NZ LANDCARE TRUST

FARMING FOR THE FUTURE

Farmers leading positive action in the Waitangi River Catchment

ACKNOWLEDGEMENTS:

Thanks to all those who kindly contributed their time, knowledge and experience to the preparation of this booklet.

Farming for the Future: Farmers leading positive action in the Waitangi River Catchment.

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Published by NZ Landcare Trust, August 2014.

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This booklet is created with funding from the Ministry of the Environment 'Community Environment Fund'.

Ministry for the Environment
Manatu Mo Te Taiao

ABOUT THIS BOOKLET

This booklet is an introduction to the farmer-led Waitangi River catchment project and showcases the effort occurring on farms across the catchment to safeguard the health of the river and the Bay of Islands. It is intended to provide information to farming and non-farming audiences alike. The farms featured are by no means perfect, a farm is always a work in progress, but their owners are taking their commitment to farming and the environment seriously.

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THE RIVER AND ITS CATCHMENT

The name Waitangi is comprised of '*wai*' meaning water, and '*tangi*' meaning noisy or weeping. The name most likely refers to the sound of water cascading over Haruru Falls into the saline world of the Bay of Islands.

Originating just east of Lake Omapere, the river is 37 km long and drains a catchment of 30,000 ha. Grassland accounts for 68% of the land cover with pastoral farming (beef, sheep and dairy) the main form of activity. The catchment is not without forest cover and stable populations of kiwi exist due to the efforts of many dedicated rural landowners.

The river is fed by several waterbodies including Lake Owhareiti, the Waiaruhe River and numerous smaller tributaries.

With the signing of the Treaty of Waitangi in 1840, the river became intertwined with the nation's history and identity. The agricultural history is also rich, from the seasonal gardens tended by Maori in pre-European times to the more recent Te Waimate Mission house, possibly New Zealand's first demonstration farm. This history, combined with the maritime influence, has made for a lucrative tourism industry in the Bay of Islands.

Waitangi River catchment


Kerikeri
WAITANGI FOREST
Tapeka Point
Paihia
OPUA FOREST
Russell

THE ISSUE

Over the last decade water quality has become a high profile issue for New Zealanders. In the Waitangi River water quality is monitored by Northland Regional Council and their data suggests that it is not as good as it could be. This is due to high turbidity (a measure of cloudiness) as well as the presence of bacteria (*E. coli*) and nutrients (primarily nitrate-nitrite nitrogen) in the samples taken. Additional studies into the relationship between soil erosion and sedimentation in the Bay of Islands suggests that past and present land uses are influencing the health of the Bay and that this influence is not necessarily a positive one.

There are reasons to be optimistic, and the attainment of a healthier river is entirely feasible. Indeed, we are already seeing an improving trend in ammoniacal nitrogen levels (but overall the level is still high) and the Haruru Falls and Waitangi Bridge bathing areas routinely comply with swimming safety guidelines for over 80% of the time in any given bathing season.

Thus far the science has been sufficient to highlight that things could be better. As we move into a new era for freshwater management, a more refined (perhaps forensic) understanding of the drivers of water quality is needed. While pastoral farming is the dominant land use in the catchment, other natural and human influences are also likely to be contributing to overall water quality. The significance of all these contributions needs to be understood so that targeted and effective interventions can be put in place.

This work has already begun with the addition of a new monitoring site on the main tributary, the Waiaruhe River, and the commissioning of further sediment source tracking studies by the regional council. The resulting information will be vital for bringing about a step change in the health of the river.

Crew aboard the R.V. Rangitahi III seal a sediment core for analysis, Bay of Islands 2009. Photo: Rod Budd, NIWA Hamilton


Hutchwilco

THE PROJECT

The project was conceived in 2009 when several local farmers gathered to discuss growing concern around water quality in the Bay of Islands. They realised that the farming community needed to be more proactive in land and water management and they resolved to make a start in the Waitangi River catchment. It was felt that working on a catchment basis would yield greater benefits than isolated individual action occurring across the much larger Bay of Islands landscape. With the support of the community, the NZ Landcare Trust secured funding to coordinate a three year project to assist with the community's efforts. The project began in June 2012 and runs until May 2015.

