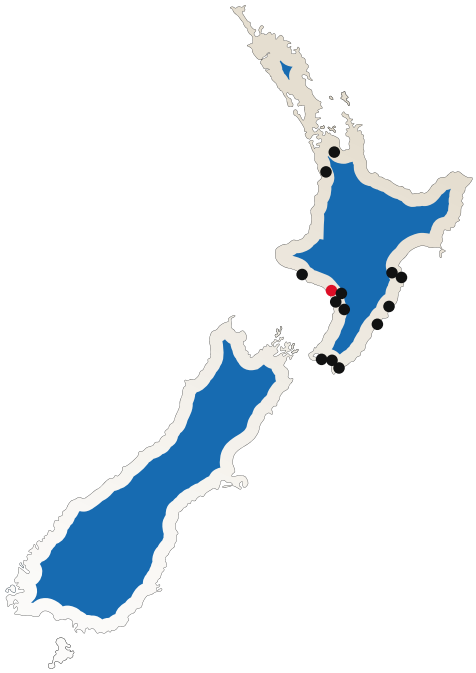
COASTAL CARE

BIODIVERSITY

Feeding you sustainably



Mackintosh Group

2022

COASTAL CARE

BIODIVERSITY

Feeding you sustainably

Since inception the Coastal Lamb Brand has connected our customers to us as farmers. This connection is a key point of difference for our brand and something that is deeply valued by consumers.

Climate change is a worldwide phenomenon in 2022 and all countries are making moves to address this problem. Customers want to know who is producing their food and now more than ever want to know how their food is produced.

Communicating the focus we have on farming sustainably and the care we take of our farm environments is now essential. **Coastal Care** gives us a tool to communicate our sustainability stories effectively with our consumers.

In Hong Kong leading hotels have a "**Quota for Sustainably produced product**" Our **Coastal Care** programme gives us the ability to showcase our credentials and participate in this growth opportunity.

The focus of Coastal Care is looking at the following elements and how they combine to create biodiversity.

Fresh Water + Fertile Soils + Healthy Habitat = BIODIVERSITY

Biodiversity is a great measure of the health and sustainability of our farm environments.

Our aim is to document each farms current status and looking to the future, encourage anything that improves the sustainability of our farming systems.

Fresh Water

Fresh water is critical for the survival of all living organisms.

The waterways on the three farms run by Mackintosh Group vary from summer-dry creeks through to semi-coastal lakes and wetlands to hill country spring fed swamps and native bush-flanked streams. The quality of the water passing through these systems is a critical driver of the health and productivity of the plants, animals and people that live in them. As it flows on beyond our property boundaries it impacts the ecosystems downstream. Drinking water source for livestock and people varies across the farms from captured rainwater on Aramaire to reticulated springwater on The Lakes and piped community bore-water supply on Dunkeld. The following are things Mackintosh Group has done, or is doing, to manage and monitor water across Dunkeld, The Lakes and Aramaire farms

- Fencing off wetlands and waterways, working towards excluding stock from all waterways.
- Collecting all poultry shed wash-water to store and use on-farm with pod irrigators.
- Storing spring-fed water at The Lakes to use in the reticulated stock water system.
- Capturing rainwater off shed rooves. At Dunkeld this is used to supplement the Fordell water scheme, on Aramaire it supplies houses and the woolshed.
- Creating and maintaining dams on Aramaire to capture water for stock to easily access so they don't need to use streams and natural wetland areas for their drinking water.
- Planting of riparian areas around lakes with appropriate native wetland species to maintain water quality and replace introduced weedy species.
- Cleaning tanks and troughs out regularly to maintain quality drinking water.
- Facilitating good drainage of rainwater from heavier soils on flatter paddocks with carefully placed and maintained tile drains to reduce waterlogging and minimise soil erosion and nutrient loss into natural waterways.
- Planting natives along waterways on Dunkeld and The Lakes to filter rainwater run-off from cropped paddocks.
- Taking an active role in managing the water supply for the local community – Paul has been a committee member for the Fordell Water Scheme for 12 years and is a member of the Whangaehu Catchment Group.

Fertile Soils

Land or soil that is fertile is able to support the growth of a large number of strong healthy plants.

