MPI Sustainable farming fund – funded projects 2013

No.	Project Title	Executive Summary	Contact/Project Manager
13/001	GLM9 Advisory Group Project	The purpose of the GLM9 Advisory Group is to manage the GLM9 spat resource using best practise that maximise the value New Zealanders obtain through the sustainable use of the Greenlipped Mussel resource while operating in an environmentally sustainable matter. The GLM9 Group has agreed a plan for the optimal management of this resource. The Group have identified two of the key strategies from this plan and include in this project. This project aims to: Develop a brochure, DVD and photo library & Develop systems and processes to collect data and provide information on spat fall. The intended outcome of this project is to: improve understanding and community support and remove any concerns relevant to GLM9 that the local communities hold & Improve the sustainable management of the resource through the collection of data and the development of an historical database of information on spat fall.	Karen Morley 03 546 2660
13/003	Farming premium King salmon	Understanding the causes of Chinook (king) salmon malformations is a priority as deviations from normal development have serious implications on the sustainable development of aquaculture, consumer perception and animal welfare. Deformed fish increase production costs, have poorer performance and cannot be sold as a premium product. The expansion of New Zealand aquaculture must be underpinned by measures to reduce the risk of producing fish with skeletal deformities. This project has three key goals: accurate diagnosis, investigation and the reduction of the incidence of deformities on farms. Environmental, genetic and nutritional factors have been linked to this problem in other species. These include temperature during incubation and inadequate nutrition at critical stages of bone development. To determine the primary factors involved	Jon Bailey 03 525 9527

		this project adopts an interdisciplinary approach combining epidemiological, anatomic and genetic data, with data on husbandry, nutrition and environmental conditions tested in replicated on-farm and tank based trials.	
13/004	Aquaculture custom bacterial vaccines, technology transfer, optimisation and demonstration: A readiness and response initiative.	This project involves technology transfer of custom fish vaccine production to New Zealand, applied research to optimise the process for Chinook salmon, a field demonstration component at a large hatchery and a seapen grow out facility and extension of the findings to the finfish aquaculture industry in terms of availability of the process, clear protocols and a vaccination manual for all farmers to use. Up to now we have relied on overseas suppliers, however to minimise trade risks and offset hugely increased costs overseas it is now advantageous to the whole industry to develop this in New Zealand. The ability to develop custom vaccines within New Zealand is a necessary and prudent component of preparing a growing industry for potential pathogen threats whilst maintaining the highest environmental standards (i.e. as a component of the overall biosecurity toolbox and a primary alternative to the use of antibiotics).	Colin Johnston 03 546 2666
13/007	Koura Aquaculture	This project will develop a best practice guide for freshwater crayfish (Koura) farming. The project will use existing information, and undertake trials in key areas where information is lacking, to develop 'practical solutions' for the nuts and bolts of Koura farming.Trials will include aspects such as pond design, refuge creation, stocking densities, male to female ratios, animal health management, and water quality requirements. This information can then be used to establish farms and/or increase production from existing Koura farms.The guide will provide for all levels of Koura farming from the hobbyist and local community operations to commercial scale with a focus of using Koura as an additional	John Hollows 03 466 7097

		revenue stream from existing productive land.	
13/009	Tuna (eel) Aquaculture - overcoming the hurdles	A key platform of the government's strategic agenda for aquaculture development is focused on increasing Māori involvement in this sector. Māori are significant eel quota holders and tuna are a highly valued customary, recreational and commercial species for Māori. There are iwi and Māori organisations who are seeking to participate in tuna aquaculture at a significant commercial scale for customary and commercial benefit. However, the opportunity to culture shortfin eels will not be realised until the uncertainty surrounding access to glass eel stocks is addressed. The project will establish a rationale for sustainable access to glass eels based on measured impacts from collecting glass eels on wild populations, separation of longfin eels (for release) and shortfin eels, and growth rates of cultured shortfin eels. It will provide a model for commercial development and the outcomes from this research will enable Māori to develop an environmentally and economically sustainable eel aquaculture industry.	Anke Zernack 06 353 1881
13/010	Tukituki Choices for Arable Farmers	Sustainable agricultural development must conserve natural resources and be economically viable. Planned water storage on Hawkes Bay's Ruataniwha plains will bring opportunity for the region. However, faced with the challenge of farming within nutrient discharge limits and the opportunity to invest in irrigation, many farmers in the area will require information about the environmental and financial implications of the farming options available. This project will provide farmers with information on which to base their business planning by: 1. Preparing detailed case studies of the environmental and economic performance of four farm enterprises;	Diana Mathers 06 877 9435

