Final project evaluation

Control of invasive species in the Galapagos Archipelago

ECU/00/G31

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Waiver of liability

This document is the result of the external and independent evaluation of the Control of Invasive Species in the Galapagos Archipelago Project (ECU/00/G31). The opinions and ideas expressed in the document are the authors' and do not reflect the official position of the Global Environment Fund (GEF), the United Nations Development Programme (UNDP) or the Ministry of the Environment of Ecuador (MAE).

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Preface

This document is the result of the external and independent evaluation of the Control of Invasive Species in the Galapagos Archipelago Project (ECU/00/G31). It begins with an Executive Summary, which condense the main elements of the Project and the findings of the evaluation.

Chapter 1 briefly explains the problems caused by the introduction of invasive species in the Galapagos and the elements and implementation arrangements of the Project. There is also an explanation of how this evaluation was carried out.

Chapter 2 contains the findings of the evaluation. First is a general overview of the findings, followed by an explanation of what was found about the phases of project formulation and design. Then the authors present the findings regarding each of the six expected results, including specific conclusions and recommendations. Next are the findings with respect to the closure of the Project. The chapter ends with the findings regarding the fulfilment of the purpose of the Project, post-project sustainability and the impacts that were identified.

Chapter 3 presents the conclusions of the evaluation, the lessons learned and recommendations.

The final part of the document contains supporting information, including bibliography, a list of abbreviations, relevant definitions, tables, figures and annexes.

Executive Summary

The Control of Invasive Species in the Galapagos Archipelago Project, ECU/00/G31 (CISGP, or "the Project") was a relevant, timely and valuable initiative which achieved important and significant outcomes. It was executed between 2002 and 2011 by the Government of Ecuador's Ministry of the Environment (MAE). The Project was undertaken with support from the Global Environment Facility (GEF) totalling US$18.65 million, with counterpart and/or matching funding of US$32.5 million from the Galapagos National Park (GNP), the Charles Darwin Foundation (CDF), the Government of Ecuador (GoE) and the German Government. It was complemented by a project sponsored by the United Nations Foundation (UNF), a loan operation from the Inter-American Development Bank (IDB) and the Araucaria Project of AECID. The GEF implementing agency was UNDP. Local implementation was carried out through a Project Administration Unit and four co-executors: GNP, CDF, the Ecuadorian Agricultural Health Service (formerly SESA, now AGROCALIDAD), and the National Galapagos Institute (formerly INGALA, now the Galapagos Government Council, CGG).

A mid-term evaluation of the Project was undertaken in 2004. Field activities were almost completely finalized in 2007; in 2008 the Fund for the Control of Invasive Species in Galapagos (FEIG) was established. This is a trust fund of approximately US$15 million, including a US$5 million donation from the GEF. In 2009 a 'Pre-Final Evaluation' was conducted, it identified that there was still some work to be done in order to complete and close the Project. An extended closing phase was recommended using US$0.5 million of remaining GEF funds. This final evaluation was carried out from May to July 2011.

The purpose of the Project was 'To develop an integrated and permanent system for the Total Control of Invasive Species which would allow for the long-term conservation of the Galapagos Islands'. In order to achieve this six outcomes were proposed involving strengthening SICGAL's ability to undertake effective biosecurity programmes, promotion and implementation of the Total Control Plan, developing eradication and impact mitigation mechanisms, enhancing financial sustainability of actions under the Total Control Plan, promoting community awareness and support, and coordinating the implementation of policies and strategies under the Total Control Plan.

The Project was a relevant, necessary and timely initiative which led to locally and internationally significant impacts. The Government of Ecuador, GEF and co-funders are to be commended for their support for what was a major national commitment and, at the time, the largest GEF biodiversity project undertaken.

While notable achievements were made in relation to planned outcomes we concluded that the purpose of the Project was not achieved. We found elements of an invasive species management system, but not a fully functional and integrated system. The design of the Project was very ambitious and complex; also it was implemented in a period of institutional and political instability, and faced serious difficulties in the first three years of execution. In addition variable institutional engagement and support, inadequate leadership and cooperation and limited mechanisms to respond to new information also contributed to the purpose not being achieved. Unrealistic expectations of success were probably also a factor.

The Project had important and variable impacts on participating agencies. The GNP benefitted through its management roles. Significant infrastructure and capacity was

developed and a number of initiatives and activities have been maintained, and important outcomes sustained. CDF employed additional staff and expanded its operations to provide a range of services under the Project. Relationships between CDF and staff from GNP and SICGAL, in particular, were extremely productive and underpinned many of the Project's achievements. SICGAL bolstered its inspection, monitoring and surveillance and emergency response capacities. INGALA used its jurisdiction and authority to develop various public policy instruments and to carry out a process of consultation and approval for the Total Control Plan. We concluded, however, that the Total Control Plan was not fully positioned and internalized within Galapagos institutions.

The pilot invasive ungulate eradication project in the northern part of Isabela Island ('Project Isabela') was very successful and demonstrated that it is possible to eradicate populations over large areas in an efficient and cost-effective way using modern technologies. Eradication costs overall were about US$20 per hectare, although there are on-going costs in removing goats which have been re-introduced. Although the outcomes are still emerging we would observe that few ecological management activities have been as cost-effective, or resulted in such a range of impacts. An archipelago-wide goat eradication strategy is now being implemented by GNP.

In addition to Project Isabela 43 other "Pilot" or "Demonstration" projects were initiated during the Project, of which 30 were aimed at eradicating or controlling 23 species of invasive plants. A further 13 projects targeted invasive vertebrates (eight species) or invertebrates (four species). Slightly more than half of the projects targeting vertebrates (5/8) were reported as successful. None of the invertebrate projects achieved their declared (eradication) objectives and only four of the 30 plant projects were successful. While most plant eradications and all invertebrate eradications were unsuccessful, a range of positive impacts in relation to capacity building, experience and awareness raising were reported. Important lessons were learned about the need for the rigorous application of selection criteria for eradications, consistent application of management tools and committed institutional support through to project completion. Based on this experience it was learned that eradication is not always the best objective, and that control or mitigation of impacts may be more appropriate, depending on the circumstances.

While important progress was made with the Project, an effective biosecurity system has not yet been established. The absence of an effective system to prevent further invasive species establishing constitutes a major risk to many of the achievements made during the Project – and to the Galapagos environment and economy more generally. Greater emphasis on establishing and supporting an effective and efficient invasive species management system is required. This was an important recommendation to emerge from this evaluation.

CDF support for applied research underpinning activities by GNP and SICGAL was an important factor in the progress made. We found little evidence, however, of a formal adaptive management approach being applied. However, a culture of decision making based on current information was not created within participating management agencies during the Project.

A large amount of information was generated during the Project. Regrettably information is scattered and not easily accessible. An inability to access project information constitutes a serious risk to on-going activities, and in sustaining outcomes.

The creation of the Galapagos Invasive Species Fund (FEIG) was a notable achievement. The Project faced serious difficulties in defining an appropriate mechanism for administering the trust fund and in raising funds. Decisions to establish a design committee and to select an experienced national entity to administer the fund were wise. The decision by the GoE to provide fiscal resources to the trust was timely

and laudable. A clear strategy, transparent procedures and declared priorities and criteria to guide the trust's allocation of resources is required to maximise the impact of the fund.

A range of mechanisms were used to raise community awareness and to generate support for invasive species management activities. Despite these efforts, however, community awareness and support remains limited. The GoE will need to facilitate a collaborative approach to identifying barriers and constraints to community engagement and support, and to identify common goals and innovative mechanisms to advance invasive species management in the archipelago.

While variable in their impact, CIMEIs were useful in raising awareness and facilitating the involvement of local residents in conservation-related activities. However, their purpose and roles need to be clarified, and their efforts better-supported if they are to contribute to greater awareness and community support for invasive species management within communities.

Despite the Project's contributions the management of invasive species in Galapagos remains as a major challenge. We concluded that it will be important to consolidate the advances that were made during the Project and to invest quickly in establishing an integrated system which builds on the achievements made and the lessons learned. This will require a collaborative approach in which key government, non-government and community entities with a stake in managing invasive species in the archipelago are involved from the outset. The potential to further-harness international interest and support for invasive species management, and conservation more generally, in the archipelago should be recognised.

Given what has been achieved we are optimistic that Galapagos entities, supported by the Ecuadorian Government, can continue to lead the world in facing the threats invasive species pose to this special place..

Below is a summary of the ratings[1] of the main elements of the Project based on the findings of the final evaluation:

Project Conceptualization and Design	Moderately Satisfactory
Project Implementation	
Implementation approach	Moderately Satisfactory
Participation of co-implementers	Moderately Satisfactory
Financial management	Not evaluated
Monitoring and Evaluation	Moderately Satisfactory
Involvement of key stakeholders	Moderately Satisfactory
Adaptive Management	Very satisfactory
Project Outcomes	
Outcome 1 Prevention of Invasive Species	Satisfactory
Outcome 2 Research, planning, adaptive management	Moderately Satisfactory
Outcome 3 Eradication and control pilot projects	Satisfactory
Outcome 4 Financial sustainability	Satisfactory
Outcome 5 Awareness-raising and public participation	Moderately Satisfactory
Outcome 6 Regional and development planning	Moderately Satisfactory
Sustainability	Moderately Satisfactory

[1] Ratings were assigned based on a six-point scale: Highly satisfactory, satisfactory, Moderately satisfactory, Moderately unsatisfactory, Unsatisfactory and Highly unsatisfactory.

Chapter 1. Introduction

The Galapagos archipelago and the problem of invasive species

The Galapagos Archipelago consists of over 100 volcanic islands, islets and stacks in the eastern Pacific Ocean, about 1,000 kilometres west from the coast of Ecuador. The archipelago supports a rich and largely intact biota including a high percentage of endemic species – including single-island endemics. Although discovered in the 1500s and occupied by pirates and some colonists, the archipelago's human population did not increase markedly until the late 20th century.

The flora and fauna of the Galapagos developed over millions of years in isolation. Like island biotas everywhere, endemic Galapagos species are especially vulnerable to induced change. Invasive alien species, in particular, are major factors in the decline and extinction of island endemics. Pirates and early settlers to the Galapagos introduced domestic plants and animals, many of which successfully established and colonised areas on inhabited islands. Since then an increasing array of invasive species have established and have colonised on many islands in the archipelago. Guezou et al., (2010) and Trueman et al., (2010) reported the existence of 870 species of invasive plants and more than 560 native species of flora, of which one-third are endemic. Jimenez et al., (2007) reported that, as of 2007, 36 species of introduced vertebrates had been recorded, of which 30 had naturalized. Causton & Sevilla (2007) reported that, as of the end of 2006, 490 invasive species of insects and 53 invasive species of other invertebrates had been recorded.

The impacts of invasive species in the archipelago have been documented by various authors. For example, Desender et al., (1999) identified that areas affected by feral goats around Alcedo volcano on Isabela Island had reduced species diversity due to changes in the structure and composition of vegetation cover. Impacts of invasive predators such as feral pigs, cats and dogs had also been reported on turtle eggs and young and young tortoises. While their effects may be subtle, weeds compete with native plants for light and space and modify native plant communities and wildlife habitats.

The archipelago has been Ecuadorian territory since February 12, 1832. In the late 1950s, Ecuador requested support from UNESCO and IUCN to establish biodiversity protection schemes for the islands. As a result, in 1959, the Galapagos National Park (GNP) and the Charles Darwin Foundation (CDF) were created. The GNP covers 97.5% of the land surface of the archipelago, with a surface area of 693,700 ha, while the remaining land is populated. There are human settlements on the islands of Santa Cruz, San Cristobal, Floreana and Isabela (Figure 1). On February 18, 1973, the province of Galapagos was founded, the capital of which is Puerto Baquerizo Moreno (located on San Cristobal Island), with three municipalities: San Cristobal, Santa Cruz and Isabela. In 1979, the islands were declared a UNESCO World Heritage Site. In 1984, they were declared a Biosphere Reserve; in 1998, the Galapagos Marine Reserve (GMR) was created, and in 2001 the World Heritage Site was expanded to include the GMR. The protected areas of the archipelago are administered by the Galapagos National Park Directorate[2] (GNPD).

[2] Administrative Statute of the Galapagos National Park published in the Supplement to the Official Registry 102 of June 11, 2007.

The CDF has been a permanent ally of conservation in the islands. It was created to conduct scientific research and to provide technical assistance and recommendations for conserving the islands. The CDF is an international non-profit organization registered in Belgium, and it operates within Ecuador through an agreement with the Government of Ecuador. In 1964 the Charles Darwin Scientific Station (CDSS) was inaugurated in Puerto Ayora. Since then, it has served as the base of operations for Ecuadorian and foreign scientists in various disciplines.

The rapid growth in the human population in the last decades and associated economic activities, primarily tourism, has led to increased flows of maritime and aerial transportation of cargo and passengers from the Ecuadorian mainland and the islands, and between islands. This has weakened the archipelago's geographic isolation, as well as of individual islands, and facilitated the introduction of invasive species (IS). The number of introduced species increased exponentially during the second half of the 20th Century (Figure 2). The GNP Management Plan recognizes that the IS are the main threat to the conservation of the Galapagos biodiversity (MAE, 2006).

In the early 1990s, a scheme to create barriers to the entry of further IS to the archipelago was created. In 1994, the Special Regulations for Agricultural Health and Quarantine and for Natural Areas for the Galapagos Islands were issued, which established an inspection system (which was later called SICGAL), under the responsibility of SESA and INEFAN[3] (today the MAE) (Figure 6).

In 1998, a new Political Constitution of the Republic of Ecuador established that the province of Galapagos will be governed by a special regime. The constitutional mandate was implemented through the Special Regime Law for the Conservation and Sustainable Development of the Province of Galapagos[4] (LOREG). This law established that invasive species were a serious problem and that all individuals and organisations must contribute to the total control of introduced species and to prevent their entry and spread[5]. LOREG made SESA responsible for inspection and quarantine efforts at ports and airports. It also established a mechanism for distributing the revenues from the entry fees to the protected areas of the archipelago, whereby 5% of revenues would be allocated to the Galapagos Province Inspection and Quarantine System (SICGAL).

In 2003, the Regulations for the Total Control of Introduced Species in the Province of Galapagos[6] were issued, which created the SICGAL[7] as an integral Programme within SESA (today AGROCALIDAD) intended to prevent the introduction of IS.

The new Constitution of the Republic of Ecuador of 2008 confirmed the special regime governing the province of Galapagos, and that it will be administered by a Council of Government (CGG), responsible for planning, managing resources and organizing other activities in the province. In accordance with these constitutional changes, LOREG is in the process of being updated.

International Context

Quarantine has long been practiced as a measure to slow the movement of pests and diseases. Global instruments such as The International Plant Protection Convention

[3] At the time the regulations were issued, the INEFAN was an office of the MAG. In January 1999, it merged with the MAE.
[4] Published in Official Registry 278 of March 18, 1998.
[5] The definition and constituent elements of Total Control are found in article 73 of the LOREG.
[6] Executive Decree 3516 published in Official Registry, Special Edition 2, of March 31, 2003.
[7] The regulation establishes that SICGAL includes (1) inspection and quarantine control, (2) epidemiological monitoring and surveillance, (3) control and eradication of emerging species and organisms, and (4) community education and outreach.

have facilitated the development of tools that analyse risk and develop measures to prevent species movement. Australia and New Zealand, both island nations, are the world leaders in the use of a quarantine system at three levels (pre-border, border and post-border), to minimize the risk of invasion (Ministry of Agriculture and Forestry, 2008; Commonwealth of Australia, 2011). The principle that all species are potentially invasive until proven otherwise, combined with a permitted species list, is the cornerstone of their policies. The application of this principle requires considerable investment in biosecurity and human capacity.

International recognition that managing invasive species for biodiversity conservation is important and potentially achievable is growing, especially on islands where invasive species impacts are especially severe (Keitt et al., 2010). The number and scale of initiatives to eradicate invasive vertebrates, in particular, has grown rapidly in the last 30 years. Recent projects have involved the removal of multiple pests from quite large islands as part of a single operation (e.g., Rangitoto-Motutapu Island, New Zealand – eight mammals; Macquarie Island, Tasmania – rats, mice, rabbits)

A few countries have adopted strategic approaches to building eradication capacity. The New Zealand Department of Conservation implemented a sequential approach to developing capacity to eradicate pests from larger islands. A similar approach has also been taken in north-west Mexico. Other countries are considering more strategic approaches (e.g., Australia, Chile).

Regional approaches, where several countries are cooperating to address invasive species problems, have also been initiated. The Pacific Invasives Partnership[8], involving 23 tropical Pacific countries and territories, has been functioning since 2002. Regional programmes have also been initiated, or have been proposed in the Caribbean, the Indian Ocean, the Aleutians and the UK South Atlantic Overseas Territories.

The GEF Project

The Control of Invasive Species in the Galapagos Archipelago Project (hereafter the Project or CISGP) was executed with support from the GEF and various sources. It was a long-term initiative, spread over 14 years, from conceptualization to implementation. The Project Document (PRODOC) lists the following project objectives:

Development Objective: Conservation of endemic and native biodiversity in the Galapagos Archipelago and preservation of natural evolutionary processes.

Purpose: To develop an integrated and permanent system for the Total Control of Invasive Species which would allow for the long-term conservation of the Galapagos Islands.

The Project was designed with six Outcomes, that were adjusted after the mid-term evaluation (MTE):

PRODOC	Post-MTE (May 2005)
Outcome 1. A coordinated inspection and quarantine system for Galapagos is in place with the full participation of local institutions and with clearly defined procedures and detection techniques.	Outcome 1. SICGAL strengthened and effective, with full participation and commitments from local and national institutions and the community.

[8] www.sprep.org/pip

PRODOC	Post-MTE (May 2005)
Outcome 2. Adaptive management mechanisms established to develop and up-date a scientifically sound, well-programmed and cost-effective bioinvasion control programme.	Outcome 2. Co-implementers and key stakeholders are adopting and promoting the implementation of the Total Control Plan.
Outcome 3. A series of eradication and control pilot projects implemented to eliminate critical invasive species populations and to strengthen the technical & operational capacity of parties with IS control responsibilities	Outcome 3. GNP and CDF develop, adopt and implement efficient mechanisms for eradication and mitigation actions of priority invasive species.
Outcome 4. An expanded and efficiently operating financial mechanism is operationalized permitting the permanent funding of IS control activities in the Galapagos	Outcome 4: The financial sustainability of priority actions of the Total Control Plan is guaranteed.
Outcome 5. A community awareness and participation programme for bioinvasion control is developed.	Outcome 5: The Galapagos Community is aware and is participating actively in the total control of invasive species.
Outcome 6. A bio-invasion overlay developed for regional planning with a set of guidelines and instruments that ensure that sector developments are consistent with invasive species control needs	Outcome 6. INGALA facilitates and co-ordinates the effective implementation of policies and strategies of the Total Control Plan.

The CISGP was implemented by UNDP (implementing agency) under the national execution mode (NEX); although at the end, it was changed to the HACT mode. The MAE was the executing agency, and had overall responsibility for Project execution. The MAE delegated project execution to a Project Administration Unit (PAU), and to four co-implementing organisations: GNPD, SESA, INGALA[9] and CDF. The first three are public sector entities, and the last is an NGO.

The Project fell within the category of a Full-Size Project, and received a GEF grant of US$ 18.3 million. The co-financing projected in the PRODOC was US$24.632 million, as described below:

Source of co-financing	Amount committed (US$ thousands)
GNPD	942
SESA	195

[9] INGALA was created in 1980 as the planning entity of the province. The LOREG established that it was the planning and coordinating institution at the regional level for the province of Galapagos. In the 2008 Ecuadorian Constitution, it was established that the province of Galapagos would have a government under a special regime, and that it would be administered by a Council of Government (CGG). In its transitory provisions, the new Constitution established that the Council would absorb INGALA and that an Organic Law for the Special Regime of Galapagos would be issued to replace the LOREG.

Source of co-financing	Amount committed (US$ thousands)
CDF	2.666
IDB	3.703
WWF	895
UNF	2,992
AECI	1,200
USAID	1,011
Private sector	10,928
UNFPA	100
Total	24,632

To design the Project, a PDF-A and a PDF-B were executed (Project Development Facilities). The PDF-A (US$25,000) was obtained in late 1997 and executed in 1998, and provided a basis for initial consultations with key stakeholders as the basis for the design of the Project. Later, a PDF-B (US$ 350,000) was requested, which was used between 1999 and 2000 to design and prepare the Project. The Project was endorsed by the Secretariat of the GEF on April 25, 2001, and was signed between the GoE and UNDP on October 19, 2001.

The administrative arrangements established in the PRODOC are summarized in Figure 3. The Tripartite Meeting[10] (or Tripartite Review) is the highest level of oversight, which is practiced through annual reviews, the approval of annual plans and budgets, and the approval of significant changes to the Project. During these meetings, progress was reviewed and strategic decisions were made.

The MAE had the overall responsibility for the Project, and coordinated its actions through the Galapagos Islands Coordination Unit (UCIGAL). This unit, which no longer exists, was based in Quito, and its purpose was to ensure compliance with operational procedures and to coordinate Project efforts.

The execution of the CISGP was administered by a PAU. It was responsible for coordinating, supervising, assisting, controlling, monitoring and reporting on the implementation of the Project. The unit was made up of a Project Head (also called Project Coordinator or Project Manager), a technical advisor and a financial team. The PAU was disbanded in late 2008. During 2009 and 2010 the Project was administered by the Project Coordination Unit (UCP) of the MAE. Since January 2011, the project was administered by the Undersecretariat of Natural Heritage of the MAE.

A Management Support Group (MSG) was formed for the Project, as well as a Technical Advisory Group (TAG), to support project implementation and facilitate inter-agency coordination. The TAG, made up of experts in invasive species managment,

[10] Participating in the Tripartite Meetings were the MAE, the Technical Secretariat of International Cooperation (SETECI, formerly known as the AECI and AGECI), and UNDP. The minutes of the Tripartite Meetings were reviewed for this evaluation.

who voluntarily donated their time and experience (the Project only covered travel costs), provided advice to the Project. The MSG was made up of one representative from each of the Outcomes, and served as a way to coordinate efforts and ensure an adequate flow of information.

