

EPA-Funded Research: Biodiversity

Reports from completed projects are available on the EPA website at www.epa.ie/downloads/pubs/research/biodiversity/

During the ERTDI Programme 2000-2006, 39 research projects were funded in the area of Biodiversity, including:

2 Capability Development project

7 Contributory scholarships

15 Doctorate projects

2 Fellowships

3 Large-scale studies

1 Medium-scale study

9 Small-scale studies

39 Total projects

39 EPA (2000 – 2006) Projects indexed by

Year and Content

Lead Organisations

Project Leaders

Year and Content:

2000-LS-3.1.1-M2	<i>Forestry and Environment Impacts Addressing Water Quality and Biodiversity - Biodiversity Assessment of Afforestation Sites</i>
2000-LS-3.1.2-M2	<i>Forestry and Environment Impacts Addressing Water Quality and Biodiversity - Assessment of Biodiversity at Different Stages of the Forest Cycle</i>
2000-LS-3.1.3-M2	<i>Forestry and Environment Impacts Addressing Water Quality and Biodiversity - Investigation of Experimental Methods to Enhance Biodiversity in Plantation Forests</i>
2000-SS-1-M1	<i>Assessment of Contaminant Burden and Genetic Variability of Bottlenose Dolphins in the Shannon Estuary</i>
2000-SS-2-M2	<i>Review of the Implementation of the Convention on Biological Diversity in Ireland and Identification of Research Strengths and Weaknesses</i>
2001-CD/B1-M2	<i>Monitoring, Functional Significance and Management Tools for the Maintenance and Economic Utilisation of Bio-Diversity in the Farmed Landscape.</i>
2001-CS-1-M1	<i>The Ecological Effects of Genetically Modified Crops</i>
2001-CS-2-M1	<i>Granivorous Birds and Intensive Agricultural Land</i>
2001-CS-7-M1	<i>Behaviour of Entomopathogenic Nematodes in Soil</i>
2001-CS-9-M1	<i>Bacterial and Fungal Communities of Upland Acidic Grasslands in the Wicklow Mountains</i>

EPA-Funded Research: Biodiversity

- 2001-CS-13-M1 [*The Microbial Ecology of Anaerobic Wastewater Treatment Biofilms*](#)
- 2001-CS-14-M1 [*Microbial Biodiversity of a Pristine River System*](#)
- 2001-CS-15-M1 [*Environmentally Relevant Bacteria \(ERB\)*](#)
- 2001-PHD-4-M1 [*Applications of Genetic Structure Control of *Sciurus Carolinesis* Populations in Ireland*](#)
- 2001-PHD-9/44-M1 [*Littoral and Benthic Macroinvertebrate Assemblages of Lough Mask*](#)
- 2001-PHD-12-M1 [*The Microbial Ecology of Methane Production in Peat Bogs*](#)
- 2002-PHD2-16 [*Interrelationships between Soil Nitrogen, Soil Microbial Communities and Grassland Stability in Upland Ecosystems.*](#)
- 2002-PHDe-4/5 [*The Ecological Significance of Water Availability for Burren Plant Communities*](#)
- 2002-SS-10-M1 [*A Desktop Study On Water Hyacinths*](#)
- 2003-FS-CD-LS-14 [*Monitoring, Functional Significance and Management Tools for the Maintenance and Economic Utilisation of Bio-Diversity in the Farmed Landscape \(Ag-Biota\)*](#)
- 2003-PHD3-5 [*Impact of Invasive Plant Species on Biodiversity: The Significance of The Soil Seed Bank*](#)
- 2003-PHD3-6 [*Identifying the Environmental Requirements of *Sciomyzidae* \(Diptera\) on Turloughs in the West of Ireland*](#)
- 2003-PHD3-7 [*Biological Diversity and Cultural Diversity: Explaining Conflict Around Ireland's Contribution Towards Natura 2000*](#)
- 2004-SS-27-M1 [*Literature Review of the Environmental Impact of Planting Broadleaved Trees on Acid Sensitive Soils*](#)
- 2004-SS-30-M1 [*An Assessment of Algal Biodiversity along the River Fergus Cascade*](#)
- 2005-CD-B2-M1 [*Biodiversity and Environmental Change: an Integrated Study Encompassing a Range of Scales, Taxa and Habitats*](#)
- 2005-FS-36-M1 [*Site Quality vs. Landscape Matrix: the Importance of Internal and External Factors Driving Biodiversity*](#)
- 2005-PHD5-B-1 [*Monitoring Mammals by Real-Time PCR DNA Analysis of Hair*](#)
- 2005-PHD5-B-16 [*Role of Induced Host Plant Resistance in Environmentally Protective Management of Crop Pests and Diseases*](#)
- 2005-PHD5-B-17 [*What are the Impacts of Alien Plants on Native Pollinators?*](#)

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- 2005-PHD5-B-18 [Characterisation of Arctic Char Spawning Grounds in Irish Lakes and the Vulnerability of Ova to Environmental Change](#)
- 2005-PHD5-B-21 [Developing Knowledge of the Taxonomy of Parasitoid Wasps \(Hymenoptera: Parasitica\) and their Community Structure as Bio-Indicators in Agro-Ecosystems](#)
- 2005-PHD5-B-28 [Global Change Impact on Grassland Biodiversity Function](#)
- 2005-PHD5-B-29 [Quantifying Links Between Turlough Vegetation Community Diversity and Hydrology](#)
- 2005-SS-23-M1 [Production of a Scoping Document for the Development of a Framework for Phenological Data Collation and Management in Ireland](#)
- 2005-SS-34-M1 [Evaluation of the Biological Reference Condition and the Type-Specific Classification of Irish Headwaters](#)
- 2005-SS-42-M1 [Invertebrate Diversity Survey of Lodge Raised Bog, Co Kildare](#)
- 2005-SS-45-M1 [Examination of 20 Years' Data on Arrival and Departure Dates of Migrating Birds to Ireland](#)
- 2006-B-MS-46-M1 [Predicting the Impact of Coexistence-guided Genetically Modified \(GM\) Cropping on Irish Biodiversity](#)

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Lead Organisations:

Freshford 20/20 Ltd

2002-SS-10-M1 [A Desktop Study On Water Hyacinths](#)

Irish Peatland Conservation Council

2005-SS-42-M1 [Invertebrate Diversity Survey of Lodge Raised Bog, Co Kildare](#)