		2. Bench marking the environmental and economic performance of 25 existing farm enterprises; 3. Demonstrating cropping sequences and mitigation measures that optimise environmental and economic sustainability in both irrigated and dryland situations. Project outcomes will support sustainable land use intensification on the Ruataniwha plains and reduce the risk of adverse environmental impacts resulting from the use of sub-optimal mitigation measures.	
13/014	Mushroom substrate for improved arable and vegetable productivity.	Mushroom substrate (MS) is a by-product of the mushroom industry, consisting of wheat straw, poultry manure and peat. Arable farmers are expressing an interest in using MS on their farms as a means of adding organic matter to the soil. There is also the potential to reduce fertiliser use as MS is high in important and costly crop plant nutrients: nitrogen (N), phosphorus (P) and potassium (K). Research has shown that MS can lead to increased productivity in both arable and vegetable production. This 2-year project will build on current information by quantifying benefits and the extent to which fertiliser reductions can be made. The latter is important to minimise risk of diffuse pollution from leached nutrients. The project will contribute to improving agricultural productivity, soil functionality and sustainability by ensuring that initiatives to capitalise on 'materials to land re-use' can be implemented in an informed and sustainable way.	Abie Horrocks 03 325 9435
13/015	Producing abundant bee pollinators for sustainable farming	Pollinator security is now a critical issue in the productive sector.Our project will ensure that healthy bee pollinators are plentiful and readily available for crop pollination on all farm-types. "Spring build-up" and "winter-preparation" are crucial "pollen dearth" times for bees when lack of pollen with sufficient protein causes failure to thrive, population crashes, and colony losses. Filling these gaps will produce bigger healthier bee	Tony Roper 021 283 1835

		colonies. We will expand the scope of our candidate list of bee forage plants for farmers to use for purposes such as erosion control, timber, riparian. New planting designs with more diverse species options are needed to optimise protein content for specific requirements on different farm-types. Covering seasonal demand for pollen requires balancing a number of factors that we will encapsulate in an algorithm for creating new planting designs. Planned nutrition for bees on farms will generate higher yields for farmers through superior pollination services.	
13/017	Project Pathfinder: Building the Leadership Capacity of New Zealand's Dairying Women	"NZ could add an additional $550 billion from agricultural exports over the next 40 years... but the ability to grasp this prize is all about leadership and our willingness to pursue economic and industry reform..." As N.Z.'s dairy industry enters the 21st century unprecedented economic and environmental challenges face the sector. Global recession and climate change threaten the sustainability of our current production model highlighting the need for our leaders to reform the sector so social and environmental footprint obligations are maintained without compromising overall productivity. The Dairy Women's Network (DWN) argues that 'business as usual' will not suffice and so aim to increase the leadership capacity of N.Z.'s dairy women at all levels (on-farm, community and governance) to address the social, economic and environmental challenges facing dairying. Key outcomes include: a DWN leadership/mentoring programme, e-Leadership Development Hubs, and an Individualised Pathway Programme to assist women map their own development journeys.	Dr Sue Peoples 03 489 9053
13/024	Enabling growers to maximise value from planting durable eucalypts.	This project builds on the knowledge and interest created by the NZ Dryland Forests Initiative with a critical opportunity to extend this to new landowners and regions. We will develop new knowledge with growers support on best silviculture	Paul Millen 03 574 1001