The co-implementers were responsible for specific Outcomes. Outcome 3 was executed jointly by GNPD and CDF. For Project Isabela (PISA), a project unit was established which reported to the PAU. Outcome 4 was initially assigned to the CDF, it was expected that the Darwin Scientific Foundation (DSF) would be the home of the trust fund, in representation of the GoE[11] and that fund-raising campaigns would be implemented through the already existing network[12]. However, there were complications and ultimately a Design Committee was formed to define how to administer the financial mechanism.

For Outcome 5, a Steering Committee was to be created, with representatives from GNPD, CDF, INGALA and Fundación Natura (an Ecuadorian NGO).

There were four phases to the Project:

Design. Between 1997 and 2001, the PDF-A and PDF-B were executed to design the project. The endorsement of the GEF Secretariat was obtained on April 25, 2001, and the PRODOC was signed on October 19, 2001.

The initial concept was focused on eradicating goats from northern Isabela Island (i.e., PISA). This was to be achieved by shooting them from helicopters and using other established best practice techniques (e.g., georeferencing using GPS and GIS, radio telemetry). PISA was built on experiences gained and capacity built during eradication operations on Santiago and Pinta Islands. This approach emerged from recognised urgency to eradicate invasive feral ungulates (i.e., goats, pigs and donkeys) from entire islands, to protect the native biodiversity. The situation on Isabela Island was pressing and required intervention on a scale that had not been possible until then. During the 1970s goats that were living in the southern part of the island managed to cross over the Perry Isthmus and invaded the northern half of the island. This endangered the survival of the giant tortoises and other elements of the flora and fauna of Isabela. During the 1990s the GNP and the CDF began to evaluate the feasibility of using new methodologies to eradicate ungulates in the archipelago. During the second half of the decade efforts began with pig eradication in Santiago, and later goat eradication on Pinta to gain experience, refine techniques and develop capacity in these types of projects.

In the situation analysis that was done during PDF-A, it was clear that eradicating the goats from Isabela Island, although important, was not enough to address the range of threats posed by invasive species; it was agreed that a more holistic approach was needed. At the same time, the scale f the invasive species problem had become much more apparent on the archipelago, and addressing the problem was incorporated into the LOREG (enacted in 1998). Consequently, during PDF-B, the Project was designed, with the participation of key stakeholders and a much broader focus. Additionally, the Project was conceived of as a means to implement the provisions of the LOREG, and was to be complemented with other initiatives underway, such as SICGAL. This began as a CDF initiative in 1991, in 1994 the Health and Quarantine Regulations for the

[11] The DSF was a United States-based NGO established in 1985 which managed a fund for research in Galapagos. The PRODOC proposed to restructure the SDF to become the foundation for the new trust fund.

[12] The work of the CDF is financed in part by fund-raising done by independent NGOs in various parts of the world, which are called Friends of Galapagos Organizations (FOGOS).

archipelago were enacted[13], and later between 1998 and 2000, the CDF executed the Pilot Project for the implementation of a new quarantine system for the Galapagos Islands (financed by USAID PL-480), which supported the established of SICGAL[14].

At the same time, two other projects were prepared for the islands:

The project entitled "Control and Eradication of Invasive Species: a necessary condition to conserve the endemic biodiversity of the Galapagos World Heritage Site", to be financed by UNF. This US$ 3 million project was a joint initiative of the CFD and the GNPD, and was executed between March 2000 and December 2006. It was complementary to the CISGP and included direct counterpart funding for Outcome 3 and US$ 1 million to be donated to a trust fund, as a match to contributions raised of the same amount.

The "Environmental Management of the Galapagos Islands" project was financed with a US$13 million loan from IDB (1274/OC-EC). This project was an initiative of the MAE in support of the GNPD and other Galapagos entities. It was executed between December 2001 and 2006, and was complementary to the CISGP. It included counterpart resources to the CISGP and US$1.8 million to bolster mechanisms to prevent the entry of IS, pests and diseases (i.e. equipment, infrastructure and training for SESA-SICGAL).

Initial Execution (2001 – 2004). Implementation began in October 2001, and by the end of 2003 had achieved some progress, but was experiencing serious problems, primarily:

1. Bringing the helicopters into the country and operating them for the hunting of goats involved procedural complications that had not been foreseen;
2. Fundraising efforts to capitalize the trust fund were not successful, and the restructuring of the DSF did not provide the conditions necessary to sustain the trust fund[15].
3. There were various administrative problems. There were delays in establishing the PAU (it was formed in August 2002). The Project Coordinator had resigned, and there were problems in filling the spot;
4. There were governance issues, due to tensions between the organizations, the distortion of the planned functions of the elements of the institutional structure (i.e. the MSG), severe political instability in the country and conflicts between conservation and development on the islands (Figure 6).

In addition, due to the existing tensions in the archipelago, the UN General Secretary commissioned Mr. Maurice Strong as a special envoy to visit the Galapagos and to analyze opportunities to balance the various perspectives on sustainable development in the islands. This visit took place between May 3 and 6 of 2004, and resulted in a proposal for a resource mobilization Programme to finance sustainable development in the Galapagos.

In light of these factors, a decision was made to move forward the mid-term evaluation (MTE). The MTE was conducted in September 2004, and generated a set of recommendations on how to strengthen the Project, including a revision of the LogFrame (Talvela & Fuentes, 2004).

[13] The Special Regulations for Agricultural Health and Quarantine and for Natural Areas for the Galapagos Islands was enacted by Accord 0267 issued by MAG, published in Official Registry 494 of July 29, 1994.
[14] The CDF and GNP began operating SICGAL in 1998.
[15] In 2002, the DSF merged with the Charles Darwin Foundation Inc., a U.S.-based NGO dedicated to raising funds and supporting conservation in the Galapagos. The new organization was called the Galapagos Conservancy (GC).

Post- MTE Execution (2005 – 2008). The Project made fundamental adjustments and achieved significant progress. For example:

1. A coordinator was hired, who remained in that post until December 2008.
2. A monitoring and evaluation system was established for Project activities.
3. Responsibilities were re-allocated. The responsibility for the TCP was passed from the CDF to INGALA. Similarly, responsibility for Outcome 4 was shifted to the PAU and a Design Committee was formed to better determine the best way to address the trust fund. Various options were evaluated, and the fund (named the Fund for the Control of Invasive Species in the Galapagos, FEIG) was grafted onto the National Environment Fund (FAN). Finally, the fundraising activities for the trust fund were completed.
4. The PISA was completed, and other eradication pilots were carried out, like the Tilapia eradication in the El Junco Lake (San Cristobal Island)(Annex 9).

By the end of 2007, field activities had been completed. During 2008, the main emphasis was to establish the trust fund and to raise the funds necessary and to initiate the closure of the project in 2009. By December 2008, the Project had managed to (i) complete the deliverables for Outcomes 1, 2, 3 and 5, (ii) establish the trust fund (as part of Outcome 4), and (iii) complete a most of the deliverables of Outcome 6. In addition, nearly all of the GEF money had been invested. The MAE decided to close the PAU in December 2008.

Closure (2009 – 2011). In 2009, work continued to make the FEIG operational (i.e., establish the FEIG-OU, settle the donation from the German Government), and the administrative and financial closure of the Project began. A final evaluation was conducted in September 2009 (Hunnam & Van der Meeren, 2009). The evaluation team found that there needed to be an appropriate closure of the CISGP, and that some tasks were still pending (especially documenting and systematizing the lessons learned). There was also a balance of US$600,000 of GEF funds that had not been used. It was proposed that the mission that had taken place be considered as the Preliminary Final Evaluation (here after the Pre-Final Evaluation, PFE), and that the remaining resources be used to execute an intensive final phase (a period of 6 months was proposed) to (i) finalize pending tasks, (ii) consolidate the progress made and complete the establishment of the System of Total Control of Introduced Species (i.e. the purpose of the Project), and (iii) to complete the documentation and analysis of achievements and lessons learned. Finally, the Final Evaluation (FE) would be completed, which would mean the definitive end of the CISGP.

A work plan was prepared to attend to the outstanding issues (with the project closure scheduled for 2010), and a decision was made to change from NEX execution to HACT.

The Final Evaluation

This document presents the results of the Final Evaluation of the CISGP. The evaluation was conducted between May and July 2011, including interviews and field visits in Quito, Guayaquil and Galapagos (Annex 1). We were assisted and accompanied by Ruth Boada and Sofia Panchi of the MAE.

The evaluation team was comprised of two independent experts hired by UNDP, with approval from the MAE: Segundo Coello, head of the evaluation team and Alan Saunders, invasive species specialist.

Segundo Coello is an Ecuadorian, a specialist in natural resource administration and sustainable development, with 26 years of experience. He has a B.S. in Biology from the University of Guayaquil (Ecuador), and a M.S. and Ph.D. from the University of

Wales (United Kingdom). He has worked in the public sector (e.g., he was Undersecretary of the MAE), and in private and non-governmental organizations (i.e. the UICN), and is especially knowledgeable about the Galapagos Islands, where he has worked on various projects since 1982. He has been part of a number of project design and evaluation teams (including GEF projects).

Alan Saunders is a New Zealander. He has been involved in biodiversity conservation management and research for nearly 40 years. He worked on a number of threatened species recovery projects and wildlife habitat surveys with the New Zealand Wildlife Service and its successor, the Department of Conservation (DOC). In DOC he managed national units responsible for the recovery of threatened species (the Threatened Species Unit) and ecological restoration at sites on the New Zealand mainland (the Mainland Island Programme). Over the last 20 years Alan has provided technical advice outside New Zealand including assessing the feasibility of proposed eradication and sustained control projects, preparing strategic and operational invasive species management plans, reviewing the effectiveness of biosecurity programmes and evaluating the outcomes of species recovery and invasive species management projects for implementing agencies and donors. Between 2003 and 2008 Alan coordinated the Pacific Invasives Initiative, a partnership programme focused on conserving biodiversity and enhancing peoples livelihoods in the south and central Pacific. Through this programme a number of conservation “firsts” were achieved in the region. In 2008 Alan was appointed by Landcare Research to manage its international invasive species management programme (Invasive Species International). His roles are to promote effective restoration partnerships through the application of effective management underpinned by sound science. Alan has a M.Sc. in Zoology from Victoria University, Wellington.

Evaluation Methodology

The evaluation is based on UNDP Guidelines for the evaluation of GEF-funded projects (UNDP, 2011). In addition, the UNDP Evaluation Manual (UNDP, 2009) and the GEF monitoring and evaluation policy (GEF, 2011) were consulted. The evaluators signed the Code of Conduct for Evaluation in the UN System (Annex 11) and took all precautions necessary to follow the code at all times during their work.

The terms used in this report are described in the Definitions section. It should be noted that even though the UNDP guidelines do not make an express distinction between "outcome" and "output", in this case "outcome" refers to a quantitative change with respect to the initial (i.e. baseline) situation, for example: better IS detection capacity. Meanwhile, an "output" refers to a tangible good or service that is generated and which contributes to the achievement of results, for example: a procedure manual.

The TORs establish that the purpose of the FE is to evaluate the implementation of the project, review the project's achievements in fulfilling its objective and its expected Outcomes, assess the importance, performance, relevance, implementation and success of the project; seek evidence of potential impact and sustainability of the results, including the project's contribution to building capacities and the achievement of global environmental goals. Additionally, it seeks to identify and document lessons learned, and to make any recommendation that could improve the design and implementation of other UNDP/GEF projects and those of other agencies and countries (Annex 2).

The FE was designed to encompass two elements:

1. To assess the fulfilment and achievement of the Outcomes of the Project, focusing on the following criteria: Relevance, Effectiveness, Efficiency, Results and Sustainability. The definitions of these criteria are in the corresponding section of this document.

The findings are organized into four aspects of the Project: (i) Design and formulation, (ii) Implementation, (iii) Results and (iv) Closure.

To evaluate the Closure of the CISGP, we assessed whether or not the recommendations of the PFE had been followed, and its contribution to consolidating the achievements and purpose of the Project.

Finally, scores were assigned based on a six-point scale: Highly satisfactory, Satisfactory, Moderately Satisfactory, Moderately unsatisfactory, Unsatisfactory and Highly unsatisfactory.

2. Evaluating the fulfilment of the purpose of the CISGP, considering that field activities ended in 2008 (although work continued to be undertaken to establish the trust fund) and that a few years had passed since then, some impacts and evidence of sustainability of the Project's achievements should be visible. This is an ex-post evaluation.

Therefore:

- Since the purpose of the project was to "Develop an integrated and permanent system for the Total Control of Invasive Species which would allow for the long-term conservation of the Galapagos Islands"; and
- Understanding that the reference to Total Control is within the context of the definition contained in article 73 of the LOREG (see Definitions).

The components of an integrated and sustainable system for managing invasive species were sketched out (Figure 4), and evidence was sought that those elements are in place.

The following questions were used as guides:

1. Is there a system for managing invasive species in the Galapagos Islands?
2. Is the system effective?
3. Is the system durable and adaptable?
4. Can what has been learned be applied later or in other places?

The FE encompassed the following activities:

1. Undertake an initial review of the supporting documentation provided by UNDP and MAE to identify key issues.
2. Analyze prior evaluations (i.e. MTE, PFE) and identify elements for analysis and verification.
3. Design the methodology and present the proposal to MAE and UNDP (May 30, 2011, in Quito).
4. Conduct interviews, in person and via Skype, with key stakeholders who were involved in the execution of the Project, using a list of guide questions (Annexes 2 and 3).
5. Hold a half-day workshop with stakeholders who were part of the co-implementing entities during the implementation of the CISGP (Puerto Ayora, June 6, 2011).
6. Hold a half-day workshop to review the information and experience of the pilot IS eradication and control projects, with actors who were part of the co-implementing entities during the implementation of the CISGP (Puerto Ayora, June 6, 2011)
7. Investigate complementary information on the Project and the selected pilot eradication projects.

8. Undertake surprise visits (with no prior warning) to sites including the CIMEI, the Guayaquil docks, and cargo inspection and handling areas at Quito airport.
9. Visits to areas with demonstrative IS eradication and control activities.
10. Follow-up discussions with key informants.
11. Presentation of preliminary findings of the evaluation to the MAE, UNDP and key stakeholders (June 13, 2011, in Quito).
12. Presentation of the draft evaluation report for review and comments, and finally prepare the final version.

Chapter 2. Findings

Overview

The Project was an extremely important and timely initiative. In addition to achieving a variety of invasive species management objectives, ecological outcomes which may be attributed to the eradication (or in a few cases, control) of invasive species are being reported as time following their removal increases. Important capacity has also been developed including the refinement of techniques and procedures, the establishment of institutional mechanisms and the development of skills and experience within participating agencies, and in the community more generally. Perhaps most importantly awareness has been raised of the various impacts of invasive species within agencies and amongst stakeholders and the community. There is greater recognition now of the potential achievability of managing invasive species, and of the benefits, risks and costs in undertaking management programs. The eradication of invasive ungulates as part of Project Isabela, the most conspicuous element of the Project, has been hailed as an international benchmark for eradications. Other initiatives during the Project and the lessons which have been learned have also been of high value (e.g., the eradication of Tilapia from the El Junco Lagoon, the development of risk analyses and priority setting mechanisms, implementation of advocacy and public awareness programs).

The Project was relevant, since (i) it was focused on addressing a key and urgent national policy issue, and an international conservation priority, at a crucial moment[16], and (ii) it helped to significantly advance the management of invasive species in Ecuador. It is clear that without the Project's contribution, the impact of IS in Galapagos would have been even more severe.

In an international context the Project built on advances made and expertise developed elsewhere. It was significant because:

1. Internationally important site – the Galapagos Archipelago is a World Heritage Site and a biodiversity Hotspot.
2. Timely – significant environmental declines as a result of invasive species impacts were taking place. Urgent action was required using recently-developed skills and technology.
3. Planned – considerable effort was put in to designing the overall Project, as well as to individual initiatives and activities.
4. Collaborative – multiple agencies (government, non-government) were involved, with agreed roles.
5. Consultative – advice and technical support was sought throughout the Project, including workshops and reviews and evaluations.
6. Multiple donors – in addition to funding through GEF and the Government of Ecuador, a number of other co-funders contributed to agreed activities. The Project followed on from, and complemented the UNF project.

[16] There were the beginnings of an IS management system, a recently approved legal-regulatory framework (i.e., the LOREG) and prior experience in IS eradication efforts on smaller islands of the archipelago.

7. GEF support – was particularly notable. This Project was the largest GEF grant for biodiversity worldwide. GEF support across the invasive species management spectrum (prevention, eradication and control) was important and appropriate.
8. Following international experience elsewhere – the Project supported base line archipelago wide inventories of introduced species and constructed new facilities to house all biodiversity collections and knowledge.
9. Archipelago-wide, island, multiple-island and archipelago-wide strategies were developed, promoting cost-effectiveness through economies of scale.
10. Range of taxa - invasive plants, vertebrates and invertebrates were variously targeted – though seldom together.
11. Scientific basis – scientific and technical support provided by CDF to project design, implementation and evaluation was a key feature of many initiatives and activities.

The Project was effective, as ultimately, it achieved its expected results. During the initial execution phase, the Project faced serious problems which made it look like it could fail. Nevertheless, during the post-MTE execution phase, the situation improved, and the Project was able to achieve its Outcomes.

The CISGP was not so efficient in the use of time. The Project was designed to be executed in six years, but required seven to achieve the expected outputs, and the Closure Phase required two additional years (October 2009 - September 2011). Nevertheless, at the end of the post-MTE execution phase, most of the Outcomes had been achieved, and there was a leftover budget of approx. US$600,000, which demonstrates efficiency in spending (despite the enormous difficulties during project implementation). However, the Closure Phase was neither effective nor efficient; it did not contribute much to consolidate the Project's achievements.

The chances of sustainability are good for several of the Project's outcomes, and there are some further opportunities that must be capitalized on. However, there are also risks which threaten the sustainability of the outcomes and jeopardize on-going efforts. The absence of a central reference source for Project information (all agencies/all projects and activities) is a critical gap which could undermine much of what has been achieved unless it is addressed urgently.

We found no evidence that the purpose of the Project has been fully achieved. We found elements of an invasive species management program, but not a fully functional and integrated system. There are still shortcomings which make it possible for invasive species to reach the archipelago and to become established in the islands (e.g., inadequate facilities and insufficient control of maritime cargo), but the solution to these shortcomings is beyond the scope of the Project and must be confronted by the GoE.

Finally, it must be recognized that the Project was large and complex, it encountered serious difficulties during implementation, and had to be carried out in an environment of significant institutional and political instability. It is of considerable credit to those involved that such progress was achieved.

Project Conceptualization and Design

Rating	Moderately Satisfactory

The initial concept was developed jointly by GNP and CDF focused on the eradication of goats in the northern part of Isabela Island[17]. During this period (the second half of

[17] This was called the "Isabela Project", and this name was maintained throughout the implementation of the Project.

the 1990s), it was thought that through the GEF, resources could be obtained on a scale that was not possible otherwise. During the PDF-A, it was identified that the project required a more integrating approach in order to be able to address the identified obstacles to managing IS in Galapagos. Consequently, during the PDF-B, the project design team incorporated (i) the other elements necessary to address IS management more broadly and (ii) additional partners (SESA, INGALA) to fulfil complimentary roles.

The design phase was extensive and made it possible to (i) evaluate options and technologies to be used to execute a massive ungulate eradication on Isabela, and other pilot eradication and control exercises, (ii) consider proposals for creating a financial mechanism to complement the resources provided for in the LOREG, and (iii) develop mechanisms to promote the involvement of the local population in managing IS.

The proposal received positive comments during the STAP review, although some concerns were expressed about its complexity. The comments of the members of the GEF Council also highlighted issues related to the high cost and complexity of the Project.

The design, which is summarized in the initial Logical Framework (Annex 4), is adequate and apparently demonstrates a solid vertical logic. Nonetheless, the design was too ambitious and complex. Although the purpose was focused on managing IS, the LogFrame was clearly skewed toward control and eradication initiatives. This is apparent in the Assumptions of the LogFrame (listed as Assumptions and Risks). There is no apparent solid analysis of the Assumptions which comprehensively identifies the risks of establishing an integrated IS management system or of specific elements (i.e., the financial mechanism, coordination between the co-implementers). Finally, the indicators were not precise nor did they comply with SMART criteria.

One weakness of the design was the administrative arrangements. No adequate assessment was made of the capacities that the organizations had to implement the activities charged to them. Nor were adequate precautions taken to ensure coordinated and synergetic efforts among the co-implementers. Furthermore, the designers underestimated the scope of the arrangements necessary to carry out an enterprise as complex as the CISGP. Below are some critical elements:

1. The proposed design (Figure 3) was very complicated, and the lack of clarity in roles and functions generated serious problems during execution. For example, at one point the MSG assumed de facto decision-making functions, thus causing a conflict with the PAU.
2. The GNP and the CDF had a long history of working together, but the fact that this was not the case with SESA-SICGAL and INGALA was not taken into account. Similarly, the capacities of these organizations were not the same as those of GNP and CDF. They required specific support and capacity-building in order to be able to contribute to IS management and to play their part within the CISGP. Eventually, this meant that, at least during the Initial Execution Phase, the components of the CISGP were carried out as independent projects.
3. Project Isabela, despite being an element of Outcome 3, was designed to be managed as a separate project, with its own implementation unit and under direct contract between UNDP and CDF. Later on, this meant that (a) it would be executed with greater efficiency than the rest of the CISGP, but (b) it caused conflicts and difficulties during execution, and fed the perception that the components were independent units. Supporting a project within another project was a mistake.

4. The plan was to have a services contract between UNDP and CDF (mentioned above) for approximately US$5.4 million (some 30% of the GEF grant), which was signed before the PAU was installed. This caused:
    a. A quick startup of CISGP activities during the first year of execution.
    b. Tension among the other co-implementers who, on the contrary, had to channel their activities through the PAU and within the overall work plan.
    c. Conflict between the CDF and the PAU, due to the control that the latter attempted to exercise.
    d. Administrative complications for the CDF, which was not used to having contracts where the payments were tied to products. Similarly, the Foundation had to issue guarantees (performance bonds) to UNDP, which in turn meant that it had to provide adequate guarantees or collateral to the institution issuing the guarantee. All of this was a new way of working, with which the CDF had no experience. Nevertheless, it should be noted that UNDP supported the CDF in developing its administrative capacity and procedures to be able to manage the contract.