The properties Mackintosh Group farms range in altitude from 0m asl to 520m asl and our paddock contours vary from flat to rolling to steep hill country. This encompasses a diverse range of soils from the heavier clay loam on Dunkeld and The lakes (the flatter finishing farms nearer the coast) to the steep, erosion-prone slopes of Class 6 land on Aramaire. Each soil type requires careful, considered management to protect and play to its strengths. The following are things we do to protect and maximise the potential of our soils.

- Utilising manure from our commercial poultry rearing operation by applying it to paddocks on Dunkeld as natural fertiliser since 1971. Poultry manure has a slow nitrogen release with 50% plant availability after a year. It is fantastic for supporting a thriving earthworm population, build humus and great soil structure.
- Testing soils across all 3 farms annually to monitor soil fertility and mineral levels. This is done by independent consultant that helps us fine-tune our inputs and taylor-make fertiliser blends specific to each paddock and crop.
- Planting the steepest erosion-prone faces on Aramaire with poplar poles, forestry plantations and encouraging native reversion in these areas to reduce slips and erosion of topsoil.
- Implementing and regularly maintaining an extensive tile drainage network on the flat land of Dunkeld and parts of The Lakes to keep water moving efficiently in high rain events to reduce water logging and nutrient loss.
- Limiting crop rotations to five years to maintain soil fertility and 'rest' soils to prevent overworking.
- Shifting stock policy away from winter break-feeding of crops for sheep and cattle to preserve soil structure and reduce compaction.
- Reducing our soil tillage by using direct drilling and minimum till methods for short-rotation pastures and feed crops to protect soil structure.
- Using dual tyres on our tractors and wide tracks on our combine harvester during wetter seasons to mitigate soil compaction.
- Supporting Plant & Food Research and the Foundation for Arable Research by providing plots on Dunkeld for them to conduct cultivar trials each summer. The research helps identify which species and cultivars grow best in the soil and environmental conditions specific to our locality.

Healthy Habitat

A diverse environment where a plant or animal naturally or normally lives, grows and reproduces.

Because of its wide variety of soil types, altitudes and contours, the land Mackintosh Group farms supports a wide variety of habitats and ecosystems. In amongst the pastures grazed by our sheep and cattle the vegetation covers include large blocks of native bush, pockets and gullies of regenerating manuka-dominant scrub, blocks of pine forest, strips of shelterbelts; some old macrocarpa, pittosporums and pines and some newer mixed native ones, banks of deciduous poplar trees and belts of lake-edge raupo, flaxes, cabbage trees and willows. We do our best to maintain and improve the habitats that support wild animal, bird, fish and insect life on all the properties we manage by

- Improving wildlife corridors along the Northern boundaries of Dunkeld and The Lakes by fencing off and planting up the margins of the creek beds running along them. This provides habitat for birds and animal breeding and protective cover as they move around the district.
- Growing blocks of sustainable forestry on marginal and less productive classes of land. The first pine forest was planted in 1965. Currently 45ha of pine trees are growing and up to 100ha of accelerated native reversion and greenfield planting is planned for 2023.
- Planting 500-1000 native trees and wetland plants every winter to bolster existing shelterbelts and increase the size and diversity of other fenced-off wildlife areas
- Protecting the 30ha block of mature native forest and 50ha block of regenerating native bush on Aramaire by keeping farmed livestock excluded from grazing their understories.
- Establishing and maintaining shelterbelts between paddocks on Dunkeld and The Lakes to provide shelter for livestock and habitat for wild animals. Working towards having shelterbelts in every paddock where no natural protection exists and choosing locally propagated native species that are best suited to the local conditions.
- Actively managing introduced pest animal species including baiting possums on all three farms and supporting recreational hunting of the wild fallow deer, pigs and goats on Aramaire.
- Limiting the spread of invasive plant pest species including gorse and blackberry. Assisting the regional council with their efforts to identify and remove banned invasive plant species.
- Adopting recently developed environmental monitoring tools like Overseer to calculate our carbon footprint and nitrogen losses.

Biodiversity

The amount of diversity between plants, animals and other species in a given habitat at a particular time.