		practice for adding value to new durable eucalypt plantations. This will be transferred to the new growers and encourage the establishment of new forests of naturally durable eucalypts in NZ drylands. A new silviculture regime for hardwood post and pole production will be developed to manage NZDFI's 11 durable eucalypt demonstration trials to maximise their crop value. Pruning workshops with growers will transfer the practical skills and knowledge and empower aspirant planters. Our measurements will provide key information on productivity thereby encouraging more landowners to plant durable eucalypts. Technology transfer will be supported by videos of best practice establishment, management and silviculture.	
13/025	High-value sawn timber from South Island Eucalyptus nitens	A cost-efficient method for greatly improving sawn timber recovery from young small-diameter unpruned North Island Eucalyptus regnans logs has been conclusively demonstrated in SFF project L09/035. This project will for the first time evaluate the same sawing technique on young small diameter pruned South Island E. nitens – a species that produces a high quality timber but is regarded as very difficult to successfully mill and process.E. nitens is the most widely planted eucalypt in the South Island where it grows extremely well and is widely planted for pulpwood, shelter, aesthetics and firewood. By documenting recoveries of high-value sawn timber products with a case study, this project will directly benefit cool climate farm foresters and other land managers considering plantation forestry options for sustainable and profitable land use.	Dean Satchell 09 407 5525
13/031	Initiatives that support a national wilding conifer strategy	Wilding conifers threaten landscape values, biodiversity and land-use options in the high country. In June 2012, the Minister for Primary Industries approved the development of a non-statutory strategy for wilding conifer management. The submitting Wilding Conifer	Dr Thomas Paul 07 343 5653

		Management Group (the strategy stakeholder group) identified priority needs for improving wilding conifer management. This project aims to meet these identified needs and inform the developing national strategy. The work will provide land managers and regulators with: (i) A national monitoring and reporting framework for wilding conifers; (ii) Cost analyses for specific wilding conifer control and management regimes based on actual costs incurred in different regions (iii) A decision support system to understand wilding Douglas-fir spread better across the wide range of environments and site conditions The project will enable stakeholders to report on long-term success, identify reasons for success and will contribute to the national strategy to manage wilding conifers in New Zealand.	
13/035	Growing a bright future for process carrots	The process carrot industry faces threats from more profitable land uses at a time when international market opportunities are growing. The juice market to Japan alone is anticipated to double within five years. To position the industry to respond to opportunities abroad and domestically carrot growing needs to be more efficient than at present (increased yields of high quality product, more efficient use of inputs) and demonstrate the environmental sustainability of its practices, while remaining profitable for growers. This project will expand on and implement recommendations of the earlier scoping study (SFF 10/154) to support the growth and viability of the NZ process carrot industry. Specifically the project will deliver on-farm practices that will allow growers to: Increase establishment success and crop uniformity, Improve the yield and/or quality of carrot crops, and Optimise and demonstrate sustainable nutrient use. New knowledge will be communicated using established grower discussion groups and case study	John Seymour 04 494 9973

		approaches that proved successful in the scoping study.	
13/040	Mitigating European canker (Neonectria ditissima) risk: a pathway to eradication	This project aims to go beyond European canker management in an apple orchard. We will strive to diminish European canker infections caused by Neonectria ditissima (syn. Neonectria galligena, Nectria galligena), meaning to reduce the disease incidence to 0.01% of commercial apple trees infected in current low risk areas (Waimea goal) and to 1% or less in other risk areas. To achieve this goal, we will develop the world's best practise in European canker control and eradication approaches. A grower's canker risk is fundamentally affected by climate (Beresford RM and Kim KS. 2011. Identification of regional and climatic conditions favourable for development of European canker in apple. Phytopathology 101(1), 135-146); but also by the grower's management of European canker within the orchard. An integral part of the proposed work will be based on the European Canker Management Strategy Ver. 1.2 (ECMS1.2) which was introduced to apple growers during 2011. We will built on and fine-tune ECMS1.2, addressing knowledge gaps and providing specific grower recommendations according to canker risk. The focus will be on amending ECMS1.2 to provide more suitable options for low canker risk orchards.	Dr Mike Butcher 06 873 7086
13/041	Establishment and impact of a new biological control agent for codling moth	Mastrus ridens, a new parasitoid of codling moth, will be released and established throughout the pipfruit growing regions of New Zealand. This project will reduce the threat posed by codling moth to the expansion of pipfruit exports into new, high value, codling moth sensitive Asian markets. It will provide a potential benefit of c.$35m/year. As a result of ongoing biological control, codling moth numbers in commercial and organic orchards and home gardens will decline. The establishment and impact of the parasitoid on codling moth populations	Dr Mike Butcher 06 873 7086