Another weakness in the design was not having sufficiently evaluated the complexity of applying UNDP administrative processes in difficult conditions (i.e. field work in remote and isolated areas, limited availability of local suppliers). For example, the implementers ignored the administrative processes and requirements for getting helicopters and arms from other countries to the islands and using them. This generated serious delays during the execution of the CISGP, although in the end it was an interesting learning process.

Furthermore, the design did not adequately weigh the monitoring and evaluation (M&E) needs for such a large and complex project. It was thought that the M&E of the Project should be carried out by the Coordinator, and sufficient resources were not allocated for this purpose. In this aspect, there was a clear technical bias, since there was a great emphasis placed on the budget for monitoring biological and social aspects, but not for monitoring progress and the fulfilment of objectives (Project monitoring).

Neither were there mechanisms planned to manage and disseminate the information that the Project would generate, which at the end was both abundant and valuable.

Finally, counterpart and matching contributions were not sufficiently secured. Later on, this made it difficult to nail down the contributions that had been established in the PRODOC.

The modified LogFrame (Annex 5) was more precise, with better developed indicators and assumptions. Also, it included targets which helped to establish intermediate benchmarks to measure results. Unfortunately, these indicators did not comply with SMART criteria.

Finally, the Project was affected by a number of external factors, among which three are particularly worth mentioning:

1. The political and institutional instability that Ecuador experienced between 1997 and 2006 (Figure 6). During this decade, Ecuador had six Presidents and numerous ministers and lower-ranking officials. Political instability also affected the islands; where there were strong confrontations between supporters of production and conservation, and much instability in the leadership posts of entities that were essential for the project (like the GNPD).
2. The CDF also had institutional problems. At the end of the 1990s, the Foundation began a restructuring process, which led, among other changes, to the merger of the positions of Director of the CDSS and the General Secretary of the CDF. During

the Initial Execution Phase, the CDF suffered a severe institutional crisis which affected its performance. The Foundation finally overcame this problem with the hiring of a new Executive Director, and internal institutional changes which continued for some years.

3. Simultaneously, various projects of significant magnitude were being implemented, which also demanded attention and effort from the organizations executing the Project. While some elements were complementary, this also led to increased pressure on the organizations and their work teams, who had to meet commitments to the other projects.

It is a notable achievement that despite these severe externalities, the Project was able to remain operational and to progress toward the achievement of its Outcomes.

Project Implementation

Implementation approach

Rating	Moderately Satisfactory

As mentioned in the preceding section, the administrative arrangements were a weakness that seriously affected the performance of the Project during the Initial Execution Phase. Later, with the administrative adjustments made post-MTE, with the strong leadership of the new Coordinator, and a greater commitment of the co-implementers, the operation was improved. Nevertheless, there are issues that should be mentioned:

1. The Project required the appropriate agencies to develop an IS management system. However, there was no structure in place to facilitate relations at high levels which could have provided political support (i.e., MAGAP), nor from other entities which could have helped to build the system (i.e., the maritime authority, municipalities). It would have been desirable to have a Steering Committee, possibly at the level of the Tripartite Meeting.
2. The roles, functions and line of authority between UNDP, PAU, co-implementers and the MSG were not clear, which caused multiple conflicts.
3. The MSG was structured as planned and functioned normally. The idea was to have a forum for discussion and coordination with the PAU and among co-implementers. However, the MSG wanted to establish itself as a decision-making body, which generated a conflict of interests, since the implementers (who were responsible for generating outcomes and outputs for the Project) wanted to make administrative decisions.
4. The TAG, made up of international experts, met twice in 2003 and 2006.
5. All of those interviewed agreed that project administrative procedures were complicated and this affected performance throughout the Project. It was mentioned to us that initially there was little flexibility on the part of UNDP with regard to the application of procedures and requirements. The problem was resolved with the preparation of a manual of procedures, adjusted to the reality of working in Galapagos, and a better definition of roles. The PISA also required a specific manual of procedures.

   In addition, the direct contract with the CDF (see previous section) caused tensions between the PAU and the other co-implementers. A key issue was that procedures were applied to all of the co-implementers except for the CDF due to the contract for services, this caused tension among them. Similarly, the PAU controlled the

execution of the activities of the CDF, which generated friction since the CDF felt that it should answer directly to UNDP.

6. During the Initial Execution Phase, there was no system for monitoring Project activities, which made it very difficult to determine the progress and status of the different CISGP initiatives. This was resolved after the MTE, when the project indicators and design were refined, and a monitoring and evaluation plan was implemented.

Participation of co-implementers

Rating	Moderately Satisfactory

During the Initial Execution Phase, the co-implementers worked almost independently. The CDF and the GNPD had a long history of collaboration, and therefore, despite the instability which affected them, their teams worked together very effectively. In contrast, they did not have much experience working together with INGALA, and SESA was assuming a new role by taking over the SICGAL. The SESA[18], as a national entity, with a series of pressing responsibilities, did not give enough priority to managing SICGAL and the Project, leading to its limited ownership of the Project. The level of participation of this entity was variable during the Project, and depended on the interest of the director assigned to the Galapagos office. There is still limited interest in the SICGAL on the part of AGROCALIDAD[19] and MAGAP.

During the post-MTE Execution Phase, the situation improved, and the co-implementers worked together and complemented each other more effectively.

It should be pointed out that at the operational level, the staff of the co-implementing entities made an enormous effort to move the Project activities forward. During the FE, we observed a good relationship and spirit of cooperation among personnel of the different organizations.

Financial management

Rating	Not evaluated

The PRODOC calls for a budget of US$42.93 million, of which US$18.30 million was a grant from the GEF and US$24.63 million was counterpart funding from various sources (Table 1). The allocation planned for each of the six Outcomes is indicated in Table 1. The Outcomes with the largest budgets were Outcome 4 (trust fund) and Outcome 3 (pilot eradication and control projects, including Project Isabela). Outcome 3 included the largest portion of the GEF grant.

There is no information available on GEF and counterpart spending by outcome for each year. Until 2003, UNDP used a financial system that did not allow for keeping track of spending details at the Outcome or result level. The FIM financial system that UNDP used between 2001 and 2003, and then during the first year of use of the current financial system (ATLAS), meant it was not possible to record details of this information. The lack of specific information at the result level limits our ability to

[18] SESA was created via Accord 0434 of November 18, 1994. In 2001, its status was elevated, and the new structure was created (with a Board of Directors comprised of three ministers) through Executive Decree 2055. In 2008, SESA was reorganized and transformed into AGROCALIDAD (Decree 1449).

[19] Refers to the national agency. At the local level, the staff were always interested in and committed to SICGAL.

provide an opinion with respect to the financial management. However, we tried to analyze all information available.

The information provided to us indicates that US$18,393,492.73 of GEF funding was spent. The spending curve between 2001 and 2007 follows the expected pattern for any project (Figure 5). The extension until 2008 to complete the creation of the trust fund is reflected in the disbursements of that year. During the closure phase, US$699,012.32 of GEF money was spent.

The Project received more financing than projected (i.e., US$32,511,968). Most of the co-financing provided was in-kind (US$21,627,782). Some sources of co-financing projected in the PRODOC did not fully materialize. The main source of co-financing was the GNP, which contributed US$10,704,338 in kind and US$1 million in cash (its contribution to the FEIG) (Table 6). The second source of co-financing was the CDF, which contributed US$4,236,000 in kind. The third largest source of co-financing was the GoE, which contributed US$ 4 million to the FEIG, followed by the German government (through KfW, which donated US$3.5 million to the FEIG).

In conclusion, total disbursements made to the project were US$51,161,968, which is US$7,879,968 more than projected in the PRODOC. GEF's contribution (including PDF funding) accounted for 36.45% of the total.

The Project underwent independent financial audits, the results of which were satisfactory. For this evaluation, we reviewed the 2002 audit of the CDF contract, and the 2004, 2005 and 2006 audits of the entire project.

Monitoring and Evaluation

Rating	Moderately Satisfactory

The oversight and monitoring mechanisms and instruments of the CISGP (i.e. the Tripartite Meeting, PIR, APR) worked adequately and were very useful for making decisions during the difficult times that the Project faced. UNDP, as the implementing agency, played an important and decisive role throughout the life of the Project.

However, during the Initial Execution Phase, there was no monitoring and evaluation system for Project activities, despite a lot of work being done to put together baseline and monitoring biological and social factors. The MTE recommended hiring a Specialist in Planning, Monitoring and Evaluation (a position that was not included in the Project design), revising the LogFrame and refining the indicators, and putting in place an M&E system. This was done during the post-MTE Execution Phase. The M&E system was applied extensively and rigorously to monitoring the activities in each Outcome. The system was very useful and contributed significantly to identifying project management concerns in a timely fashion. For UNDP, the methodology used was very useful and it has been replicated it in other projects.

Annex B in the PRODOC sets out success criteria, baseline values and ‘target values for 2006’ for a range of indicator or target species. Unfortunately reports detailing changes in indicators in relation to baseline or target values were not made available to us during this final evaluation and are dispersed. We were therefore unable to comment in any systematic way on progress made in the Pilot Projects in relation to these pre-determined indicators. We assume detailed (at least annual) reports were prepared for each of the Pilot Projects, and that these reports included information on progress in relation to success criteria, baseline values and targets for the nominated native indicators or introduced target species. Even general success criteria such as “Not extinct” or “Decline in abundance” have some value in assessing progress. We would expect, however, that more specific criteria and targets will be developed as monitoring continues and as a better understanding of trends and outcomes is gained.

It will be very important that monitoring data continue to be analysed and collated so that on-going monitoring programmes may be refined based on improved understanding. We recommend that all available information on the Pilot Projects – including project reports, is collated and made accessible on the Internet as soon as possible and that their individual and collective progress towards targets set in the PRODOC is evaluated. We suggest the collation of this information will be a vital step in ensuring the achievements made during the Project are "captured" and that information is available as a basis for important activities to be maintained, and for outcomes to be sustained. The evaluation of this material will also be important in determining further projects and activities to be initiated, and in setting new targets.

Throughout the Project, the APR and PIR forms were used, which were very useful in monitoring the Project and were analyzed in the Tripartite Meetings. Nevertheless, the indicators used in these reports were changed several times, did not meet SMART criteria, and were not fully aligned with the LogFrame.

Finally, one element that was not sufficiently addressed was the systematization of achievements and lessons learned. The Project generated very valuable information in its diverse components, but this information was not organized nor shared in a timely way among the co-implementers. This information is dispersed in various formats (paper, digital) in various places (i.e., personal computers, institutional files). The PFE recommended that during the Closure phase, all of the documentation be compiled and a complete catalogue be put together that covers all of the aspects of the Project and the work done by all participants. A consultant was hired to do this task (Sandoval, 2011), who compiled the accessible information and identified lessons learned. Nonetheless, during the FE we found that there is still a lot of dispersed information that is not easily accessible.

In the PIRs, there is a space for lessons learned that was not adequately used (in the PIRs of the post-MTE Execution Phase, the same content is repeated). This would have served to identify and document the valuable lessons learned from the project.

Involvement of key stakeholders[20]

Rating	Moderately Satisfactory

The Project made a great effort to disseminate information on IS and to involve local stakeholders through Outcome 5. The CDF and the GNP did collaborated well together which was helped by the prior experience of cooperation between these two organizations. The Project managed to position the profiles of invasive species management in the community and within key entities (e.g., municipalities), and to position it into the national agenda. At the beginning of the Project, despite the fact that the issue of IS had been included in the LOREG, for the local population it was still something that seemed irrelevant to their daily lives. One very important element was the support given to the establishment and operation of the CIMEIs[21] (which was not included in the original Project design). This was an important contribution that facilitated the engagement and promoted synergy with local stakeholders.

[20] In this document the term stakeholder is used according to the UNDP guide for evaluating GEF-funded projects ("actor clave" in Spanish).

[21] In May 2001, there was an outbreak of canine distemper (virus) in Puerto Ayora (Santa Cruz Island). The outbreak was controlled, but caused concern about the possible impacts on domestic animals and the wildlife. Based on this motivation, the first CIMEI was formed in the Municipality o San Cristobal, through an ordinance in February 2002 (the ordinance addressed the management and control of species introduced into the canton), then in 2003 and 2008, respectively, the Municipalities of Isabela and Santa Cruz issued similar ordinances.

Project Isabela generated stronger resistance among the local population, and intense opposition from some local groups (e.g., fishers, politicians). This was the most conspicuous element of the Project, which is still referred to as "the goat project" in reference to the hunting of goats using helicopters. From the local point of view, it was a waste to spend millions of dollars to kill goats, when there were other needs for the well-being of the population (e.g., safe water); the waste of so much meat was also questioned. In the MTE, this point was noted and the evaluators recommended that PISA and Outcome 5 teams prepare joint outreach efforts so that the population could understand the importance of the eradication efforts. During the FE, we learned that all of the objections were answerable, and that there was a lot of internal debate with respect to how to proceed.

There was a proposal to implement a communication campaign to respond to the criticisms, but PISA decided on a strategy involving being proactive at a local level and reactive at national and international levels. For example, any animal rights-type concerns about shooting goats would have been responded to immediately at a local level – no such concerns emerged. It was determined that no television footage of helicopter shooting would be provided for broadcast through national or international networks before the project was finished. It is necessary to highlight that an eradication of ungulates on the scale undertaken here was inevitably controversial. We understand the level of community acceptance of the eradication grew during the project. Nonetheless, strong concerns remain in some sectors, which are probably due to a combination of a lack of information and resistance to accept alternative views for political reasons. We heard little comment on positive outcomes from Project Isabela, which is unfortunate. The controversy around PISA also clouded over other important achievements of the Project.

Adaptive Management

Rating	Very satisfactory

The Project demonstrated a significant capacity for adaptation, and was able to take advantage of opportunities and move forward to achieve the planned results. During the Initial Execution Phase, the Project faced serious difficulties (some due to the design and others do to unforeseen externalities), and there was a real chance of failure. The MTE was crucial, since it allowed for a reflection on the situation and the barriers that were being faced, and led to decisions being made to resolve the problems. The adjustments in the form of operation and in the accuracy of the outcomes did not change the overall scope and purpose of the Project. Ultimately, the planned results were achieved.

Three examples illustrate the Project team's ability to adapt:

1. Bringing the helicopters and weapons for PISA into the country entailed levels of complexity that were not anticipated during the design; it took approximately two years to overcome all of the obstacles. The hunters had to receive special training and to pass unexpected tests to be able to use the arms. The delay meant that since the contract amount was the same, the time for helicopter operation had to be reduced, and the work intensified. During the delay, the eradication operation of Santiago was advanced taking advantage of the opportunity to train the hunters, which accelerated the process and helped to eradicate pigs, donkeys and goats from the island.

   This experience generated a number of lessons learned for the GNP, which has served it in subsequent aerial operations.

2. The establishment of the trust fund faced serious complications, since the CDF failed in its efforts to structure the fund and raise money, and the plan to have it be administered by the DSF did not work out. The responsibility initially passed to the UNDP, but then a Design Committee was formed (an innovative solution not provided for in the Project design), which analyzed the options and guided the process that resulted in the formation of the FEIG on June 8, 2007.
3. The Project capitalized on the interest in managing domestic introduced animals in populated areas, which derived from the outbreak of canine distemper in 2001. It took advantage of the experience and technical capacities to lead to the founding and operation of the CIMEIs and IS management ordinances for populated areas.

Project Outcomes

Outcome 1. SICGAL strengthened and effective with full participation and commitment of local and national institutions and the community.

Rating	Satisfactory

This Outcome was initially an inspection, quarantine, surveillance and effective rapid response system, focused on preventing the entry and establishment of invasive species in the Galapagos. This component included: (a) developing inspection, detection and quarantine facilities for people and goods that enter the archipelago, through airports and seaports; (b) the management of internal transportation (within and between the islands); (c) systematic surveillance of the areas which have a high risk of introduction (specified as maritime ports, airports and agricultural areas); (d) a rapid response mechanism to prevent the dispersion of newly arrived species; (e) developing the necessary facilities – infrastructure, equipment; (f) analysis of species with a high potential of being introduced; (g) the continuous development of information resources; and (h) training for personnel on duty.

After the MTE, the scope of this Outcome was limited and better-focused. Below is the text of the Outcome and the indicators in the original version of the LogFrame (PRODOC) and in the revised 2005 version.

Original Outcome 1	Indicators
A coordinated inspection and quarantine system for Galapagos is in place with the full participation of local institutions and with clearly defined procedures and detection techniques.	Existing IS monitoring system extended to all seaports and airports by year 2. In the third year, rapid action mechanisms to identify and eradicate or control recently introduced species are operating with the full participation of local residents. By the third year, an optimum cargo transportation system for IS management is in place. By the fourth year, SICGAL has the technical and institutional ability to carry out introduction/ dispersal - prevention interventions for nonnative species.

Revised Outcome 1.	Indicators
SICGAL strengthened and effective with full participation and commitment of local and national institutions and the community.	Increase of at least 75% in the number of inspections at points of arrival and departure of passengers and cargo The system to detect and respond to new introductions of IS is working and the arrival of undetected IS can be estimated. SICGAL's evaluation system is working The annual operating plans of the co-implementing institutions of SICGAL include actions to control IS.

The PRODOC specified that the support for Outcome 1 would come from the GEF, IDB, UNF and the GoE. The GEF funds were intended to develop operations manuals for quarantine and inspection, related training and risk analyses and the design of an optimal protocol for internal transportation. The IDB contributions were allocated toward supporting the infrastructure and development of a cost recovery mechanism. The UNF and GoE resources were to be used together with GEF funds to strengthen the systematic monitoring of areas with a high risk of introduction (i.e. seaports, airports, agricultural zones) and to put in place a rapid emergency response team. The implementing agency identified in the PRODOC for Outcome 1 was SESA Galapagos, although most of the activities were carried out by CDF staff or consultants subcontracted by CDF.

The PFE identified the following outputs:

Planned Outputs	Reported/ Achieved Outputs
1.1 A monitoring system to detect new IS...	· 4 technicians (1 each inhabited island) paid for, equipped and trained by CDF (2001-2006); now paid by SICGAL/AGROCALIDAD; total complement of technicians to be increased to 8 by end of 2009.
1.2 Emergency rapid response team, in co-ordination with activity 5.2	· Plan prepared for rapid response system · Rapid Emergency Response Team formed & trained. · SICGAL led response to 2008 fruit fly invasion. · Response to tilapia introduction
1.3 I&Q procedures analysis, Procedures Manual development and up-dating	· Risk analysis and scheduling of 30 imported plant products · Risk analyses of air and maritime transport (to and within Galapagos) · Procedures Manual introduced to SICGAL staff · Field Protocols Manual developed by CDF and GNP · Pests Identification Manual produced by consultant · Schedule of products transported between islands · Contingency plans prepared for West Nile Virus and avian flu · Fumigation and disinfection protocols developed for planes and boats · Protocols developed for biological control activities · Evaluations of SICGAL regulatory framework and operations · Evaluation of compliance with SICGAL protocols by airlines, shipping lines, tourist boats · Strategic plan prepared for SICGAL
1.4 Infrastructure for SICGAL (control points, detection, offices...)	· None provided by Project [IADB provided infrastructure]
1.5 SICGAL communications, information management and computer systems	· 7 computers and 4 printers purchased by Project for SICGAL; only in 2005. · Database established for SICGAL inspection records
1.6 Training Programme for SICGAL	· Training Manual for SICGAL inspectors · Monitoring technicians well-trained with on-job

inspectors and technicians	experience. · Useful exchange visits of Inspectors - Galapagos and mainland · Plant quarantine course for 2 inspectors (to Peru) · Web-site consultancy · Invertebrate monitoring system plus Manual for technicians
1.7 Planning - coordination workshops and seminars... for SICGAL institutions	
1.8 Optimal internal cargo transportation system (OITS)	· Cargo Transportation Optimization System study undertaken by consultant; INGALA Council ratification of OITS as policy; · AGROCALIDAD now starting to implement portions of OITS. INGALA producing information materials.

During the closure phase, accessible information was compiled (Sandoval, 2011), the documents (products) that were identified are listed in Annex 8.

One of the basic principles established in the LOREG was the "Reduction of the risk of introducing diseases, pests and exogenous plant and animal species into the province of Galapagos." This task was assigned to SESA, under which SICGAL was established. The first inspectors and the SICGAL coordinator were hired in 1998 and 1999. Consequently, it was important to establish mechanisms for the inspection, quarantine, and monitoring of pests and for rapid response to emergencies. These four elements are components of a Prevention Programme. Outcome 1 primarily focused on building capacities for inspection, monitoring and rapid response; agricultural quarantine was not developed.

The budget for Outcome 1 was US$3.5 million, of which 27% (US$950,000) was funded by GEF and 73% (US$2.6 million) involved co-financing from UNF, SESA, IDB, USAID and CDF (mostly from parallel projects) (Table 1). There is no detailed information that reveals the total amount of GEF and counterpart funds spent by Outcome, and therefore we cannot determine what the final disbursement was.