Natura

2000-SS-2-M2 [Review of the Implementation of the Convention on Biological Diversity in Ireland and Identification of Research Strengths and Weaknesses](#)

NUI Galway

2001-CS-13-M1 [The Microbial Ecology of Anaerobic Wastewater Treatment Biofilms](#)

2001-PHD-9/44-M1 [Littoral and Benthic Macroinvertebrate Assemblages of Lough Mask](#)

2001-PHD-12-M1 [The Microbial Ecology of Methane Production in Peat Bogs](#)

2003-PHD3-6 [Identifying the Environmental Requirements of Sciomyzidae \(Diptera\) on Turloughs in the West of Ireland](#)

NUI Maynooth

2001-CS-1-M1 [The Ecological Effects of Genetically Modified Crops](#)

2001-CS-7-M1 [Behaviour of Entomopathogenic Nematodes in Soil](#)

Teagasc

2006-B-MS-46-M1 [Predicting the Impact of Coexistence-guided Genetically Modified \(GM\) Cropping on Irish Biodiversity](#)

Trinity College Dublin

2000-LS-3.1.1-M2 [Forestry and Environment Impacts Addressing Water Quality and Biodiversity - Biodiversity Assessment of Afforestation Sites](#)

2000-LS-3.1.2-M2 [Forestry and Environment Impacts Addressing Water Quality and Biodiversity - Assessment of Biodiversity at Different Stages of the Forest Cycle](#)

Trinity College Dublin

2000-LS-3.1.3-M2 [Forestry and Environment Impacts Addressing Water Quality and Biodiversity - Investigation of Experimental Methods to Enhance Biodiversity in Plantation Forests](#)

2001-CS-2-M1 [Granivorous Birds and Intensive Agricultural Land](#)

Trinity College Dublin (continuation)

- 2001-PHD-4-M1 [Applications of Genetic Structure Control of *Sciurus Carolinesis* Populations in Ireland](#)
- 2003-PHD3-7 [Biological Diversity and Cultural Diversity: Explaining Conflict Around Ireland's Contribution Towards Natura 2000](#)
- 2005-CD-B2-M1 [Biodiversity and Environmental Change: an Integrated Study Encompassing a Range of Scales, Taxa and Habitats](#)
- 2005-FS-36-M1 [Site Quality vs. Landscape Matrix: the Importance of Internal and External Factors Driving Biodiversity](#)
- 2005-PHD5-B-17 [What are the Impacts of Alien Plants on Native Pollinators?](#)
- 2005-PHD5-B-29 [Quantifying Links Between Turlough Vegetation Community Diversity and Hydrology](#)
- 2005-SS-23-M1 [Production of a Scoping Document for the Development of a Framework for Phenological Data Collation and Management in Ireland](#)
- 2005-SS-45-M1 [Examination of 20 Years' Data on Arrival and Departure Dates of Migrating Birds to Ireland](#)

University College Cork

- 2001-CS-15-M1 [Environmentally Relevant Bacteria \(ERB\)](#)
- 2005-PHD5-B-16 [Role of Induced Host Plant Resistance in Environmentally Protective Management of Crop Pests and Diseases](#)
- 2005-PHD5-B-18 [Characterisation of Arctic Char Spawning Grounds in Irish Lakes and the Vulnerability of Ova to Environmental Change](#)

University College Dublin

- 2001-CD/B1-M2 [Monitoring, Functional Significance and Management Tools for the Maintenance and Economic Utilisation of Bio-Diversity in the Farmed Landscape.](#)
- 2001-CS-9-M1 [Bacterial and Fungal Communities of Upland Acidic Grasslands in the Wicklow Mountains](#)
- 2001-CS-14-M1 [Microbial Biodiversity of a Pristine River System](#)
- 2002-PHD2-16 [Interrelationships between Soil Nitrogen, Soil Microbial Communities and Grassland Stability in Upland Ecosystems.](#)
- 2002-PHDe-4/5 [The Ecological Significance of Water Availability for Burren Plant Communities](#)
- 2003-FS-CD-LS-14 [Monitoring, Functional Significance and Management Tools for the Maintenance and Economic Utilisation of Bio-Diversity in the Farmed Landscape \(Ag-Biota\)](#)

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- 2003-PHD3-5 [*Impact of Invasive Plant Species on Biodiversity: the Significance of The Soil Seed Bank*](#)
- 2004-SS-27-M1 [*Literature Review of the Environmental Impact of Planting Broadleaved Trees on Acid Sensitive Soils*](#)
- 2005-PHD5-B-21 [*Developing Knowledge of the Taxonomy of Parasitoid Wasps \(Hymenoptera: Parasitica\) and their Community Structure as Bio-Indicators in Agro-Ecosystems*](#)
- 2005-PHD5-B-28 [*Global Change Impact on Grassland Biodiversity Function*](#)
- 2005-SS-34-M1 [*Evaluation of the Biological Reference Condition and the Type-Specific Classification of Irish Headwaters*](#)

University of Limerick

- 2004-SS-30-M1 [*An Assessment of Algal Biodiversity along the River Fergus Cascade*](#)

Waterford Institute of Technology

- 2005-PHD5-B-1 [*Monitoring Mammals by Real-Time PCR DNA Analysis of Hair*](#)

West Clare Wildlife

- 2000-SS-1-M1 [*Assessment of Contaminant Burden and Genetic Variability of Bottlenose Dolphins in the Shannon Estuary*](#)

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Project Leaders:

Anderson, Ms Mary

2001-CS-14-M1 [Microbial Biodiversity of a Pristine River System](#)

Berrow, Dr Simon

2000-SS-1-M1 [Assessment of Contaminant Burden and Genetic Variability of Bottlenose Dolphins in the Shannon Estuary](#)

Clarke, Ms Phyllidia

2002-SS-10-M1 [A Desktop Study On Water Hyacinths](#)

Clipson, Dr Nicholas

2002-PHD2-16 [Interrelationships between Soil Nitrogen, Soil Microbial Communities and Grassland Stability in Upland Ecosystems.](#)

Cloney, Ms Susan

2001-CS-1-M1 [The Ecological Effects of Genetically Modified Crops](#)

Connaughton, Mr Sean

2001-CS-13-M1 [The Microbial Ecology of Anaerobic Wastewater Treatment Biofilms](#)

Connolly, Dr John

2005-PHD5-B-28 [Global Change Impact on Grassland Biodiversity Function](#)

