



# finalreport

## FEEDBASE AND PASTURES

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## Field Research Site Register Project

### **Abstract**

A web-based, browser access, Field Research Site Register data base has been established to create a knowledgebase of the location of field research sites and the measurements undertaken at them. It will be accessible by remote access for MLA research managers and contracted researchers to use seeking details of field sites associated with current and past research projects.

The Field Research Site Register will enable more efficient management of projects and sharing of current research assets between projects for improved efficiency and collaboration of research activities and also provide a corporate memory for MLA of passed field research site location and activities.

## Executive Summary

Based on the approval of a prototype developed under project PAST.238, a web-based, browser access, Field Research Site Register (the Register) data base has been established to create a knowledgebase for MLA Management and contracted researchers to use in identifying where MLA funded project field research sites are located and what measurements are undertaken at those sites.

The register also automatically creates an archive of field site information (location and measurements taken) as projects pass their end dates to incrementally develop an MLA corporate memory of past field research activities.

The Field Research Site Register will enable more efficient management of projects and sharing of research assets between projects for improved efficiency and collaboration of research activities and also review and retrieval of historical site information for strategic use by researchers and research managers.

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### 1 Background

Meat and Livestock Australia (MLA) have a requirement for a web-based field research site register to consolidate and provide access to information relating the MLA field based research investments.

This project was commissioned to further develop a prototype web-based system in PAST.238 which would allow researchers and MLA Research Managers to easily share information on field site research projects.

This project represents phase two of a two-phase project – Phase 1 was the development of a prototype site register. Based on the successful development and acceptance of the prototype, phase 2 was commenced to develop a final web-based research site register based on a revised detailed briefing provided by MLA (see appendix)

### 2 Project Objectives

*The Consultant will achieve the following objective(s) to MLA's reasonable satisfaction:*

1. By 30th December, 2006 construct, test, populate and deliver a fully functional web-based field research site register to specifications as provided in writing by MLA.

**Note:** The contractor, Progressive Business Technologies, completed their task by this date. Population of the register with MLA project information and researcher responses was facilitated by R J Hannam, Southern Feedbase coordinator MLA consistent with support from MLA administration and managers.

### 3 Methodology

Visual Basic, SQL, HTML, Java Script and ASP programming capability was used to further develop the prototype into a finished product with full planned functionality by enable MLA Management have access to knowledge on where their field research sites are located, their key features and the measurements undertaken at them.

### 4 Results and Discussion

#### 4.1 Operational Information

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The system is now fully functional and has been tested by Dr Hannam and a range of researchers who have reported no technical problems with site functionality.

The site requires that the site administrator, currently Dr Hannam, establish a project file for each MLA contracted project that has field research sites as part of their agreed activities. During this process a researcher identity is established which define a user name (email address) and password (generated by the site administrator) for use by the researcher as log-in details for access to their specific project file.

Once the project file has been established, the site administrator sends an email to the researcher with their specific log-in details and instructions for them to access their specific project file and enter details on site description and the nature of the measurements they undertake at their various field sites. There may be several field sites attached to any one project which requires the researcher to generate a separate site record for each site. Once these details are entered the project and site files are complete and stored in the site register database.

A key feature of the register is that when a project comes to an end and passes its end date, it is identified in the database as an “archived” project. This allows the register to incrementally develop a corporate knowledgebase of field sites used as part of its research investments.

These projects and sites can then be searched in terms of:

- Project status – current, archive
- Last name of researcher
- State
- Soil type,
- Annual rainfall
- Pasture type
- Animal type
- Soil measurements
- Water measurements
- Pasture measurements
- Animal measurements
- Economic measurements

There is also a “Quick Find” feature which, by entering the project code, displays information about the project and sites details specific to that project.

Once the search is complete, a list of projects that match the search parameters are displayed on the report manager page. Selection of any of the sites listed within a project will display a pop-up site report that displays all the relevant details associated with the chosen site record. This record can be printed.

To assist navigation around the site, tip boxes have been provided. Once the cursor is hovered over these navigation points in the main menu, a small tip box appears which describes advises on how to use that particular function and what it will do. These were designed and entered by Dr Hannam in association with Progressive site developers.

It should be emphasised that the field research site register simply describes what is being done, and where. It does not allow for attachment of reports, pictures, and research progress logs to be stored, nor is it a research database to store raw data gathered. These are some of the misunderstandings of purpose that have needed to be clarified among the users of the site register so far. These are features that MLA may wish develop in future.

Appendix 9.1 provides some screen shots of the site to provide an impression of appearance and function.

### Website Design

The website design remains as presented in the prototype. Should MLA wish to enhance the appearance and graphic design of the website, Progressive can refer MLA to a competent graphic designer if required.

### Data Validation

Data validation rules have been created for the site according to specifications.

### Database Development

A database design has been undertaken based on the provided material. Tables and fields have been created to enable the above mentioned functionality (login, site and soil saving and searching) to operate. This was developed based on the precise definition of the required fields by MLA.

### Backend Coding

Backend coding joins the website pages to the database and implements business rules. The completed backend coding has ensured compliance with the business rules in the specification and enabled provision of full functionality.

## 5 Success in Achieving Objectives

### 5.1 Success in Achieving Objectives and Next Steps

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#### 5.1.1 Fully functional site completed

The fully functional version of the Field Research Site Register has been successfully completed and tested.

To the extent to which MLA was able to provide project and researcher details, project file fields for those MLA projects that have field research sites have been populated on the site register.

All relevant researchers have been communicated with to enter their specific project and site details. A high proportion of researchers have successfully accessed the site to enter their project-specific details. However, some remain to be completed. This requires the managers of those projects to ensure compliance.

#### 5.1.2 Developing and implementing an operational robust site.

The move from the prototype version to the fully functional version was based on the revised specification for the project as described in Appendix 9.2. The specification was developed by Dr Hannam in consultation with other MLA managers.

The site was tested by Dr Hannam and has since been verified to be robust through use by researchers. Only minor adjustments in layout were required during this process to help site administration functions.

The site is currently hosted and maintained at Progressive Business Technologies. Dr Hannam acts as the site administrator.



## **6 Impact on Meat and Livestock Industry – now & in five years time**

### **6.1 Future developments Stage 3 – System Enhancements**

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Future enhancements are generally a suggested ‘wish list’ of items that would be of value to implement to enhance the current version of the site. However these enhancements are not critical to the successful operation of the system for the functions for which it was designed.

Some enhancements might include:

Automatic email functionality to/from website

Auditing changes

Additional data to be captured

Automating process for creation of additional data base information fields

Additional reporting at case and summary level

Website design change

Archiving and Knowledge base; copy the site register to an archive format in which sites no longer in use are held with capacity to attach research reports and other documents as either MS Word or PDF files.

### **6.2 Impact on Meat and Livestock Industry – now & in five years time**

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The impact of this research site register will be through more efficient management and collaboration of MLA field based research activities.

## **7 Conclusions and Recommendations**

### **7.1 Conclusions**

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This project has successfully created a valuable field research project database through a browser based internet format. It allows for the site to grow incrementally to develop a useful knowledgebase of what field research is being and has been conducted and where these sites are/were located from among MLA research investments.

The site will allow research managers to monitor where research sites are located and what measurements are being undertaken at them. This may facilitate possible sharing of research sites between researchers and research projects to attain efficiencies of research investments and enhance collaborative efforts in research to attain synergy in research outputs from different but similar projects.

The archiving feature of the site allows for MLA to develop a corporate “memory” of field research activities over time.

The site is largely populated with information relevant to MLA's existing projects which have field research sites attached.