The purpose of the project is to involve the farming community in practically-focussed actions that improve water quality. The first step was to survey the community to understand their perceptions of the issue, and a strong environmental ethos emerged from the survey participants. However, the survey also found that financial constraints and a lack of time remain very real barriers to progress. Indeed, good environmental performance is dependent upon productive and profitable farms.

So far the project has revealed many examples of on-farm practices that manage soil erosion, prevent nutrient run-off, and limit pathogens entering waterways. One aspect that has emerged as needing attention is the practice of farm environmental planning. It's an approach that takes in the whole farm, prioritising environmental factors alongside other critical farm tasks so that they can be addressed within the farm budget and in a realistic timeframe. Promoting and encouraging farm environmental planning has been a focus for the project.

Wetland fencing at Te Toru Farm

NGAWHITU LTD

The Jack family farm is an 880 ha mixed farm on the shores of Lake Owhareiti. Alec Jack has gradually taken over the running of the farm from his father, Ned, and has set about future proofing the farm, integrating dairy and forestry with Ned's well established beef operation. Diversifying the farm was a move to insulate the farm against future shocks (financial or otherwise) and ensure the farm's succession.

The farm is production-orientated with high standards of environmental performance and animal welfare ingrained in the business ethos. The majority of the waterways and wetlands were fenced out several years ago, and unproductive land retired into pine forestry or simply fenced off and allowed to regenerate.

The remaining 650 ha of pasture is the powerhouse of the farm and this is intensively and intelligently farmed. The paddocks are subdivided and rotationally grazed to build a dense pasture sward capable of carrying the farm through the critical periods,

these being winter for the beef operation and spring calving for the dairy operation. Fortunately these high production techniques are also key environmental controls. Dense pastures prevent soil loss and, with Alec's careful attention to fertiliser application, ensure efficient nutrient cycling within the upper soil profile.

Deep rooting trees, primarily poplars, have been planted on the alluvial flats to capture any nutrients that may be lost from the pasture root zone. These trees are managed to provide a future timber crop and in the meantime provide valuable shelter for the stock as well as providing aesthetic value.

Matching the stock class to the soil type is another significant aspect of the farm's management regime. For example, heavier animals are grazed on the lighter soils, an approach which limits pasture damage (by reducing soil pugging) through the winter months.

The farm also includes 70 ha of native bush and Alec is keen to encourage local possum trappers into the forest in return for mustelid trapping. Keeping possum numbers low will ensure healthy trees in the forest and mustelid control will go some way towards reviving the native bird population.

VESEY FAMILY FARM

Andrew and Susan Vesey run a small dairy herd from which they are determined to make a productive, profitable business. The farm in its entirety is 26 ha with a herd size of around 60 cows. Though small, the stocking rate at 2.6 cows per hectare is above the average for the Far North but a little less than the national average.

The family are very aware of the farm's position in the upper catchment, and water clarity in Watercress Creek as it flows through their farm is magnificent. The creek, which is fed by nearby Lake Owhareiti was excluded from stock in April 2013 and the Veseys avoid conventional fertilisers in preference to products such as seaweed to replenish soil nutrients. With stock now excluded from the creek, the family has turned their attention to the creek's margins.

The Veseys have a preference for planting native species (particularly manuka for Andrew's bees) which will in time shade the stream and improve the habitat for aquatic wildlife. Creek planting commenced in winter 2013 with Oromahoe School providing the manpower and the Kerikeri Shadehouse supplying the plants. The students did a superb job spurred on by the promise of a swim in

the creek. The glistening water proved too alluring for Room Four who rounded off a muddy afternoon's planting with a quick dip despite the time of year.

As well as manuka for the bees, the creek plantings include cabbage tree, flax and kanuka. These colonising species are the basic ingredients for river and stream revegetation in this area. Once these plants have become established, further plant diversity can be added in to reflect local conditions. Many other native species require the shade that these colonising species provide. However, if there is mature native forest in the vicinity of the site then further planting may not even be necessary as birds will do a great job of spreading seed into the area for free.

The success of the Veseys' planting programme will depend on site maintenance. In the early years, weeds and grasses will out-compete the plantings, so clearing around the plants is required until they are sufficiently mature. This typically involves biannual weed clearance by hand or 'spot' spraying with a suitable herbicide for two to three years after planting.