Dalton, Dr Catherine

2004-SS-30-M1 [An Assessment of Algal Biodiversity along the River Fergus Cascade](#)

Davenport, Prof. John

2005-PHD5-B-18 [Characterisation of Arctic Char Spawning Grounds in Irish Lakes and the Vulnerability of Ova to Environmental Change](#)

Donnelly, Dr Alison

2005-SS-23-M1 [Production of a Scoping Document for the Development of a Framework for Phenological Data Collation and Management in Ireland](#)

Farrell, Mr Ted

2004-SS-27-M1 [Literature Review of the Environmental Impact of Planting Broadleaved Trees on Acid Sensitive Soils](#)

Gormally, Dr Mike

2003-PHD3-6

[Identifying the Environmental Requirements of Sciomyzidae \(Diptera\) on Turloughs in the West of Ireland](#)

Hurley, Ms Caroline

2005-SS-42-M1

[Invertebrate Diversity Survey of Lodge Raised Bog, Co Kildare](#)

Iremonger, Dr Susan

2000-LS-3.1.1-M2

[Forestry and Environment Impacts Addressing Water Quality and Biodiversity - Biodiversity Assessment of Afforestation Sites](#)

2000-LS-3.1.2-M2

[Forestry and Environment Impacts Addressing Water Quality and Biodiversity - Assessment of Biodiversity at Different Stages of the Forest Cycle](#)

2000-LS-3.1.3-M2

[Forestry and Environment Impacts Addressing Water Quality and Biodiversity - Investigation of Experimental Methods to Enhance Biodiversity in Plantation Forests](#)

Johnson, Mr Giles Christopher

2001-CS-2-M1

[Granivorous Birds and Intensive Agricultural Land](#)

Jones, Prof. Mike

2005-SS-45-M1

[Examination of 20 Years' Data on Arrival and Departure Dates of Migrating Birds to Ireland](#)

Jones, Prof. Peter

2005-PHD5-B-16

[Role of Induced Host Plant Resistance in Environmentally Protective Management of Crop Pests and Diseases](#)

Kelly-Quinn, Dr Mary

2005-SS-34-M1

[Evaluation of the Biological Reference Condition and the Type-Specific Classification of Irish Headwaters](#)

Kennedy, Ms Nabla

2001-CS-9-M1

[Bacterial and Fungal Communities of Upland Acidic Grasslands in the Wicklow Mountains](#)

Kerr, Ms Linda

2001-CS-15-M1

[Environmentally Relevant Bacteria \(ERB\)](#)

McCarthy, Dr T.K.

2001-PHD-9/44-M1

[Littoral and Benthic Macroinvertebrate Assemblages of Lough Mask](#)

Mullins, Dr Ewen

2006-B-MS-46-M1 [Predicting the Impact of Coexistence-guided Genetically Modified \(GM\) Cropping on Irish Biodiversity](#)

Nairn, Dr Richard

2000-SS-2-M2 [Review of the Implementation of the Convention on Biological Diversity in Ireland and Identification of Research Strengths and Weaknesses](#)

O'Flaherty, Dr Vincent

2001-PHD-12-M1 [The Microbial Ecology of Methane Production in Peat Bogs](#)

O'Reilly, Dr Catherine

2005-PHD5-B-1 [Monitoring Mammals by Real-Time PCR DNA Analysis of Hair](#)

Osborne, Prof. Bruce

2002-PHDe-4/5 [The Ecological Significance of Water Availability for Burren Plant Communities](#)

2003-PHD3-5 [Impact of Invasive Plant Species on Biodiversity: the Significance of The Soil Seed Bank](#)

Purvis, Dr Gordon

2001-CD/B1-M2 [Monitoring, Functional Significance and Management Tools for the Maintenance and Economic Utilisation of Bio-Diversity in the Farmed Landscape.](#)

2003-FS-CD-LS-14 [Monitoring, Functional Significance and Management Tools for the Maintenance and Economic Utilisation of Bio-Diversity in the Farmed Landscape \(Ag-Biota\)](#)

2005-PHD5-B-21 [Developing Knowledge of the Taxonomy of Parasitoid Wasps \(Hymenoptera: Parasitica\) and their Community Structure as Bio-Indicators in Agro-Ecosystems](#)

Regan, Dr Eugenie

2005-FS-36-M1 [Site Quality vs. Landscape Matrix: the Importance of Internal and External Factors Driving Biodiversity](#)

Rochford, Dr John

2001-PHD-4-M1 [Applications of Genetic Structure Control of *Sciurus Carolinesis* Populations in Ireland](#)

Rolston, Mr Alec

2001-CS-7-M1 [Behaviour of Entomopathogenic Nematodes in Soil](#)

Stout, Dr Jane

2005-PHD5-B-17

[*What are the Impacts of Alien Plants on Native Pollinators?*](#)

Tovey, Dr Hilary

2003-PHD3-7

[*Biological Diversity and Cultural Diversity: Explaining Conflict Around Ireland's Contribution Towards Natura 2000*](#)

Waldren, Dr Stephen

2005-CD-B2-M1

[*Biodiversity and Environmental Change: an Integrated Study Encompassing a Range of Scales, Taxa and Habitats*](#)

2005-PHD5-B-29

[*Quantifying Links Between Turlough Vegetation Community Diversity and Hydrology*](#)

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PROJECT TITLE

Forestry and Environment Impacts Addressing Water Quality and Biodiversity - Biodiversity Assessment of Afforestation Sites (BioForest) (2000-LS-3.1.1-M2)

LEAD ORGANISATION

Trinity College Dublin / University College Cork

START DATE

15/11/2000

CONTACT

Dr Susan Iremonger / Dr Paul Giller

STATUS

Completed (**ERTDI Report 51**)

PROJECT TYPE

Large-scale study

TOTAL BUDGET (€)

530,449.59

PROJECT DESCRIPTION

Develop methodologies for biodiversity assessment and identify indicator species in important habitats which might be subjected to afforestation. Assess the efficacy of the Forestry Biodiversity guidelines and recommend improvements. The above objectives will be achieved by identifying study sites and comparing afforestation sites with adjacent, closely comparable sites which are to remain unplanted. The location of the sites will be stratified according to habitat type and will include unimproved grassland, peat land and lowland agricultural sites, ensuring replication is maintained within any one habitat type.