		will be measured both within and outside commercial orchards.	
13/045	The Mana Whenua Project Stage II (Accelerator Phase)	The purpose of the project is to develop a decision support tool which helps Māori land trustees and advisers improve the management, environmental sustainability, productivity and profitability of Māori land. The project will develop an assessment tool which gauges the capability development needs of Māori land entities including governance and management (e.g. financial management systems, strategic and business plans), land use capability compared to current land use, current production levels and/or conservation potential. Secondly, it'll apply the tool to assess the individual needs of a group of Māori land blocks and produce recommendations and strategies to be adopted by those trusts. The project team will then support the trusts to implement those strategies over a period of time which includes, but may not be limited to, the project term. Progress will be monitored against milestones contained in the plans. On completion, the project will be evaluated and the results disseminated.	Shona Jones 06 870 3785
13/047	Ngā Aho Rangahau - "the threads of research".	The primary output for the Ngā Aho Rangahau project is a high-level scoping study that defines the economic opportunities within the Ngāti Maniapoto rohe (region) for our Iwi. Aligned with our economic outcome "to develop and grow the Ngāti Maniapoto tribal estate by stimulating the Maniapoto AND regional economy", we believe this project will provide a platform to successfully benchmark our future financial decisions.The secondary output is a detailed commercial analysis of 5 Maniapoto value propositions which build on optimisation of existing/new developments and a set of tools to integrate opportunities into the future. The Ngā Aho Rangahau project team is enormously experienced; drawing on Maniapoto Māori business experts, Maniapoto Trusts and Incorporations and	Simon Phillips 04 499 3383

		senior Crown Research Institute researchers. The team will collectively build innovative new capacity, tools andopportunities for Ngāti Maniapoto.	
13/049	Pig - SEER - integrating outdoor pigs into OVERSEER	The introduction of the National Policy Statement for Freshwater required regional councils to seek detailed information on nutrient leaching rates from all agricultural practices. As a result, Regional Councils across New Zealand (NZ) (such as Horizons, Canterbury, and Otago) have signalled that the primary method of recording these leaching rates will be through the use of the program OVERSEER® Nutrient budgets (Overseer). Currently while indoor pig farms in NZ can be modelled using Overseer, outdoor bred pigs, which comprise approximately 40% of all NZ production, cannot. This limits both the regional councils' abilities to adequately assess the nutrient leaching risk of outdoor units as well as farmers' abilities to make informed decisions about good nutrient management. This project proposes a multi stage approach with the final goal of the project being to integrate outdoor pig farming into Overseer, benefitting both Regional Councils and creating a valuable resource for NZ pig farmers.	Ian Barugh 06 350 5308
13/052	Addressing key goat industry issues of parasites & lameness	We will increase the productivity of Angora and Dairy goats by improving animal parasite resistance and foot quality. We will use the CARLA Saliva test (section 9) to identify animals with improved protective immunity to internal parasites. This is potentially an important tool for sustainable parasite control strategy for these industries. Foot scores will be used to identify animals with minimal lameness issues to improve flock productivity and address welfare issues. In Dairy goats, we will determine information on the CARLA response and establish its association with faecal egg counts and lameness. In Angora goats results from the progeny of selectively mated animals will be used to determine trait heritabilities and correlations with	Richard Shaw 06 351 8644