Conclusions and recommendations

1. The project generated important information tools for SICGAL (e.g., a procedure manual for inspectors and technicians, a boat disinfection procedure) and provided technicians and inspectors with training. The Project helped to build capacities in the areas of pest inspection, monitoring and surveillance, and emergency response (i.e. contingency plans for the appearance of the West Nile Virus and the Avian flu, and emergency drills). The Project's intervention had a positive impact on the process of developing SICGAL.
2. During the Initial Execution Phase, SESA received the outputs or project deliverables through the CDF. A very positive change was that subsequently, in the post-MTE Execution Phase, the Project worked directly with SESA, which helped to strengthen relations and ownership of the Project.
3. Nevertheless, we should point out some weakness in this Outcome:

a. From what we could tell, SESA did not participate in the design of the Project and therefore the support provided was perceived as an outside intervention, and not as a response to the organization's needs. It would probably have been more beneficial to directly involve SESA in conceptualizing the Project.

b. There was a lack of ownership on the part of SESA. As mentioned previously, the support that it gave to SICGAL and its involvement in the project were very variable. This later factor had repercussions in the limited political, administrative and budgetary[22] support provided to the system. The transition from SESA to AGROCALIDAD did not improve the situation.

c. During our visits to the inspection points, we found committed personnel who were familiar with the procedures to be followed, but with serious limitations in support to do an effective job.

d. Insufficient support was given to communication and information dissemination. The Project did not manage to change the attitude of the local population with respect to the value of preventing the entry of IS. During our visit, we learned that it is local people who repeatedly violates the restrictions on the entry of products from the continent, and who seek ways to avoid controls.

e. The information generated was not organized and shared adequately. During the FE we found that the information generated in Outcome 1, despite being very valuable, is dispersed and is not easily accessible. The consultant responsible for compiling documentation during the Closure Phase faced many difficulties in tracking information. Consequently, the information produced has not been fully utilised. Moreover SICGAL did not have access to the information products generated by the other Project Outcomes.

f. The integration of Project activities and complementarity among projects (e.g., IDB) and entities was compromised by the absence of a programmatic approach. For example, the infrastructure which the IDB project built at the Caraguay dock in Guayaquil has subsequently been abandoned.

4. The Project and the parallel initiatives (IDB, UNF) did not manage to make the SICGAL effective, efficient or sustainable. Some factors that contributed to this outcome were beyond the scope of the CISGP. In 2007, a performance evaluation of the SICGAL was published (Zapata, 2007) which found that it was not successfully reducing the entry of IS, and identified three causes: (i) Insufficient resources, personnel and financing; (ii) technical ineffectiveness and inefficiency and (iii) weak and inopportune public policy and administration. In the Closure Phase, another evaluation of the SICGAL was done (Arriagada, 2011) which found that the inspections on the continent did not prevent the entry of pests and IS into the islands. This evaluation also highlighted the relative unimportance that AGROCALIDAD gives SICGAL.

[22] The LOREG (article 18) establishes a financial mechanism for SICGAL. Of the revenues earned from the visitor entry fees into protected areas of Galapagos, 5% is earmarked for SICGAL; this generates US$ 400,000 – 500,000 per year. In addition, AGROCALIDAD allocates state funds (approximately US$580,000 per year) that includes revenues from the inspection service (which is charged for each inspection but which generates little income). Nevertheless, this amount is insufficient to finance all of the activities required for an effective IS entry prevention system.

Outcome 2. Co executors and key actors involved adopt and promote the implementation of the Total Control Plan (TCP)

Rating	Moderately Satisfactory

This Outcome was initially focused on establishing adaptive management mechanisms, with an emphasis on research elements to feed into decision-making. After the MTE, the Outcome was limited to the adoption and implementation of the Total Control Plan. Below is the text of the Outcome and indicators in the original LogFrame (PRODOC) and the revised version (2005).

Original Outcome 2	Indicators
Adaptive management mechanisms established to develop and up-date a scientifically sound, well-programmed and cost-effective bio-invasion control programme.	2.1. A comprehensive IS control research programme developed by the end of year 1. 2.2 An IS control research unit created in the CDSS set-up by the end of the second year. 2.3. By year 5, operational costs of the CDRS research unit are transferred to other funding sources. 2.4. A collection and database of aggressive invasives is created during the first year of the project and continually updated. 2.5. By year 4, a prioritisation methodology is designed & being applied. By the end of year 6, an agreed and fully financed plan of action for Total Control of IS is being executed. 2.6. By year 6, new methodologies developed & tested for vertebrate, invertebrate & plant invasive control & eradication. 2.7 International advisory group meeting held annually to provide advice on control methods and input to M&E.

Revised Outcome 2	Indicators
Co executors and key actors involved adopt and promote the implementation of the Total Control Plan (TCP)	Increase of 5% in the budgets of the co-executing institutions allocated to TCP activities beginning in 2006.

The budget for Outcome 2 was US$4.17 million, of which US$1.88 million came from GEF funds, and the rest was co-financed by the CDF and WWF (Table 1). There is no detailed information that identifies all of the GEF and counterpart funds invested by Outcome, and therefore we could not corroborate the final amounts disbursed.

During the Closure Phase, the accessible information was compiled, and the documents (outputs) recorded are listed in Annex 8.

The original focus of Outcome 2 was “Adaptive management mechanisms established to develop and up-date a scientifically sound, well-programmed and cost-effective bio-invasion control programme.” The scope of this Outcome included the establishment of a Programme to research and develop planning tools to establish an adaptive management approach for the TCP. After the MTE, Outcome 2 was adjusted to focus only on the adoption and promotion of the TCP (the production of the TCP was output 2.7). After 2005, Outcome 2 became practically identical to the revised Outcome 6. Most of the key actors continued to perceive that the TCP was part of Outcome 6 together with other policy and planning products. In this evaluation, we consider TCP as part of Outcome 6.

Adaptive management is a structured, iterative decision making process to reduce uncertainty over time through systematic monitoring (Holling, 1978). It is a tool which can be used to learn about a system, as well as to change it through management. Adaptive management can be used to improve long - term management outcomes through the application of new knowledge. Whether active or passive approaches are adopted adaptive management involves updating models and refining new management strategies based on new information as it is acquired.

Activities and tasks set out in the Project Document, including the use of predictive models and prioritisation methods, the application of targeted research and associated monitoring and data collation indicate that an adaptive management approach was envisaged in the design of the Pilot Projects. Given the uncertainty and associated risks associated with many of the Pilot Projects we believe an adaptive management approach was entirely appropriate.

It was beyond the scope of this evaluation to assess the effectiveness of any adaptive management undertaken as part of the Project. Our impression was that the requirements for a rigorous adaptive management approach were probably not satisfied in many cases, although the adaptation and refinement of management activities based on new information and monitoring clearly took place in some initiatives. This is not to say iterative decision making based on information from management was not undertaken, but we saw little evidence of structured or systematic approaches through which models were updated and optimal management strategies derived.

The following analysis of the outputs of Outcome 2 focuses on the extent to which the Project supported the original objective to develop a scientifically sound, well-programmed and cost-effective bio-invasion control programme.

2.1 Design the first phase of a permanent research programme... creation of predictive models of invasion and prescriptive models for the selection of control or eradication methodologies.

Close collaboration between CDF and GNP staff was a feature of conservation activities in the Galapagos even before the Project started. CDF was the main proponent in raising awareness of the invasive species issue in the Galapagos prior to the Project, and in promoting a science-based approach. CDF’s initial focus was on designing a quarantine system and developing a research strategy. This led to the successful proposal by CDF for UNF funding for a wider range of research and management activities, including invasive plants and invertebrates. The technical workshop in 1997 (PDF-A) reinforced the merits and feasibility of undertaking a broader range of activities targeting invasive plants and invertebrates, as well as vertebrates, and of adopting a more strategic, science-based approach. Predictive models of invasion were used to identify management priorities.

A workshop of conservation biologists, GNP staff and others was organised by CDF and WWF in 1999 to develop a biodiversity vision for the Galapagos Islands. The proceedings from this workshop, contained summaries of the status of terrestrial and marine ecosystems and a vision for future biodiversity conservation based on an 'eco-region-based conservation model'. In addition to identifying prescriptive strategies for management a number of research needs were identified including the establishment of baseline monitoring programmes. A need for a strategic plan to provide a basis for priority setting and to guide integrated research and management activities was also identified. The declared purpose of the vision document was to provide a benchmark to guide and motivate planners and politicians and to inform provincial/regional planning.

Mid-way through the Project CDF produced a strategic plan (2006-2016) which reinforced objectives to undertake research, foster communication and to provide technical assistance to partners and stakeholders, and to provide administrative support and institutional management advice. These strategic roles, and the services CDF provided to GNP and SICGAL, in particular, during the Project underpinned many of the achievements made. It was our impression, however, that there was little recognition amongst the other partners of either the 1999 vision document, or the CDF strategy. No mention was made to us by other partners of efforts to set research priorities or to integrate research and management activities.

While the CDF strategy may have been useful in guiding its own activities the absence of a research plan which was supported by all partners was probably an impediment to the establishment of an integrated and permanent research programme to underpin the Project overall. The absence of an integrated research programme may have allowed a number of existing CDF research projects to be maintained which may not have been a priority in an agreed Project research plan. We did not examine in detail changes in CDF research priorities at the start of the Project, but we would observe that CDF support, including research, was a key to many achievements under Outcomes 1, 2 and 3, in particular. No research framework to ensure that research results were applied to support project objectives (Task 2.1.4) was established.

2.2 Implement first phase of permanent research programme...

CDF substantially expanded its research programmes using its own and GEF resources. In addition to working with invasive vertebrates and plants, additional people and resources were employed to focus on invertebrates. Reference collections and baseline monitoring programmes were created and maintained. Research into the ecology and possible control of the cottony cushion scale was initiated.

Small working groups of CDF and GNP staff were established to focus variously on invasive invertebrates, plants and vertebrates. These working groups planned and oversaw the implementation of the Pilot Projects and associated research and monitoring activities. Research topics and priorities were identified in management plans for many projects.

Working groups carried out a mix of activities including undertaking research and providing technical advice, training and administrative support to GNP and SICGAL. They were, in effect, the key mechanism through which Project objectives and tasks were achieved, and through which scientific and technical support was provided to Project partners. Through effective communication and collaboration within the working groups scientists and national park rangers were able to develop predictive models of invasion and to trial and adapt management techniques based on direct observations.

The invertebrates working group coordinated and supported the development of SICGAL, undertaking research, developing protocols, producing manuals and providing training and technical advice in support of the development of quarantine and

inspection services. The plants working group focused on ecological research on key weeds, developing a weed eradication feasibility model, undertaking risk assessments, preparing weed management plans and associated manuals. Initially focused on Project Isabela, the vertebrates working group oversaw subsequent ungulate eradication and biosecurity measures. It also contributed to the planning and implementation of other vertebrate eradication projects (e.g., cats and rock doves). The range of products and services produced by CDF (Annex 12) reflects their important roles during the Project. In addition to technical and scientific support to GNP, CDF also increased its efforts in environmental education and promoting dialogue and cooperation with community groups.

While there was clearly dialogue between the working groups there was no mechanism through which critical gaps could be identified, the effectiveness of research activities evaluated or overall research priorities refined as part of an integrated research programme. Increased effort by CDF to address new research themes was a feature of the Project. We would expect that CDF's focus to have been on longer-term research priorities reflecting its need to attract funds for its activities. Conversely GNP's decision making was shorter-term, focused on more immediate issues and pressures. We suggest that a more comprehensive and inclusive planning process would have led to research (and adaptive management) priorities being agreed, and to further progress towards strategic research and management objectives being made. One of the consequences of the collaborative working groups has been that GNP staff is more aware of scientific networks and can access research advice from a wider set of advisors, rather than relying almost solely on CDF. Since GEF funding ended, CDF has encountered problems in funding and retaining some of the positions created during the Project. It is unfortunate that more appropriate provisions were not put in place by CDF to minimise the impacts on its core activities when the Project closed. It was suggested to us that one consequence of the Project is that GNP is now a much stronger proponent for science-based management, and actively seeks science advice from a range of scientific institutions.

2.3 Create collections and databases of existing and potential invasive species... complete collection of native species... extend knowledge of species distribution (and field identification)... improve the monitoring system...

CDF put considerable effort into the establishment, population and maintenance of collections and databases, and to undertaking distribution surveys. For example:

a. Databases of introduced vertebrates, invertebrates and introduced plants, with the histories of introduction, biology and management options were created and maintained.

b. An on-line database for recording observations of introduced species was developed.

c. A database to support SICGAL inspections was developed.

d. Reference collections of introduced insects were established in 3 SESA-SICGAL offices.

e. An inventory of introduced invertebrates in agricultural and urban areas was produced (200 new records), with community participation.

f. An inventory of introduced plants on populated islands was produced (370 new records).

g. World class collection established to aid in identification. For plants alone over 3.000 voucher specimens were lodged, representing 600 known and 370 new exotic species were documented and are lodged in the herbarium.

h. A preliminary checklist and database of plant pathogens was developed.

i. A checklist of introduced ants, with distribution maps, was produced.

j. Bibliogalapagos was created as an on-line information site.

These products and services were clearly important and undoubtedly impacted on the effectiveness of inspection activities. On-going impacts include:

a. CDF scientists are continuing to use the collections, databases, inventories, risk assessments and priority analyses in a number of their invasive species management initiatives. Examples include work by Trueman et al., (2010). A checklist and the collections have been put on line[23] and soon a number of products from the Project will be linked to these tools (M. Gardener, pers. comm.)

b. An initiative (post-Project) to encourage planting of endemic species in private and Municipal gardens.

c. Development of the invertebrate database (post-Project) into a Web-site with photo identification and information on invasive ant characteristics and distribution. This useful tool is publicly available; although it is not clear to what extent it is used by GNP or SICGAL.

d. GNP and CDF have planned a comprehensive monitoring and control programme for blackberry, based on knowledge acquired under Outcomes 2 and 3.

2.4 Carry out basic research in sensitive habitat restoration and threatened species recuperation.

A range of research projects were undertaken to inform species recovery and habitat restoration activities. Examples include:

a. Atkinson, R., Jaramillo, P., Washington,T. 2009. Establishing a new population of Scalesia affinis, a threatened endemic shrub, on Santa Cruz Island, Galapagos, Ecuador. Conservation Evidence 6: 42-47 www.ConservationEvidence.com

b. Causton, C.E., Peck, S.B., Sinclair, B.J., Roque-Albelo,L., Hodgson,C.J., Landry,B. 2006. Alien Insects: Threats and Implications for Conservation of Gala´pagos Islands. Ann. Entomol. Soc. Am. 99(1): 121-143

c. Duffie, C.V., Glenn, T.C.G., Vargas, F.H., Parker, P.G. 2009. Genetic structure within and between island populations of the flightless cormorant (Phalacrocorax harrisi). Molecular Ecology 18, 2103–2111 doi: 10.1111/j.1365-294X.2009.04179.x © 2009 Blackwell Publishing Ltd.

d. Walsh, S.J., McCleary, A.L., Mena, C.F. Yang Shao., Tuttle,J.P., Gonzalez, A., Atkinson, R. 2008. QuickBird and Hyperion data analysis of an invasive plant species, Galapagos Islands of Ecuador: Implications for control and land use management. Remote Sensing of Environment 112: 1927–1941

The number and range of research projects undertaken and published during (and following) the Project is impressive. CDF continues to publish 'Galapagos Research' (formerly *Noticias de Galapagos*), which includes many papers on invasive species issues. Few if any other invasive species projects have generated as much scientific and technical information.

Information on IS was included in the institutional websites of CDF (www.darwinfoundation.org) and GNP (www.galapagospark.org). We understand a large amount of information on invasive plant management projects and activities was

[23] http://www.darwinfoundation.org/datazone/collections/

placed on a page called 'Datazone' on the GNP website. It appears that institutional support was not forthcoming to maintain these sites. Project information was transferred to the Hawaii Ecosystems at Risk website (www.hear.org) in an attempt to ensure current project information was readily available. This website is still online but is not being updated. A comprehensive collation of scientific information, including about the Project ('Bibliogalapagos') was also created on the GNP site. Unfortunately none of these websites remain as current and comprehensive information sources. There would be enormous value in resurrecting Bibliogalapagos – or an alternative site, and maintaining it as a comprehensive and current information resource.

2.5 Develop control and eradication methodologies for species that currently lack effective control and eradication methodologies

Most eradication and control projects were based on successful projects undertaken elsewhere (e.g., rat eradication, weed control). In some cases best practice procedures were well-established (e.g., rat and goat eradication), although all required adapting to local situations. In other cases, however, there were few precedents on which to base management – such as the eradication of birds and fish. International advice was sought in designing some and, in the case of tilapia, specialists from US Geological Survey provided technical support in designing and implementing the eradication.

Subsequent work was undertaken by CDF and GNPD to identify and adapt methodologies for further and more effective control and eradication of invasive plants. A feature of many of the eradication and control Pilot Projects (see Outcome 3 section) was the collaboration between CDF and GNP staff which promoted the development and refinement of eradication and control methodologies based on targeted research and monitoring. Eradication and control methodologies for many of the Pilot Projects have been described in scientific publications. Some were outlined in project plans.

2.6 Establish scientists exchange programme.

A formal scientists exchange programme was not established during the Project, although a funded exchange programme with Cambridge University has subsequently eventuated (M. Gardener, pers. comm.) Through established CDF arrangements a number of visiting scientists and research collaborators contributed to various activities within the Project. Several Ecuadorian students were supported to do Masters-level research associated with plant Pilot Projects. At least two subsequently went on to do doctoral degrees. A number of international volunteers contributed to research and monitoring programmes. Extensive inputs were also obtained through peer review as part of the process of publishing scientific papers.

2.7 Develop a total control plan and detailed accompanying plans for its implementation

1. A Total Control Plan was drafted by CDF in 2007.
2. Invasive species management activities were included in annual Action Plans by GNP and CDF.
3. CDF staff drafted biosecurity legislation.
4. The PCT had major impacts in establishing further biosecurity measures including cargo inspections at Guayaquil and Galapagos, and aircraft spraying.

2.8 Develop a priority setting methodology as part of the total control plan...

1. A technique for prioritizing important sites for conservation (SPS) was developed and made available on the internet.
2. Detailed invasive plant inventories were prepared
3. An introduced Plant Risk Analysis Methodology (ARM) was developed, 500 plant species were prioritized
4. An introduced Invertebrate Risk Analysis Methodology (ARII) was developed, 312 insect species were prioritized.
5. GIS methodologies were developed by CDF including generating GIS tracks and the development of a Galapagos Weed Risk Assessment (WRA).

2.9 Establish an international technical advisory group for the IS total control system

1. An international Technical Advisory Group (TAG) was established for the Project and met twice.
2. An email 'listserve' with experts on invasive species was set up.

A notable feature of the Project was the range of advice sought from international specialists, through established networks.

Conclusions and recommendations

CDF inputs were central to many Project achievements. CDF scientists contributed to eradication and control Pilot Project activities including project selection, planning, implementation, monitoring, analysis and reporting. CDF staff also contributed to strategic issues – including drafting biosecurity legislation and the PCT, as well as technical tasks such as undertaking training and preparing news releases. Impacts as a result of these inputs included:

1. Pilot Projects were planned, implemented and monitored using established international best practice procedures, where these existed, or based on declared hypotheses and rigorous scientific methods where they weren't. A science-based approach undoubtedly contributed to project achievements.
2. The development of inventories, collections and databases, and processes and systems for analysing risks, identifying sites and determining priorities can be expected to provide important bases for future decisions and management actions, provided these resources and tools remain current, and people are able to access and use them.
3. GNP staff were able to participate in science-based approaches, including planning and taking detailed records of activities and results. They also received training in a wide range of sampling techniques. This experience and training has underpinned the continuation of monitoring programmes and the initiation of further projects subsequently. CDF, as well as GNP staff also developed new skills in project management. While many staff left the Galapagos at the end of the Project some stayed on in various roles, either with the GNP, or with other locally-based organisations. A number of those remaining in the GNP have responsibilities in relation to invasive species management, and influence in setting directions and priorities.
4. The large number of scientific papers published on topics related to project activities suggests the Pilot Projects, in particular, had significant impacts in the international science and conservation communities. Reported achievements and the opportunities created for species recovery and ecological restoration have no doubt stimulated wider interest in further research, perhaps involving different

participants and donors. Organisations such as the FOGOS – a world-wide network of national groups committed to securing funds for conservation activities are likely to have been stimulated to provide further support by reported achievements from the Project.

As a result of high-quality advice and support services from its professional and committed staff CDF was able to make significant contributions to projects and activities across all six Outcome areas. As a result of CDF inputs many pilot eradication and control projects were well-designed, with monitoring, evaluation and reporting procedures in place. Close collaboration with GNP staff, and other field workers meant that CDF was able to advance capacity building objectives – including training and collaborative activities, and to progressively hand over management responsibilities to GNP staff in a number of projects.

The original objective of Outcome 2 is highly relevant to the Project's purpose: a "scientifically sound, well-programmed and cost-effective bio-invasion control programme... and adaptive management" are central to achieving effective long-term control of invasive species. The outputs from Outcome 2 include increased knowledge on invasive species and its accessibility, and a number of useful invasive species management tools such as risk analysis that have been applied effectively to the prioritisation and planning of management actions. However, there is little evidence that the improved knowledge and the tools which were developed have continued to be used to support and strengthen science-based planning of invasive species management activities in the Galapagos. Joint planning of invasive species work by the various agencies is limited to sharing annual action plans. Coordination between the agencies is hindered by different funding cycles and institutional responsibilities and priorities, limited channels of communication and the lack of a common strategic planning framework for invasive species control, or for broader conservation management programming.

In order to be able to establish a cost-effective invasive species control programme in the near future, there is a need to support Galapagos institutions to assess the costs of the various components of the Total Control System and to budget for a multi-year programme. This must include a research plan, with research themes and priorities to underpin management needs identified. Given the critical roles and services of CDF in supporting many projects and activities during the Project this analysis must address the issue of funding for CDF to fulfil its mandate to provide technical and scientific advice for conservation in the Galapagos. At the end of the Project CDF continues to rely on overseas donors and fund-raising, which detracts from the organisation's capacity to respond to the needs of the management authorities in Galapagos.

A large amount of information was generated during the Project including scientific and popular publications, magazine articles, brochures, fact sheets, guides and manuals. Information was also transferred through email networks. This information dissemination reflected efforts by CDF, in particular, to develop a scientifically sound and cost-effective bio-invasion control programme. The partnerships between CDF and GNPD staff through which information and advice was informally transferred were a critical success factor in the success of the Pilot Projects, in particular. We concluded, however, that a significant proportion of technical information is contained within 'internal reports' or on personal databases. While both GNPD and CDF established libraries of reports and publications, use of these resources seems to be limited. The absence of a single, authoritative and accessible repository of project information undoubtedly constituted a major impediment to learning, and to adaptive management. It also meant we were not able to thoroughly evaluate the extent to which the projects were scientifically sound, or whether adaptive management approaches were rigorously applied. We concluded that there is an urgent need to collate project information into a central database which is regularly up-dated and is easily accessed

through the web. Unless measures are taken quickly to collect and store this information we anticipate that information will be increasingly “lost” with negative implications for continued impacts of the Project.