An in-depth inventory of all taxa is outside the scope of this project: instead a targeted approach will be used, with three avenues:

1. Literature searches and will be used to draft a suitable methodology for assessing the biodiversity of afforestation sites in Ireland;
2. Review current knowledge on the biodiversity of habitats most usually used for planting will be assembled and used to reinforce the choice of indicators of biodiversity in each habitat type, and
3. Surveys of flowering plants, ferns, mosses, liverworts, birds, and selected invertebrate fauna will be conducted in a number of study sites. Rare and threatened species and any special indicators will be highlighted. The literature reviews will provide information on the range of methodologies used overseas and inform the current projects of the best options and approaches.

They will also provide a valuable tool for future work and publications and for interpreting the results from the Irish study in an international context. The data from the survey of non-afforested sites will be used as a baseline against which changes in biodiversity can be monitored through the establishment and growth stages of the forest.

These initial changes will be monitored at a range of sites over the first two years post-planting and will be able to inform management practices as to the likely effects on the species complement and may lead to the identification of potential procedures to ameliorate negative effects on biodiversity. The data will also begin to contribute to identifying the actual range and diversity of species present in Irish plantation forests.

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PROJECT TITLE

**Forestry and Environment Impacts Addressing Water Quality and Biodiversity - Assessment of Biodiversity at Different Stages of the Forest Cycle (BioForest)
(2000-LS-3.1.2-M2)**

LEAD ORGANISATION

Trinity College Dublin / University
College Cork

START DATE

01/05/2001

CONTACT

Dr Susan Iremonger / Dr Paul Giller

STATUS

Completed (**ERTDI Report 51**)

PROJECT TYPE

Large-scale study

TOTAL BUDGET (€)

327,224.21

PROJECT DESCRIPTION

This project is addressing the current gaps in knowledge as to how forest biodiversity changes during the forest growth cycle. Most plantation forests in Ireland are managed under a clearfelling regime, which means that they have very distinct stages of development from the planting stages up through thicket and pole stages to finally harvesting and re-planting, or 'over mature' (where the forest is left to grow beyond the commercial optimum).

There is very little information on biodiversity in plantation forests in Ireland, and even less on how this may change as the forest develops. As forests are dynamic systems, it is essential not only to have a picture of biodiversity which represents only one stage in the forest cycle, but a series of pictures which can be put together to provide a truer picture of biodiversity in the complete forest system as it changes with age.

The project objectives are:

- Assess the range of biodiversity in representative forests at key stages of the forest cycle;
- Review and recommend opportunities for enhancement of biodiversity in plantation forests;
- Assess the effectiveness of the Forest Service Guidelines for Forestry and Biodiversity, and
- Site selection was aided by querying the extensive Coillte and FIPS (Forest Inventory and Planning System of the Forest Service) databases, and covers as broad a geographical range as allowed by the project logistics.

There are representative sites in both the more westerly 'Atlantic' locations and in more central 'continental' areas. Forest types studied during this project have been pure Sitka, pure ash, and a non-intimate Sitka ash mix. Four growth stages have been surveyed, ranging from juvenile to mature. Taxonomic groups under investigation are: birds, hoverflies, spiders, and higher and lower plants. Much of the fieldwork was carried out during the 2001 field season, and the remaining work will be carried out in 2002.

An official report was produced on Best Practice Overseas of Biodiversity Assessment in Preparation for Forestry. A database for the Project has been designed and constructed by the Coastal Research Centre in UCC. It is based on ArcView 3.2, and has been populated with data collected during the 2001 field

season. the data collected in the field will contribute to identifying the actual range and diversity of species present in selected Irish forest types. the changes in biodiversity and species composition over the forest cycle in the range of forest types examined will be used to inform management as to species likely to be present at each stage and their vulnerability to change brought about through the forest cycle. Suggestions will be made as to potential management procedures to ameliorate any negative effects on biodiversity.

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PROJECT TITLE

**Forestry and Environment Impacts Addressing Water Quality and Biodiversity - Investigation of Experimental Methods to Enhance Biodiversity in Plantation Forest (BioForest)
(2000-LS-3.1.3-M2)**

LEAD ORGANISATION

Trinity College Dublin / University
College Cork

START DATE

01/10/2002

CONTACT

Dr Susan Iremonger / Dr Paul Giller

STATUS

Completed (**ERTDI Report 51**)

PROJECT TYPE

Large-scale study

TOTAL BUDGET (€)

411,220.00

PROJECT DESCRIPTION

The objective of this project is to identify those forestry management practices which are best suited to maintaining and enhancing biodiversity in plantation forests. This will be accomplished through measuring plant and animal diversity in forests under different management regimes and comparing their biodiversity and through experimental manipulations of the forest and associated habitats.

In particular, the following will be investigated:

1. The effects of including broadleaves into coniferous plantations, at both afforestation and reforestation;
2. The effects of tree species, age class composition on forest biodiversity;
3. The effects of different thinning and harvesting techniques on forest biodiversity;
4. The effects of different patterns and management techniques of open ground within the forest;
5. The influence of landscape diversity and pattern on biodiversity of forests in the landscape, and
6. Active processes such as the provision of woody debris, nest boxes, bat boxes, and soil litter from other ecosystems.

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PROJECT TITLE

Monitoring, Functional Significance and Management Tools for the Maintenance and Economic Utilisation of Bio-Diversity in the Farmed Landscape (Ag-Biota) (2001-CD/B1-M2)

LEAD ORGANISATION

University College Dublin

START DATE

01/12/2001

CONTACT

Dr Gordon Purvis

STATUS

Ongoing

PROJECT TYPE

Capability Development

TOTAL BUDGET (€)

01/10/2002

PROJECT DESCRIPTION

The AG-BIOTA project will study the impact of agricultural practice on bio-diversity within the Irish landscape and seek to encourage the development of a more bio-diverse agriculture by identifying and promoting farming practices which improve environmental quality.

Specific aims are:

- To develop a long-term monitoring programme to document the current status and future trends of change in terrestrial and aquatic bio-diversity within the intensively-farmed Irish landscape which will provide an intelligence gathering system and help direct future agricultural research strategy;
- To identify the major determinants of bio-diversity within existing and alternative, less intensive, farming systems;
- To study the ecology of functionally important populations within agro-ecosystems and develop tools for the practical management and agronomic utilisation of bio-diversity, and
- To address more theoretical questions regarding the wider ecological and functional significance of bio-diversity.

