The Evolution of the Darwin Initiative:

From biodiversity research to global conservation impact

Charles Darwin as a model of thought leadership for Darwin Initiative projects

Charles Darwin is recognised as having developed the foundations of modern biological science through his theories on evolution and natural selection. His work provided the explanation for diversity of life on earth and is thus critical to any activity relating to conservation of biodiversity.

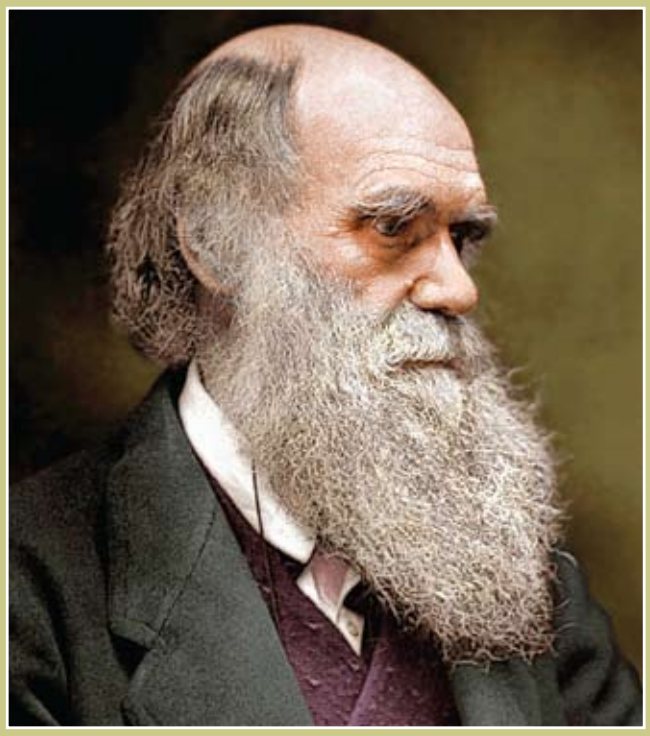

Photo credit: Copyright Natural History Museum, London

Charles Robert Darwin, the father of evolutionary science

Darwin's experience on the Beagle voyage has become iconic. Using his prolific studies on the Beagle he published numerous accounts of new species, geological observations and even theories on biological and geological processes such as the formation of coral reefs. As a result he quickly became a respected natural scientist. He was a leader in looking at the relevance of geographical distributions to speciation, and in understanding how divergent life forms worked. He increasingly worked through important and sensitive emerging ideas, such as transmutation of species, divergent and niche evolution and eventually published his theory of Natural Selection 23 years after completing his journey on the Beagle. Much of this went against the contemporary scientific and religious beliefs.

Darwin was the epitome of cutting edge and innovative thought leadership in the natural sciences. He laid the foundations for much of our modern day work on conservation of biodiversity. As we will now see, many Darwin Initiative projects follow his example, linking closely to his concepts, to institutions that he worked with, and to countries he visited whilst developing his ideas.

The Darwin Initiative – an evolution in support to biodiversity conservation

The Darwin Initiative was announced by the UK government in 1992 at the Rio Convention. Its key objective is to draw on expertise from within the United Kingdom, to work with partners in countries rich in biodiversity but poor in resources, to achieve the conservation of biological diversity, the sustainable use of its components, and the fair and equitable sharing of benefits arising out of the utilisation of genetic resources. It does this through awarding grant funds for a range of biodiversity conservation projects.

A typical project lasts for up to three years and has Darwin-funded costs of about £50,000 to £80,000 a year. Project activities are diverse, including:

- Producing strategies and management plans for specific areas and species.
- Delivering best practice in conservation (producing field guides, local keys or databases), in research methods and fieldwork, or in environmental impact assessments.
- Tackling key issues such as data access and repatriation, and benefit sharing.

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The Darwin Initiative – following the Beagle voyage

Photo credit: Keith Willmott

Batesia hypochlora

1835 – Peru - 17 Darwin Initiative projects

Darwin himself was not able to spend much time in Peru due to what he said was 'a troubled state of public affairs'; indeed he only managed to stay for 6 weeks. Darwin projects here have taken a close look at evolution and speciation in mammals, amphibians and insects.

Tropical Andean butterfly diversity project (14-047)

Butterflies are considered a very good potential indicator group for the conservation of biodiversity, but like many insects are relatively poorly described. This Darwin Initiative project supports an ambitious programme for the Andean region which is developing regional taxonomic research networks and capacity, establishing a new regional conservation strategy and supporting revision of the IUCN Red List for world butterflies. These will provide real impact and legacy from the project.