LUDBROOK FARM

Roger and Carol Ludbrook run a 410 ha beef farm south of Ohaeawai. Like many farmers, debt is a major concern and increasing debt levels leave little money or motivation to deal with environmental matters. “You can’t be green when you’re in the red” is common parlance amongst farm discussion groups. However, Roger is not shying away from the challenge, he’s just realistic about the task ahead recognising that first and foremost the farm needs to turn a profit.

Roger is gradually extending the farm’s stock-water supply, a task that will take several years to complete but one that will eventuate in stock exclusion on all the farm waterways. One aspect often overlooked in waterway management discussions is the need for an alternative water supply following stock exclusion. A reticulated water supply is an expense that usually eclipses fencing costs and it is this component that a farmer must primarily budget and plan ahead for.

The cell grazing system being developed at Ludbrook Farm will eventually be expanded across the entire property to balance production with land and waterway management. This grazing system allows for intensive production over a core area while avoiding sensitive areas such as wetlands, which can be better utilised as natural water filters. The water supply is central to the system and will make stream access unnecessary, indeed inefficient. With regards to production, Roger's long term target is to produce a net carcass weight of 450 kg per hectare using this system. By comparison the average net carcass weight for Northland is around 200 kg/ha. It is an ambitious target and one that hinges on the herd being both well fed and watered.

A farm environmental plan was completed in 2013 and the resulting paddock by paddock identification of soil types will allow for further fine-tuning of the grazing system. For example, concentrating winter grazing effort on the more robust silt loam pastures while farming more cautiously on the Aponga and Waipapa clay soils. These clay soils cover around a third of the farm and are more prone to soil erosion requiring grazing with lighter stock to minimise pugging and pasture damage. From a production perspective, this approach will afford Roger with better pasture cover and ultimately the animal weight gains that he is seeking.

WIROA HOLDINGS LTD

The Baxters have been dairying since the mid-1980s and three decades on the farm is a profitable business with a herd size above the national average. No mean feat for a farm situated on the impoverished, podzolised Wharekohe soils that are characteristic of this part of the catchment. The herd size is currently at 550 and the farm consists of a 220 ha milking platform with a further 140 ha of run-off.

