Welcome to
The "*Scottish Centre for Ecology & the Natural Environment*"

University of Glasgow

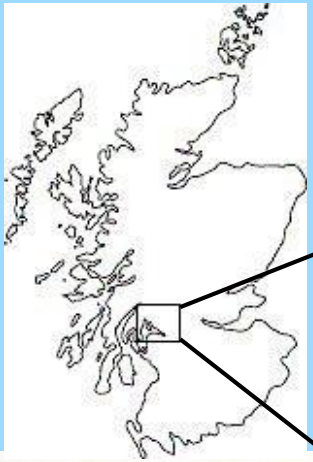
Prof Colin Adams

SCENE

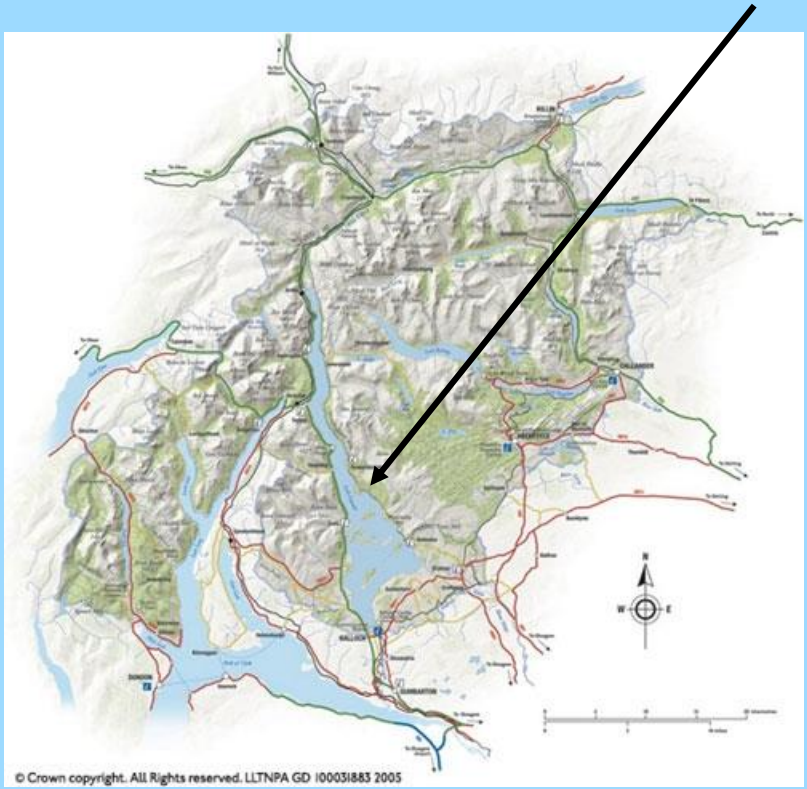
University of Glasgow

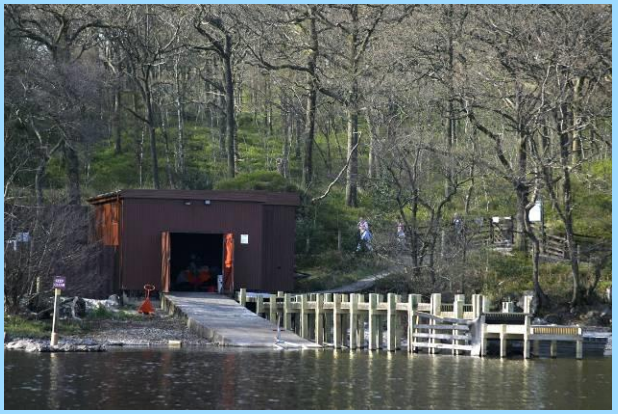
- History of SCENE
- Current research and teaching
- Tour of new facilities