1835 - Ecuador & Galapagos - 22 Darwin Initiative projects

The Galapagos Islands were a key influence in Darwin's emerging ideas. In the Galapagos he found a remarkable population of plants, birds and reptiles that had developed in isolation from the mainland, but often differed on almost identical islands next door to one another. He could only explain these characteristics by a gradual transformation of the various species. Several Darwin Initiative projects have looked at endemic land and marine species in Galapagos and increasingly the projects here are at the cutting edge of climate change research.

Marine Benthic Invertebrate Study in Coastal Waters of Ecuador (6-029)

Photo credit: Daniel Fitter

Mangrove Finch

Marine invertebrates were a keen interest of Charles Darwin. This project established a unit based at the University of Guayaquil dedicated to the specialised study of marine invertebrate taxonomy and benthic (sea floor) ecosystems. Through training and published science, the project established a much improved understanding of the importance of the biodiversity in benthic communities of Ecuador. Something Charles Darwin would have been proud of.

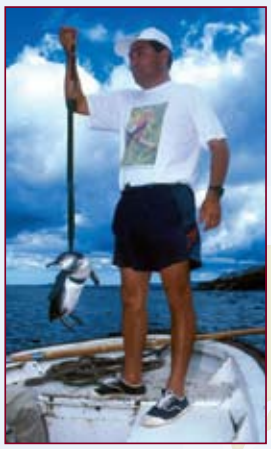

Photo credit: Carlos Villalba

Hernán Vargas monitoring body condition of a young Galapagos penguin during the 1997-1998 El Niño event

Acaena magellanica

Calafate

Photo credits: Shaun Russell

1834 – Chile - 27 Darwin Initiative projects

A number of projects in Chile reflect Darwin's work in surveying the diversity of life, including work on less visible groups of life such as nematodes and fungi.

Inventory and Conservation of the Bryoflora of South Western Patagonia (13-024)

This innovative and highly successful project was one that Darwin would have been truly fascinated by. It carried out extensive specimen collection through scientific exploration and established international standard laboratory facilities in Chile. The work resulted in the discovery of two species potentially new to science and new discoveries on the biogeographical affinities of the moss flora and high levels of endemism. The project has contributed to the successful bid for UNESCO Biosphere Reserve status for the Cape Horn. It has also attracted extensive international collaboration and produced publications far in excess of those planned.

1834 - Argentina - 11 Darwin Initiative projects

Charles Darwin recognised the barren vulnerability of parts of this extreme environment, as do today's Darwin Initiative projects. Whilst in Argentina Darwin took great interest in the cyclical nature of the climate here and the resultant impacts this had on the flora and fauna of Argentina.

Endangered otter and invasive mink in Patagonia (13-016)

The Southern River Otter is in danger of complete extinction. This Darwin Initiative project's outstanding research has had critical impacts on the conservation of the otters by providing new information about the status and threats to the species (especially invasive American mink). It has also provided the capacity and justification for several specific conservation actions. It has highlighted the critical status of another otter species and obtained Darwin Initiative Post Project funding to study the decline of this species and to implement otter conservation along the Beagle Channel.

1832-33 - Brazil - 18 Darwin Initiative projects

Much of Darwin's time with the Beagle was spent exploring the eastern coast of South America. Brazil is clearly a country with significant natural resource use potential - Darwin Initiative projects often work on how conservation and sustainable economic use can be combined.

Biodiversity and functional value of Amazonian forests (12-014)

By assessing the value of different forest management approaches in terms of ecosystem functions and carbon sequestration, this project helped the Brazilian Government to optimise options in meeting biodiversity and carbon commitments. It had a strong focus on producing high quality scientific research papers involving both UK and Brazilian authors, as well as on training, resulting in significant scientific and technical progress. It was a very successful project, making real contributions to scientific knowledge and skills about conservation biology in the Brazilian Amazon.

Nessaea obrina (Linnaeus, 1758), from the family *Nymphalidae*. Normally found in primary forest, but has been very abundant in plantations

Laura Fasola (left) (Darwin Fellow EIDPS016) during her training in the UK: releasing an American mink fitted with a tracking collar

January 1832 - Cape Verde Islands -1 Darwin Initiative project

These islands formed a large part of Darwin's developing theory on evolution. Observing how similar but different species filled the same habitat niches on different islands provoked much of his thinking.

Phyllosoma larvae of (Rock lobster in) the Cape Verde Islands (10-020)

Rock lobsters are of high commercial value in the Cape Verde islands, making their sustainability important. This project set out to improve the information base on the various species of lobster, especially at larval stage. Understanding of all stages of the life cycle is required to understand the ecological needs of different species, to properly protect habitats and to ensure a sustainable fishery.