### 7.2 Recommendations and Options

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#### Transfer of the site to MLA Management

Currently the site is hosted at Progressive Business Technologies in Adelaide. Going forward, the following options are suggested:

- The site to be transferred to the MLA server for the MLA IT section to manage and support. Progressive can offer instruction to the MLA staff during this transfer phase and provide technical support to ensure the site operates successfully on the MLA systems. This service is offered by Progressive at standard time-based consultancy rates and expenses reimbursed.
- The site can continue to be hosted and supported by Progressive Business Technologies for a negotiated monthly maintenance and support fee.
- However, the operation and site administration functions would be performed by MLA or their nominee. Currently this function is performed by Dr Hannam of R J Hannam & Co Pty Ltd of Adelaide in a consultancy role. Alternative arrangements for site administration should be negotiated with Dr Hannam directly.

#### Site Enhancements

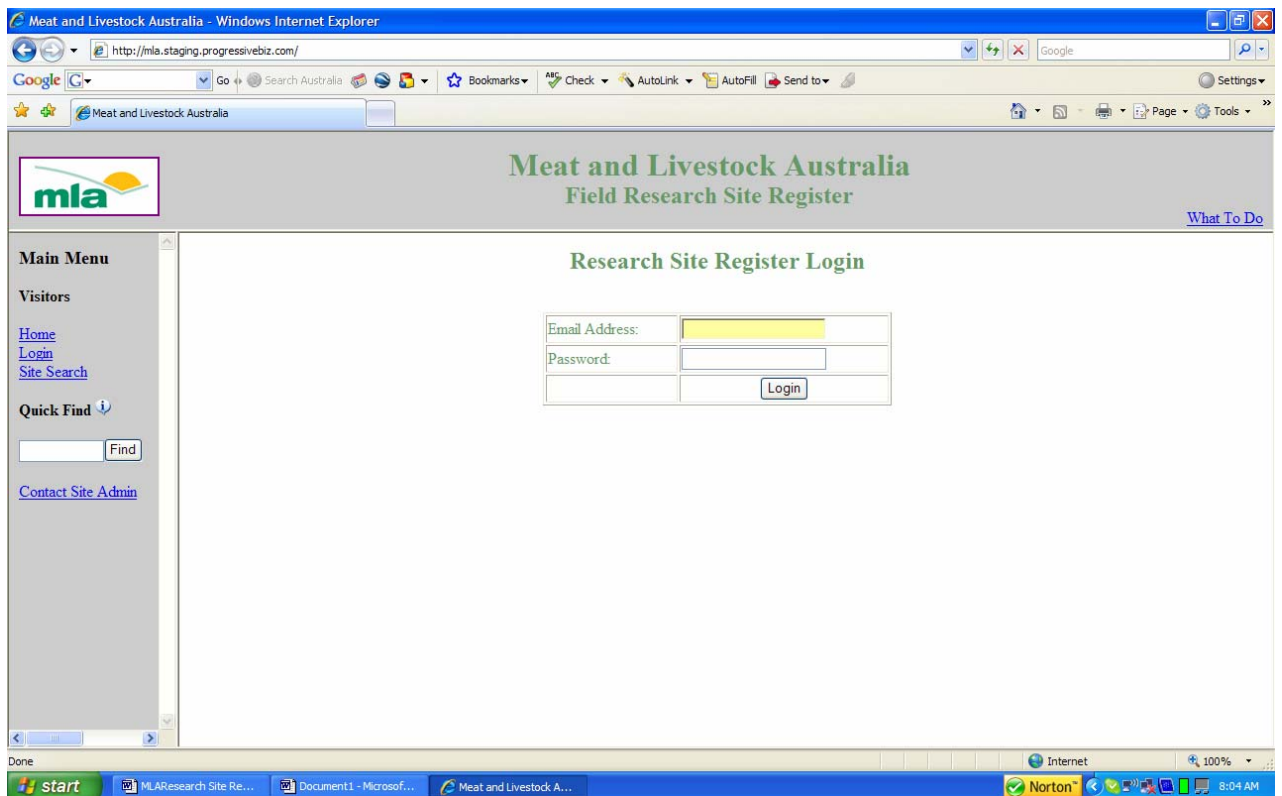
- **Appearance** – the prototype appearance has been retained. Should MLA wish to enhance the appearance and presentation of the site, Progressive Business technologies can direct to a competent graphic designer to undertake this task. Any services or technical support required of Progressive would be charged at standard consultancy rates
- **Knowledgebase** - The original concept for the field research site register was that during design, provision could be made for future enhancements to allow for attachment of reports, papers, visuals etc relevant to the project. This was suggested by Dr Hannam as a way for archived projects in particular to have appropriate reporting materials available over the web and be a way to develop a knowledgebase of MLA research activities and outcomes. Should MLA wish to develop this component, Progressive may either negotiate a suitable arrangement against a detailed specification or refer MLA to another service provider.
- **Further technical/functional enhancements** – These have been suggested in 6.1 and progress here should be subject to a precise brief being developed to allow for suitable costing and proposal preparation.

## 8 Appendices

### 8.1 Appendix 1 - Screen Shots

#### MLA Site Register Screen Shots

##### Login Screen



## Home Page

The screenshot shows a web browser window titled "Meat and Livestock Australia - Windows Internet Explorer". The address bar shows the URL "http://mla.staging.progressivebiz.com/". The page features the MLA logo on the left and the title "Meat and Livestock Australia Field Research Site Register" in the center. A "What To Do" link is visible in the top right corner. The main content area is titled "Research Site Register" and includes an "Introduction" section with the following text: "Welcome to the Meat and Livestock Australia Field Research Site Register. MLA invests in a wide range of research activities, much of it field based and this register is designed to enable better management of these MLA research investments and help facilitate better utilization of research assets. The Register seeks to describe the location and characteristics of all the field research sites and the measurements undertaken at them across the wide range of research projects and programs with MLA investment. The Register does not store data - simply describes what field experimentation is done and where. It foreshadows a developing interest in MLA to make information more accessible to research managers and scientists." Below this, it states: "The register will remain current by indicating sites associated with currently active projects. After project completion, the files will be housed in a site register archive which still provides access and helps retain a corporate memory of past field research. All researchers working on field trials with MLA investments are required to complete the research site Register as a key part of their project." It further explains: "All researchers and visitors to the Register will be able to search the site on key words to identify and describe the range of sites which may be of interest. A brief site report for each site of interest can then be generated which includes contact details, an overview of the research, site description and data collected. These reports can be printed." A note follows: "It is important that the information entered into the Register is correct and complete." A "contact us" link is provided for additional fields. The "Purpose" section states: "The aims of the Register are to:" followed by a bullet point: "• Create opportunities for research asset and data sharing between projects". A "Main Menu" sidebar on the left contains links for "Visitors" (Home, Login, Site Search), "Quick Find" (with a search box and "Find" button), and "Contact Site Admin". The Windows taskbar at the bottom shows the Start button, several open applications, and the system tray with the time 8:03 AM.

