (right) will be required to prevent damage to planted natives.

Pindone is generally the most effective bait to use for rabbit control, and a variety of traps and poisons exist for possum control. For those inexperienced in the use of traps and toxic baits it is recommended that the advice of experienced pest control experts is sought to avoid unsafe practice and poor results.

Pindone pellets laid at the entrance to a large rabbit burrow in a recently fenced area about to be planted with natives. Use the advice of pest control experts in the use of poisons.

Long grass between planted native seedlings can deter rabbits and hares.

Pest-exclusion fencing options

Conventional farm fencing will not provide an effective barrier to possums, hares or rabbits. These animals can be excluded by special pest-proof fence designs but this sort of fencing is expensive and may be hard to justify if only to protect native seedlings.

Rabbits

Rabbits can be excluded from a planted area by the attachment of small aperture (50 mm or less) wire mesh to a standard post and batten fence. To be effective the mesh should extend out horizontally from the fence base (on the pest side) by no less than 400 mm. This is to prevent the rabbits from digging under the fence. Rabbits (and other digging mammalian pests) will try repeatedly to dig at the base of the fence but research has shown that they do not deliberately choose to start digging 350 mm or more away from the fence in order to get under it (Day and MacGibbon 2007).

The mesh "skirt" should be pinned down tightly on top of short-cropped pasture, or onto cleared soil and then covered with a thin layer of topsoil. Pasture grasses (but not weed species) should be encouraged to grow through the mesh because they will help to bind the mesh firmly to the ground.

The mesh should extend at least 800 mm up the face of the fence and can be attached to the fencing wires using ring clips. Consequently, a 1200 mm wide roll of mesh is needed.

To make an area rabbit proof, gates need to be hinged so that they sit within 50 mm of the ground along the full length when closed. The substrate under the gate should be consolidated gravel or any material that a rabbit can't dig through, or a horizontal layer of rabbit mesh pinned to the ground and extending out from the gate (towards the pests) by at least 400 mm.

Rabbit fencing must be maintained regularly and thoroughly to be effective.

Hares

Rabbit mesh, as described above, will also exclude hares but it is recommended that the mesh is extended up the full face of the conventional 8 wire fence (ie. to 1.1 metres).

A rabbit-proof fence established before planting of natives on pastoral hill country. This fence comprises posts and steel waratahs and several wires, two of which are electric to keep stock out (left). In addition, wire mesh is attached to the fence with a "skirt" pinned down on the pest side to prevent rabbits digging at the base of the fence (right).

A wide range of traps are available to control possums, mustelids and rodents.

Possums, cats, hedgehogs, mustelids and rodents

Specially designed pest-proof fences are required to exclude possums, cats and other small mammalian pests. The cost of these fences can range up to $300 per metre. Unless there are plans to reintroduce threatened native animal or plant species to the planted area conventional control techniques should be adequate. If a multi-species pest proof fence is being considered seek the assistance of experienced advisers to avoid expensive failures.

MANAGEMENT OF PUKEKOS

Where the forest or planting area lies near a stream, river or wetland the native pukeko is likely to be present, possibly in quite large numbers. Pukekos are one of the few native bird species that have increased in number since the arrival of humans and they thrive in damp, cleared agricultural landscapes. Unfortunately, they can cause significant damage to new native tree plantings. They have the playful, but destructive, habit of pulling freshly planted seedlings out of the ground, especially smaller plant grades such as root-trainers and small planter-bag (PB) grades. A small population of pukekos can extract dozens of seedlings over a short period if so inclined, and will do so repeatedly if they are replanted.

If pukekos are a problem the best preventative measure is to plant larger, well grown plant grades (such as PB3 or PB5 grades), and to make sure each plant is firmly planted. They are less able to pull heavier plants out of the ground.

Although livestock can benefit from shade and shelter provided by scattered remnant native trees, most native trees such as these tawa (Beilschmiedia tawa) above will not regenerate in the presence of grazing.

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Tãne's Tree Trust
Native Trees for the Future

Tãne's Tree Trust promotes the successful planting and sustainable management of New Zealand native trees and shrubs for multiple uses.

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