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PROJECT TITLE

Applications of Genetic Structure Control of *Sciurus Carolinesis* Populations in Ireland (2001-PHD-4-M1)

LEAD ORGANISATION

Trinity College Dublin

START DATE

01/12/2001

CONTACT

Dr John Rochford

STATUS

Ongoing

PROJECT TYPE

Doctorate

TOTAL BUDGET (€)

76,184.28

PROJECT DESCRIPTION

The introduced American grey squirrel *Sciurus carolinensis* is implicated in the decline of the red squirrel *Sciurus vulgaris* and in damaging broadleaved trees through bark stripping. Control of grey squirrel populations is therefore desirable.

Previous work has shown grey squirrel populations recover in a matter of weeks following intensive culling. This project aims to study the processes of dispersal, recruitment and colonisation in grey squirrels, using molecular genetic tools, with a view to developing models to assess the potential of immunocontraception as a local control measure.

First and foremost, the level of genetic diversity in the Irish grey squirrel population must be established. Microsatellite loci will be analysed in individuals taken from different populations spread throughout Ireland. This data will allow the identification of the most variable microsatellite loci for future work and also allow N_m , the effective number of migrants between these subpopulations, to be estimated giving a baseline measure of dispersal/gene flow. Then, intensive culling will occur in several sites and the origin of colonising individuals forming the 'new' population identified using microsatellite data, *i.e.* by population assignment tests and/or by establishing paternity/relatedness for these individuals. These data will be supported by results from intensive radio tracking and will show whether recruitment of juveniles/sub-adults from within study sites or immigration is responsible for recovery in post cull populations.

Immunocontraception will prevent local recruitment of juveniles and can then be assessed as a possible local control measure through modelling.

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PROJECT TITLE

***Littoral and Benthic Macroinvertebrate Assemblages of Lough Mask
(2001-PHD-9/44-M1)***

LEAD ORGANISATION

NUI Galway

START DATE

02/09/2002

CONTACT

Dr T.K. McCarthy

STATUS

Ongoing

PROJECT TYPE

Doctorate

TOTAL BUDGET (€)

75,676.39

PROJECT DESCRIPTION

- Characterisation of the littoral and benthic invertebrate assemblages of Lough Mask, an ultra-oligotrophic large lowland lake, which is in near pristine condition and still contains unique floral/faunal species assemblages largely typical of many Irish lakes.
- Determination, mostly through scuba diving transect sampling, of the variation in benthic assemblages, in relation to bathymetry type. Identification of environmental factors affecting vertical distribution of macro invertebrate species and their abundances.
- Development of new sampling protocols for long-term monitoring of Lough Mask and other environmentally sensitive lakes, and for protection of their faunal assemblages through maintenance of high water quality levels.

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PROJECT TITLE

***The Microbial Ecology of Methane Production in Peat Bogs
(2001-PHD-12-M1)***

LEAD ORGANISATION

NUI Galway

START DATE

04/06/2002

CONTACT

Dr Vincent O'Flaherty

STATUS

Ongoing

PROJECT TYPE

Doctorate

TOTAL BUDGET (€)

76,184.28

PROJECT DESCRIPTION

The production of methane by anaerobic microorganisms in peat lands is very significant in terms of the gaseous composition of the atmosphere. Methane is produced as a result of a complex microbial food chain unique to anaerobic environments. The study of the ecology of this process is a prerequisite to understanding the processes which shape our planets atmosphere.

However, until very recently, the techniques and methods necessary for this work have not existed. This project is using a novel combination of powerful molecular, microscopy and activity-based methods to describe the location, activity and structure of the microbial communities in peat lands, with particular focus on methanogenic anaerobes. The results obtained will shed new light on the basic transformations which occur in nature.

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PROJECT TITLE

Interrelationships between Soil Nitrogen, Soil Microbial Communities and Grassland Stability in Upland Ecosystems (2002-PHD2-16)

LEAD ORGANISATION

University College Dublin

START DATE

01/01/2003

CONTACT

Dr Nicholas Clipson

STATUS

Ongoing

PROJECT TYPE

Doctorate

TOTAL BUDGET (€)

75,000.00

PROJECT DESCRIPTION

Soil nitrogen status is an important determinant of plant and microbial diversity and activity in upland grassland ecosystems. The focus of this project is to assess how microbes associated with N-cycling processes. In particular, ammonification, N-mineralization, nitrification and nitrogen fixation contribute to changes in soil nitrogen pool sizes and floristic diversity in unimproved and improved upland grassland ecosystems. Soil nitrogen pools will be quantified, together with rates of microbially-mediated N-cycling processes. Microorganisms associated with N-cycling processes will be isolated and identified conventionally, or by molecular community fingerprinting approaches. Activity of N-cycling microbes will be related to grassland ecosystem processes

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PROJECT TITLE

*The Ecological Significance of Water Availability for Burren Plant Communities
(2002-PHDe-4/5)*

LEAD ORGANISATION

University College Dublin

START DATE

01/11/2002

CONTACT

Prof. Bruce Osborne

STATUS

Ongoing

PROJECT TYPE

Doctorate

TOTAL BUDGET (€)

65,708.95

PROJECT DESCRIPTION

The Burren area, in Co. Clare, is one of Europe's most botanically important regions, although our understanding of the factors which have shaped the types of plant communities present are still unknown. Given the increased political, economic and conservation issues associated with tourism and altered land use patterns more ecological information is required for the formulation of appropriate management plans for sustained use of this region. We have recently identified water availability as a potentially ecological determinant and this study will provide a detailed assessment of the role of water in the ecology of common Burren plants.

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PROJECT TITLE

*Monitoring, Functional Significance and Management Tools for the Maintenance and Economic Utilisation of Bio-Diversity in the Farmed Landscape (Ag-Biota)
(2003-FS-CD-LS-14)*

LEAD ORGANISATION

University College Dublin

START DATE

01/12/2003

CONTACT

Dr Gordon Purvis

STATUS

Ongoing

PROJECT TYPE

Fellowship

TOTAL BUDGET (€)

202,343.00

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PROJECT TITLE

Impact of Invasive Plant Species on Biodiversity: the Significance of The Soil Seed Bank (2003-PHD3-5)

LEAD ORGANISATION

University College Dublin

START DATE

01/12/2003

CONTACT

Dr Bruce Osborne

STATUS

Ongoing

PROJECT TYPE

Doctorate

TOTAL BUDGET (€)

73,500.00

PROJECT DESCRIPTION

Globally the invasion of ecosystems by alien plant species is considered one of the major factors influencing biodiversity and this is predicted to increase as a consequence of human interference and climate change. To date however, we have little understanding of the impact of introduced species on ecosystems in Ireland or their influence on biodiversity. In particular, little consideration has been directed towards an assessment of the impact of invasive species on the soil seed bank or the role of the soil seed bank as a reservoir of biodiversity for habitat restoration. This is the major focus of this grant application.