## Project File Registration

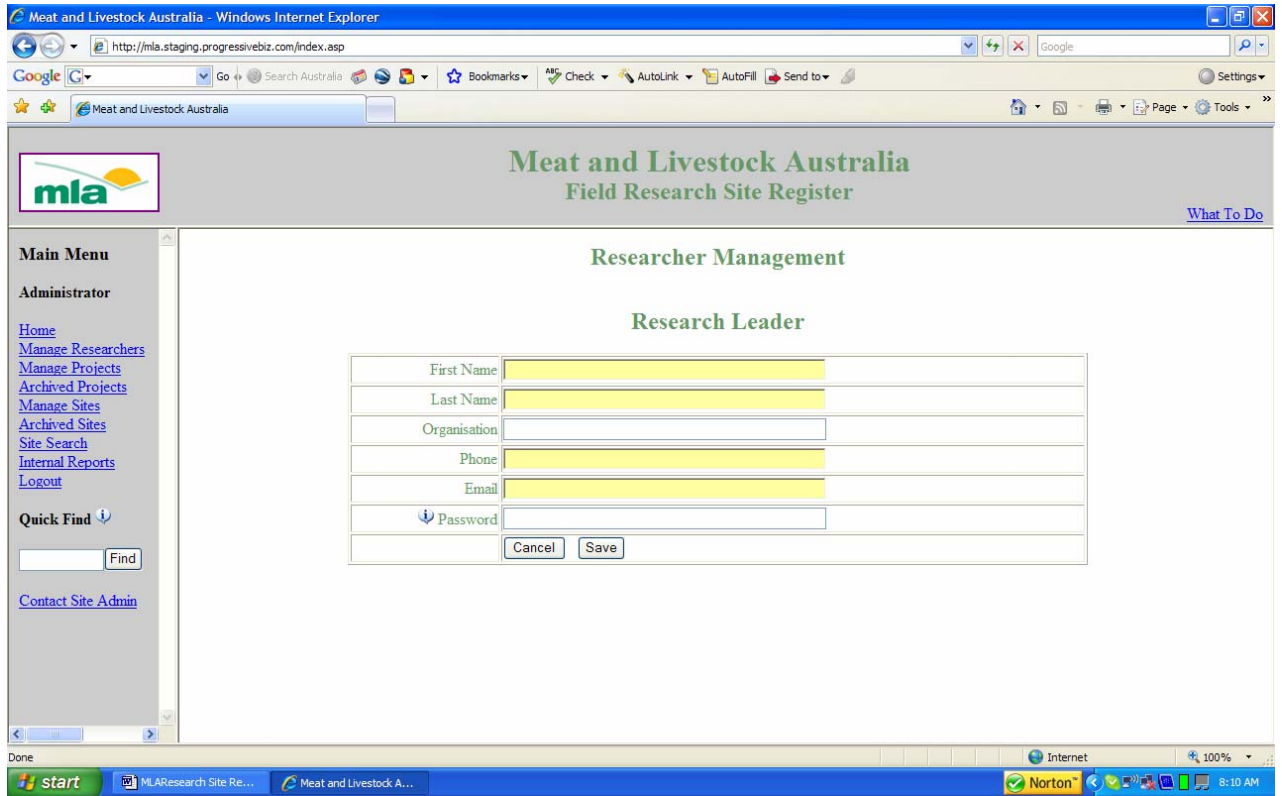
The screenshot shows a web browser window titled "Meat and Livestock Australia - Windows Internet Explorer" with the URL "http://mla.staging.progressivebiz.com/index.asp". The page header includes the MLA logo and the text "Meat and Livestock Australia Field Research Site Register". A "What To Do" link is visible in the top right corner.

The main content area is titled "Project Management" and "Add / Edit Project". It contains a form with the following fields:

Project Code	<input type="text"/>
Project Title	<input type="text"/>
Research Leader	<input type="text"/>
Name	Please Select... <input type="button" value="v"/>
RDC Contact	<input type="text"/>
Name	<input type="text"/>
Email	<input type="text"/>
Start/Finish	<input type="text"/>
Start Date	<input type="text"/> (DD/MM/YYYY)
Finish Date	<input type="text"/> (DD/MM/YYYY)
Purpose & Objectives	<input type="text"/>

The form is displayed within a browser window. The taskbar at the bottom shows the Windows Start button, several open applications (MLAResearch Site Re..., Document1 - Microsof..., Meat and Livestock A...), and system tray icons including Norton, Internet, and the time 8:06 AM.

Researcher Register



Site Details Register

**Meat and Livestock Australia**  
Field Research Site Register

**Site Details**

<b>Site Location</b>	Nearest town	<input type="text"/>
	State	Please Select...
	Latitude	<input type="text"/>
	Longitude	<input type="text"/>
<b>Experimental Design &amp; Management</b>	Brief Summary	<input type="text"/>
<b>Site Features</b>	Ave Rainfall (mm)	Please Select...
	Soil Type	Please Select...
	Pasture Type	Please Select...
<b>Paddock History</b>	Year 1	
	Paddock use	Please Select...
	Fertiliser	K N Other P

Site Measurements - Soil

Meat and Livestock Australia  
Field Research Site Register

What To Do

**Site Measurements**  
**SOIL**

Parameter	Select for Yes	Frequency/Comments
<b>Physical</b>		
<input type="button" value="Please Select..."/>		<input type="text"/>
<input type="button" value="Australian Soil Classification"/>		<input type="text"/>
Colour	<input type="checkbox"/>	
Texture	<input type="checkbox"/>	
Bulk Density	<input type="checkbox"/>	
Soil Water	<input type="checkbox"/>	
Dispersion	<input type="checkbox"/>	
Penetrometer	<input type="checkbox"/>	
<b>Chemical</b>		
<input type="button" value="Please Select..."/>		<input type="text"/>
pH	<input type="checkbox"/>	
EC	<input type="checkbox"/>	
Macronutrients	<input type="checkbox"/>	
Micronutrients	<input type="checkbox"/>	

Done

start MLAResearch Site Re... Document2 - Microsof... Meat and Livestock A... Norton 100% 8:25 AM



Site Measurements - Water

The screenshot shows a web browser window with the URL <http://mla.staging.progressivebiz.com/index.asp>. The page header includes the 'Meat and Livestock Australia' logo and the text 'Meat and Livestock Australia Field Research Site Register'. A 'What To Do' link is present in the top right. The main content area is titled 'Site Measurements Water' and contains a table with the following data:

Parameter	Select for Yes
Salinity	<input type="checkbox"/>
Infiltration	<input type="checkbox"/>
Run-Off	<input type="checkbox"/>
Sediment Load	<input type="checkbox"/>
Water Balance	<input type="checkbox"/>
Chemical Analysis	<input type="checkbox"/>

Below the table are 'Cancel' and 'Save' buttons. The left sidebar contains a 'Main Menu' with links for 'Home', 'Manage Researchers', 'Manage Projects', 'Archived Projects', 'Manage Sites', 'Archived Sites', 'Site Search', 'Internal Reports', and 'Logout'. There is also a 'Quick Find' search box and a 'Contact Site Admin' link. The Windows taskbar at the bottom shows the Start button, several open applications, and the system tray with the time 8:25 AM.

Site Measurements - Pasture

Meat and Livestock Australia - Windows Internet Explorer

http://mla.staging.progressivebiz.com/index.asp

Meat and Livestock Australia

**Meat and Livestock Australia**  
Field Research Site Register

[What To Do](#)

**Site Measurements**  
**PASTURE**

Parameter	Select for Yes	Frequency
<b>Herbaceous Pastures</b>		
Dry Matter	<input type="checkbox"/>	Please Select...
Pasture Species	<input type="checkbox"/>	
Pasture Composition	<input type="checkbox"/>	
Pasture Growth	<input type="checkbox"/>	Please Select...
Ground Cover	<input type="checkbox"/>	Please Select...
Root Depth/Mass	<input type="checkbox"/>	
Nutritive Value	<input type="checkbox"/>	
Nutritional Metabolites	<input type="checkbox"/>	
Other	<input type="checkbox"/>	
<b>Weeds</b>		
Species	<input type="checkbox"/>	
Other	<input type="checkbox"/>	

Done

start MLAResearch Site Re... Document2 - Microsof... Meat and Livestock A... Norton Internet 100% 8:26 AM