Glasgow University Field Station 1946-1963



FIELD STATION AT LOCH LOMOND





University Field Station 1963-2006

2006 - SCENE, Loch Lomond

- In the most important habitats in Europe

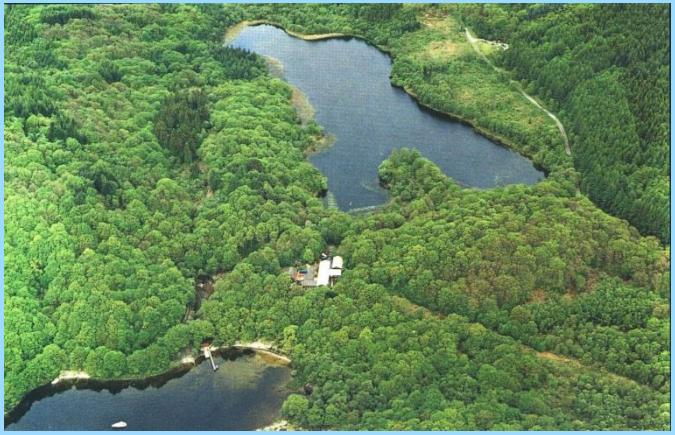
Major investment in SCENE

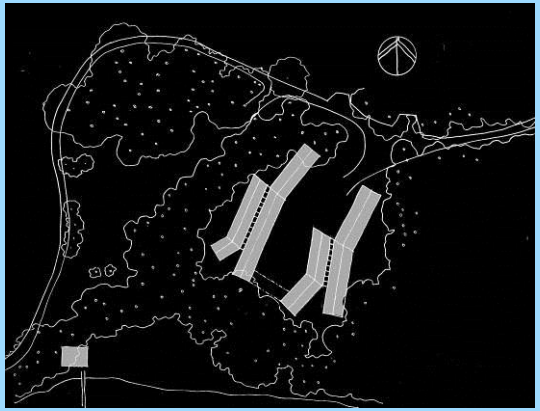
Aims:

• a world class residential field teaching and research facility

•High quality construction reflecting quality of the surroundings

•Highly sustainable building





£7.2 M - re-development project

To

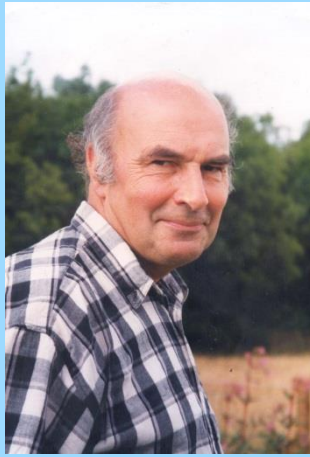
- construct a new and expanded field station
- designed, built and managed to the highest sustainable standards

Features:

•Highest sustainability possible
•Low environmental impact
•Low embedded energy
•Geothermal heat pump
•High levels of insulation

Phase 1 – Research Facility – Maitland Building

- £3.6 M
- Scottish Enterprise
- Sustainable development grants
- SRIF



Prof Peter Maitland

SCENE Phase 1 research facilities

Building Awards:

2007 Scottish Low Carbon Building Award

2007 Royal Institute of Facility Managers award

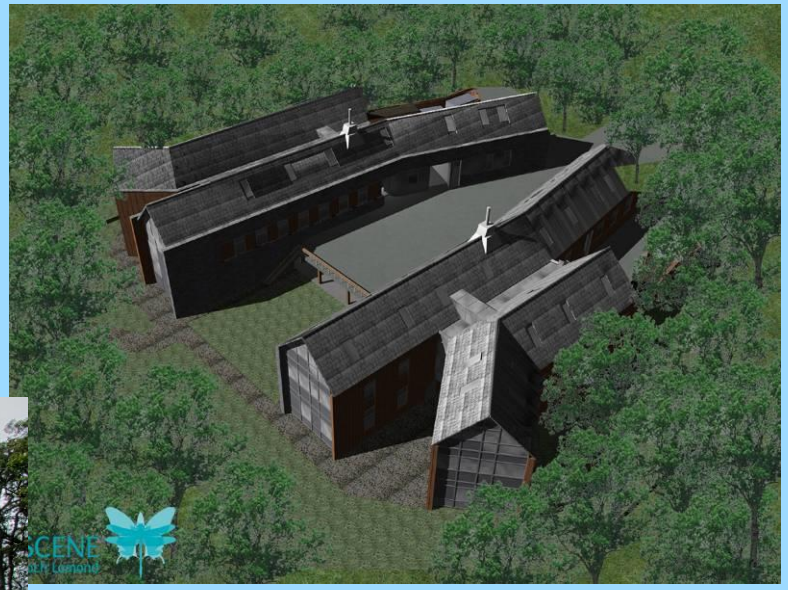
2007 Green Apple Award

Phase 2 – replacement of teaching facilities; Harry Slack Building

£3.4 M cost

- £1.5 M philanthropic
- £1.9 M grants

- Residential teaching facility for 43

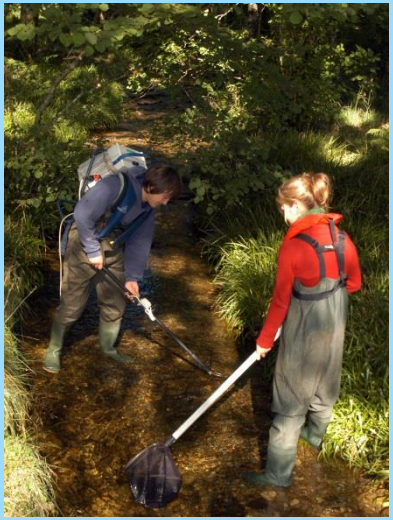


Dr Harry Slack – Director 1946 - 1972

What does S.C.E.N.E. do?

- Teaching

- Research



Inspiring the next generation:

“Fieldwork in science education is … declining”
Source: Royal Society working group statement Jan 2004
25-60% decline

Early Research

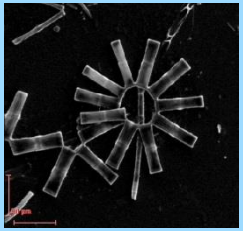
Dr Harry Slack – Director 1946 - 1972

Biology of Powan

Lake and river functioning

Aphid population dynamics

Dr Roger Tippett - Director 1972 - 1995



Plankton dynamics

Biting midge

Three main themes

Environments are changing at ever faster rates. How can animals cope?

In the woodlands surrounding SCENE, we study wild species under natural conditions. We use innovative technology, like thermal imaging (shown above) and radio-tracking, to detect when birds become stressed and when their biological clocks become disturbed. Non-invasive experiments, such as simulating different food availability, give insights into how animals cope with changes in their surroundings.

We also compare woodland birds to their urban and farmland relatives to learn how genes, behaviour and health are affected by human lifestyles. Such fundamental research is essential for identifying ways towards securing a future for wild animals.

SCENE's habitats and novel technologies provide unique opportunities to study wild animals and their responses to environmental change.

Image: Great Tit *Parus major* Thermal Image (© Paul Jerom, www.pauljerom.com)

Studies on freshwater systems provide insights into the origin of new species

The rich diversity of life in the natural world originates through the process of evolution. Understanding how this diversity arises & is maintained is one of the most challenging areas of biology.

At SCENE, together with Glasgow Polyomics, we are using freshwater systems & fish as models of evolutionary processes. We bring together experimental & field studies on ecology, genetics and development to try to understand the mechanisms that lead to diversification. Another strand of our studies is providing answers to applied questions related to evidence-based conservation & management of our aquatic resources.

These studies are shedding new light on how species form but also provide crucial information on the protection of biodiversity for the future.

Image: Electrofishing (Travis van Leeuwen)

Arthropods and the diseases they transmit: the impacts of environmental change

Arthropods such as midges (shown above) and ticks are an integral part of the Scottish countryside. Some species are responsible for transmitting infectious diseases to wildlife, livestock and humans. Our research is investigating how interactions between pathogens, vectors and hosts are being modified by changing environmental conditions.