Photo credits: Eddie Duff

1836 - St Helena - 1 Darwin Initiative project

Charles Darwin was fascinated by the geology of St Helena, noting the changes and disturbances that have lead to a high number of indigenous species. He also observed that British imported plants were thriving better than, and probably out-competing, many indigens (invasive exotics), and that human land-use was devastating parts of the ecosystem.

Ecology and conservation of the endemic St Helena wirebird (7-115)

St Helena has lost much unique biodiversity. In the 1990s, the wirebird was the only remaining endemic bird species, a flagship species for the biodiversity of St Helena, and evidence suggested that it was in decline. This project set out to understand the population dynamics and design long-term management actions. This project contributed to the survival of the wirebird through research, monitoring, database development, training and management planning. It gave the St Helena Government firm scientific grounding for developing conservation action.

1836 - Mauritius - 10 Darwin Initiative projects

On this relatively young volcanic island with recent extinctions (such as the Dodo), Darwin noted the potential increase in agricultural pressures. Today's conservationists are dealing with the consequences, in the shape of extinctions, survival and restoration of populations of some species.

Restoring Island Biodiversity: the Reintroduction of Endemic Mauritian Reptile Communities (15-038)

As Charles Darwin implicitly predicted, human land use has caused extinction and fragmentation in the unique Mauritian ecosystem. Loss of reptiles has caused the loss of important ecological associations, which once underpinned the stability of the now impoverished ecosystem. This ongoing project is training local staff and working effectively with Government to successfully re-establish sustainable reptile communities in Mauritius, securing future reptile populations and restoring functional island ecosystems.

Photo credits: Nic Cole

1. Lesser night gecko (*Nactus coindemirensis*)
2. Orange-tail skink (*Gongylomorphus fontenayi sp.*)

- Providing training, education and awareness-raising to people at all levels and ages.
- Enabling early career and mid career professionals from developing countries to access training, expertise and facilities.
- Monitoring and evaluation of biodiversity, taxonomy and species descriptions.

Initially, Darwin projects had a strong focus on 'pure' science, technical management planning and training. Projects quickly evolved to place more emphasis on local stakeholders, communication and links to policy. This reflects the wider change in best practice in conservation and extends the legacy of Darwin projects. Since September 2002, there has been an increased funding commitment and three new types of Darwin funding (Darwin Fellowships, Darwin Scoping Awards and Post-project funding). These aim to enhance the legacy and impact of the Darwin Initiative. In 2008, the remit of the Darwin Initiative was expanded to include CMS (the Convention on the Conservation of Migratory Species) and CITES (the Convention on International Trade in Endangered Species); in addition, it was clarified that applications from the UK Overseas Territories were particularly welcome.

Future evolution – how the Darwin Initiative is taking conservation science forward

Darwin Initiative projects clearly reflect the legacy of Charles Darwin. Many are at the cutting edge of thought-leadership in conservation science. Increasingly projects are exploring emerging issues like climate change, or are pushing forward new science. Projects are recognising the complexity of conservation, including:

- The need for an ecosystem approach when applying conservation based research and management measures.
- The value (in terms of conservation) of recognising indigenous people livelihoods issues.
- The importance of involving local communities in conservation such as through participatory management as demonstrated in Taraba State, Nigeria (14-049) and the Rodna Mountains in Romania (14-019).
- The role conservation can play in reducing poverty as highlighted by the recent link of the Millennium Development Goals to the reduction of biodiversity loss. Examples of where reducing poverty has contributed to conservation of biodiversity include a project on Human Elephant

Case study – Key achievements of the Darwin Initiative

Since its launch in 1992, the Darwin Initiative has funded over 650 projects and invested over £73 million. It has supported work in 146 countries; held 16 rounds of competitive funding; involved almost 200 renowned British institutions; partnered with 764 organisations in host nations. Like Charles Darwin, the Darwin Initiative has greatly enhanced scientific knowledge, with high quality research forming the backbone of many Darwin Initiative projects. Some of the key achievements of the Darwin Initiative include:

– Almost 53,000 people have received training to help them do their job better, including completion of 68 PhDs and around 200 Masters degrees.

– Some 1,420 peer reviewed scientific papers have been published including an impressive 253 in 2007/8 alone.

– A total of £2.4 million pounds worth of physical assets have been handed over to host countries to support implementation of conservation efforts.

– Many areas of important biodiversity have been better protected through improved knowledge and management by the creation and implementation of management plans, species action plans and gazettement of protected areas.

– Like Charles Darwin a number of species have been discovered such as three corals in Galapagos, a new amphibian in Columbia and Madagascar, a new land snail species, family and genera in Thailand and a new species of orchid in Costa Rica.