Site Measurements - Animals

**Meat and Livestock Australia**  
Field Research Site Register

**Site Measurements**  
**ANIMAL**

Parameter	Select for Yes	Frequency/Comments
<b>Animal</b>		
Animal		Please Select...
Genotype Sire		
Genotype Dam		
Stocking Rate	<input type="checkbox"/>	
Liveweight	<input type="checkbox"/>	Please Select...
Fat Score	<input type="checkbox"/>	Please Select...
Condition Score	<input type="checkbox"/>	Please Select...
Wool Production	<input type="checkbox"/>	
Wool Test	<input type="checkbox"/>	
Other	<input type="checkbox"/>	
<b>Reproduction</b>		

Site Measurements - Economic, Modelling and Delivery

The screenshot shows a web browser window displaying the 'Meat and Livestock Australia Field Research Site Register' application. The page is titled 'Site Measurements Economics, Modelling and Delivery'. On the left, there is a 'Main Menu' for administrators with links like Home, Manage Researchers, Manage Projects, Archived Projects, Manage Sites, Archived Sites, Site Search, Internal Reports, and Logout. Below the menu is a 'Quick Find' search box and a 'Contact Site Admin' link. The main content area contains a table with the following structure:

Parameter	Select for Yes	Frequency/Comments
<b>Economics</b>		
Input Costs	<input type="checkbox"/>	
Returns	<input type="checkbox"/>	
Profit	<input type="checkbox"/>	
ROI	<input type="checkbox"/>	
Gross Margins/Head	<input type="checkbox"/>	
Gross Margins/HA	<input type="checkbox"/>	
Partial Budgets	<input type="checkbox"/>	
Farm Profit	<input type="checkbox"/>	
Other	<input type="checkbox"/>	
<b>Modelling</b>		
Objectives		<input type="text"/>

## Project Manager

The screenshot displays the 'Project Manager' interface for the Meat and Livestock Australia Field Research Site Register. The browser window title is 'Meat and Livestock Australia - Windows Internet Explorer'. The URL is 'http://mla.staging.progressivebiz.com/index.asp'. The page header includes the MLA logo and the text 'Meat and Livestock Australia Field Research Site Register'. A 'What To Do' link is visible in the top right corner.

The main content area is titled 'Project Manager' and features a table with the following data:

Project Code	Project Title	Task
	<a href="#">Add New Project</a>	
AHW.085	Increasing Lamb Survival By Selection For Temperament	<a href="#">Edit</a> <a href="#">Delete</a>
B.SGS.0403	Reedy Creek Lamb Finishing Project	<a href="#">Edit</a> <a href="#">Delete</a>
ER.101	Understanding the interactions between biodiversity and the management of native pastures in the Murray Darling Basin.	<a href="#">Edit</a> <a href="#">Delete</a>
ER.211	The pasture growth and environmental benefits of dung beetles to the southern Australian cattle industry	<a href="#">Edit</a> <a href="#">Delete</a>
FLOT.331	Greenhouse gas emissions from Australian beef cattle feedlots	<a href="#">Edit</a> <a href="#">Delete</a>
HRZ.200	Evergraze - More Meat from Perennial\$	<a href="#">Edit</a> <a href="#">Delete</a>
MBFP.025	Demonstration of Rotational Grazing to Increase Production	<a href="#">Edit</a> <a href="#">Delete</a>
MS.027	LambMax Australia - Towards the Future of Australian Lamb Production	<a href="#">Edit</a> <a href="#">Delete</a>
MS.028	Best practice management to increase the profitability of Merino sheep meat production	<a href="#">Edit</a> <a href="#">Delete</a>
NBP.317	Sustainable Development of VRD Grazing Lands	<a href="#">Edit</a> <a href="#">Delete</a>
NBP.339	Understanding and improving heifer fertility in the NT.	<a href="#">Edit</a> <a href="#">Delete</a>
NBP.352	Feeding to increase productivity and reduce greenhouse gas emissions	<a href="#">Edit</a> <a href="#">Delete</a>
NBP.356	Pre-emptive eradication of weedy tropical forages	<a href="#">Edit</a> <a href="#">Delete</a>
PAST.001	Perennial Grass Improvement for Low-Medium Rainfall Recharge Environments	<a href="#">Edit</a> <a href="#">Delete</a>
PAST.235	Enrich - Multi-purpose 'healthy' grazing systems using shrubs	<a href="#">Edit</a> <a href="#">Delete</a>
PAST.202		

The left sidebar contains a 'Main Menu' for 'Administrator' with links: Home, Manage Researchers, Manage Projects, Archived Projects, Manage Sites, Archived Sites, Site Search, Internal Reports, and Logout. Below this is a 'Quick Find' section with a search box and a 'Find' button, and a 'Contact Site Admin' link. The Windows taskbar at the bottom shows the start button, several open applications, and the system tray with the time 8:29 AM.

## Search and Report Manager

The screenshot shows a web browser window titled "Meat and Livestock Australia - Windows Internet Explorer" with the URL "http://mla.staging.progressivebiz.com/index.asp". The page header features the MLA logo and the text "Meat and Livestock Australia Field Research Site Register". A "What To Do" link is visible in the top right.

The main content area is titled "Report Manager" and contains a "Select Search Criteria" section. Below this, there are "Search Tips" and a note: "Not all fields are required to be filled in to perform a search. However the narrower the search the quicker the results will be returned. In the measurements fields, use Ctrl to select additional measurements of interest."

The search criteria are organized into two columns of dropdown menus:

Search Criteria	Options
Project Status	All Projects
Last name of researcher	Please Select..
State	Please Select..
Nearest Town	
Soil Type	Please Select..
Annual Rainfall	Please Select..
Pasture Type	Please Select..
Animal Type	Please Select..

Measurement Category	Options
Soil Measurements	Please Select.. Colour Texture
Water Measurements	Please Select.. Salinity Infiltration
Pasture Measurements	Please Select.. Dry Matter Pasture Species
Animal Measurements	Please Select.. Stocking Rate Liveweight

The left sidebar contains a "Main Menu" with an "Administrator" section listing links: Home, Manage Researchers, Manage Projects, Archived Projects, Manage Sites, Archived Sites, Site Search, Internal Reports, and Logout. Below this is a "Quick Find" search box with a "Find" button and a "Contact Site Admin" link.

The Windows taskbar at the bottom shows the Start button, several open applications (MLAResearch Site Re..., Document2 - Microsof..., Meat and Livestock A...), and system tray icons including Norton, Internet, and the time 8:31 AM.

## Internal Reports

The screenshot shows a web browser window displaying the 'Meat and Livestock Australia Field Research Site Register' website. The page title is 'Internal Reports'. On the left, there is a 'Main Menu' with links for 'Home', 'Manage Researchers', 'Manage Projects', 'Archived Projects', 'Manage Sites', 'Archived Sites', 'Site Search', 'Internal Reports', and 'Logout'. Below the menu is a 'Quick Find' search box and a 'Contact Site Admin' link. The main content area features a 'Report' section with three links: 'Number of sites registered per researcher', 'Number of sites registered per RDC Contact', and 'List of projects, title, researcher, and RDC contact'. Below these links is a table with two columns: 'Statistics' and 'Value'. The table contains the following data:

Statistics	Value
Number of projects registered	47
Number of current projects	41
Number of archived projects	6
Number of sites registered	37
Number of current sites	37
Number of archived sites	0

Site Reports

The screenshot shows two overlapping browser windows from the Meat and Livestock Australia website. The background window displays a search results page with a table of projects. The foreground window displays a detailed site report for project ER.101.