This diversity of habitat found on the three properties that Mackintosh Group manages supports a wide diversity of plant, animal, bird, fish and invertebrate life that coexists alongside the sheep and beef cattle that we farm. As with all of New Zealand environments there is a mixture of both native and introduced species to be found

- The pasture species grazed by our livestock range from tough mixed native grasses, rushes & older introduced pasture species on our tougher hill country through to premium high production AR37 rye grasses, nitrogen-fixing clover-rich pastures and lush swards of brassicas and herb species like pasja and chickory that drive our lamb finishing platforms nearer the coast. These not only support the sheep and cattle we farm but also provide valuable food and habitat for native and introduced birds, animals and insects.
- When planting shelterbelts and wetland areas we choose a wide variety of species to increase plant biodiversity and in the past 10 years we always use natives rather than introduced species such as the macrocarpa, hawthorn and gums planted by previous generations.
- The blocks of established and regenerating native bush on Aramaire are rich in plant biodiversity. Mature bush blocks include dense canopies of (listing but a few) Hinau, Kamahi, Heketara, Halls Totara, Rimu, Rewarewa, Maire, Kahikatea, Karaka, Lancewood and other Pseudopanax species and tree ferns. Manuka, Kanuka, Cabbage trees, Flaxes, Punga, Coprosmas, Hinau and Mahoe are dominant in areas of regenerating bush and native climbers such as Ratas, Clematis, Supplejack vines and Bush lawyer can be found throughout most pockets of bush. A wide variety of ferns, lichen and mosses carpet the forest floor on drier faces while various sedges, Toi-toi and rushes dominate in boggy spring-fed areas.
- The established gardens around the houses at Dunkeld include a mix of natives and introduced species including some massive old oak, Norfolk pine, maple, elm, silver birch and eucalyptus trees interspersed among the native pittosporums, kauri, rata, totara and kowhai trees to list but a few.
- Native birds found on all three farms include Tui, NZ Bellbirds, Fantails, Rifleman, Whitehead, Grey Warblers, Morepork, New Zealand Pigeon, New Zealand Falcon, Rifleman, Silvereyes, Kingfishers, Tui, New Zealand Bellbird and Whitehead, Paradise Shelduck to name but a few.
- Introduced bird species commonly seen include the Australian Magpie, Australasian Harriers, Blackbirds, Starlings, Goldfinches, Sparrows, Pheasants, Eastern Rosellas, Quail. Peacocks are gradually establishing on the back of Aramaire. Seagulls are common on Dunkeld and The Lakes being so close to the coast but will occasionally make their way to Aramaire too.
- The Lakes Farm with its two lakes linked by streams and wetland areas attracts large numbers of native and introduced waterfowl including Mallards, Dab Chicks, Bitterns, Brown Teal, Pukeko, Coots, Herons, Cormorants and Black Swans.
- Canadian Geese, Pacific Golden Plovers and Paradise Shellduck will frequent pastures on all farms in between visiting nearby waterways.
- The rivers, lakes and streams on all three properties support a range of fish and invertebrate species including eels and koura (freshwater crayfish) on Aramaire and perch, eels, common bullies and a few inanga at the Lakes although we are hoping to see inanga species increase as other properties in the catchment areas remove barriers to migration.

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FRESH WATER | FERTILE SOILS | HEALTHY HABITAT

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- We work in partnership with Comvita to provide wintering sites on Dunkeld and The Lakes and summer nectar-gathering sites on Aramaire for around 100 bee hives each year. Bees are critical for pollinating many plant species which is great for supporting regeneration of tree, shrub and clover species while the manuka-dense regenerating bush provides abundant nectar for the bees which they turn into high UMF delicious honey.
- Cool moist and dark grottos of bush-dense creeks on Aramaire support glow worms
- Possums, ferrets, stoats, weasels, wild cats, rats and mice are inevitable animal pests found on all three properties but baiting and trapping keeps numbers to a level where their impact is manageable. Unfortunately stoats will be preventing the establishment of kiwi on Aramaire but the intensity of trapping that would be required across the farm makes this currently unviable.
- The remote and wild bushclad hills of Aramaire support substantial populations of wild fallow deer a few wild pigs and the occasional wild goat and red deer. These numbers are kept to sustainable levels with recreational hunting that has the additional benefit of providing delicious meat for the hunters and their families.

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