Important progress was made during the Project in developing systems and protocols for setting priorities and guiding management activities. The development and application of such systems was probably due largely to the influence of CDF scientists operating as technical advisors and coordinators within the working groups. It seems that the continued application by GNPD of systems and procedures developed during the Project, however, is sporadic. Predictive and prescriptive modelling based on risk and prioritisation tools which were developed do not appear to be actively used by any of the agencies. Application of relevant procedures by SICGAL appeared even less consistent. Key staff in both CDF and GNP continue to access information and apply procedures. While their continued efforts are admirable it is clear that an overall invasive species management “programme” where systems and procedures are used to coordinate and consistently manage suites of projects, is not in place. While there were also some excellent examples of cooperation between scientists and managers, mechanisms were not in place through which knowledge and tools could be transferred or used to underpin adaptive management. We concluded that a well-programmed bio-invasion programme had not been developed.

If the achievements and impacts of the Project are to be sustained and built on, it will be important that an integrated programme is developed as quickly as possible. This will require statements of support by key agencies to a shared vision, and commitments by agencies and stakeholders to participate in an agreed process. We suggest current reviews of LOREG and PCT, as well as the completion of this Final Evaluation of the Project could be used to stimulate the development and refinement of plans and legislation which would underpin a more unified invasive species control programme into the future. The ‘Biodiversity vision for the Galapagos Islands’ document could be a useful information resource.

We recommend that an inter-agency committee is established involving all participating agencies to facilitate and coordinate dialogue, and to promote the regular exchange of technical and scientific information. This committee should have an initial brief to prepare a Strategic Action Plan for Invasive Species Management. The Strategic Action Plan would give effect to the (revised) Total Control Plan and would provide a basis for a Research Plan to be prepared which identified responsibilities, costs and timelines through which research priorities would be addressed. This will require in particular an effective mechanism for GNP, SICGAL and CDF to work as partners on an integrated invasive species control programme. The Strategic Action Plan should define the research-planning-monitoring-adaptive-management mechanism that will form an essential part of a Total Control System. The Strategic Action Plan should specify the role of each organisation and the mechanisms for financing and managing implementation of each of its components. Once the plan has been prepared the inter-agency committee should also have roles to oversee its implementation and to monitor and evaluate progress.

Several examples of an adaptive management approach being applied were noted. Most eradication and control projects included the key elements of adaptive management - research and analysis, and monitoring and evaluation, although it seemed that there was considerable variation in the rigour applied. The mechanisms by which new information influenced management were not always obvious. Provided CDF has the resources and capacity to continue to provide scientific support we suggest the Project provides a good basis upon which a more robust adaptive management programme may be established.

Information on project costs was available for some Pilot Projects (e.g., 21 plant pilot projects, tilapia and ant eradications), and detailed economic analyses were undertaken of ungulate eradications during and following Project Isabela. Unfortunately economic information was too incomplete to allow the cost-effectiveness of most pilot projects and activities to be evaluated. This is unfortunate since our impression was that successful eradication operations were remarkably cost-effective. We recommend that the cost- effectiveness of other pilot projects undertaken during the Project are undertaken where information is available, and related to measured outcomes. While cost-benefit analyses per se are not possible until a monetary value is ascribed to conservation outcomes, such investigations could be very useful in informing decisions by management agencies and donors about their support for further invasive species management projects.

CDF had key roles in supporting and coordinating Project activities. Unfortunately not enough consideration was given to maintaining and strengthening CDF's own institutionality and ability to continue its roles and services beyond the end of the Project. Furthermore, it struggled to provide the administrative support required by the various projects, including a large number of progress reports for different donors.

Assessing the research-adaptive management costs and how these will be funded will be the key to effective implementation of the Strategic Action Plan; and the specific issue of funding CDF's invasive species research must be addressed. One option is for CDF to be commissioned by the management agencies – SICGAL, GNP, Municipal Environment units – to undertake identified and prioritised research and to provide required scientific advice, data or tools. This mechanism establishes a clear and close collaborative partnership between the organisations. It operates to a small extent at present but would be suitable for expansion as a key part of the sustainable financing mechanism for a Total Control System.

Outcome 3. GNP and CDF develop, adopt and implement efficient mechanisms for eradication and mitigation actions of priority invasive species

Rating	Satisfactory

This Outcome was initially a set of pilot eradication and control projects. The priorities in terms of the form of intervention, areas, species and threats to be addressed were identified during the design of the Project. Pilot Projects were selected reflecting different scenarios across a range of options in a spectrum of possible management objectives. Biological indicators and success criteria were identified (Annexes B and D in the PRODOC). These pilots included Project Isabela.

After the MTE, this Outcome changed and became more general; the indicators were also changed. Below is the text of the Outcome and the indicators in the original version of the LogFrame (PRODOC), and in the revised version (2005).

Original Outcome 3	Indicators
A series of eradication and control pilot projects implemented to eliminate critical invasive species populations and to strengthen the technical & operational capacity of parties with IS control responsibilities	3.1 Goats completely eliminated from northern Isabela Island by year 6 of the project. 3.2 A continual decline in goats removed per unit effort in southern Isabela throughout the course of the project. 3.3 By the end of year 4, control and eradication methodologies involving other

	species and other ecological circumstances have been validated. 3.4 By year 6, various experiments have been analysed and results have been published. 3.5 By the end of year 6, a plan to replicate control and eradication activities undertaken during the project has been developed and approved, with dedicated funding sources identified.
Revised Outcome 3 GNP and CDF develop, adopt and implement efficient mechanisms for eradication and mitigation actions of priority IS	Indicators 3.1 Coordination Unit established and operational. 3.2 By 2007, all eradication and mitigation projects are identified as priorities according to TCP 3.3. Species eradicated with proven eradication methods.

The PFE points out that the changes to indicators were inappropriate, and cites as an example that the new indicator 3.3 was originally the objective of Outcome 2. We agree with the EPF, the original indicators, while not ideal, were more specific and provided an appropriate basis for planning activities and evaluating progress. We also agreed with the EPF that the changed Outcome 3 statement is more appropriately an 'Outcome' statement with a series of 'Objectives and Tasks' through which the Outcome was to be achieved.

The PRODOC budget specified that US$7.21 million of GEF funds and US$3.31 million in funds from UNF, CDF and GNP would be spent on this Outcome.

The PFE identified the following outputs:

Planned Outputs	**Reported/ Achieved Outputs**
Eradicate goats from northern Isabela Island as a demonstration project for the eradication of mega-populations...	Eradication of goats from northern Isabela island completed effectively. Only Judas goats remain. Goat control activities in southern Isabela have reduced goat populations to low levels
Undertake series of demonstration projects for species-specific eradication of small-scale populations...	Goats from Baltra, Pinta, and Marchena Cats from Baltra Donkeys from Isabela and Santiago Feral pigs from Santiago Feral dogs from Isabela, Floreana and Santa Cruz Black rats from Bainbridge and Marielas Rock pigeons from Galapagos Fire ants from Marchena – not successful - and Santa Fe

Planned Outputs	Reported/ Achieved Outputs
	Eradication of Ani from Fernandina – not successful CDF report that 3 out of 30 attempted plant eradication projects were successful
Undertake series of control and mitigation demonstration projects... (in) control and habitat restoration needs...	A series of long-term control projects were initiated or continued, including the management of quinine in Media Luna and blackberry in Los Gemelos
Series of “how-to” guides... for eradication and control of species... for Galapagos and other parts of the world.	Project Isabela goat eradication Atlas published. Manual for identification and management of weeds, for farmers; pamphlets and laminated cards also produced.
Determine full cost of control and eradication activities for selected IS... evaluation of cost effectiveness of methods	No overall assessment of the predicted costs of IS management priorities in Galapagos Project Isabela Atlas gives some comparative costs of goat eradication projects and general assessment of cost effectiveness. Detailed cost-effectiveness analyses subsequently published (Carrion et al., 2011)
Develop strategy for replication of the demonstration projects as a component of the I.S plan...	No strategy developed. Rat eradication plan produced for Pinzon island.
Pilot eradication project implemented and evaluated...	Project Isabela was implemented on-time and within-budget and evaluated to have achieved its key objectives.
Prioritisation systems implemented for the prevention, eradication and mitigation of invasive plant and invertebrates...	Prioritisation methods were developed under Outcome 2.
A biological invasion programme implemented.. scientifically sound, well programmed and cost efficient.	Not achieved, but vital to effective management of IS. (Note: This was originally the Outcome 2 objective statement)

During the Closure Phase, the accessible information was compiled, the documents (outputs or products) recorded are listed in Annex 8.

We were not provided with the information necessary to undertake a comprehensive final evaluation of the Pilot Projects. We would have expected at least detailed annual reports from each of the projects prepared by GNP and CDF to have been compiled by the UAP, and made available for this final evaluation. In addition these reports should have been used to inform decisions about future management approaches and priorities as the projects proceeded, and to inform stakeholders and donors of progress being made.

Information on results and achievements from most Pilot Projects was obtained from various sources including scientific publications, UNDP/GEF Project Implementation Reports and earlier evaluations. Past and present GNP and CDF staff also provided information from their own records. These people were also helpful in providing comments and insights based on their knowledge and recollections of Pilot Projects.

While a large amount of information was generated, its accessibility was highly variable making a review across projects difficult. The level of detail was also highly variable between projects ranging from detailed analyses and reports to anecdotal reports. It was not appropriate for us to undertake detailed reviews of activities, results and outcomes of individual Pilot Projects, although there would be value in establishing a peer review process through which all projects would have been regularly evaluated. Instead our objective was to evaluate the impacts of Pilot Projects generally, and lessons learnt. Table 2 lists the projects for the eradication and control of animal species which were executed during the Project.

Output 3.1 Eradicate goats from northern Isabela Island as a demonstration of eradicating mega-populations

Project Isabela was completed and a Final Evaluation of the project (Parkes & Aguirre-Munoz, October 2006) was submitted to UNDP. The Final Evaluation found that PISA "… had achieved its primary goal – to eradicate feral goats and donkeys from the northern half of Isabela and Pinta Islands, subject to final confirmation. In addition goats were eradicated from Santiago Island and controlled to low densities in southern Isabela. This was achieved on time and on budget despite delays in the availability of key control techniques and the stresses inherent in a complex funding and governance system." The Final Evaluation highlighted a number of project impacts, including capacity building, and made a number of recommendations related to governance, planning and "institutionalisation". A risk analysis was suggested to inform decisions about the relative effort put into determining if any survivors remained, versus effort to complete an archipelago-wide goat eradication. The Final Evaluation concluded that Project Isabela was a "spectacular conservation achievement". It has subsequently been promoted as an international reference project. Further consideration of Project Isabela during this Final Evaluation of the overall Project was limited to further impacts and lessons learnt since 2006.

<u>Further achievements</u>

1. Since 2007 eradication has been declared by the GNPD. Some Judas goats remain on Isabela, but are not being actively monitored. Radio collars are either no longer functional or soon will be (Karl Campbell, pers. comm.)
2. GNP support has been maintained for on-going ecological monitoring and surveillance programmes.
3. 12 intentional re-introductions of goats to previously eradicated islands have been responded to.
4. Analyses of the cost-effectiveness of PISA have been undertaken showing that goats were eradicated from Santiago Island at a cost of US$105/hectare, and from northern Isabela, using helicopters from the outset, for a cost of US$8/hectare. Overall PISA was completed at a cost of a little over US$20/hectare. These costs, coupled with reported outcomes indicate Project Isabela was a highly cost-effective operation (Cruz et al., 2009; Carrion et al., 2011).
5. An archipelago-wide goat eradication strategy has been initiated to remove goats from the remaining islands where they exist (i.e., San Cristobal, southern Isabela and Santa Cruz). Goats may have already been eradicated from Floreana Island – further surveillance is required before eradication can be confirmed. Feral cattle and donkeys were successfully eradicated from Floreana in 2008.

6. A number of technical publications (including operational manuals) and peer reviewed scientific publications were produced and made available to local, national and international audiences.

Further impacts

Ecological outcomes reported subsequently:

1. Significant increase in Galapagos rail population on Santiago.
2. Positive response in Galapagos hawk population on Santiago.
3. Marked increases of threatened plant populations on Santiago and Floreana .
4. A mass recovery of the Pinta endemic *Scalesia bauri* ssp. Hopkinsii.
5. Rapid recovery of the endangered *Scalesia attractyloides* on Santiago leading to a proposal to downlist its endangered status.
6. Rapid and vigorous seedling growth and vegetation recovery on Pinta, Santiago and Alcedo volcano.
7. Tortoise distribution expanding.
8. Opportunities for re-introductions and other restoration activities created.

While more time will need to elapse before a wider range of outcomes can be interpreted it is clear that ecological responses have been both significant, and largely positive.

In addition to positive responses, negative or undesired changes have also been attributed to the removal of introduced herbivores:

1. Increase in the distribution of *Rubus niveus* on Santiago
2. Other invasive plants are also increasing in the absence of mammalian herbivores

Further significant changes are likely to be reported, provided ecological monitoring programmes remain in place and results are properly analysed and reported.

Note: Comprehensive literature reviews were not undertaken. Key references and information sources only are presented here:

- Atkinson, R., Gardener, M., Harper, G., & Carrion, V. 2011. 50 years of eradication as a conservation tool in Galapagos: What are the limits? In M. Wolff & M. Gardener eds. The role of science for the Conservation of the Galapagos: a 50 years experience and challenges for the future. Routledge, UK (in press).
- Carrion, V., C. J. Donlan, K. Campbell, C. Lavoie & F. Cruz. 2007. Feral donkey (Equus asinus) eradications in the Galapagos. Biodiversity and Conservation 16:437-445.
- Carrion, V., C. J. Donlan, K. J. Campbell, C. Lavoie & F. Cruz. 2011. Archipelago-wide island restoration in the Galapagos Islands: Reducing costs of invasive mammal eradication programs and reinvasion risk. PLoS ONE 6:e18835.
- Cruz, F., V. Carrion G., K. J. Campbell, C. Lavoie & C. J. Donlan. 2009. Bio-economics of large-scale eradication of feral goats from Santiago Island, Galapagos. Journal of Wildlife Management 73:191-200.
- Donlan, C. J., K. Campbell, W. Cabrera, C. Lavoie, V. Carrion G. & F. Cruz. 2007. Recovery of the Galapagos rail (Laterallus spilonotus) following the removal of invasive mammals. Biological Conservation 138:520-524.
- Donlan, C.J., Carrion, V., Campbell, K.J., Lavoie, C. & Cruz, F. 2011 Archipelago-Wide Island Restoration in the Galapagos Islands: Reducing Costs

of Invasive Mammal Eradication Programs and Reinvasion Risk. PLoS ONE 6(5): e18835.
- Lavoie, C., Cruz, F., Carrion, G.V., Campbell, K., Donlan, C.J., Harcourt, S. & Moya, M. 2007. The thematic atlas of Project Isabela: an illustrative document describing step-by-step, the biggest successful goat eradication project on the Galapagos Islands, 1998-2006. Puerto Ayora, Galapagos: Charles Darwin Foundation: 60 pp.

Institutional capacity

In line with a specific objective, significant capacity was developed during Project Isabela – both within GNP and CDF, and amongst almost 100 local people who were engaged and trained. Continued support by GNP for surveillance and rapid response (to goat re-introductions), as well as for the archipelago-wide goat eradication strategy are important flow-on impacts from the project itself. The knowledge, skills and motivation developed amongst local people and the infrastructure established means that further large-scale eradications – and perhaps more effective sustained control measures can be contemplated. We noted, however, that many experienced and skilled practitioners left after PISA was completed (2006), or by the end of field activities of the overall Project (2008) because of funding issues, leaving a small cadre of experienced staff within GNP and CDF. While the emphasis on capacity building during Project Isabela was both appropriate and productive, capacity retention – that is, retaining experienced, knowledgeable and motivated people and the infrastructure and resources to support their activities, represents a risk to sustaining Project outcomes. This has partly been mitigated by the GNP and CDF creating partnerships with other NGOs, such as Island Conservation, to support further eradication activities.

Costs and benefits

While an objective to undertake cost-benefit analyses was not achieved during Project Isabela, bio-economic analyses (cost-effectiveness) were undertaken and published subsequently (Cruz et al., 2009; Carrion et al., 2011). Analysing and comparing the costs and benefits of eradication operations is not a realistic objective unless the benefits (to biodiversity) can be measured in the same currency as the input costs. This has not yet been undertaken with any rigour anywhere. The cost-effectiveness analyses undertaken here, however, constitute an important step and are informative for the donors of PISA.

The Project resulted in the total area globally from which goats have been removed being nearly doubled, with more than 140,000 goats being removed from Pinta, Santiago and northern Isabela Islands (567,000 hectares in total) for a cost of US$10.5 million. The cost of eradicating goats was remarkably cheap – especially when aerial hunting was combined with ground-based approaches augmented with ‘Judas goats’ and supported by technology and an adaptive management approach. Few ecological management activities would lead to such a range of outcomes for overall costs of about US$20 per hectare.

Near the end of the project restoration costs averaged US$9 per hectare as practitioners became more efficient at eradication operations, and further refined technology and techniques. Less than five years after the end of PISA, GNP has removed goats from an additional 17,000 hectares. Given the clear, tangible, and cost-effective biodiversity outcomes of Project Isabela it has been observed that the investment of GEF funds has produced a particularly high return with respect to environmental gains.

While the outcomes which are emerging (“the benefits”) are impressive in relation to the cost per hectare operational costs, the overall costs of Project Isabela were significant, and much greater than any other project undertaken. Continued political and institutional support for on-going activities is notable. Helicopter contracts for aerial

hunting, for example, are now part of GNP' annual budgets. Recurring costs in responding to deliberate re-introductions are also high. Linking on-going operational costs with conservation outcomes – such as ecological restoration, capacity development and retention and generating stakeholder support, will be important if political, institutional and stakeholder support is to be maintained.

Social impacts.

A strategy for communicating was agreed by senior Project Isabela staff which promoted a reactive approach at national and international levels, and was proactive locally. This approach appears to have been effective, although tensions between PISA managers and the UAP may have been reduced had this communication strategy also focused on audiences within the host institutions.

Although we spoke to only a few community representatives during our visit we got the impression that community awareness of ungulate impacts and recognition that Project Isabela had been a major success, had increased. There are clearly still people in the community that feel the project was a waste of money, and that they could have done it better. It is likely, however, that these views would not stand up to objective debate and that remaining concerns are based on wider issues such as resentment that so much money is being spent on conservation projects on uninhabited islands rather than solely about ungulates and their retention or removal.

Additional lessons learnt

1. Eradicating ungulates (goats, donkeys, pigs) from islands in the archipelago using the approach and techniques developed during the Project was a highly cost-effective conservation measure. The continuing impacts of Project Isabela including further eradications and sustained eradication capacity, as well as the significant ecological outcomes which are still emerging, mean that "GEF certainly got its money's worth".
2. Deliberate goat re-introductions continue to be a draw on GNP resources. In addition to responding quickly to new arrivals, further efforts are needed to build greater stakeholder support for a feral goat-free archipelago.
3. Rigorous planning and thorough implementation of detailed plans and continuity of support by GNP throughout the project were additional factors which contributed to the success of Project Isabela.
4. Techniques adapted and refined during Project Isabela, and the lessons learnt (e.g., removing every goat on first encounter) have application not just in the Galapagos, but around the world.
5. The strategic planning, including an international workshop in 1997, a visit to New Zealand by key personnel – and on-going technical advice from international specialists, coupled with the detailed planning which went into Project Isabela had a strong influence on how operational plans were implemented. More could have been done to transfer strategic planning approaches and skills to other Pilot Projects.

Comment

Project Isabela was a timely and appropriate response to serious ecological degradation, and involved eradication operations being successfully undertaken on an unprecedented scale. Significant institutional, financial and logistical challenges were overcome and the project was completed on time and to budget – remarkable achievements in their own right! It is difficult to imagine a project which could have led to the range and scale of impacts that continue to emerge following completion of the project.

A large number of Pilot Projects undertaken during the Project focused on eradicating or controlling invasive plants, invertebrates and vertebrates. Impacts of these Pilots ranged from significant and on-going, to relatively minor or difficult to assess. PISA, involving the eradication of invasive ungulates from more than 500,000 hectares on three islands had the greatest impacts. In addition to important ecological responses, which continue to be monitored, significant capacity building outcomes also accrued including skills and procedures within the GNP and a cadre of skilled and motivated local people who continue to participate in a wide range of ecological management activities. An important legacy of Project Isabela is an “eradication ethic” amongst practitioners – recognition of the mix of skills and commitment to success which are critical elements in any eradication operation. Following Project Isabela GNP continues to support on-going surveillance and monitoring, as well as rapid response measures to remove re-introduced goats. A whole-archipelago goat eradication strategy is now being implemented. Project Isabela also established a working model of cooperation between the CDF and GNP which was replicated in a number of subsequent projects such as managing little fire ants, fruit flies and invasive plants.

While significant impacts were reported there is a risk that these will decline with time unless a deliberate approach is taken to sustaining them. Ecological monitoring programmes, for example, must be maintained so that management priorities may be set. These may include ecological restoration activities and concerted responses to the expansion of invasive species. The preparation and implementation of a Galapagos Restoration Strategy, including inputs from local people, as well as national and international specialists, would be a useful document in guiding further invasive species management decisions and restoration activities.

Capacity for a range of roles and tasks was developed during the project – within CDF and GNP, and the wider community. Although up to 40 local people are still available for various skilled tasks, and a small cadre of experienced CDF and GNP staff remain, retaining capacity from Project Isabela is now an important challenge for CDF and GNP. The loss of even a few of the remaining staff would constitute a significant loss of remaining capacity. The preparation and implementation of strategic plans may be a positive retention tool although we would imagine more comprehensive staff retention and recruitment policies may be warranted.