**Search Results Table:**

Code	Title
ER.101	Understanding the interactions between management of native pastures in the Murrumbidgee region, Victoria
	Alexandra, VIC
	Binalong, NSW
	Boorowa, NSW
	Gundagai, NSW
	Holbrook, NSW
	Jugiong, NSW
	Strathbogie, VIC
	Yackandandah, VIC
	Yass, NSW
FLOT.331	Greenhouse gas emissions from Australian feedlots
	Charlton, VIC

**Site Report Details:**

**Project Details**

Project Code	ER.101
Project Title	Understanding the interactions between biodiversity and the management of native pastures in the Murray Darling Basin.
Research Leader	
Name	Vivienne Turner
Organisation	CRC for Plant Based Management of Dryland Salinity
Phone	03 9450 8662
Email	Vivienne.turner@dse.vic.gov.au
RDC Contact	
Name	Michelle Kellaway
Email	mkellaway@mila.com.au
Start/Finish	
Start Date	11/04/2005 (DD/MM/YYYY)
Finish Date	30/05/2008 (DD/MM/YYYY)
Purpose & Objectives	The project aims to better inform the management of native biodiversity in sheep grazing uplands of the Murray Darling Basin by: 1. Providing empirical evidence on the influence of grazing management on plant, bird and reptile species diversity relative to other site and systems features such as rainfall, slope, tree cover, farm income, proximity to nature reserves and large remnants. 2. Developing predictive models of the influence of strategic grazing on plants, birds, and reptiles, relative to other site and systems features such as rainfall, slope, soil fertility, tree cover, proximity to nature reserves and large remnants and farm



## **8.2 Appendix 2 – Project Specification (Developed by R J Hannam)**

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### **Introduction**

MLA requires a register of the field-based research sites which are subject to funding by MLA with a view to help MLA managers optimize utilization of research assets and for researchers to investigate possible sharing of research sites for synergistic outcomes.

In summary the following is required:

- A browser based capability consistent with MLA visual branding to enable:
  - The hosting of details associated field research sites in MLA funded projects including the measurements undertaken at these sites in a suitable database
  - MLA to upload data into specified fields consistent with information in project contracts and which cannot be edited by users other than the site administrator
  - Registered researchers (contracted to MLA projects) managing the sites to input specified data consistent with the research activity at those sites (may be more than one site per project)
  - Free access to the register by any user for searching the database to identify current and past (concluded) field research sites to view site reports which describe project details and measurements undertaken at those sites.
- The essential elements required are:

<b>welcome page</b>	Contains descriptive information on the purpose of the site and how to use it
<b>Log-in</b>	For the MLA site administrator and contracted researchers
<b>Researcher profile screen</b>	For the site administrator to create a researcher profile for new projects and allocate passwords to facilitate researcher log-in.
<b>“enter project” screen</b>	<p>With which the MLA site administrator enters essential information into prescribed fields to establish and save each project file in the database. These are to include:</p> <ul style="list-style-type: none"> <li>• Project code – this is the key identifier for individual project which will be a unique alpha-numeric sequence associated only with that project</li> <li>• Project title</li> <li>• Research leader – name and email address (important for researcher log-in)</li> <li>• Start and finish dates</li> <li>• The above fields are essential but the following fields should also be allowed for:                             <ul style="list-style-type: none"> <li>○ Researcher phone number</li> <li>○ RDC contact – name ad email</li> <li>○ Purpose and description</li> </ul> </li> </ul>
<b>“enter new site details” screen</b>	<p>Into which researchers enter site descriptive details associated with each project. A single project may have multiple sites, each with a different location. Prescribed fields to be completed in each site details record are:</p> <ul style="list-style-type: none"> <li>• Site location – nearest town, state</li> <li>• Site features – annual rainfall, soil type</li> <li>• The above fields are required but the following should be allowed for:</li> </ul>

## Field Research Site Register Project

	<ul style="list-style-type: none"> <li>○ Experimental overview – a brief description of experimental activity</li> <li>○ Paddock history – paddock use, fertilizer, and soil ameliorants. Allow for repeated entry for each of three years prior to the experimental site being established.</li> <li>○ Latitude/longitude</li> </ul>
<b>“site measurements” screens</b>	In which researchers check prescribed boxes associated with measurements they undertake to describe their on-site activities. Some of these are associated with frequency as shown in the definition of fields. There is a series of these, each representing site measurement categories – soil, pasture, animal, water
<b>page navigation</b>	A logic/system which permits navigation between screens within projects and also creates new project files and attending site details records.
<b>Current and completed projects</b>	A mechanism to distinguish between active and past projects
<b>“report manager”</b>	<p>which provides:</p> <ul style="list-style-type: none"> <li>● A search function – see functionality</li> <li>● List project codes, titles and researcher contact</li> <li>● Identify the projects as current or completed</li> <li>● Ability to select an item in the list to bring up the chosen project records which may be printed</li> </ul>
<b>“quick-find”</b>	A feature which, on entry of the project code, brings up the appropriate project(s) in the report manager listing.

To achieve this, the following specification has been compiled.

### Business Rules:

1. MLA to create and save a file on the site register for each project by entering a project code and other details as described in the definition of fields.
2. MLA contracted researchers to complete data entry into the specified fields (see definition of fields).
3. Only the nominated MLA site administrator and currently contracted researchers should have access to the site to insert and edit field entries. A log-in function restricted to these people is required to control access. The site administrator should have access to all site and projects records in the register while researchers should have access only to those projects for which they are contracted
4. All other users have free access to search for and retrieve summary reports of the site details and measurements undertaken. No registration is required. These users are not able to access or edit fields in the register. They can print site reports.
5. Naming and format conventions are to be determined by the site administrator.
6. Once projects pass the completion date, site records are to be represented in a completed projects list. Links to “current” and “completed” projects to be displayed on the site register site in the form of navigation menus. These are to display the same details for sites but simply displayed on separate lists. The completed projects need no editing. Visitors are able to search either list.
7. Addition of new fields or changes to existing fields is to be managed via application to the site administrator. Inclusions and changes will be approved by MLA and updating the site negotiated with Progressive on a fee-for-service basis.

### Website Design (comment relative the prototype)

1. For the current purpose screen design is adequate at this time other than:
  - a. Navigation menus to be used to navigate around the site
  - b. The colour scheme to be advised by MLA
  - c. Tip boxes are to be used where directed by MLA to provide supporting information to help users complete the data entry– mainly associated with major headings on the forms. Tip boxes are to be completed by Bob Hannam, MLA coordinator
  - d. Separate boxes for researcher and RDC contact first and last names.
  - e. Complete coding for measurement forms
  - f. Build javascript data validation code
  - g. Link database with website
  - h. Complete code to retrieve data from database

### Database Design

2. Complete database design and build database

### Data Validation

In this version of the site register it is proposed that the site administrator and the researcher will enter information directly into the web site database. Hence data inserted into the web site will not be validated against information in pre-existing, separate MLA databases.

For the MLA administrator and establishment of project files:

- Entry of a new project code should be checked against there being that code pre-existing in the site database.

For the researchers and data entry:

- the project code should be validated against an pre-existing code in the database and the last name and email address of the researcher to authorize access
- For multiple site entries – a new site entry should be checked against a pre-existing location identifier (nearest town) for that project code and if so, generate a pop-up instructing to alter the location identifier to discriminate.