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PROJECT TITLE

Identifying the Environmental Requirements of Sciomyzidae (Diptera) on Turloughs in the West of Ireland (2003-PHD3-6)

LEAD ORGANISATION

NUI Galway

START DATE

02/01/2004

CONTACT

Dr Mike Gormally

STATUS

Ongoing

PROJECT TYPE

Doctorate

TOTAL BUDGET (€)

74,898.00

PROJECT DESCRIPTION

Turloughs, which are restricted to Ireland and are currently threatened by unsustainable land management practices, are listed as a priority habitat in Annex 1 of the 1992 European Union Habitats Directive. Studies to date on turlough plant and aquatic invertebrate communities give no indication of land management effects on the terrestrial invertebrate communities which inhabit turloughs during the dry summer phase. This proposal will identify, for the first time, the environmental requirements of *Sciomyzidae* of the Order *Diptera* (proven sensitive indicators of habitat change) on turloughs with respect to management practices. The outcome of this research will be the production of a base-line inventory of sciomyzid assemblages associated with an internationally important Irish habitat and the determination of key sciomyzid indicator species for turloughs.

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PROJECT TITLE

Biological Diversity and Cultural Diversity: Explaining Conflict Around Ireland's Contribution Towards Natura 2000 (2003-PHD3-7)

LEAD ORGANISATION

Trinity College Dublin

START DATE

01/04/2004

CONTACT

Dr Hilary Tovey

STATUS

Ongoing

PROJECT TYPE

Doctorate

TOTAL BUDGET (€)

71,562.00

PROJECT DESCRIPTION

The EU Sixth Environment Action Programme (EU Commission 2001a) identifies two key requirements for continued attempts to protect the European environment:

- Better integration of environmental protection into economic and social policies, and
- An increased sense of ownership of environmental protection by citizens and stakeholders.

This project proposes to investigate, in this context, relationships between ecological experts and local stakeholders in the designation of sites in Ireland for Natura 2000 and in the development of management plans for designated sites. It will analyse the reasons behind the contestation surrounding the designation process, and provide models for more participatory arrangements for biodiversity protection.

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PROJECT TITLE

Biodiversity and Environmental Change: an Integrated Study Encompassing a Range of Scales, Taxa and Habitats (BioChange) (2005-CD-B2-M1)

LEAD ORGANISATION

Trinity College Dublin

START DATE

09/01/2006

CONTACT

Dr Stephen Waldren

STATUS

Ongoing

PROJECT TYPE

Capability Development

TOTAL BUDGET (€)

1,622,559.50

PROJECT DESCRIPTION

This research cluster, involving researchers from eight institutions, will provide an integrative multi-disciplinary research framework for national and local biodiversity policy in Ireland. Core research in the cluster directly addresses the protection and management of ecological resources in the context of pressures which might lead to environmental change by focusing on habitat fragmentation and loss, impacts of non-native species, climate change, pollution, and resource management.

The research will also extend capability by developing fundamental biodiversity research and capacity building in taxonomic skills as well as biodiversity indicators and biomonitoring tools. Additionally, two cross-cutting research projects will make specific progress in the inventory and output of taxonomic data and in the understanding of political processes, including public participation, which also shape biodiversity policies. While utilising national information where appropriate primary data collection will be concentrated in the greater County Clare area to maximise integration across disciplines, habitats, taxa and drivers of change. Desk studies, workshops and working groups will synthesise current knowledge and identify priority areas for future research. Our strategic aim is to build a foundation for collaborative biodiversity research capacity in Ireland through a network of researchers delivering the high quality multidisciplinary research required for sustainable management of Ireland's biodiversity.

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PROJECT TITLE

Site Quality vs. Landscape Matrix: the Importance of Internal and External Factors Driving Biodiversity (2005-FS-36-M1)

LEAD ORGANISATION

Trinity College Dublin

START DATE

01/12/2005

CONTACT

Dr Eugenie Regan

STATUS

Ongoing

PROJECT TYPE

Fellowship

TOTAL BUDGET (€)

138,446.57

PROJECT DESCRIPTION

A major aim of conservation research is to maintain biodiversity in isolated or fragmented habitats and ecosystems. However, to manage such habitats, we need to understand the factors which determine levels of biodiversity. Such factors fall into two groups:

- internal factors, *e.g.*, habitat quality and patch size, and
- external factors, *e.g.*, the surrounding landscape matrix and isolation.

I will use grasslands and invertebrates to determine the relative importance and role of these factors in producing biodiversity in isolated habitats. The results will have both heuristic value, and an immediate practical value for the management of rare and threatened grassland ecosystems.

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PROJECT TITLE

**Monitoring Mammals by Real-Time PCR DNA Analysis of Hair
(2005-PHD5-B-1)**

LEAD ORGANISATION

Waterford Institute of Technology

START DATE

26/09/2005

CONTACT

Dr Catherine O'Reilly

STATUS

Ongoing

PROJECT TYPE

Doctorate

TOTAL BUDGET (€)

75,000.00

PROJECT DESCRIPTION

In recent years, the need to maintain biodiversity has been formally recognized by the adoption of the Convention on Biological Diversity at the Earth Summit in Rio de Janeiro in 1992 and within the EU by the 1992 EC Habitats Directive. The availability of high quality and reliable information on population size and distribution is one of the cornerstones of effective biodiversity conservation and management. Identification of mammals from field signs can lead to misidentification. This project aims to assess the use of real-time PCR DNA analysis as an analytical tool to monitor mammals from hair samples.