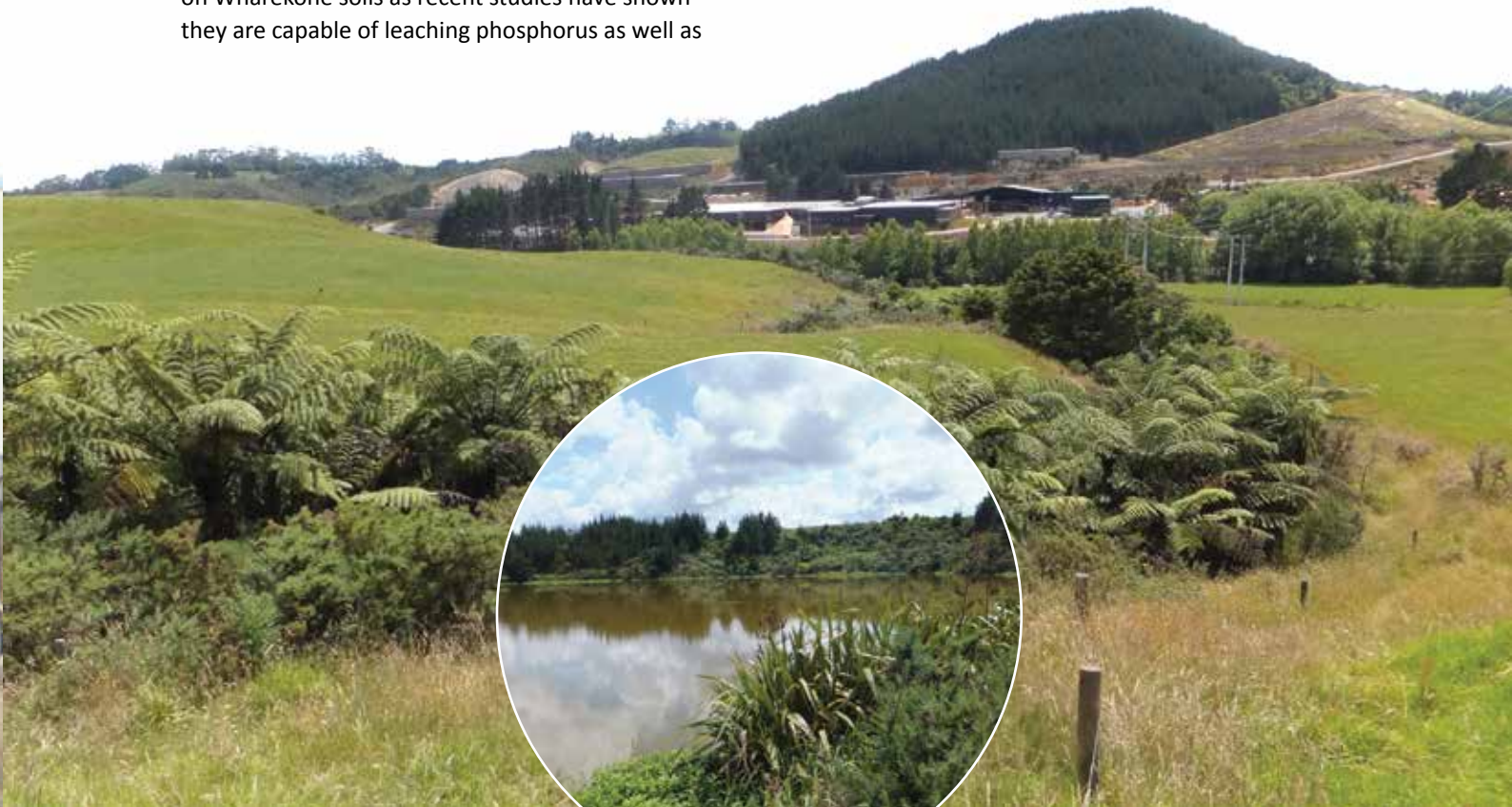
Podzolisation is a complex chemical and physical process resulting in a soil that is typically lacking in nutrients and, in the absence of the original forest cover, prone to drying out. From an agricultural perspective the challenge is to create a more beneficial soil structure for plant and grass growth. Kevin's gut feeling is that their farm is about halfway there. Getting there has required significant improvements to the farm infrastructure, the first being the irrigation system which was installed in 1996. Considered experimental at the time it has provided greater certainty during dry summer periods but, with hindsight, Kevin says that the biggest challenge has been the wet winters.

Stock can do a tremendous amount of damage to the pasture if allowed to graze through the prolonged wet periods. The pugging that results leads to compaction and soil erosion which inhibits pasture growth. Recent field trials suggest the effects of pugging can continue well into the following autumn and possibly even winter. The installation of a feedpad, combined with maize cropping, has provided greater flexibility for stock and pasture management by reducing grazing pressure over the critical winter months. The feedpad is essentially a 'soil guard' and to quote Kevin, "unless you protect your soils you don't have a farm."

Effluent storage and disposal has increased markedly since 1986. Not only has the herd size increased but so too has the infrastructure capable of generating effluent. Kevin's approach mirrors a changing philosophy across the dairy sector which is that effluent is a nutrient-rich resource that should go back on the paddock. Disposal of treated effluent to waterways may still be an option but increasingly it is becoming the option of last resort and occurring only when dilution rates are optimal.

For many farmers there has been a shift in overall nutrient management. Kevin describes past attitudes as a 'fill up the tank' mentality, the problem being that there had always been holes in the tank. Nutrient management is all the more important on Wharekohe soils as recent studies have shown they are capable of leaching phosphorus as well as nitrogen, a double whammy (typically phosphorus remains bound to most soil types). Given this limitation, Kevin's approach is to apply phosphate fertiliser at maintenance levels rather than trying to build reserves. Annual soil testing is an important step in ensuring that optimal phosphorus levels are attained. Similarly, nitrogen application rates are low and are not applied during wet periods.

The farm's success has been founded on observation, experimentation, intensification and mitigation. But it isn't just cows that are prospering here, it's kiwi too! Fenced areas of forest complete with predator control and formal protection through QEII Trust and district council covenants make this a farm for the future.