		other important traits. Results from these studies will be disseminated to the wider goat communities via newsletters and meetings. This work will benefit all goat farmers by generating knowledge required to improve animal health and goat productivity.	
13/053	Adoption of Deer Industry Environmental Best Practice	The aim is to assist deer farmers to identify best practice for their individual farms, and their regional environmental challenges to improve soil management, nutrient management and water quality. We will encourage commitment to 'farmerssupporting farmers' to adopt best management practices. Ultimately inspiring sustainability and meeting future environmental standards are the key outcomes. The NZ Landcare Trust will facilitate workshops with deer farmers supported by the industry, processors, Beef+ Lamb NZ, fertiliser companies, Regional Councils, Fish & Game NZ, and other stakeholders, encouraging greater understanding and adoption of environmental best practices as identified in the NZ Deer Farmers' Landcare Manual. This will incorporate principles of practice change, identified in the industry's productivity improvement programme. By working with DINZ and the NZDFA, the project will aim to reach as many deer farmers as possible including younger farmers and those located in remote areas, to gain greater adoption of best practice.	Janet Gregory 03 208 7883
13/059	Nitrogen leaching from cut-and-carry lucerne: A change to sustainable low N-leaching farming systems, Lake Taupō.	Each farm in the Taupō Lake Care (TLC) region has a nitrogen (N) discharge allowance that potentially renders many current farming systems uneconomic. To assist farmers in the region, the Lake Taupō Protection Trust (LTPT) has initiated a research programme to provide data for evaluating and enabling a shift to a potentially low N-leaching farming system, which will assist farmers maintain a profitable enterprise while meeting their nitrogen discharge allowance. The proposed SFF project will expand the LTPT programme by:	Dr Malcolm McLeod 07 859 3704

		1. Extending the current Lake Taupō Protection Trust funded N-leaching under lucerne trial for a further two years to obtain robust scientific parameters for the Overseer® model (used to calculate farm nitrogen discharges) 2. Providing robust data on N-leaching under cut-and-carry lucerne to the Overseer® committee to fill a critical data gap 3. Communicating environmental results from the Lucerne trial to farmers in the catchment.	
13/061	Biological control of field horsetail (Equisetium arvense L.) in New Zealand	Field horse tail (Equisetum arvense), a fern-like plant native to North America and Eurasia, has become a serious invasive pest of pasture, crop and riparian areas in wetter regions of New Zealand. Traditional control measures are costly and are failing to control or reduce the spread of this weed. Biocontrol potentially offers a cost-effective and enduring solution. A feasibility study has suggested that prospects for biocontrol of FHT are extremely promising and has identified some potential control agents. This project seeks to implement such a programme for New Zealand, which would involve surveys, importation and testing of up to four potential agents, and preparation of an Environmental Protection Authority (EPA) application to release at least one agent. Crop and pastoral farmers, along with other land owners/managers (including DOC, regional councils, LINZ, Transit NZ) who have areas infested with, or are under threat of invasion, by FHT all stand to benefit.	Alistair Cole 06 359 3700
13/068	Stopping the Chilean Needle Grass Invasion	The objective of this project is to increase awareness and develop tools that different stakeholders can use to reduce the impact of Chilean needle grass (CNG). The outcomes will be that landowners and the general public throughout New Zealand will be able to identify this weed, understand the risk it poses and use a range of tools to control and contain it. The main beneficiaries are New Zealand's pastoral, viticulture and arable farmers	Laurence Smith 03 314 7034