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PROJECT TITLE

Role of Induced Host Plant Resistance in Environmentally Protective Management of Crop Pests and Diseases (2005-PHD5-B-16)

LEAD ORGANISATION

University College Cork

START DATE

01/11/2005

CONTACT

Prof. Peter Jones

STATUS

Ongoing

PROJECT TYPE

Doctorate

TOTAL BUDGET (€)

75,000.00

PROJECT DESCRIPTION

Pest control in agricultural crops is increasingly achieved through integration of cultural methods, crop resistance and rationalised pesticide usage. For many crops, however, pest resistance in crop varieties is of limited value, as a result of a lack of appropriate genes. The aim of this project is to evaluate an alternative source of host resistance by switching on host genes which are present but which are expressed too slowly or in too small amounts to control the pest. The PI has identified two chemicals which, when applied ahead of the pest arrival, increase the expression of two anti-herbivore defence pathways. Induced host resistance should help control pests directly and, indirectly by increasing biodiversity, including populations of beneficial insects.

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PROJECT TITLE

***What are the Impacts of Alien Plants on Native Pollinators?
(2005-PHD5-B-17)***

LEAD ORGANISATION

Trinity College Dublin

START DATE

01/10/2005

CONTACT

Dr Jane Stout

STATUS

Ongoing

PROJECT TYPE

Doctorate

TOTAL BUDGET (€)

75,000.00

PROJECT DESCRIPTION

Pollinators provide essential ecosystem services and may be directly affected by alien plants. Bumblebees are important generalist pollinators which have declined during the last century, partly as a result of a reduction in wildflower forage resources. This project will investigate whether invasion by rewarding alien plants has beneficial impacts on native bumblebees by providing an alternative forage resource, or negative effects, both directly by providing low quantity and quality rewards, or indirectly by reducing rewarding native forage resources. By manipulating numbers of alien plants, this project will assess the impacts of management of invasive alien plants on native bumblebee species.

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PROJECT TITLE

Characterisation of Arctic Char Spawning Grounds in Irish Lakes and the Vulnerability of Ova to Environmental Change (2005-PHD5-B-18)

LEAD ORGANISATION

University College Cork

START DATE

01/10/2005

CONTACT

Prof. John Davenport

STATUS

Ongoing

PROJECT TYPE

Doctorate

TOTAL BUDGET (€)

75,000.00

PROJECT DESCRIPTION

Circumstantial evidence strongly supports the hypothesis that recruitment failure due to anthropogenic causes is a critical factor leading to the extinction of a number of Irish Arctic char populations. However direct empirical evidence is absent. The project will characterise and compare Arctic char spawning beds in a number of char lakes and former char lakes. Possible factors resulting in recruitment failure will be identified and laboratory experiments will assess their impact on char ova development.

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PROJECT TITLE

Developing Knowledge of the Taxonomy of Parasitoid Wasps (Hymenoptera: Parasitica) and their Community Structure as Bio-Indicators in Agro-Ecosystems (2005-PHD5-B-21)

LEAD ORGANISATION

University College Dublin

START DATE

10/10/2005

CONTACT

Dr Gordon Purvis

STATUS

Ongoing

PROJECT TYPE

Doctorate

TOTAL BUDGET (€)

72,336.00

PROJECT DESCRIPTION

The proposed study will further the development of taxonomic, bio-geographical and ecological knowledge of the *Hymenoptera: Parasitica* in Irish farmland and evaluate their potential as bio-indicators of changing grassland farming practice. The study will complement the existing work of the Ag-Biota project and have a four-fold impact on the development of biodiversity expertise in Ireland by:

- Addressing a significant taxonomic and bio-geographical knowledge gap;
- Advancing knowledge of the influences of management practice within grassland habitats;
- Assisting in the identification of surrogate biodiversity indicators relating to farm practice, and
- Directly informing the process of agri-environmental policy development.

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PROJECT TITLE

**Global Change Impact on Grassland Biodiversity Function
(2005-PHD5-B-28)**

LEAD ORGANISATION

University College Dublin

START DATE

01/09/2005

CONTACT

Dr John Connolly

STATUS

Ongoing

PROJECT TYPE

Doctorate

TOTAL BUDGET (€)

74,931.00

PROJECT DESCRIPTION

The effect of global change on biodiversity is central to national and international environmental policy. We will examine global change and biodiversity in respect of three facets of ecosystem functioning in grasslands. We will model the effects of climatic and environmental gradients on the dynamics in four-species plant communities, using data from a 42-site grassland experiment. A new modelling approach will be developed to examine the role of competition between *Rhizobium* strains for nodule occupancy in N fixation in clover. The impact of simulated global change on reproductive allocation in plants will be assessed using a new modelling approach.

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PROJECT TITLE

*Quantifying Links Between Turlough Vegetation Community Diversity and Hydrology
(2005-PHD5-B-29)*

LEAD ORGANISATION

Trinity College Dublin

START DATE

01/10/2005

CONTACT

Dr Stephen Waldren

STATUS

Ongoing

PROJECT TYPE

Doctorate

TOTAL BUDGET (€)

75,000.00

PROJECT DESCRIPTION

This project will derive quantitative relationships between the vegetation of turloughs (priority EU habitats, largely restricted to Ireland) and the incidence of flooding. Vegetation communities in a range of turlough basins will be described quantitatively, thereby providing great improvement on currently available qualitative descriptions.

These data will be used to describe how vegetation changes along gradients of flooding, using data derived from continuously monitored water depth in selected turlough basins, and this approach will be used to derive predictive models of turlough vegetation in relation to flooding. The information provided will help to deliver both environmental and biodiversity conservation policy.

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PROJECT TITLE

Predicting the Impact of Coexistence-guided Genetically Modified (GM) Cropping on Irish Biodiversity (2006-B-MS-46-M1)

LEAD ORGANISATION

Teagasc

START DATE

13/11/2006

CONTACT

Dr Ewen Mullins

STATUS

Ongoing

PROJECT TYPE

Medium-Sized Study

TOTAL BUDGET (€)

102,995.00

PROJECT DESCRIPTION

Following the approval of 17 genetically modified (GM) crops in 2004 for cultivation across the EU, it is evident that future crop management systems will be reliant upon the implementation of effective coexistence plans for both novel and established crop systems. From an Irish context, a key requirement for the development of coexistence regimes which effectively prevent any adverse effects on biodiversity, will be to increase our knowledge of biodiversity impacts resulting from gene flow between a GM crop and inter-related wild species in the Irish flora.

Hence, the goal of this proposal is

- (i) To significantly improve our understanding of the actual rates of gene flow arising from existing and future Irish GM cropping systems and, more significantly,
- (ii) The likely consequences for biodiversity conservation of such gene flow.