We study the tick vectors of Lyme disease and their mammalian hosts, and the midge and mosquito vectors of avian malaria and their bird hosts. We combine field data with computational & genomic analyses to identify pathogens, and to examine immunity, health and fitness of the hosts.

Our aim is to determine how changes to the environment will impact disease risk, and to identify strategies for mitigation.

Image: Highland midge *Culicoides impunctatus* (APS, www.apsbiocontrol.com)

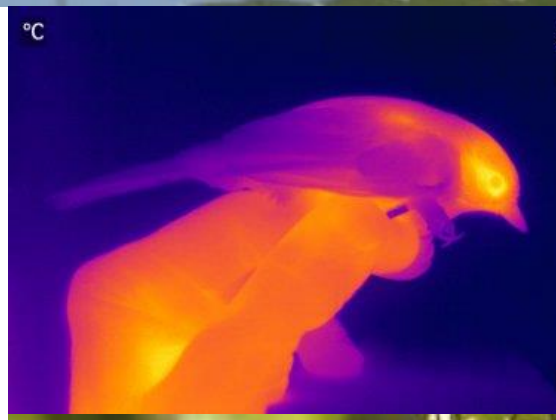
Birds as models in research


1427

Hotel
Blairvockie
Dubh Lochan
Inverbeg Inn
Mid Hill
2149
Beinn Dubh
2108
Glen Mollachan
Glenmollachan
Edentaggart
Steamer track
A 82
Culag
Torr
Luss
Pier
Inchlonaig
Auchengavin
The Paps
Cruach Dhubh
Aldochlay
Ruisg
Inchcruin
Inchtavannach
Inchmoan
Inchfad
Inchcailloch
Cashell
Camping Site
Millarochy
L O C H
Ardlui
LOCH KATRINE
Inversnaid
THE COBBLER
(Ben Arthur)
A83
Tarbet
BEN LOMOND
(3195 feet)
B829
Rowardennan
A814
DOUNE HILL
West Highland Way
LOCH LOMOND
Luss
Balmaha
B837
A817
Drymen
A811
B832
Balloch

Dr Ruedi Nager

Research interests focus on how organisms cope with the environment in which they live



Projects at SCENE:

- The use of seabirds as monitors of coastal habitat (*with N. O'Hanlon*)
- Body surface temperature as a non-invasive measure of stress in wild animals (*with P. Jerem, Dr D. McCafferty and Dr D. McKeegan*)

Dr Davide Dominoni

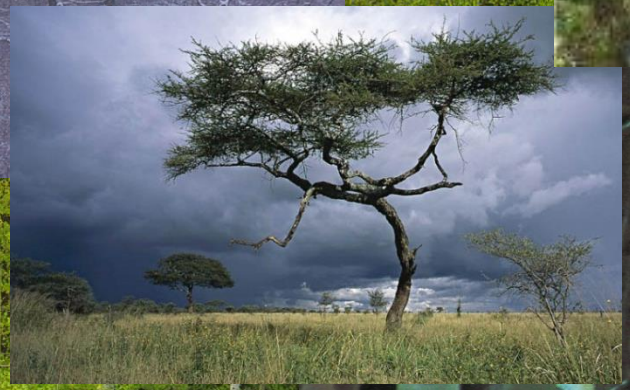
University of Glasgow

- Adaptations of birds to anthropogenic habitat change (urbanization, light pollution)

- Recently established gradient of nest-boxes from SCENE to Glasgow (Blue tit, Great tit)