The current archipelago-wide goat eradication strategy, if achievable, is probably an appropriate way to manage the risk of further deliberate re-introductions. Maintaining a goat-free status however, will require the support of the community for biosecurity measures, even when the archipelago is free of feral (or even all) goats. This will require understanding by stakeholders of the ecological consequences of re-introducing goats, and their support for quarantine and inspection measures. Since there are important social dimensions involved – in relation to goats and, perhaps, other invasive species which may also be released in the future, there would be merit in consulting with community stakeholders and seeking their inputs into managing these risks and sustaining outcomes.

GEF projects addressing invasive species impacts elsewhere have included support for eradications at pilot sites. Evaluations and analyses of sustainability of project impacts have led to a gradual shift through GEF4 and GEF5 to a focus on supporting systemic approaches underpinning prevention and early detection activities and developing necessary policy and regulatory frameworks. An outcome for GEF5 also links invasive species management to mainstreaming – thus focusing on invasion pathways. It is not clear if this shift is based on systematic comparisons of the cost-effectiveness and sustainability of different invasive species management objectives (i.e., prevention, eradication and sustained control). We suggest that the approximately US$20 per hectare overall cost of Project Isabela and the scale and scope of the impacts which persist five years later – including systems, policies and capacity in the Galapagos,

represent a very good return on investment. Wider benefits including increased international awareness and support for invasive species management, and the application of techniques and tools developed during Project Isabela would make any cost-benefit analysis even more compelling. Unfortunately details of costs and benefits of many invasive species management projects are seldom collected or published. There would be merit in GEF supporting further investigations into the cost – effectiveness of eradications (of ungulates and other vertebrates), in particular, as this tool is increasingly being considered as an important step in the restoration of islands around the world. Analyses would appropriately be focused on cost minimization and benefit maximization. Such information could be used to inform GEF's consideration for support of further eradication projects.

Other subsequent impacts have included the initiation of further eradications, using GNP funds, and their oversight by experienced GNP staff – of ungulates and other taxa. Goat eradication operations have been initiated on Floreana, San Cristobal and Santa Cruz Islands. The eradication of feral donkeys and cattle from Floreana was achieved in 2008 and goat eradication may now be complete there. In response to requests for support, GNP staff provided technical advice and support to eradication projects elsewhere, including participating in the eradication of goats from Machalilla National Park in Ecuador, providing training on how to sterilize and manage Judas goats on Guadalupe Island (Mexico), and contributing to discussions about proposed multi-species eradications in the Juan Fernandez Archipelago (Chile). Apart from GNP staff about 100 local people received training and had practical experience during Project Isabela in a range of field activities. Some of these people continue to be available for eradication projects and other conservation activities undertaken by GNP, including monitoring and surveillance. A small number have subsequently taken up ranger positions within GNP. Others have influential positions elsewhere in Galapagos communities. Managerial skills were developed within GNP and CDF as a by-product of PISA. A small number of key staff remain in influential roles within GNP and retain important oversight of eradication and control projects throughout the archipelago.

Output 3.2 Undertake a series of small-scale eradications as demonstration projects.

Results, impacts and lessons reported by project staff were summarised for each demonstration project based on available reports, scientific publications and discussions with remaining project staff (Annex 9). We made comments in relation to features of individual projects and discussed eradication project activities and achievements generally. Further outcomes and lessons learnt from Project Isabela after the Final Evaluation of that project were also summarised.

We encountered difficulties in accessing information about individual projects, this was a major impediment to our review, and a constraint to the conclusions we were able to draw. However, from the information we did assess, it is clear that a lot of effort was applied to compiling inventories, developing risk assessment models and creating priority-setting tools which were applied to the selection and implementation of many of the demonstration projects. Management plans, including research objectives, were prepared for most projects and were used to guide activities. In addition to the eradication of goats, pigs and donkeys as part of PISA, other vertebrate eradications were also achieved, including rats, cats, rock doves and tilapia. The subsequent development and support of archipelago-wide eradication strategies for goats and introduced rodents is a significant outcome. Challenges in eradicating invertebrates, such as ants, and plants were reinforced. More careful consideration will need to be given to applying well-established criteria to the selection of eradication projects targeting invertebrates and plants, in particular, in the future.

We concluded that internationally significant ecological, institutional and awareness-raising outcomes resulted from some of the demonstration projects. Key elements underpinning these achievements included consistent institutional support throughout the Project and close cooperation between CDF and GNP staff. However, the absence of a strategy to maintain selected activities and to sustain desired outcomes after the Project was closed, and the loss of impetus and capacity after key staff left were disappointing features. While information on the costs of most pilot projects was not reported we concluded that goat eradications within Project Isabela were highly cost-effective suggesting that donor support for further eradications in the Galapagos, and elsewhere, may be justified.

Output 3.3 Undertake a series of control and mitigation projects as demonstration projects.

Results, impacts and reported lessons were summarised for three animal control projects for which information was available to us (Annex 10). At least two other animal control projects were initiated. We are not aware of any impact mitigation projects (in the absence of eradication or control) having been initiated. In some cases whilst eradication was the declared objective, in reality control was more realistic (e.g., reducing rat impacts around land-locked breeding colonies and sites).

Sustained control operations must be regularly evaluated and management refined if effectiveness and efficiency is to be maximised. While it was suggested to us that improvements to rat control around mangrove finch breeding areas was an example of iterative improvements being made to a control programme, we found little evidence of a rigorous adaptive management approach being applied at any of the animal control projects. GNP support for the experimental black fly control project was withdrawn following doubt being expressed about whether this was actually a native species, as well as concerns about testing a biocontrol agent. Of the 21 plant “eradication” projects only three were reported as being successful. For most of the remainder eradication was unlikely to be achievable, based on well established eradication selection criteria. In some cases a sustained control objective, rather than eradication, may have been a more appropriate and realistic objective. With further time we would expect some to have evolved as control projects. We agreed with suggestions that a more active approach to evaluating the feasibility of biological control for some weeds should be prioritised, and that a wider landscape view which acknowledged the continued presence of some introduced plants in some areas was more appropriate..

Based on the information available we concluded that results at the control pilot projects were variable, with some ecological outcomes attributed to rat control. Other reported impacts included development of close inter-agency collaborations, increased knowledge and enhanced capacity to monitor invertebrates and plants.

Output 3.4 Prepare and publish “How-to” guides to assist replication in the Galapagos and elsewhere.

It was planned to produce “How to” guides to support replication. A thematic atlas of Project Isabela was produced and gives a clear overview of the work done and methods used, including GIS maps to show management strategies and impact, and an analysis of efficiency and costs. A manual for the identification and management of weeds was also produced for farmers.

We observed that there is a limit to the use of ‘How to’ guides. Even where best practice procedures and protocols exist caution is needed in treating these as formulae as every project is different, requiring at least flexibility to modify and adapt established procedures.

A large volume of other technical and scientific information which may inform future activities was also prepared including:

1. Scientific publications
2. Technical reports
3. Internal (CDF/GNP) reports
4. Mid-term and Final evaluations

Output 3.5: Determine the full cost of control and eradication activities.

Analyses of the costs of control and eradication operations for selected invasive species were planned. The recent publication of the costs of the goat and donkey eradication operations as part of Project Isabela represents important progress. While PISA may be viewed as a high-risk and expensive biodiversity conservation project, those risks appear to have been justified given the cost-effective outcomes being reported. Invasive ungulates were removed from over 500,000 hectares at a cost of approximately US$20 per hectare.

Management plans for most of the invasive plant Pilot Projects included estimates of costs. Few of these pilot projects were completed, however – including because of inadequate funding and/or institutional support. Costs were also reported for ant eradication projects; although no cost-effectiveness or cost-benefit assessments were undertaken.

We understand GNP managers plan and budget for future eradication operations based on financial records of past projects and their knowledge of the equipment, personnel and activities required. This illustrates the importance of key staff remaining in relevant and influential positions. Again, detailed reports on the financial costs and benefits – along with other details, will be crucial resources as time advances, and as key staff move on.

Output 3.6: Develop a strategy for replication of the demonstration projects as a component of a bio-invasion control programme.

Archipelago-wide rodent and goat eradication strategies were prepared following inputs from international specialists, and based on experiences from Pilot Projects. These strategies constitute an important step towards a more progressive and systematic approach to invasive species management and ecological restoration in the archipelago.

Important progress was made in developing models and systems for prioritising native, as well as invasive plants for management. A site-led prioritisation model was also developed and was used to prepare an eradication and control strategy for fire ants.

We suggest elsewhere that an over-arching invasive species management strategy should be prepared to give effect to the Total Control Plan. The process of preparing such a strategy, including the engagement of stakeholders and community representatives, could be as important as the strategy document itself in relation to achieving and sustaining important conservation outcomes.

Impact of the Pilot Projects

The Pilot Projects were selected to represent a range of challenges associated with invasive species management needs in the Galapagos. The inclusion of control and mitigation objectives, and the targeting of invasive birds, fish, amphibians, invertebrates

and plants – as well as mammals probably meant from the outset that not all project objectives would be achieved due to risks associated with a lack of precedents upon which to model projects, and a lack of skills and experience to undertake them. Where information is available it appears that some creditable achievements were made (e.g., increased mangrove finch survival as a result of rat control). The achievement of eradication objectives at some projects was variable, with rodent and ungulate projects being more successful due to the availability of existing best practice procedures and experienced operators. Reported lessons about the achievability of eradication objectives – in some cases compared to sustained control, are appropriate and reflect trends elsewhere as the potential advantages of eradication over control, where it is achievable, are recognised.

A blend of local and international expertise was engaged in a number of the Pilot Projects. Building institutional capacity was a specific objective in most projects and was actively and productively pursued – with significant impacts. It is clear that a lot has been learned by members of the CIMEIs, and by GNP and CDF staff as a result of their involvement in the Pilot Projects. Some GNP staff have developed interests, knowledge and skills in managing and monitoring different invasive taxa, including plants and invertebrates. GNP continues to replicate eradication projects, using the techniques developed under the Project. GNP and CDF have continued to train and work with residents on the inhabited islands on other eradication projects. We understand that CDF and GNP are now using the lessons from these Pilot Projects to develop strategies such as an archipelago-wide strategy for the biological control of blackberry.

We suggest that the full value of these projects as “Pilots” or as “Demonstration Projects” was not realised due to inadequate reporting and information collation and dissemination. An enormous amount of information was generated by Project Isabela. Scientific papers covering various aspects of the eradications, their costs and outcomes were sourced as part of this final evaluation. A number of scientific publications also outline aspects of other projects. Unfortunately it appears the conclusions and recommendations from these papers have not been synthesized for further consideration and incorporation into future strategies. Eradication plans were prepared for some eradication projects which seemed comprehensive and incorporated best practice procedures.

Below is an evaluation of the achievements according to the indicators for Outcome 3 (original):

Indicator	Performance assessment
3.1 Goats completely eliminated from northern Isabela Island by year 6 of the project.	Highly satisfactory
3.2 A continual decline in goats removed per unit effort in southern Isabela throughout the course of the project.	Satisfactory
3.3 By the end of year 4, control and eradication methodologies involving other species and other ecological circumstances have been validated.	Satisfactory
3.4 By year 6, various experiments have been analysed and results have been published.	Moderately Unsatisfactory
3.5 By the end of year 6, a plan to replicate control and eradication activities undertaken during the project has been developed and approved, with dedicated funding sources identified.	Moderately Unsatisfactory

The Pilot Projects collectively constituted a notable attempt to objectively set appropriate management objectives related to both ecological and capacity building outcomes. The wide scope of pilot projects initiated, the lack of precedents internationally on which to base some activities, and the limited experience within GNP and CDF to undertake some of the proposed management activities meant that achieving Outcome 3 was a bold undertaking from the outset. While it was difficult to evaluate them because of the variable amount of information available, it is clear that important progress was made towards solving key invasive species dilemmas, in strengthening operational and technical capacity and eliminating critical populations. The absence of a strategy, however, to maintain selected activities and to sustain desired outcomes after the Project was closed, the loss of impetus and capacity after key staff left, coupled with a variability in the availability of detailed information about some projects were disappointing features.

Conclusions and recommendations

Difficulties in accessing information

Difficulties in accessing information about individual projects, and collated and summarised information in particular, were a key constraint to the completion of this Final Evaluation. This was disappointing given that the extended final phase of the Project was intended to allow such material to be collated. As a consequence the information presented here cannot be taken as comprehensive and our observations on project impacts and lessons learnt may also have been different with better information. Unless urgent efforts are taken to collate technical information about project activities, results, outcomes, impacts and lessons learned, and to make it widely accessible, there is a risk that this information and associated experience will be lost, jeopardising the achievements of the Project overall. We recommend, as a first step, that the Bibliogalapagos website is resurrected, populated with recent information, and maintained as an authoritative, comprehensive and accessible information source. We were informed that CDF is currently in the process of including this information in its on-line species checklist[24].

Species eradicated

According to information we were able to obtain, 15 species were either eradicated from islands or archipelago wide during the Project, or eradication projects were initiated using GEF funds (Tabla 4). Two further animal species were targeted for eradication soon after the Project ended (feral cattle on Floreana, Medfly on San Cristobal). Rats have been eradicated from a number of islands following the Project, as part of an archipelago-wide strategy. A number of plant eradication or control projects initiated during the Project continue. We noted claims ranging from 14 to 27 species having been eradicated and suggest this is probably a function of the difficulty in accessing comprehensive information about eradication success, coupled with ongoing discussion about the fate of some projects. Some plant projects appear to have moved from eradication to control objectives. These are significant achievements in an international context

Realistic expectations of systems being developed

Many of the activities initiated during the Project were new to Galapagos agencies, and in some cases, anywhere. There were also many social and political externalities which were beyond the control of executing agencies (Figure 6). Some of these externalities had major influences, making achievements even more remarkable. In this context, it was a “big ask” to expect systems to be created and impacts to be sustained encompassing the wide range of pilot projects and activities which were initiated. Many

[24] http://www.darwinfoundation.org/datazone/checklists/

objectives were achieved, significant outcomes reported and a number of systems were created. More comprehensive planning to guide further activities to sustain these outcomes will be needed if growing expectations of further successes are to be realised.

Eradication can be an appropriate and cost-effective tool

The success of Project Isabela showed that large, complex eradication operations are possible in the Galapagos. They can lead to important social and economic outcomes, in addition to environmental ones, which may continue to emerge years later. Ungulate and rodent eradications involving the use of helicopters, modern technology and current best practices can be very cost-effective. PISA probably represents some of the best "value for money" that donor agencies have encountered. GEF should consider providing further support for eradication operations where the criteria for success can be met. Recognising that negative outcomes may also arise is important and monitoring programmes should be in place to inform decisions about any subsequent actions required. On the contrary, eradication is unlikely to be feasible for the majority of invasive plants and invertebrates. A broader range of goals and approaches is more realistic, including more effective biosecurity and sustained control and containment at priority sites. Improvements in effectiveness and efficiency can be expected if an adaptive management approach underpins longer-term control programmes.

Retaining capacity

Considerable effort was applied to develop technical and operational capacity within local organisations and communities as part of many of the Pilot Projects. As a result GNP staff developed and applied a wide range of technical skills which they have used subsequently. The replication of eradications by GNP without assistance from GEF funds after the Project had closed illustrates the impact of capacity building. Continued GNP support for invasive species management is a further example. However, impetus and continuity was lost when Project funding ceased and many people left the Project (completion of field activities). Significant reduction in CDF capacity since the end of the Project has also led to its advisory and support services being reduced. Retaining capacity (as much as building it), is now a critical issue for GNP and CDF if outcomes are to be sustained and further progress made.

Consistent institutional support

"Institutional complexities" can hinder progress, without a shared vision and strategic goals to unify participating agencies. In small communities 'personality-driven' policies can have both positive and negative impacts. Both were clearly evident during the Project. Consistent institutional support involving predictable allocations of funding and resources is critical to conservation outcomes being achieved and sustained. Institutional support will need to come from people in roles extending from field operators and project managers – as well as from programme directors and political decision makers. A commitment to achieve and sustain conservation outcomes should underpin this support.

A key step in securing institutional and stakeholder support should be the preparation of a strategic invasive species management plan which would provide a link between the Total Control Plan and operational plans. A strategic plan would be useful in engaging participants and providing a mechanism for communication and coordination.

Science-management partnerships

It is important that invasive species management activities are based on a good understanding of the biology and life histories of targeted species. While good information is available for most mammals, other invasive taxa, such as invertebrates and plants have been less well studied. Greater effort is needed to gain knowledge about the ecology, impacts and management options for other invasives, in priority

sites. Collaboration between CDF scientists and GNP managers, focused on invertebrates, plants or vertebrates was a feature of the Project but a more holistic ecosystem level focus is required. Further effort would be required, however, to ensure science information and advice is available for consideration and application by project staff.

Monitoring and evaluation

As invasive species management becomes more complex, and costs and risks increase, it will be important that comprehensive monitoring and evaluation systems are in place so that information about activities, results, outcomes and costs is collated and made available to guide future operators and to inform stakeholders. Post-operational monitoring is also essential to assess ecological responses which may require further interventions. Monitoring to detect any new introductions ("surveillance") is also important. Monitoring and evaluation of Pilot Projects during the Project was generally inadequate. A key problem in eradication projects is knowing when success has been achieved and determining that the operation can stop. Data was collected during Project Isabela which might have been used to inform decisions about stopping eradication operations. However, the projects were not designed with this in mind and the data was not used to inform the decision to halt operations.

Community awareness

While opposition to eradications has declined, local concerns persist. Goats have been deliberately reintroduced at least nine times to islands from which they have been eradicated; quickly removing these animals is costly. Protecting goat-free areas will involve social, financial and political challenges, as well as logistical and ecological ones.

Working more closely with farmers to improve techniques to control plant and invertebrate pests on rural lands could generate greater local support for invasive species management more generally, as well as environmental benefits. This is particularly important since most environmental weeds first establish on private lands. Some farmers recognise that invasive plants may present economic as well as environmental threats and may be interested in undertaking collaborative projects to effectively reduce these threats. Collaborative experimental projects focused on selected weeds on private lands may lead to important new information being collected, new management approaches and techniques being developed, and to further support for collaboration between farmers and GNP. We suggest Municipalities and CIMEIs should play a stronger role in facilitating such collaboration.

Stakeholder support

There is an urgent need to more effectively inform and engage stakeholders, and facilitate their involvement and ownership of pest control and biosecurity activities and outcomes. More comprehensive, concerted and targeted efforts should be taken to inform and engage other sectors, such as the health sector and tourism industry which have strong interests in invasive species being effectively managed.

A wider focus

A focus on different invasive taxa (invertebrates, vertebrates, plants) has raised awareness of the need to consider trophic relationships and community-level dimensions to conservation management. "Unpleasant surprises" and perverse outcomes can result from removing invasive species from a system. A focus on biological communities, ecosystems and whole islands may present opportunities to improve the effectiveness and efficiency of invasive species management, and to sustain conservation outcomes. There are different challenges in effectively managing invasive plants and invertebrates, compared with ungulates and rodents. There is a need for greater effort to develop methods to control or eradicate invertebrates and

plants so that this can complement mammal eradications and enhance ecological outcomes.

Emerging opportunities

Biological control of key invasive plants such as blackberry and quinine, and of insects such as fire ants, may be the only effective measure which could potentially be applied in the Galapagos. Creating further opportunities to engage the support and involvement of national and international organisations with relevant interests and capacity would lead to important benefits. There is clear evidence of strong interest from international conservation organisations, for example, which could be encouraged, and inputs facilitated.

Outcome 4. The financial sustainability of priority actions of the Total Control Plan is guaranteed

Rating	Satisfactory

The Outcome proposed in the PRODOC was a permanent financing mechanism of the IS control activities in Galapagos. The PRODOC states: "In the medium term, the activities of the fund will be geared primarily to addressing the threat posed by invasive species. Accordingly, the fund will provide incremental financing to cover the bio-invasion control campaigns of the GNP and CDF (as per their responsibilities under the Special Law). However, the fund will be designed so that its activities may in the future be expanded, in the event that biodiversity threats of comparable importance arise."

Outcome 4 was based on the idea that the requirements for attending to the problem of IS, as established in the LOREG, need levels of funding beyond what is available, even considering the allocation that LOREG earmarks for SICGAL. Consequently, the Project was to develop a financing mechanism to cover the additional costs (not current expenses). This concept remains valid.

In the PRODOC, US$17.66 million was budgeted for this Outcome. The GEF contribution would be US$6.64 million, of which US$898,000 would be used to (i) prepare the Fund (legal instruments, governance and administrative structures, create an operations unit, develop manuals of operations and procedures); (ii) to partially cover the administrative costs in the country of the operations unit in year 4 and (iii) for the fundraising operations. The goal of the Project was to capitalize a fund of US$15 million, by raising US$10 million and thus releasing US$5 million in GEF funds as seed money. CDF was charged with establishing the fund, with the DSF as its base.

There were serious difficulties in implementation with this Outcome during the Initial Execution Phase. In the revision of the LogFrame, the Outcome was focused on the TCP. Below is the text of Outcome 4 and the indicators in the original version of the LogFrame (PRODOC), and in the revised version (2005).

Original Outcome 4	Indicators
An expanded and efficiently operating financial mechanism is operationalized permitting the permanent funding of invasive species control activities in the Galapagos.	By end year 1 an intensive fund-raising campaign is underway for capitalising the fund
	By year 2 the DSF is well advanced in its restructuring process.
	By year 3 the DSF has completed its restructuring and has well-defined procedures

	and bylaws consistent with GEF requirements and international norms. By year 4, the DSF Operations unit is set up and functioning. US$10 M raised by year 4 of the project for the Fund, triggering US$ 5 million in GEF seed capital.
Revised Outcome 4. The financial sustainability of the priority actions of the Total Control Plan is guaranteed.	Indicators The resources of the TCP are channelled through appropriate financial mechanisms

During the Closure Phase accessible information was compiled, the documents (outputs) collected are listed in Annex 8.

The concept of the trust fund was based on the proposal prepared by Guerin-McManus (2000) within the PDF-B. The recommendation was to work with the CDF, to take advantage of the existence of the DSF and the existing administrative and operational structures, but to restructure them so that they comply with a series of criteria and conditions. The proposal was to sign a Tripartite Agreement between the GoE, UNDP and the DSF to establish the responsibilities for administering the fund. At that point, the FAN[25] was dismissed as a candidate to administer the trust fund.