BLACKBRIDGE SIMMENTALS

Located in the mid-lower-catchment, the Vujcich family run a 76 ha Simmental stud farm. The Simmental breeding cows supply male progeny, mainly to local farmers, for breeding bulls as terminal sires. The females are used as 'farm tractors' to maintain grass quality. Excess stud stock, along with bought-in finishing cattle, are fattened and sent to local meat processors.

The family love the farming lifestyle and aesthetic appeal is part and parcel of a functioning farm. Trees are a big feature of the farm although some trees are "more equal than others". Vaughan is slowly removing the privet trees that have established along the stream banks (a legacy that came with the farm's purchase) and replacing with native species. Their removal is proving a bit of conundrum. Although a pest plant, the trees are providing excellent shading for the stream, which is home to resident populations of eel and crayfish. Radical privet removal would be harmful to these populations so Vaughan's approach is to selectively cull the privet trees and infill around them with native plant species.

All but a small section of the farm's streams have now been fenced and the riparian margins are as wide as 30 metres in some places. The Vujcich family were keen to engage in this project and agreed to a farm plan being completed for the property. The process afforded them an opportunity to step back and consider the whole farm rather than on a paddock-by-paddock basis. The plan is an affirmation of their approach to stock and pasture management. The farm comprises floodplain and rolling slopes with four distinct soils types comprising silt loams, clays loam and clay soils. The shallow free-draining silt loams provide a natural stand-off pad with 80% of the herd overwintered in this area with baleage being their main diet for 8-10 weeks during the wettest periods. The younger, smaller animals are capable of grazing the other soil types throughout the year without any significant pasture damage.

The farm is a secondary income with Vaughan currently working off farm fulltime, but don't be

fooled, this is no hobby farm. The farm has to be profitable and this is achieved by running a low cost operation with selected inputs. The day may come when the farm becomes the family's main income and Vaughan and Susan are mindful of passing the farm on to their children. Fertiliser is often the greatest farm expense and the most obvious area to keep the overheads down.

This desire to keep costs down has piqued their interest in using biological approaches over conventional fertiliser practices. Vaughan's careful how he conveys this, as it's the process and outcomes that are appealing rather than the 'greenie edge'. Biological farming should not be confused with organic farming. It is more a business as usual approach where natural products replace synthetic fertilisers to provide the soil with the nutrients and base chemicals. This is combined with the careful development of soil organisms and organic matter to create a healthy pasture. The underlying principle is that there should be less nutrient leaching and run-off associated with biological farming.

Converting to dairy is a serious option for the farm and the family is weighing up the economic advantages along with the greater commitment it will require. Considering the environmental perspectives will also be critical. Research commissioned by the Parliamentary Commissioner for the Environment (PCE) shows that environmental impacts increase when a sheep/beef farm is converted to a conventional dairy operation, principally through greater losses of nitrogen and phosphorus. The family's interest in biological farming practices will certainly be an advantage if the conversion is to proceed.

The PCE research predicts that land used for dairy in Northland will increase by 16,000 ha between 2008 and 2020. At present, sheep and beef farming is the dominant land use in the catchment and whether or not there will be a significant shift towards dairying is unclear. Certainly the scientific evidence suggests that a major shift would have implications for catchment water quality.

OROMAHOE TRUST

The Oromahoe Trust represents 700 shareholders and manages a land base of 1080 ha held predominantly in Maori title. The business is based on finishing cattle, and breeding and finishing lambs. With 900 cattle and 1200 ewes it is one of the biggest farming operations in the catchment. The primary focus of the Trust is to provide social and economic returns to its shareholders by operating a sustainable and profitable farming enterprise. Aligned with this focus is an environmental strategy to clean up the streams, control pests in the native bush areas, and to safeguard Waahi Tapu (sacred) sites.

The farm is dominated by flat to easy rolling country with heavy soils. In addition there are areas of free draining volcanic flats and steeper hills. The Trust has made significant progress on its gully fencing and, as with Ludbrook Farm, a major feature has been the investment in the reticulated water supply that has made stock exclusion possible. These wide gullies, once well vegetated, will play a vital role in filtering sediment and nutrient run-off. To offset the costs of the programme, the Trust successfully applied to Northland Regional Council's Environment Fund for financial assistance with the fencing costs.