Coping with seasonal change

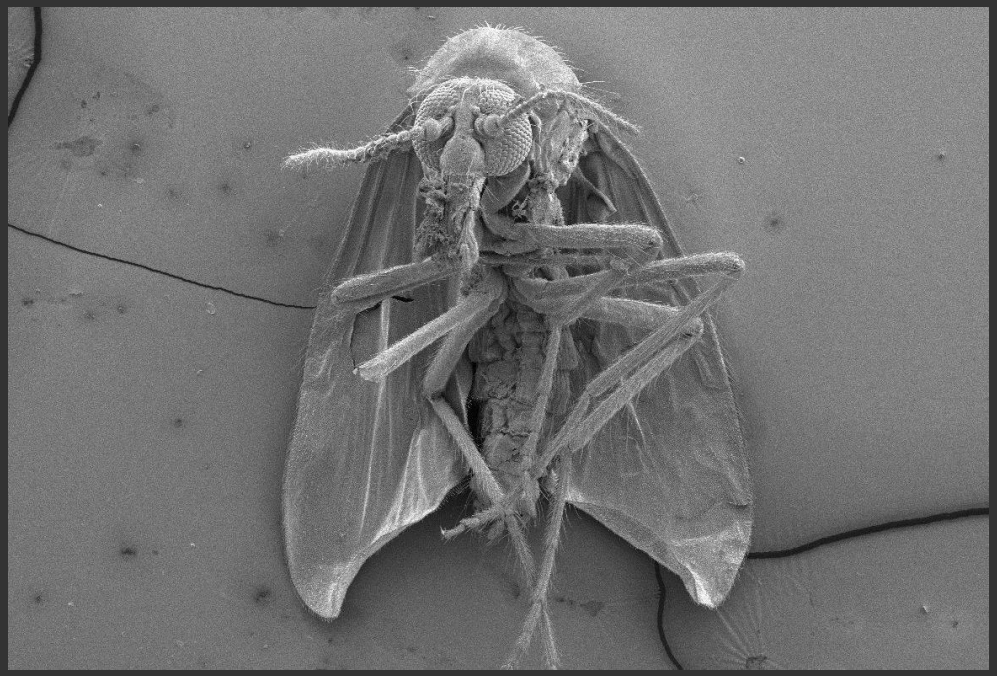
changing energetic needs



changing risks of disease and predation

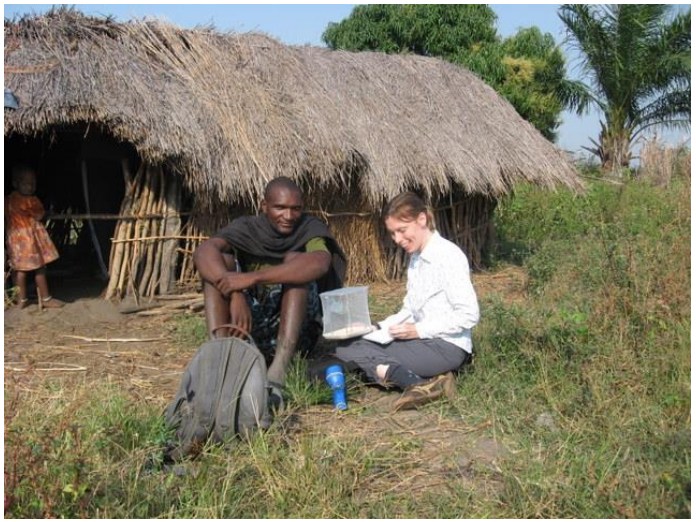
changing availability and quality of food

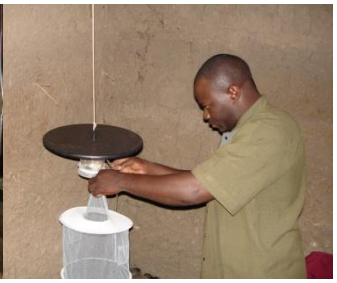
Vectors and diseases...



Dr Heather Ferguson

- Ecology, evolution and control of disease transmitting insects
- Previously focus on malaria, with studies in Tanzania and south east Asia
- Now studies of avian malaria transmission by midges and mosquitoes at SCENE
- Using SCENE to assess the impact of climate change on disease risk





Dr Roman Biek

- Ecology and evolution of viral and bacterial pathogens
- Research generally aims to reveal mechanisms of pathogen emergence, spread and persistence
- In Scotland, focus is on tick-borne diseases, especially **Lyme borreliosis**
- Seeks to explain spatial and temporal variation in Lyme disease risk and its ecological determinants (e.g. changes in host communities)


SCENE
Loch Lomond
THANKS!