		and the aligned people and businesses that support and benefit these industries. The project contributes to the sustainability of agriculture in New Zealand by raising the national awareness of CNG thereby (1) facilitating the early detection, control and containment of this plant beyond its known current distribution of 3400ha and (2) stopping its wider spread to the 15 million hectares of susceptible land by ensuring land owners have the ability to manage it.	
13/070	Sustainable management of undervine vegetation on grape quality, vine performance, grape composition, and soil properties	This project compares two nonchemical means for managing undervine vegetation to the current standard practice of repeated herbicide sprays	Dr Simon Hooker09 306 5556
13/071	Sustaining vineyards through practical management of grapevine trunk diseases	Grapevine trunk diseases can kill vines and have major economic impact in wine regions worldwide. In New Zealand, they are becoming prevalent and threaten the sustainability of the $1.6 billion wine industry, reliant on the highly susceptible variety Sauvignon Blanc. This project will develop strategies to reduce the impact of trunk diseases, contributing to the Sustainable Winegrowing New Zealand programme. It will deliver recommendations for practical application of pruning wound treatments using tractor-driven sprayers, along with advice on optimal timing of application and a range of effective treatments to provide chemical and non-chemical alternatives for growers. Economic analysis will provide decision support for growers and encourage adoption of practices for the benefit of the wine industry. The project will also build scientific and technical capability in New Zealand for grapevine trunk disease management and is highest priority for the NZ wine industry and the only SFF proposal being supported.	Dr Simon Hooker09 306 5556
13/075	North Canterbury Sustainable Farming Systems	The Project addresses an information and technology gap for North Canterbury Pastoral farmers. The Canterbury Water Management Strategy (CWMS) has	Andrew Harris 03 319 2842

		identified 100,000 hectares of land in North Canterbury suitable for irrigation which has high potential for increased productivity.However the Land and Water Regional Plan impose nutrients limits by catchment and the requirement for nutrient management regimes for rural land use, both new and existing. This will force farmers to search out and implement new technologies, economically and financially sustainable land-uses, whether or not they choose to irrigate. Currently conversion to dairying is perceived to provide the most viable option to support the high level of capital investment required for irrigation establishment, infrastructure establishment and ongoing management. However, key dryland research has identified sustainable management practices for improved forage and grassland species and their pasture management. The sustainable management of water resources and water quality will require appropriate balancing of the ecological, social, economic and cultural needs within each catchment. This project aims to address these issues. Through catchment groups the Project will provide a comprehensive set of background information and supporting data to allow better analysis and understanding of improving sustainability and its application in Land Management to meet ECAN regulations.	
13/077	Producing an action plan for productivity, environment and collaborative water management in the Mangatarere Catchment.	This project will develop a whole-catchment action plan for water quality management in the Mangatarere sub-catchment of the Ruamahanga Catchment. This project will: develop a partnership forum to bring key water stakeholders together to discuss productivity, environment and water management; use collaborative processes to identify participants views on environmental problems and solutions associated with water management in the catchment while considering how these issues and solutions can impact on productivity; design an Action Plan to allow a strategic approach	Esther Dijkstra 06 379 8340

		to implementing solutions that meet both environment and productivity objectives; and facilitate commitment and sign up by water stakeholders to implementing the action plan; share learnings with other sub-catchments in the region to assist the facilitation of Greater Wellington Regional Council's limit setting activities in the Ruamahanga Catchment; and prioritise the spending of funding committed to the MRS for on-ground work to improve stream health. It will bring together existing activities such as a NIWA Envirolink Project to allow more effective targeting of farm plans to priority hot spot areas, movements towards collaborative limit setting activities by Greater Wellington Regional Council and the recent formation of the Mangatarere Restoration Society. This project will bring together water stakeholders to own and develop solutions through catchment based collaborative processes that result in productivity improvements while improving environmental sustainability.	
13/078	Pomahaka Integrated Catchment Management Investigation	The Pomahaka catchment has been identified by the Otago Regional Council as a hotspot within Otago due to poor water quality. This is caused by a combination of relatively high rainfall combined with tile and mole drainage, stock access in waterways and winter feed crop grazing on saturated hillside pastures. This project will be a scoping project to ascertain the most effective way to assist farmers and other stakeholders to improve water quality in the catchment while optimising profitability and will: 1. build on existing relationships within and between the catchment's communities as well as with agency and industry stakeholders 2. draw together existing knowledge of current land use practices and their contribution to water quality issues within the catchment	Janet Gregory 03 208 7883

		3. identify the effective options to assist land managers to change current land use practices contributing to poor water quality while also optimising farm profitability.	