Together with the waterway programme, effective grazing and pasture management are cornerstones of the operation. The farm is well managed, producing dense pastures which include the deeper rooting species chicory and plantain. These species along with the clover varieties contribute to nutrient cycling within the upper soils and provide a degree of drought protection during the summer months. As with the other case studies, matching the size of the animal to the capabilities of the soils is a component of the grazing regime although market conditions mean the Trust is seeing greater profit in beef rather than sheep farming. This creates challenges for the grazing regime, with increasingly heavier stock on the land.

The photo below illustrates the effect of compaction on the pasture. Repeated crossings of the farm vehicle have resulted in localised compaction of the soil which is shown by the purple trail lines. The trail lines are the flowers of the undesirable pasture weed Penny Royal which is thriving in the localised conditions in an otherwise dense pasture. The effect here is mild and of no concern but demonstrates how compaction adversely affects pasture cover. Poor stock grazing has a similar but more pronounced effect which in wet conditions not only compacts the soil but thins out the pasture, inhibits nitrogen fixing (preventing plant growth) and increases soil loss.

FARM SUPPORT

A variety of organisations are available to provide on-farm advice and support.

NZ Landcare Trust – www.landcare.org.nz

An independent organisation working on a range of field based projects, from large catchment projects such as the Waitangi Catchment to smaller Landcare groups with a specific biodiversity focus. Throughout NZ, hundreds of farmers and landowners have been encouraged to review and improve their land management practices. They have planted trees, protected waterways, controlled pests and fostered native flora and fauna, in an effort to maintain a productive, sustainable environment.

Northland Regional Council – www.nrc.govt.nz

The Council engages in statutory and non-statutory functions to manage Northland's environment and its Land Management Advisors can assist landowners with tailored farm water quality improvement plans. The plans use up to date aerial photography and include features such as soil type along with suggested actions for improvement. Funding may also be available for farm improvements that protect the soil, water quality, biodiversity or the coastal environment through the Council's Environment Fund.

DairyNZ – www.dairynz.co.nz

DairyNZ is the industry organisation representing all dairy farmers. Funded by farmers through a milksolid levy, their vision is to ensure that dairy farming in NZ is both competitive and responsible – dairy farming working for everyone. Specific resources are available on effluent systems, nutrient management, riparian and water management. These are supported by a Northland-based Catchment Engagement Leader working with farmers and catchment groups to provide proactive environmental stewardship and wise use of natural resources.

Beef + Lamb New Zealand – www.beeflambnz.co.nz

Farmers levies are invested to help farmers make informed business decisions and promote their collective interests. The recently released B+L NZ Land & Environment Planning Toolkit is one such programme giving farmers an opportunity to develop responses to on-farm issues at their own pace. The toolkit includes a stock-take of land, soil and water resources, an assessment of the production opportunities and the environmental risks. A plan is then developed detailing the required actions, where they will be targeted and by when.

FARMING FOR THE FUTURE

Change is ahead for how we manage freshwater. The foundations for change were laid in 2011 when central government introduced the National Policy Statement for Freshwater Management. This policy statement triggers a statutory process whereby regional councils must improve overall water quality in their regions. They must also set objectives and limits for all water bodies and in doing so there is an emphasis on working closely with the community to put in place effective solutions.

Northland Regional Council has identified the Waitangi River catchment as a priority area and in April 2014 initiated a collaborative stakeholder group. This group, which includes dairy and dry stock representation, will develop regulatory and non-regulatory management options for the catchment over a three year period.

The outcomes of this farmer-led project provide a platform to enter into the collaborative stakeholder discussions. For this project has been a collaboration of family farms working with regional agencies and organisations to realise practical action on farm. Indeed the themes that have emerged through this project - good science underpinning broad community responsibility in a landscape of profitable, well managed farms and environmentally-based tourism - should resonate with all stakeholders.

Haruru Falls

'the best restoration is not based on nostalgia for the past but on an engagement with the present.'

Paddy Woodworth, author of *Our Once and Future Planet*.

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