The initial actions to establish and capitalize the trust fund, which the CDF was in charge of, were not successful. The fundraising efforts did not have the hoped-for results, and the restructuring of the DSF (which was merged with Charles Darwin Foundation Inc. to create the Galapagos Conservancy) did not turn out as expected, and the organization declined to be the base for the trust fund.

In 2003, an evaluation was conducted (Spergel & Oleas, 2003) to identify options to move forward in establishing the fund, and the following options emerged:

1. Establish a sub-account within the CDF Inc.
2. Establish a sub-account within the FAN
3. Establish a sub-account in a new NGO / “Umbrella Fund”
4. Establish a sub-account in a “reformed” CDF

Of these options, numbers 1 and 4 were not viable, since the organization that emerged from the reform (the GC) did not meet the requirements of the GEF for the trust fund. In the MTE, it was found that the stakeholders in Galapagos were opposed to managing the trust fund via the FAN.

The responsibility for creating the trust fund passed from the CDF to UNDP-CO and later to the PAU.

In November 2003, the then Secretary General of the United Nations, Kofi Annan, visited Ecuador and pledged his support for the fund-raising process. This led to the visit of Maurice Strong in May 2004, who proposed a worldwide fundraising campaign

[25] The National Environment Fund (Fondo Ambiental Nacional or FAN) is a private institution established in 1996, through an agreement between the civil society and the GoE to support the funding of environmental management in Ecuador. The FAN administers various funds, including the Protected Areas Fund. See: www.fan.org.ec.

to fund the sustainable development of Galapagos (which was called the Strong Initiative). The initial concept was to take advantage of Mr. Strong's contribution to support the fundraising efforts for the trust fund, but the Strong Initiative was subject to a broader context, in response to the conflicts among the actors in the archipelago. However, since the timeframe of the Strong Initiative could be extended, in October 2004, a decision was made to create a Design Committee (which was not called for in the PRODOC) to develop the agreements, manual and other documents required to establish the fund.

The work of the Design Committee was very productive. It was a very participatory body that put a lot of effort into identifying ways to establish the fund and make it work.

It was eventually decided that the FAN was the best choice for administering the trust fund. On June 8, 2007, the Fund for the Control of Invasive Species of Galapagos (FEIG) was created, through a tripartite agreement between the MAE, UNDP and FAN. The FEIG[26] is a fund in perpetuity, the proceeds of which are dedicated to funding projects and activities for the total control of invasive species in the Galapagos. The recipients of the funding are the organizations responsible for the total control of IS according to the legal framework of the Galapagos islands (i.e., GNP, AGROCALIDAD, CDF, municipal governments). The FEIG has by-laws, manuals of operations and project selection criteria, and a monitoring and evaluation system (prepared by the Design Committee). The Fund has a structure made up of:

1. A Board of Directors made up of representatives from the Ministry of the Environment, the civil society of Galapagos, a scientist/ expert in biodiversity conservation and two donor representatives[27].
2. An Invasive Species Committee comprised of seven members, to advise, study and recommend the projects to be funded: GNP, CGG, AGROCALIDAD, CDF, the Consortium of Municipalities of Galapagos and two invasive species experts.
3. An Operating Unit (FEIG-OU), which includes a coordinator, a project evaluator and an administrative/financial official. The unit's offices are in Puerto Ayora (Santa Cruz Island), and it has a basic operating infrastructure.

The FEIG website includes the following institutional information:

> Mission of the FEIG
>
> Galapagos conserves its native and endemic biodiversity, preserves the natural evolutionary processes, safeguards the well-being of its inhabitants and maintains its economic and social systems within the framework of long-term sustainable development.
>
> Vision of the FEIG
>
> The institutions and the civil society of Galapagos practice in a coordinated and systematic way the total control of introduced species to protect the native and endemic flora and fauna, the ecosystems and the natural evolutionary processes of the Galapagos islands, the health of its inhabitants and economic activities, from any biological, health and phytosanitary risks.
>
> General Objective of the FEIG

[26] More information can be found at www.feigalapagos.org.
[27] As of the time of the FE, neither the representative from Galapagos nor the scientist had been appointed. UNESCO participates in representation of UNF and Conservation International represents the other donors.

Define holistically and systematically the general guidelines, the strategies and the short and long-term actions for the implementation of the total control of introduced species in the Galapagos Islands.

In 2007, an evaluation was conducted of the design of the trust fund (Shores, 2007), which found that all of the important elements were in place to establish the fund. Nevertheless, it was believed that raising the US$ 10 million required to trigger the GEF seed money would be a very difficult task. At that time, less than US$1 million had been raised. It was then that the GoE, through the MAE, pledged a contribution of US$ 4 million, which became a critical catalyst. Conservation International donated US$1 million, which then released the US$1 million from UNF. The GNP then contributed another US$1 million, and finally, the KfW development bank of Germany pledged to donate the remaining money needed to reach the US$ 10 million goal. With these donations, the GEF fund was triggered and the trust fund was fully capitalized in 2008.

At the end of the post-MTE Execution Phase, there was a surplus of about US$600,000 in GEF funds. The idea was raised to ask the donor for permission to contribute those funds to the FEIG, but it was decided to invest it in following the recommendations of the PFE.

Beginning in 2009, work was done to make the FEIG operational. Also, the KfW resources underwent a long process of approval, and were finally contributed to the FEIG in 2011. On June 1, 2011, the Minister of the Environment released the first call for proposals to be financed by the FEIG (Annex 6), and with this, Outcome 4 was completed.

Before the call for proposals, the FEIG-OU invested a lot of effort in (i) making the TCP operational (so it could be implemented), (ii) encouraging the beneficiaries to get involved in the implementation of the TCP and to form alliances to complement the initiatives, and to present proposals to the FEIG, (iii) prioritizing areas and IS on which to focus the initial work, and (iv) training the different organizations on how to present proposals. In the call for proposals (Annex 6), it states that the Operations Unit will help those interesting in preparing their proposals.

Conclusions and recommendations

The creation of the FEIG was a notable achievement of all those involved in the Project, who managed to take a very negative situation with a high risk of failure, and turn it into a success, in which the fundraising target established in the PRODOC was reached. This experience has served UNDP in providing support to the GoE to establish the trust fund for the Yasuni-ITT Initiative[28].

The creation of the Design Committee was a good decision. Its work facilitated the conceptualization and design of the instruments that were later solidified in the FEIG.

The decision of the GoE to contribute state resources to the FEIG was crucial for catalyzing the raising of the US$10 million required to trigger the GEF contribution.

The Project did not manage to raise private sector resources for the FEIG. With the exception of the donation from Conservation International, the remaining funds all came from public sources.

The decision to put the FAN in charge of administering the FEIG was proper. The FAN is a national, experienced and professional organization which administers other conservation funds. FAN's administration guarantees the sustainability of the FEIG.

[28] http://yasuni-itt.gob.ec

The FEIG has great potential, but its impacts cannot yet be seen. We recommend monitoring its performance, and documenting its achievements.

The proceeds from the FEIG will not be sufficient to fund effective IS management initiatives, which are costly and long-term projects. At a yield of approximately 5%, the fund would produce some US$750,000 per year. It has been agreed that 20% of this will be used for administration (13% for FEIG-OU, and 7% for FAN), which leaves about US$600,000 available for projects each year. However one must compensate for inflation so that the capital does not devalue (an issue that was already flagged in the 2007 evaluation of the design). In the call for proposals that was published, it was stated that the budgets for FEIG co-financing (the amount requested) should be in the range of US$60,000 to US$130,000. Eradication and control initiatives may require sustained, long-term investments that require levels of funding far greater than what the FEIG can generate. On the other hand, FEIG proceeds could be better used in prevention initiatives. This must be analysed to prevent the effectiveness and usefulness of the FEIG from weakening over the medium term. It is urgent to determine the true funding needs that must be supported by the FEIG, and to prepare a strategy to address these needs in particular.

We are concerned that the FEIG-OU, in light of the lack of local interest in the TCP, has assumed the role of the champion of the Total Control Plan and the entity responsible for coordinating its implementation. This blurs the purpose of the FEIG (expressed in the MAE-UNDP-FAN Agreement), which is simply a financial mechanism to support the total control of invasive species. Similarly, we were informed that the FEIG is the embryo of the global fund for the sustainable development of Galapagos (the Strong Initiative). This is laudable but deflects the efforts from the true purpose of the FEIG. Therefore, we recommend taking the measures necessary, as soon as possible, to clarify and specify the scope of the FEIG.

We are also concerned that the decision-making process for approving projects could become corrupted. On the one hand, the FEIG-OU helps applicants to prepare their proposals and then prepares an evaluation report on the proposals submitted for consideration of the Invasive Species Committee. On the other, the applicants / potential beneficiaries of the fund are members of that same Committee. When we asked the FEIG-OU about the possible conflict of interest, they said that it had been agreed that when the Committee is considering a proposal from an organization that is on the committee, that organization's representative will temporarily leave the meeting. This is a simplistic solution and does not help to avoid conflicts of interest. Therefore, we recommend establishing an independent mechanism to review and evaluate proposals submitted to the FEIG.

Outcome 5. Galapagos Community is sensitized and is participating actively on the total control of invasive species

Rating	Moderately Satisfactory

The initial Outcome was very broad. After the MTE, the scope of Outcome 5 was cut back to focus on awareness-raising and the participation of local communities. Below is the text and indicators of the Outcome, in the original version of the LogFrame (PRODOC) and in the revised version (2005).

Original Outcome 5	Indicators
A community awareness and participation programme for bio-	A public forum established by end of year 1 with participation and management procedures defined and

invasion control is developed.	disseminated. Participation in the forum continues to grow and meetings resolve the conflicts arising from control, eradication and quarantine measures. The number, and geographic and sectoral scope, of private reports on the presence of I.S grows progressively throughout the project. At project closure, 85% of the Galapagos community is aware of the problem of I.S and control procedures and responsibilities. 80% of the air and marine cargo transport companies conform with procedures established in the SICGAL. At least 50% of tourist ship passenger cabins are 'ecologically certified' by project completion.
Revised Outcome 5	Indicators
Galapagos Community is sensitized and is participating actively on the total control of invasive species	By the end of the project i) 79% of the community consider very important prevention, control and eradication of IS; ii) 50% of the community is familiarised with the list of products and iii) 76% of the community is willing to participate in actions of control and eradication of IS

The budget for Outcome 5 was US$ 1.55 million, of which US$800,000 was financed by GEF and the rest was co-financing by WWF, UNF and IDB (Table 1). There is no detailed information on the total amount of GEF funds and counterpart resources invested by Outcome, and therefore we cannot confirm the final amount disbursed. During the Closure Phase, all accessible information was compiled, and the documents recorded are listed in Annex 8.

This Outcome was advanced as a joint effort between GNP and CDF, although it was subcontracted to CDF. It is reported that the two teams had an excellent working relationship. Two impacts resulted from these positive working dynamics: (i) capacities were built which stayed in the GNP, and (ii) later the GNP created a communication unit under the CEPA approach (Communication, Education and Public Awareness), which the CDF had previously been using.

Initially, the teams worked on adjusting the plan of activities, since the scope indicated in the PRODOC was very broad. Work was done along four lines:

Public Information

A large volume of informational materials on IS were produced and disseminated, and were used in various campaigns for different audiences.

Community participation

In the PRODOC, one of the outputs was to "Establish a discussion forum to help limit potential conflicts between interest groups and to promote and support the effective participation of groups involved in introduced species control." The team took advantage of the conditions of the moment and supported the creation and operation of the CIMEIs. While the CIMEI is not a public forum, it was an excellent initiative which facilitated relations and cooperation among local institutions and the development of specific regulations at the local level.

The CIMEIs developed at different paces, to a large extent depending on the interest of each municipality, and are based on municipal ordinances[29]. Regulating pets and domestic animals implies a strong political component, since voters do not necessarily support any restrictions. At the beginning there was a lot of resistance from communities, primarily because of requirements and limitations on pet owners (e.g., sterilization for population control, control of strays). This resistance gradually declined and eventually urban communities, for the most part, assimilated the management scheme. The CIMEIs also worked hard on raising public awareness and promoting public education. The CIMEIs also worked hard on raising public awareness and on public education. The GNP website contains information on the CIMEIs[30]; there are other sites[31] that also have information (though not updated).

The CIMEI which had the most difficulties in functioning and in sustaining itself was that on Isabela, where the municipality did not fully support the initiative. Eventually this CIMEI closed down. During the Project Closure Phase, the Project financed a coordinator and materials to try to reactivate the CIMEI, but once the financing ran out, the situation returned to what it had been.

O the other three CIMEIs, the Project contributed by paying the coordinator's salary, materials, medicines, and field work expenses. The GNP also contributed its staff time, transportation and inputs costs. Other entities also contributed. For example, the Araucaria Project of AECID contributed personnel and supplies to the CIMEI of San Cristobal. The veterinarian was usually a volunteer. In San Cristobal, there was an agreement signed with the Central University for this purpose. Now, the CIMEIs of Santa Cruz and San Cristobal l have a volunteer doctor/veterinarian provided by Darwin Animal Doctors[32].

The CIMEIs contributed significant inputs to controlling pet populations, eradicating pigeons and controlling rodents. However, the prospects for sustaining CIMEIs are not good. During the FE, we learned that the Mayor of Santa Cruz had said that they were having difficulty in covering the current expenses of the CIMEI (i.e. staff, utilities) and that he had thought that the FEIG would cover these costs (which is not included in the design of the fund). Financial problems, once Project funding ceased, has forced CIMEI staff to seek means of self-financing. For example, some are offering veterinary services and animal care (e.g., dog grooming). This has distorted the purpose of the CIMEIs, potentially moving their focus away from IS and biodiversity conservation. During the FE, we observed that the DAD approach is focused on animal protection and not on controlling invasive species.

Community invasive species monitoring

We understand that three pilot monitoring exercises were carried out to detect new IS or to measure increases in established populations. Not enough information or evidence was found to evaluate this initiative.

Formal education

The CISGP prepared a training programme for teachers and training materials for inclusion in the formal syllabus. During the FE, we were told that these materials are not being used. Apparently there was strong resistance from the Ministry of Education, which argued that it was responsible for the curriculum. In the interviews conducted

[29] The San Cristobal ordinance was updated in 2006.
[30] http://www.galapagospark.org/programas/desarrollo_sustentable_cimei.html
[31] http://www.hear.org/galapagos/invasoras/temas/concienciacion/comites.htm
http://www.angelfire.com/moon/cimei/index.html
[32] www.darwinanimaldoctors.org

during the FE, it was clear that it was a mistake not to incorporate the Ministry of Education as a Project stakeholder.

Finally, we should note that there is information on public opinion regarding IS. At the beginning of the project, a baseline of perceptions was prepared (Velasco, 2002) which contains information on the modified Outcome indicators. During the Closure Phase, a survey was carried out in 2010 (Diaz, 2010). Unfortunately this later survey did not address the same questions as the initial one, and only generated comparable information for the second indicator.

At the end of the project changes were reported in relation to the following indicators:

i) 79% of the community feels that the prevention, control and eradication of IS is very important.

2002 = 48,8% 2010 = Not available

ii) 40% of the community are completely familiar with the list of products.

2002 = 9,7% 2010 = 20%.

iii) 76% of the community is very willing to participate in efforts to control and eradicate IS.

2002 = 46,3% 2010 = Not available.

In the Galapagos 2006-2007 Report, there is also information about the acceptance of the inspection of luggage and cargo (Barber & Ospina, 2007). In response to the question "I would let my bags be checked for the quarantine", the percentage of acceptance fluctuated between 69.9% in 1997 and 74.3% in 2001.

Conclusions and recommendations

The Project helped to position the issue of invasive species among the local population and to put it on the national political agenda. However, it did not manage to change the attitude of the local population. However, we must observe that the effort required achieving significant changes in attitudes and behaviour in the communities involved here and in the social and political contexts which prevailed was beyond the capacities and time available to the entities undertaking the Project. While the percentage of people who are completely familiar with the list of products increased from 9.7% in 2002 to 20% in 2010, this is still a low percentage. During the FE the SICGAL inspectors on the continent informed us that the residents of Galapagos repeatedly violate the restrictions on carrying products and live animals to the islands, and are always looking for new ways to evade the controls. Similarly, during the FE AGROCALIDAD staff detected on a cargo ship at Puerto Ayora an illegal shipment of meat, with falsified papers, so that there was no real person or party to penalize. The existing rules and regulations do not allow for sanctioning the vessel. An additional element to consider is the message communicated by the numerous intentional re-introductions of goats.

Consequently, it is essential for the GoE to invest in a long-term Programme aimed at changing the attitudes and behaviours of the population of the archipelago with regard to IS.

The CISGP did not manage to create a positive image among the local community. While acknowledging that there are some actors who know about the CISGP, the main image they have is "the goat-killing project" or "the goat project". This overshadows many notable achievements of the Project. At the closing of the CISGP, an effort should be made to highlight the valuable achievements of the project that were not related to the killing of goats.

The CIMEIs have been a valuable and positive experience, with a number of lessons and great potential for replication in other places. However, they were not taken over and internalized by the municipalities. The prospects for their being sustained in their current form are not bright. We suggest there would be merit in identifying the strengths and weaknesses of CIMEIs in their current form and, in consultation with all stakeholders, establish if better mechanisms might be used to achieve agreed objectives. We observed that popularly elected officials sometimes found it convenient to not support the work of CIMEIs for their own political reasons. Engaging with local politicians to determine the conditions upon which their active support and engagement might be secured would be useful. ,

Despite the efforts of CIMEI staff and supporters relatively minor impacts on community perceptions or local political agendas were achieved.

Outcome 6. INGALA facilitates and coordinates the effective implementation of the policies and strategies of the Total Control Plan

Rating	Moderately Satisfactory

Outcome 6 as proposed in the PRODOC was aimed at developing local and regional sector-specific policies (with an emphasis on the agricultural and tourism sectors) that incorporated IS. This Outcome statement was broad and very ambitious. Subsequently, the Outcome was refined to focus on the TCP. Below is the text of the Outcome and its indicators, in the original version of the LogFrame (PRODOC) and in the revised version (2005).

Original Outcome 6	Indicators
A bio-invasion overlay developed for regional planning with a set of guidelines and instruments that ensure that sector developments are consistent with invasive species control needs	By year 2, an agricultural management policy developed that enhances the control of I.S introduction and dispersal; resources have been earmarked for its implementation Policy development guidelines for key sectors completed by the end of year 2. By year 4, regional and local sector policies have incorporated guidelines designed to prevent the establishment and propagation of IS By year 2, a tourism sector code of ethics exists which incorporates total control elements. In areas newly opened for tourism activities, no new introductions are detected. Successful co-ordination of different investment initiatives in Galapagos by end of year 1 An environmental assessment system is established within the main public institutions in the province by year 3 The process of environmental planning is institutionalised in INGALA by year 5

Revised Outcome 6.	Indicators
INGALA facilitates and co-ordinates effective implementation of policies and strategies of the Total Control Plan.	By 2006 the Technical and planning committee is familiarised and approves the TCP
	By the end of the project, the TCP is approved, published in the Official Registrar and actions are implemented by co executing institutions
	District development plans of the 3 municipalities include actions of IS control

The budget for this Outcome was US$5.71 million, of which the GEF contributed US$820,000 (Table 1). During the Closure Phase, all accessible information was compiled; the documents recorded are listed in Annex 8.

During the Initial Execution Phase, this Outcome was well behind schedule. INGALA did not have sufficient capacity to address the entire magnitude of the elements that needed to be developed and that could help to support the realization of the Galapagos Regional Plan. After the revision of the LogFrame in 2005, Outcomes 2 and 6 were left nearly identical.

During the Initial Execution Phase, the CDF was in charge of the TCP, and the Foundation's team prepared a technical plan. Later, the responsibility passed to INGALA, a consultant was hired to support the process of structuring and getting feedback on the document. During 2006, a participatory process was carried out to review the proposed TCP with various entities, including the Subcommittee on Agricultural Health, the MSG and the TAG. Efforts were also made to link agricultural policy with the TCP (Barriga, 2007). Eventually, the TCP was approved by the INGALA Council, on August 23, 2007[33] and later published and disseminated; a version for the public was prepared and was also published and disseminated (FEIG, 2007a).

Later on, when the FEIG-OU was established, it was found that (i) local entities had not adopted the TCP and it was not used as a reference for various sectoral actions, (ii) that the policy instruments that were previously created were also not used, and (iii) that the TCP was not executable in the form in which it was published. This point was highlighted by the PFE, which recommended that an Action Plan be prepared to make the TCP operational. During the Closure Phase, a consultant was hired (Fonseca & Ramos, 2011) to identify planning and legal/regulatory instruments applicable to the management of IS[34], and to update the TCP so that it was implementable[35].

Conclusions and recommendations

The CISGP managed to generate the TCP, get it approved and disseminate it. The TCP is a valuable instrument, with the potential to serve as a guide in other areas.

The Project generated a series of public policy documents that included IS considerations.

[33] Resolution 11-CI-21-VIII-2007 published in Official Registry 168 of September 12, 2007.
[34] New policies and instruments have been issued since the adoption of the country's new Political Constitution of 2008.
[35] For example, a logical framework matrix and referential budget for activities were included.

The Project did not succeed in positioning the TCP as a public policy instrument for the archipelago. The CGG, as the body responsible for planning in the province[36], must push for institutionalizing the TCP in the islands.

Project Closure

The PFE concluded that various key outcomes had not been completely developed or finalised[37] and that the Project still had some tasks pending to properly close the CISGP. It also concluded that the CISGP "has strengthened the knowledge base and capacities of Galapagos institutions for invasive species management. However, it has not yet achieved its purpose of establishing an 'integrated and permanent system' for invasive species control. In their current unconsolidated state, none of the six Outcomes can be considered to have been satisfactorily or soundly achieved, with good prospects for sustainability beyond the Project."