Photo credit: A I Pyak

Lagopis darwiniana, a new species named after the Darwin Initiative

Puerto Blest field station in Argentina, equipped by the Darwin Initiative and now fully functional

conflict in Assam, India (16-007) and a certification programme for the wood used by wood carvers in Kenya (11-004).

- Darwin Initiative projects are becoming very successful as catalysts for further ongoing work, including levering additional funds from a wide range of sources. In total, since the inception of the Darwin Initiative, projects have secured a further £26.8 million to fund conservation.

The widespread success of Darwin Initiative projects is a continuing celebration of both Charles Darwin's work and the British expertise in conservation biology. Numerous Darwin projects have won awards and international credits such as:

- Rodrigues Shoals project in Mauritius won the highly coveted Arab Gulf Programme for United Nations Development Organisation (AGFUND) award of $100,000 in 2006 in addition to the Medaille de la Reconnaissance Rodriguaise;
- Richard Brock a staff member on the Lake Bogoria project (16-007) won the 'Film-Makers for Conservation' prize at the 2006 Wildscreen Festival and;
- The Assam Haathi Project won the top prize at the British and Irish Association of Zoos and Aquaria 2007.

Without doubt, the Darwin Initiative is continuing its evolution and going from strength to strength.

Case study – Leveraging support for Conservation – The Role of The Darwin Initiative

The Darwin Initiative supported 2 successive projects in the Las Perlas Archipelago of Panama (projects 12-021 and EIDPO17). This area is important for biodiversity and has important marine ecosystems that are threatened by sedimentation, pollution, overfishing and coastal development. Developers plan to build entirely new towns with residential areas, malls, marinas and golf courses on several of the islands in this fragile ecosystem.

The first project was successful in facilitating the establishment of a 'Special Management Zone' for 168,771 hectares of marine environment. The creation of this new marine protected area in the Tropical Eastern Pacific (Las Perlas Archipelago) has required extensive guidance by the Darwin Initiative project especially with regard to specific zoning implementation. The subsequent Post Project was important in shaping the actual start-up management plans for operating the zoning structure, with the Darwin Initiative project intimately recognised as key players in this process by all stakeholders and communities. During this Post Project the team were instrumental in aiding the Panamanian Government in its dealings with the Inter American Development Bank for a loan of $600,000 to develop further management plans for the Las Perlas Archipelago.

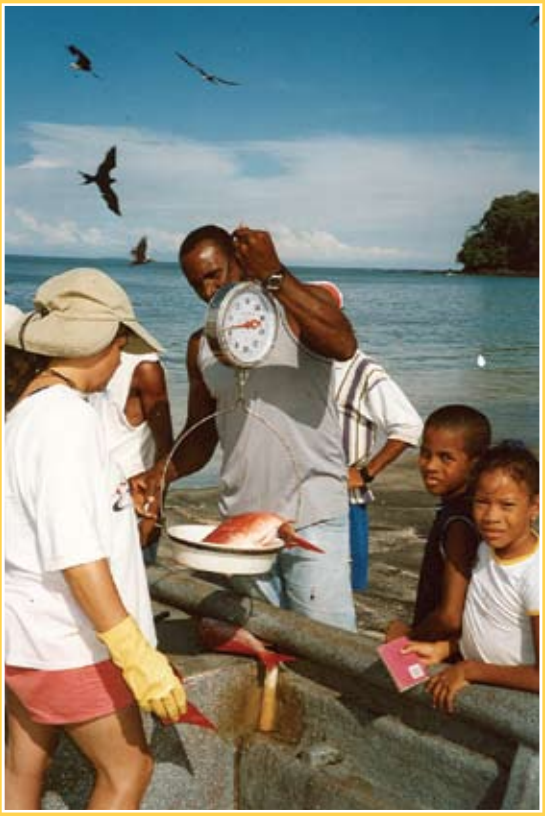

Photo credit: Orea Anderson (project MSc student)

The Darwin team carried out an assessment of the important Snapper fishery within the Special Management Zone to assist in future plans for conserving the archipelago's renewable resources

The Darwin Initiative aims to promote biodiversity conservation and sustainable use of resources around the world. It uses UK expertise working with local partners to help countries rich in biodiversity but poor in resources to fulfil their commitments under the CBD, CMS and CITES. The Initiative is funded and administered by the UK Government's Department for Environment, Food and Rural Affairs (Defra). Since 1992, the Darwin Initiative has committed over £73m to over 650 projects in over 100 countries.

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For information on the Darwin Initiative see http://darwin.defra.gov.uk. For information on the CBD see www.biodiv.org.

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