By collating and processing information from national and international GM-based studies, the gene flow-based impacts of GM crop cultivation on Irish biodiversity will be predicted. All data collated and synthesised during this project will be disseminated through a publicly-accessible internet database. The consolidation and contextualisation of information in this manner will assist future research and policy decision-making regarding relationships between biodiversity and GM crop cultivation in Ireland.

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Small-scale Studies:

PROJECT TITLE

Assessment of Contaminant Burden and Genetic Variability of Bottlenose Dolphins in the Shannon Estuary (2000-SS-1-M1)

LEAD ORGANISATION

West Clare Wildlife

START DATE

01/02/2001

CONTACT

Dr Simon Berrow

STATUS

Completed

PROJECT TYPE

Small-scale study

TOTAL BUDGET (€)

1,904.61

PROJECT TITLE

Review of the Implementation of the Convention on Biological Diversity in Ireland and Identification of Research Strengths and Weaknesses (2000-SS-2-M2)

LEAD ORGANISATION

Natura

START DATE

02/04/2001

CONTACT

Dr Richard Nairn

STATUS

Completed

PROJECT TYPE

Small-scale study

TOTAL BUDGET (€)

7,618.43

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PROJECT TITLE

*A Desktop Study on Water Hyacinths
(2002-SS-10-M1)*

LEAD ORGANISATION

Freshford 20/20 Limited

START DATE

01/01/2003

CONTACT

Ms Phyllidia Clarke

STATUS

Completed

PROJECT TYPE

Small-scale study

TOTAL BUDGET (€)

7,681.08

PROJECT TITLE

*Production of a Scoping Document for the Development of a Framework
for Phenological Data Collation and Management in Ireland
(2005-SS-23-M1)*

LEAD ORGANISATION

University of Limerick

STATUS

Completed

CONTACT

Dr Alison Donnelly

TOTAL BUDGET (€)

6,348.00

PROJECT TYPE

Small-scale study

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PROJECT TITLE

Literature Review of the Environmental Impact of Planting Broadleaved Trees on Acid Sensitive Soils (2004-SS-27-M1)

LEAD ORGANISATION

University College Dublin

START DATE

04/05/2004

CONTACT

Mr. Ted Farrell

STATUS

Completed

PROJECT TYPE

Small-scale study

TOTAL BUDGET (€)

12,837.60

PROJECT TITLE

An Assessment of Algal Biodiversity along the River Fergus Cascade (2004-SS-30-M)

LEAD ORGANISATION

University of Limerick

STATUS

Completed

CONTACT

Dr Catherine Dalton

TOTAL BUDGET (€)

6,348.00

PROJECT TYPE

Small-scale study

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PROJECT TITLE

Evaluation of the Biological Reference Condition and the Type-Specific Classification of Irish Headwater (2005-SS-34-M1)

LEAD ORGANISATION

University College Dublin

STATUS

Completed

CONTACT

Dr Mary Kelly-Quinn

TOTAL BUDGET (€)

6,348.00

PROJECT TYPE

Small-scale study

PROJECT TITLE

Invertebrate Diversity Survey of Lodge Raised Bog, Co Kildare (2005-SS-42-M1)

LEAD ORGANISATION

Irish Peatland Conservation Council

STATUS

Completed

CONTACT

Ms Caroline Hurley

TOTAL BUDGET (€)

6,348.00

PROJECT TYPE

Small-scale study

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PROJECT TITLE

Examination of 20 Years' Data on Arrival and Departure Dates of Migrating Birds to Ireland (2005-SS-45-M1)

LEAD ORGANISATION

Trinity College Dublin

STATUS

Completed

CONTACT

Prof. Mike Jones

TOTAL BUDGET (€)

6,348.00

PROJECT TYPE

Small-scale study

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Contributory Scholarships:

PROJECT TITLE

*The Ecological Effects of Genetically Modified Crops
(2001-CS-1-M1)*

LEAD ORGANISATION

NUI Maynooth

START DATE

17/12/2001

CONTACT

Ms Susan Cloney

STATUS

Completed

TOTAL BUDGET (€)

7,618.43

PROJECT TYPE

Contributory scholarship

PROJECT TITLE

*Granivorous Birds and Intensive Agricultural Land
(2001-CS-2-M1)*

LEAD ORGANISATION

Trinity College Dublin

START DATE

17/12/2001

CONTACT

Mr Giles Christopher Johnson

STATUS

Completed

TOTAL BUDGET (€)

7,618.43

PROJECT TYPE

Contributory scholarship

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PROJECT TITLE

*Behaviour of Entomopathogenic Nematodes in Soil
(2001-CS-7-M1)*

LEAD ORGANISATION

NUI Maynooth

START DATE

17/12/2001

CONTACT

Mr Alec Rolston

STATUS

Completed

PROJECT TYPE

Contributory scholarship

TOTAL BUDGET (€)

3,809.21

PROJECT TITLE

*Bacterial and Fungal Communities of Upland Acidic Grasslands in the
Wicklow Mountains
(2001-CS-9-M1)*

LEAD ORGANISATION

University College Dublin

START DATE

17/12/2001

CONTACT

Ms Nabla Kennedy

STATUS

Completed

PROJECT TYPE

Contributory scholarship

TOTAL BUDGET (€)

7,618.43

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PROJECT TITLE

*The Microbial Ecology of Anaerobic Wastewater Treatment Biofilms
(2001-CS-13-M1)*

LEAD ORGANISATION

NUI Galway

START DATE

01/09/2001

CONTACT

Mr Sean Connaughton

STATUS

Completed

PROJECT TYPE

Contributory scholarship

TOTAL BUDGET (€)

11,427.64

PROJECT TITLE

*Microbial Biodiversity of a Pristine River System
(2001-CS-14-M1)*

LEAD ORGANISATION

University College Dublin

START DATE

17/12/2001

CONTACT

Ms Mary Anderson

Completed

PROJECT TYPE

Contributory scholarship

TOTAL BUDGET (€)

7,618.43

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PROJECT TITLE

Environmentally Relevant Bacteria (ERB)
(2001-CS-15-M1)

LEAD ORGANISATION

University College Cork

START DATE

01/10/2001

CONTACT

Ms Linda Kerr

STATUS

Completed

PROJECT TYPE

Contributory Scholarship

TOTAL BUDGET (€)

11,427.64

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End of listing of EPA Biodiversity Projects (2000-2006)