### Functionality:

1. Log-in for the site administrator:
  - a. A “Site Administrator” tab on the register navigation menu links to a log-in function
  - b. The site administrator logs into the site with username = email address and password = (to be determined).
  - c. Successful log-in links to a page which has three navigation tabs:
    - 1) Create new project – see 2.
    - 2) View active/current projects – links to a list of project codes of registered current projects. These are displayed in order of sequence of entry. Select a project code to bring up the project file. Select edit to make changes. Select delete to delete the file.
    - 3) View past projects – links to a list of project codes for which the end date is passed. These are displayed in order of entry. Select a project code to bring up the project file. Select edit or delete as above.
    - 4) See 5. re current and passed projects
  - d. A log out tab navigates to the home page
2. Creating a new project file/record by the MLA administrator:
  - a. Undertaken by the MLA site administrator through an “add a new project” link to the enter project details screen. Fields to be entered are described in the definition of fields and will be entered manually by MLA.
  - b. A preview and save tab is required to create the file, save the details and display (pop up box).
  - c. An edit function is required to enable fields to be edited.
  - d. A delete function is required to delete project files – available only to the site administrator
  - e. Only the MLA site administrator has access to the project detail records
3. Editing project files by the MLA administrator:
  - a. See 1.c.2)
4. Creating a researcher profile:
  - a. The site administrator creates a researcher profile (p 9) containing last name, project code, organization, phone number and email
  - b. The site administrator creates a password for the researcher
  - c. The site administrator emails the researcher with log-in details (username = email address, password = as created by the administrator in the researcher profile)
5. Entering field site information by researchers:
  - a. Once a project file has been established and identified by its unique project number on the register, researchers can log-in (see 7.) to the site to access the file and complete the remaining fields as described in the definition of fields. (See also researcher log-in below). The researchers cannot edit the project details entered by MLA.
  - b. The researchers select the project code number to bring up the “enter site details” screen. They can then populate this site’s records and identify the measurements that are undertaken at this site by selecting the measurement category tabs in the navigation menu and completing the respective templates.
  - c. A “create new site record” link is required so that the researcher can add additional site records for the same project.
  - d. The various sites are to be discriminated by nearest town and state. Where multiple sites are located in the same vicinity (same nearest town name) researchers will be instructed (via a tip box) to add a discriminating number or word in the location field. (Perhaps if within a single project code attempts to create a new site record with the

- same location identifier (nearest town), an error message should display to indicate that this location already exists in the database and instruct on modifying the location details? See earlier in data validation).
- e. When each additional site record is created, it copies all the entered information from the initial site record and which the researcher is instructed to edit if different from the initial record. The site location is to be the key discriminating element between site records.
  - f. For each site record (site plus measurement details) a preview and save function is required to display (pop-up box) the completed site record. "Edit" and "clear" functions are also required for each site record.
  - g. On the pop-up box preview, an edit function is required to return to the site record templates for editing.
6. Current and past projects:
    - a. Current and completed projects are to be distinguished.
    - b. A project becomes a past/completed project when the finish date is passed.
    - c. Users should be able to search on both current or active sites and completed/past sites.
  7. Login for approved researchers:
    - a. A "Researcher Log-in" tab on the register navigation menu links to a log-in function for contracted researchers.
    - b. Approved researchers (for entering and editing data) are to be identified by MLA from research project contract schedules and entered into the site register database by the MLA site administrator. They will be recognized by matching a project code, their last name and email address.
    - c. Researcher log-in is required to enter data into the site register or edit site details. The site administrator will send the researcher log in details to comprise the researcher email address (username) and a password created by the administrator.
    - d. With successful log-in navigates to a researcher page (see p 9) with navigation features to default list of projects and sites within projects.
    - e. Selecting the project code links to the site and measurement detail screens the researcher can populate or edit.
    - f. A log-off tab logs the researcher out and navigates to the home page.
  8. A "Contact the Site Administrator" link should be included on the navigation menu to bring up an email box for communication with the site administrator by email.
  9. Within "Report Manager" the following features are required:
    - a. A "search for a site" tab in the navigation menu which takes the user to the search function page. See 10 for search criteria. Links to search either current or past project sites should be separate.
    - b. A "Quick Find" function where entry of the project code will bring up all the records associated with that project.
    - c. Based on the search criteria chosen a list of projects will appear which display project code project title and contact and sites associated with that project which meet the search criteria. The essential search function is to search by site and then group by project:

<b>Project Code</b>	<b>Title</b>	<b>Contact</b>
PAST.001	Perennial grass improvement	Nie
Sites	Hamilton, VIC	
	Badgingarra, WA	
	Inverell, NSW	
PAST.235	EverGraze – more \$s from perennials	Smith
	Site 1	
	Site 2	
WEED.112	Silver Leaf Nightshade	Lemerle

- d. Selection of a site displays the site details in a pop-up box. A close and print tab is included. Selection of Print – prints the record for that site which includes the project details comment to each site
  - e. Site details can be printed one by one at this stage.
10. Search fields – the following fields should be developed for searching:
- a. Last name of researcher – drop down list box (from researcher profile)
  - b. Location 1 – state – drop down list box
  - c. Location 2 - nearest town – key word
  - d. Soil type - drop down list box (from list in site features - p 11)
  - e. Annual rainfall - drop down list box (from list in site features - p 11)
  - f. Pasture type - drop down list box (from list in site features – p 11)
  - g. Animal type - drop down list box (from list of animals – p 14)
  - h. Measurement parameters separated by category (restricted to check box fields):
    - 1) Soil - drop down list box
    - 2) Water - drop down list box
    - 3) Pasture - drop down list box
    - 4) Animal - drop down list box
11. Internal reports – The following internal reports are envisaged for reporting in simple tabular format:
- a. Number of sites registered at any one time, both current and completed projects
  - b. Sites registered per researcher
  - c. Sites registered per RDC contact
  - d. List of projects, title, researcher contact name, RDC contact name

**Testing**

1. Once the site is developed to full functionality, it will be tested by at least 5 people including the site administrator, a research manager and Dr Bob Hannam
2. Based on this pilot testing – problems, suggestions for improvements and new measurement parameters will be pooled for consideration and approval by MLA
3. Progressive will incorporate the approved changes and improvements to the site based on agreed costing for changes. For other than fixing site errors or “bugs”, addition of new changes and improvements will subject to further costing by Progressive.

**Data Entry**

1. Once the site is tested, and errors removed:
  - a. Test data will be cleaned from the site
  - b. MLA will establish project files
  - c. All contracted researchers will be asked by MLA to enter all additional site information for each project. This will be coordinated by MLA.
  - d. The MLA site administrator will be the point of contact for researchers in this process. Dr Bob Hannam will be the backup contact.

- e. Progressive will be asked to advise MLA on site-register related IT problems that arise during this process.

### Hosting

1. The site is to be hosted through Progressive Business Technologies until advised otherwise by MLA.
2. Progressive to set up a hosting environment and copy from testing to production environment

### Delivery

1. Delivery will be complete when a fully functional field research site register, complete with MLA project and researcher data is populated and the site hosted along with a final report to contain:
  - a. a summary of the project activities
  - b. Comment of the project processes – highlights, challenges
  - c. suggestions for improvement
  - d. Conclusions

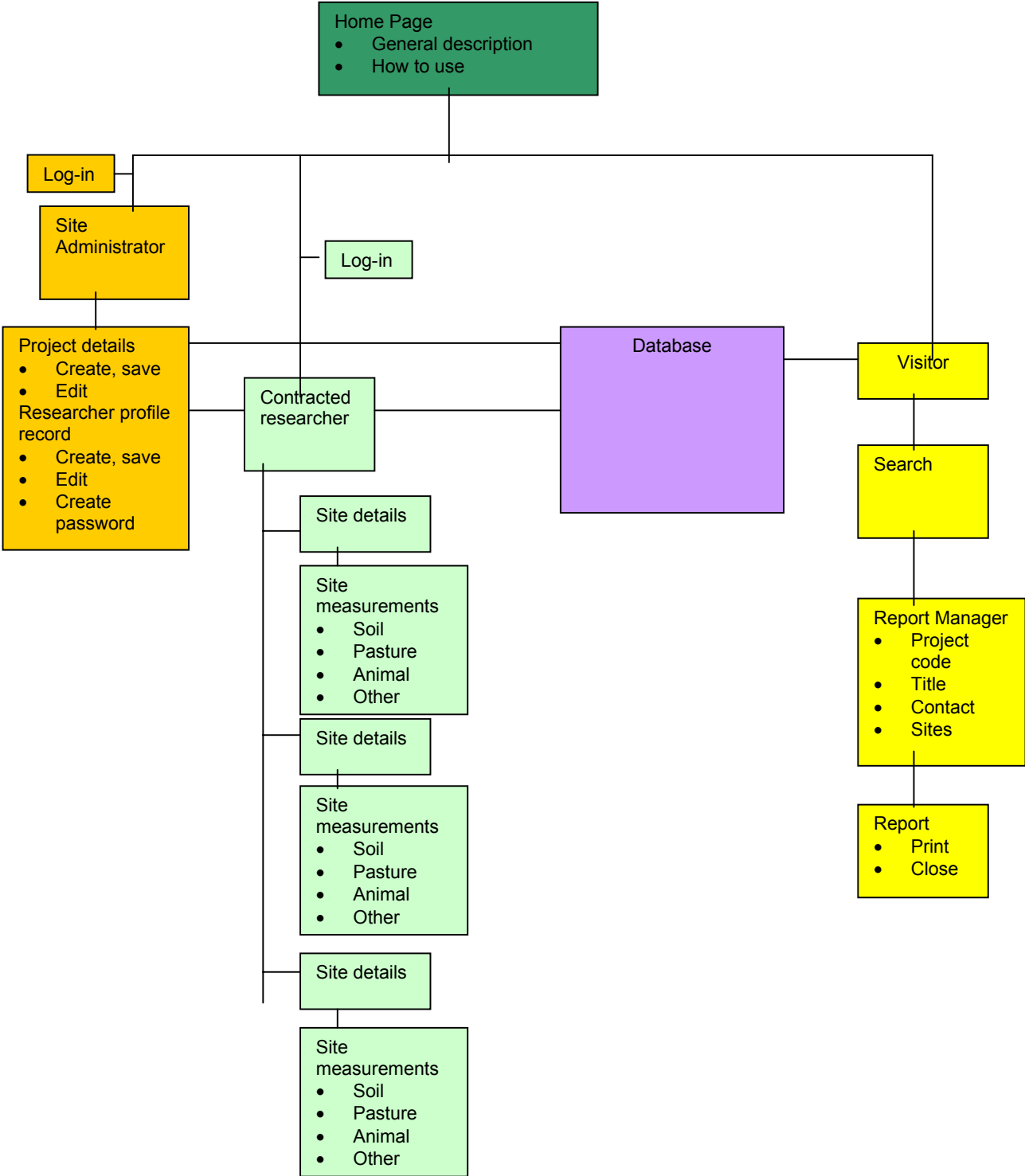
### Liaison – Project Management

Dr Bob Hannam will be the direct contact with Progressive during the development, testing, data entry and delivery of the field research site register.

An initial meeting between Progressive and Dr Hannam should develop a work-plan which allocates tasks for MLA and Progressive so that the completion of the project occurs in a timely manner.



Site Register Layout



Site Appearance – after researcher log in

Meat and Livestock Australia

Field Research Site Register

Researcher Navigation Menu				
Welcome Bob	Project	Site	Home	Log Out

**Navigation menu**

**Administrator**

- Log in
- New project
- Current projects
- Past projects
- Researcher profiles

**Contracted researchers**

- Log in

**Visitors**

Site search

- Current sites
- Past sites

Quick Find:

Code:

For researcher – list of projects appears

Site Register Manager			
Project	Site		Add New site
PAST.001	Wagga	NSW	
	Albany	WA	
	Hamilton	VIC	
	Wagga 2	NSW	
	Tamworth	NSW	
PAST.238	Riverton	SA	
	Lameroo		

When select a project code – navigate to site list for that code.

- Highlight existing site to edit.
- Add new site – copies all initial site records which are then edited by the researcher if different. Instructions by tip box.

Contact administrator

Creating a researcher profile (by the site administrator)

Select Research Profile in the Administrator navigation menu

Researcher Profile Manager	
Name	Create New Profile
Allan	
Bellamy	
Christie	
D'head	
Hannam	
Mason	
Simpson	
Zhongnan	

Name	
Project code	
Organisation	
Phone	
Email	
Password	Save

Select a listed name to edit or delete

Name	Edit
Project code	Save
Organisation	
Phone	
Email	
Password	

**Definition of Fields**

See below – these are to be refined and confirmed by MLA:

**Project details – Enter project screen – MLA create and save project file**

Field	Details	Comments
<b>Project Code</b>	Mandatory, MLA	Key identifier
<b>Project Title</b>	Mandatory, MLA	MLA to fill
<b>Research Leader</b>		
Name	Mandatory, MLA	MLA to fill
Organisation		
Phone		
Email	Mandatory, MLA	MLA to fill
<b>RDC Contact</b>		
Name		
Email		
<b>Start/Finish</b>	Mandatory, MLA	MLA to fill
<b>Purpose &amp; Objectives</b>		

## Field Research Site Register Project

### Site Details screens – researchers enters descriptive info for each site

Note – there may be several sites for any particular project.

<b>Site Location</b>	<b>Ma</b>	Nearest town (freeform), state (drop do	
		Lat/long	
<b>Experimental Design &amp; Management</b>		Brief summary of experimental de	
<b>Site Features</b>		Free form	
Annual rainfall (mm)	Mandatory, researcher	Drop down	
Select soil type	Mandatory, researcher	Drop down	
Pasture type		Drop down	
<b>Paddock History</b>	Allow for three years	Prior to project start year	
<b>Year 1</b>			
Paddock use		Drop down	
Fertiliser		Drop down	
Soil ameliorants		Drop down	
<b>Year 2</b>			
Paddock use		Drop down	
Fertiliser		Drop down	
Soil ameliorants		Drop down	
<b>Year 3</b>			
Paddock use		Drop down	
Fertiliser		Drop down	
Soil ameliorants		Drop down	

<ul style="list-style-type: none"> <li>• Lucerne</li> <li>• Annual Subclover Pasture</li> <li>• Annual Grassy pasture</li> <li>• Perennial grass pasture</li> <li>• Native pasture</li> <li>• other</li> </ul>			
<ul style="list-style-type: none"> <li>• N</li> <li>• P</li> <li>• K</li> <li>• S</li> <li>• Trace elements</li> <li>• Other</li> </ul> <p style="color: red; font-weight: bold; font-size: small;">Note need to allow for multiple selections</p>	<ul style="list-style-type: none"> <li>• None</li> <li>• lime</li> <li>• gypsum</li> <li>• clay spread</li> <li>• other</li> </ul>	<ul style="list-style-type: none"> <li>• Sand</li> <li>• Loamy sand</li> <li>• Loam</li> <li>• Sandy clay loam</li> <li>• Clay loam</li> <li>• Sandy clay</li> <li>• Clay</li> <li>• other</li> </ul>	<ul style="list-style-type: none"> <li>• &lt;100</li> <li>• 100-150</li> <li>• 151-200</li> <li>• 201-250</li> <li>• 251-300</li> <li>• 301-350</li> <li>• 351-400</li> <li>• 401-450</li> <li>• 451-500</li> <li>• 501-550</li> <li>• 551-600</li> <li>• 601-650</li> <li>• 651-700</li> <li>• 701-750</li> <li>• 751-800</li> <li>• 801-850</li> <li>• 851-900</li> <li>• 901-950</li> <li>• 951-1000</li> <li>• &gt;1000</li> </ul>
			<ul style="list-style-type: none"> <li>• Lucerne</li> <li>• Annual Subclover Pasture</li> <li>• Annual Grassy pasture</li> <li>• Perennial grass pasture</li> <li>• Native pasture</li> <li>• Wheat</li> <li>• Barley</li> <li>• Oats</li> <li>• Pulse</li> <li>• Brassica</li> <li>• Fallow</li> <li>• Forage</li> <li>• other</li> </ul>

Save and Preview	Edit	Clear
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## Field Research Site Register Project

### Site Measurement screens -

#### Site measurements - Soil

- Frequency list:

  - Project start
  - Annually
  - Monthly
  - Weekly
  - Other
  - Project end

Parameter	Select for yes	Comments	
<b>Physical</b>		Insert frequency	▼
Australian soil classification		Free form, optional	
Colour	<input type="checkbox"/>		
Texture	<input type="checkbox"/>		
Bulk density	<input type="checkbox"/>		
Soil water	<input type="checkbox"/>		
Dispersion	<input type="checkbox"/>		
Penetrometer	<input type="checkbox"/>		
<b>Chemical</b>		Insert frequency	▼
pH	<input type="checkbox"/>		
EC	<input type="checkbox"/>		
Macronutrients	<input type="checkbox"/>		
Micronutrients	<input type="checkbox"/>		
Exchangeable cations	<input type="checkbox"/>		
Heavy metals	<input type="checkbox"/>		
Other	<input type="checkbox"/>		
<b>Biological</b>		Insert frequency	▼
Total C	<input type="checkbox"/>		
Labile C	<input type="checkbox"/>		
Microbial biomass	<input type="checkbox"/>		
Microbial activity	<input type="checkbox"/>		
DNA – soil borne orgs	<input type="checkbox"/>		
DNA – soil biological function	<input type="checkbox"/>		
Free living nematodes	<input type="checkbox"/>		
Other	<input type="checkbox"/>		

Save	Edit	Clear
------	------	-------

**Site measurements - Water**

Parameter	Select for yes	Comments
Salinity	<input type="checkbox"/>	
Infiltration	<input type="checkbox"/>	
Run-off	<input type="checkbox"/>	
Sediment load	<input type="checkbox"/>	
Water balance	<input type="checkbox"/>	
Chemical analysis	<input type="checkbox"/>	

**Site Measurements - Pasture**

Parameter	Select for yes	Comments
<b>Herbaceous pastures</b>		
Dry matter	<input type="checkbox"/>	Insert frequency ▼
Pasture species	<input type="checkbox"/>	
Pasture composition	<input type="checkbox"/>	
Pasture growth	<input type="checkbox"/>	Insert frequency ▼
Ground cover	<input type="checkbox"/>	Insert frequency ▼
Root depth/mass	<input type="checkbox"/>	
Nutritive value	<input type="checkbox"/>	
Nutritional metabolites	<input type="checkbox"/>	
Other	<input type="checkbox"/>	
<b>Weeds</b>		
Species	<input type="checkbox"/>	
Other	<input type="checkbox"/>	
<b>Shrubs and Trees</b>		
Species	<input type="checkbox"/>	
Root depth/mass	<input type="checkbox"/>	
Water use	<input type="checkbox"/>	
Nutritive value	<input type="checkbox"/>	
Nutritional metabolites	<input type="checkbox"/>	
Rooting depth	<input type="checkbox"/>	
Other	<input type="checkbox"/>	
<b>Chemistry</b>		
Feed test	<input type="checkbox"/>	Insert frequency ▼
Wet chemistry - Fibre (NDF, ADF)	<input type="checkbox"/>	
Water soluble CHO	<input type="checkbox"/>	
Other	<input type="checkbox"/>	
<b>Mineral analysis</b>		
Macronutrients	<input type="checkbox"/>	Insert frequency ▼
Micronutrients	<input type="checkbox"/>	
Other	<input type="checkbox"/>	

Frequency list:

- Project start
- Annually
- Monthly
- Weekly
- Other
- Project end

## Field Research Site Register Project

### Site Measurements – Animal

Parameter	Select for yes	Comments
<b>Animal</b>		
Animal	▼	Drop down box
Genotype sire		Free form
Genotype dam		Free form
Stocking rate	<input type="checkbox"/>	
Liveweight	<input type="checkbox"/>	Insert frequency ▼
Fat score	<input type="checkbox"/>	Insert frequency ▼
Condition score	<input type="checkbox"/>	Insert frequency ▼
Wool production	<input type="checkbox"/>	
Wool test	<input type="checkbox"/>	
Other	<input type="checkbox"/>	
<b>Reproduction</b>		
Ovulation	<input type="checkbox"/>	
Pregnancy scan	<input type="checkbox"/>	
Other	<input type="checkbox"/>	
<b>Lambing/calving</b>		
Birth weight	<input type="checkbox"/>	
Birth date	<input type="checkbox"/>	
Litter size	<input type="checkbox"/>	
Survival	<input type="checkbox"/>	
Autopsy	<input type="checkbox"/>	
Other	<input type="checkbox"/>	
<b>Growth and fatness</b>		
Marking weight	<input type="checkbox"/>	
Weaning weight	<input type="checkbox"/>	
Fat depth	<input type="checkbox"/>	
Eye muscle	<input type="checkbox"/>	
Growth rate	<input type="checkbox"/>	
Other	<input type="checkbox"/>	
<b>Finishing</b>		
Slaughter weight	<input type="checkbox"/>	
Carcass weight	<input type="checkbox"/>	
Fat depth	<input type="checkbox"/>	
Meat quality	<input type="checkbox"/>	
Other	<input type="checkbox"/>	
<b>Supplementary feeding</b>		
Planned frequency		Free form
Purpose		Free form
Type of supplement		Free form
Feeding value	<input type="checkbox"/>	
Other	<input type="checkbox"/>	
<b>Animal health</b>		Insert frequency ▼
Blood analysis	<input type="checkbox"/>	
Faecal egg counts	<input type="checkbox"/>	
Drench resistance	<input type="checkbox"/>	
Metabolic disorders	<input type="checkbox"/>	
Disease status	<input type="checkbox"/>	
Other	<input type="checkbox"/>	

- Sheep
- Beef cattle
- Dairy cattle
- Goats
- Other

- Frequency list:
- Project start
  - Annually
  - Monthly
  - Fortnightly
  - Weekly
  - Daily
  - Other

Save Edit Clear

**Site supporting activities – Economics, modeling, delivery**

Parameter	Select for yes	Comments	
<b>Economics</b>			
Input costs	<input type="checkbox"/>		
Returns	<input type="checkbox"/>		
Profit	<input type="checkbox"/>		
ROI	<input type="checkbox"/>		
Gross Margins/head	<input type="checkbox"/>		
Gross Margins/ha	<input type="checkbox"/>		
Partial budgets	<input type="checkbox"/>		
Farm Profit	<input type="checkbox"/>		
Other	<input type="checkbox"/>		
<b>Modelling</b>			
Objective	<input type="checkbox"/>	Free form	
Models used		Free form	
<b>Delivery</b>			
Planned producer engagement		Free form	
Field days	<input type="checkbox"/>	Insert frequency	▼
Demonstration sites	<input type="checkbox"/>		
Technical forums	<input type="checkbox"/>	Insert frequency	▼
Seminars	<input type="checkbox"/>	Insert frequency	▼
Other		Free form	

- Frequency list:

  - 1 per year
  - 2 per year
  - 3 per year
  - 4 per year
  - > 4 per year
  - Project end
  - Other