Consequently, the evaluators recommended that a final closure phase of six months be carried out, to take advantage of the remaining GEF funds, which would focus on:

1. Completing the Project, particularly compiling a comprehensive registry of the activities and achievements of the CISGP; and
2. The four main institutions in Galapagos (INGLALA, GNPD, SICGAL and CDF) should review and consolidate the progress made in establishing the Total Control System for Invasive Species. The recommendation was to form a working group to prepare a Strategic Action Plan for the Control of IS in Galapagos over the medium term (2010-2020).

We agree with the PFE that it is necessary to prepare a Strategic Action Plan (we suggest a five-year horizon) to operationalise the TCP and the integrated and sustainable invasive species management system.

The Closure Phase experienced some administrative delays. One factor that contributed to this delay was the shift to the HACT process.

The following deliverables were contracted for:

1. A catalogue of the Outcomes of the CISGP (Sandoval, 2011).
2. A communication strategy (Diaz, 2010) which included:
    a. Research into the prohibited products that are most commonly introduced by temporary and permanent residents.
    b. A short-term communication strategy to inform the community about the problem generated by introduced species, pests or diseases linked to the

[36] Article 258 of the 2008 Constitution states that the Province of Galapagos will be governed under a special regime, and that it will be administered by a Council of Government, which will be in charge of planning, managing resources and organizing the activities that take place in the province.

[37] The PFE states: The evaluation found that the CISG Project has yet to be completed and formally closed. Project field activities apparently ceased at the end of 2007, the original planned completion date; work on the invasive species trust fund was extended through to the end of 2008; and at that point the project ended abruptly. It is apparent that there had been no opportunity to organise an exit and closure strategy or to complete collation of project financial and technical records. To date, $0.6 million of GEF funds remain unspent. Of equal or great significance, many of the Project's key results and outcomes have not been fully developed or completed.

entry of prohibited products from continental Ecuador to the Galapagos Islands, and between the islands.

c. A report on the community's awareness and perception about the issue of introduced species and their effects on the Galapagos.

d. Communication materials (radio, TV, print).

3. An assessment of the status of SICGAL (Arriagada, 2011).
4. Monitoring of land invertebrates on cargo ships (Herrera, 2011).
5. A homologation with existing policies, including an update of the TCP (Fonseca & Ramos, 2011).
6. The systematization of the lessons learned from the CISGP (in progress).
7. Equipment[38], supplies and medicines were purchased for the CIMEIs and staff was hired for the Isabela CIMEI.

Conclusions and Recommendations

We reviewed the fulfilment of the recommendations of the PFE and the contribution of the Outcomes to the achievement of the project purpose and the sustainability of the achievements of the CISGP (Annex 7). We made the following conclusions:

Some important outputs were produced, but what was lacking was a strategic approach to spending the resources available to consolidate the achievements and make progress in establishing a sustainable IS management system.

The catalogue of information (Sandoval, 2011) is very valuable since, as mentioned in an earlier section, the information generated by the CISGP is dispersed and difficult to access. This catalogue, however, is incomplete, as it includes only that information that was possible to locate. There is a large amount of technical information that continues to reside in personal and institutional computers and files. During the FE, we were told that the GNP would have all of the information produced by the CISGP on paper in bound books in a storage room / archive in Puerto Ayora. When we visited the site, these documents were not able to be located.

The assessment of the state of SICGAL is also an important document, and SICGAL itself has acknowledged that it has been very useful.

While other outputs are important, they did not contribute significantly to consolidating an invasive species management system. It should be noted that the updated TCP document does not constitute an Action Plan for consolidating the IS management system.

The investment in the CIMEIs was largely unproductive. Despite the fact that the Project purchased equipment and material for pet sterilization campaigns and poison for rat and ant control efforts, much of the equipment and materials, which were requested by the CIMEIs, are being used to provide veterinary services to people's pets, which is not the intended purpose of these entities. In addition, once the funding for the staff ran out, the CIMEI in Isabela shut down again[39].

As a result of our investigations we concluded that the investment of time and resources in the Closure Phase did not contribute significantly to providing

[38] A biochemical tester was purchased at the request of the San Cristobal CIMEI. The MAE felt that this equipment required specialized handling and can be useful for multiple activities; thus it was put in the custody of the GNP.

[39] At the close of this evaluation, we were informed that the GNP is trying to keep the Isabela CIMEI active.

sustainability to the achievements of the CISGP or to consolidating the IS management system.

During the short time remaining in the Closure Phase, the following tasks should be a priority:

1. Locate all of the information that the Project produced, systematize it and make it available in digital form via various websites (i.e. GNP, FEIG, CDF), for the benefit of executing and implementing agencies, stakeholders and interested people in the Galapagos, Ecuador and around the world.
2. Prepare a report of the Project by systematically documenting the main lessons learned and experiences of the CISGP and publishing them digitally (in Spanish and English, professionally edited) on various websites. We suggest that the publication should be user-friendly (not a technical document) and include graphics, stories and opinions of local stakeholders from various points of view (e.g., people who worked on the Project, people who opposed the Project, people who saw the Project from the outside). The document should highlight the Project's achievements across the range of projects. This report should help the reader to understand that the Project was about more than "killing goats".

Fulfilment of the Project's Purpose

Based on a review of the existence of the elements and components expected in an integrated and sustainable IS management system (Figure 4), we concludee the following:

Is there a permanent, integrated system for the management of invasive species in the Galapagos Islands?

No. While there are some elements of such a system, they are not sufficiently developed or integrated to constitute a functioning system

Some policies and procedures were developed, but they are not fully internalized in the organizations that are part of the system. In addition, the legal and regulatory foundation is lax and insufficient. There is no capacity to effectively penalize offenders. When prohibited products are found at the inspection points, they are removed and held in custody until the owner claims them. During the FE, AGROCALIDAD found an illegal shipment of frozen meat on a ship in Puerto Ayora, but since the shipment had false papers, it was impossible to determine who the offender was, and there was no way to sanction the boat which accepted the illegal cargo and took it to the Galapagos. However, some notable products were produced by the Project like the SICGAL procedures manuals, General Protocols for Rapid Response System for Health and Phytosanitary Emergencies for Galapagos, aircraft and boat disinfection protocols, and GNP's protocols for field trips and camping. Further effort is required, however, so that comprehensive and appropriate policies and procedures are in place and may be consistently applied.

Institutional capacity within AGROCALIDAD to implement an effective biosecurity system is completely inadequate. Institutional support, a critical requirement for such a system, also appears lacking. There are not enough inspectors and they lack the support and resources to do an effective job. The air cargo inspection facilities in Quito are inadequate (e.g., there are not enough parking spaces to be able to do thorough inspections). The working conditions at the docks in Guayaquil are deplorable. The inspectors are vulnerable to being harassed or ignored, and do not enjoy even the most minimal standards of a decent working environment. There are not enough inspectors to effectively inspect all cargo taken onto the boats. There are also no facilities for quarantining the cargo that is sent to Galapagos. There is an initiative

underway, led by the CGG, to improve the maritime cargo management conditions in Guayaquil which could help to significantly improve the situation. The importance and urgency in rectifying the current situation cannot be over-stated.

The capacity of participating agencies to undertake research and monitoring is variable and requires strengthening in most. The collation, analysis and dissemination of information in the Project generally was inadequate, and remains the case. Important information is not accessible to those who need it to inform decisions or to guide management. As time goes on there is a serious risk that information will be increasingly "lost", jeopardising many Outcomes from the Project. We recommend that a high priority be given to compiling all available information and making it available as an authoritative and sustainable resource.

Support for the development of an IS management system is also variable. The national office of AGROCALIDAD has given little political and administrative support to SICGAL. The GNP, on the other hand, systematically has invested human and financial resources and supported invasive species management initiatives. The local population, for the most part, does not support an IS management system. Many residents of Galapagos repeatedly try to sneak banned cargo onto the islands; they have not internalized the benefits of preventing the entry of IS into the province. However there are specific stakeholders that have an interest in biosecurity. For example, farmers have serious problems with pests (e.g., slugs, ants) and invasive plant species (e.g., blackberries), and therefore are open to backing prevention, control and eradication initiatives. The FEIG has prioritized working with farmers, and this represents an opportunity to move forward in gaining support with local stakeholders.

There is a funding mechanism for current costs (i.e., 5% of the revenues from visitor entry fees), and now the FEIG resources for new initiatives (non-current spending). However, the financing appears to be insufficient to sustain an IS management system and its components (Figure 4).

Is the system effective?

No. For example, the barriers to the entry of IS into the islands, and between islands, are very permeable. As mentioned previously, there are many obstacles that limit the effectiveness of current measures. The result is that invasive species continue to enter the archipelago. The recent entry of the Giant African snail is cause of much concern. On the Ecuadorian continent it has become an aggressive pest that is destroying agricultural crops and its impact on Galapagos could be even more devastating.

Is the system durable and adaptable?

Not likely, given the current state of the components and their elements. We were informed of a very advanced initiative to create a Biosafety and Quarantine Regulation and Control Agency for Galapagos (ABG), under the Ministry of the Environment. This Agency would take charge of SICGAL and the CIMEIs. This could be a significant step forward, although it will require appropriate institutional, financial and political support to develop properly.

Has what has been learned been applied later on or in other places?

Yes. The Project generated many lessons learned and experiences which have already been applied in other sites. For example the GNP has undertaken an aerial rodent eradication and is planning further ones in-line with an archipelago-wide introduced rodent eradication strategy. The experience of the GNP was also used in 2008 to eradicate goats and rats on Isla de La Plata (part of the Machalilla National Park) on the Ecuadorian continent. Helicopters, trained hunters, dogs trained in goat hunting and Judas goats were used. The Galapagos experience was also used to control populations of birds who settled on the El Palmar islet (across from Guayaquil

airport) and which constituted a threat to air navigation. GNP staff has also contributed technical advice to proposed eradications elsewhere, including in Mexico and Chile.

Commentary

The Project did not fulfil its purpose. However, that purpose was very ambitious and depended on a series of elements that were beyond of the Project's control. The "purpose"[40] proposed in the PRODOC in reality should have been the "development objective". The Project contributed significantly to moving Galapagos toward establishing an IS management system, but consolidating that system depends on further and strong support (political, financial and institutional) from the GoE.

Sustainability

The different Outcomes of the Project have varied prospects for post-project sustainability.

SICGAL has limitations in effectively preventing the entry of invasive species into the islands. It is sustainable in that it has staff and financial resources[41], but these are insufficient and therefore in its current condition it is not an effective mechanism for preventing IS from entering Galapagos. SICGAL must be urgently strengthened. The initiative of establishing the ABG seems to be positive and could be a way to provide sustainability to SICGAL and the CIMEIs. Similarly, there it is urgent to take advantage of process of updating the LOREG to fortify the legal and regulatory foundation for IS management in the archipelago.

No mechanisms have been developed which promote the application of an adaptive management approach. There are initiatives with adaptive management elements, but no rigorous application of the concept. As mentioned previously, there is no research strategy with priority research themes identified, nor a mechanism to ensure funding for research and technology transfer. The FEIG could provide "seed funding" to stimulate further research initiatives.

There are prospects that outcomes from some eradication operations – and, perhaps, some control programmes, may be sustained. The GNP has internalized efforts in relation to some projects (e.g., ungulates, rodents, ants), and continues to allocate financial resources for this purpose. An important limiting factor is the shortage of suitably experienced staff. GNP faces an important challenge in retaining the small cadre of experienced staff, and training and supporting further staff. Unless further support is found for CDF so that it may consistently provide technical and scientific support services to other participants, we anticipate further declines in effort, and further consequent losses of gains previously made.

We suggest that there are good prospects for sustainability of the FEIG. The administrator of the trust fund is an experienced and professional organization with the capacity to manage the investments appropriately and to execute the fund effectively. The governance and administration mechanisms for the fund have been developed and are already being implemented. Nevertheless, the proceeds from the FEIG might be insufficient to sustain long-term eradication and control programmes.

There are good sustainability prospects for the communication efforts. The GNP and CDF have installed capacity and experienced personnel. The GNP has Environmental Communication and Education Programmes which include the issue of IS and work with a CEPA approach. In contrast, the current state of the SICGAL does not ensure

[40] The "purpose" of a project must be achieved as the result of the intervention carried out. The "development objective" is a larger goal that a project can contribute to but that is not necessarily achieved immediately after the project ends.
[41] It should be clarified that the GISF is not the financial mechanism of SICGAL.

the sustainability of its community outreach and education work. It must be remembered that, despite more than a decade of communication and education efforts with respect to IS, local stakeholders are still not fully behind IS management efforts. One factor that has surely contributed to this is the large flow of temporary residents and immigration from the continent. Galapagos agencies must carry out, and maintain over the long-term, programmatic, systematic and sustained communication, education and public awareness activities regarding IS. This work can only be maintained with public sector funding.

The CIMEIs in their current condition are not sustainable. They have had serious problems for operating without outside support from the Project and other initiatives (e.g., AECID's Araucaria Project, GNP). Nonetheless, they are a valuable initiative that deserves to be strengthened and empowered. The initiative to establish the ABG appears to be positive and could be a way to make SICGAL and the CIMEIs more sustainable.

Finally, while environmental pressures continue to increase there is still no effective or sustainable invasive species management system in place. Tourism, mobility between islands and the demand for further imports to the archipelago all continue to grow rapidly. The risks of further invasions of species with economic, social and ecological, continue to rise. These risks must be more-effectively addressed if significant further impacts are to be avoided. During the Project the GoE was supportive of managing IS. The declaration of the environmental conservation and management of Galapagos as a national priority[42], the direct contribution to capitalize the FEIG and the initiative to create the ABG are examples of this support. The continued support by GoE will be critical if the benefits from the Project are to be sustained, and further measures put in place to protect the natural assets of the Galapagos. It is essential that the GoE continues to provide strong and consistent political, institutional and financial backing to consolidate the IS management system. Building up and strengthening this system is essential for guaranteeing the conservation of the native biodiversity of Galapagos and for reinforcing the progress made in managing invasive species over the past 20 years.

Overall impacts

We have identified that the main impacts of the Project were:

1. The institution of a process of inspection of baggage and cargo sent to the islands, and the disinfection of ships and aircraft, which is the first barrier to preventing the entry of invasive species into Galapagos. While not yet effective, this constitutes important progress.
2. A number of bold eradication pilot projects were successfully completed – some of which were unprecedented in their scope and scale. As a result Ecuador is now seen as a world leader in invasive species management and island restoration. All involved can take considerable credit for these achievements.
3. While many outcomes will need to be interpreted over longer timeframes, important ecological outcomes have already been reported following several eradication operations. Native vegetation is recovering following the removal of goats from northern Isabela Island, and land iguanas are increasing following the removal of cats from Baltra[43]. Ecological responses are mainly positive. However, some negative consequences, such as the expansion of weeds following the removal of

[42] Executive Decree 270 published in Official Registry 68 of April 20, 2007. One of the points in the Decree deals with determining the effectiveness of the total control of introduced species.
[43] Where the eradication of cats significantly helped the process of repatriation begun in 1991 (Cayot & Menoscal 1992; Phillips et al 2005).

herbivorous ungulates, have been reported. Such responses can be anticipated. Actions should be put in place to manage these adverse consequences.

4. Project staff (especially in GNP and CDF) developed new skills and knowledge as a result of their involvement in the Project. This pool of skilled, experienced and motivated practitioners and managers constitutes one of the most important impacts of the Project. These people will underpin further actions.
5. The capacities, experience and attitudes generated amongst project staff during the Project have led to important outcomes being sustained in the archipelago, and further projects being initiated. GNP staff have contributed their skills and perspectives elsewhere in Ecuador, and internationally.
6. Awareness amongst local communities of invasive species was raised, including the management of domestic animals in urban areas. Challenges in raising further awareness within Galapagos communities and generating further support for invasive species management activities will need to be more comprehensively and collaboratively addressed if conservation outcomes are to be sustained.
7. The GNP team has become interested in developing ecological restoration initiative, and some of these types of activities are already in progress, like the introduction of 39 hybrid turtles on Pinta Island[44] (in a joint effort with the CDF and with GC support).
8. As a result of the work of the CIMEI, control of IS has been instituted in urban areas, along with good pet management practices, like vaccination and sterilization.
9. The establishment of the FEIG represents an important mechanism to sustain some project outcomes and to stimulate further activities involving further collaborators.

[44] See: http://www.galapagos.org/2008/index.php?id=68

Chapter 3. Conclusions, lessons learned and recommendations

General conclusions

1. The Project was a relevant, necessary and timely initiative, which led to locally and internationally significant impacts. The Government of Ecuador and GEF are to be commended for their support for what was a major national commitment and, at the time, the largest GEF biodiversity project worldwide. We suggest that the achievements made, the capacity developed and the systems created could provide a valuable basis for further support to be provided and further achievements to be made in this global Biodiversity Hotspot.
2. The Control of Invasive Species in the Galapagos Project constituted an important development in an international context. Projects and activities were designed and implemented using current best practices and leading technologies based on information and advice sourced from other countries. In addition to workshops to which experienced practitioners were invited to contribute, international advice was also provided through extensive technical networks. Visits by Project staff to New Zealand, and by overseas specialists to the Galapagos also contributed to the strong international links to the Project. A range of nationalities (e.g., UK, US, Australia, New Zealand) were represented in the Project.
3. The political and social context in which the Project was undertaken was very complex and dynamic. In addition to rapid population growth, the political situation was also changeable – with implications for participating agencies, their policies and priorities. Tourism was also increasing, with associated pressures. In combination these externalities provided a challenging environment in which to undertake a large, complex, multi-agency project.
4. The purpose of the Project 'to develop an integrated and permanent system for the Total Control of Invasive species that permits the long term conservation of the Galapagos archipelago' was not achieved. This was due to a variety of reasons. In addition to the political and social externalities mentioned above, other factors included variable institutional engagement and support, inadequate leadership and cooperation, and limited mechanisms to respond to new information. Unrealistic expectations of success were probably also a factor. Despite the overall purpose not being achieved important progress was made in relation to project results. Political and institutional support and capacity was developed which would not have occurred without the Project.
5. The Project had important and variable impacts on participating agencies. The GNP benefitted through its management roles. Significant infrastructure and capacity was developed and a number of initiatives and activities have been maintained, and important outcomes sustained. CDF employed additional staff and expanded its operations to provide a range of services under the Project. Relationships between CDF and staff from GNP and SICGAL, in particular, were extremely productive and underpinned many of the Project's achievements. CDF staff also played important roles in communications and raising awareness. SICGAL bolstered its inspection, monitoring and surveillance and emergency response capacities. Finally, INGALA used its jurisdiction and authority to develop various public policy instruments, and to carry out a process of consultation and approval for the Total Control Plan.

6. Project Isabela was a spectacular conservation success. It was achieved on-time and within-budget and led to a range of impacts, including capacity building within GNP and the creation of a cadre of local practitioners with the necessary skills and commitment to undertake a variety of conservation tasks. However, it was a project within another project (with its own administrative structure and external evaluation process), which caused serious tensions among the other implementers, and was disconnect from the other outcomes of the Project.

7. Project Isabela was a compelling demonstration that eradication is a powerful conservation tool which could be used more widely for ecological, social and economic benefits. An archipelago-wide goat eradication strategy is now being implemented. Some of the other Pilot Projects showed, however, that eradication may not always be the most appropriate objective. Sustained control may be more appropriate, or impact mitigation where the management of invasive species is not possible.

8. Furthermore, Project Isabela showed that large-scale eradications can be cost-effective. 140,000 goats were removed from Pinta, Santiago and northern Isabela Islands (totalling about 560,000 hectares) for about US$20 per hectare. Although the outcomes are still emerging we would observe that few ecological management activities have been as cost-effective, or have had such a range of impacts.

9. In addition to PISA 43 “Pilot” or “Demonstration” projects were initiated during the Project, of which 30 were aimed at eradicating or controlling 23 species of invasive plants. A further 13 projects targeted invasive vertebrates (eight species) or invertebrates (four species).

   A wide range of species were targeted for either eradication or control, including plants, vertebrates and invertebrates. No impact mitigation activities were recorded.

   Slightly more than half of the projects targeting vertebrates (5/8) were reported as successful. Successful vertebrate operations – in particular, of ungulates and rodents, have led to archipelago-wide strategies being developed and implemented. This was an important impact of the Project

   None of the invertebrate projects achieved their declared (eradication) objectives and only four of the 30 plant projects were successful. While most plant eradications and all invertebrate eradications were unsuccessful, a range of positive impacts in relation to capacity building and awareness raising were reported. Important lessons were learned about the need for the rigorous application of selection criteria for eradications, consistent application of management tools and committed institutional support through to project completion

10. While important progress was made in establishing a system for preventing futher invasions (i.e., a biosecurity system) during the Project – and this is likely to have reduced somehow invasion risks, the current scheme is largely ineffective. The absence of an effective biosecurity system constitutes a major risk to many of the achievements made during the Project – and to the Galapagos environment and economy more generally. Greater emphasis on establishing and supporting an effective and efficient invasive species management system is required. This was an important recommendation to emerge from this evaluation.

11. CDF support for applied research underpinning activities by GNP and SICGAL was an important factor in the progress made. Informal dialogue between scientists and practitioners allowed an “iterative applied research approach” to be taken. While this may have constituted passive adaptive management in a few cases, we found little evidence of a formal adaptive management approach (either passive or active) being applied. Even in Project Isabela, where good information was collected

during the project, data is only now being analysed which could have informed decisions about when to stop operations, to declare eradication success, and to determine the level of on-going surveillance effort.

12. A large amount of information was generated during the Project – especially from the Pilot Projects. Unfortunately, material was not collated and made available to us – this was an important constraint to our undertaking a comprehensive final evaluation of the Project. Collating existing material and making it accessible to local, national and international audiences will be important if lessons from the Project are to be learnt more widely, and if institutional, donor and stakeholder support is to be provided in the future. We understand that a lot of this information was collated and made available through the Bibliogalapagos website. Unfortunately it appears that this site is no longer accessible.
13. The executing agencies did not have a culture of collecting and reviewing information to inform decisions, and to refine objectives and indicators. In addition to ensuring information was collated and available, a more comprehensive and consistently applied monitoring and evaluation process would have allowed for regular dissemination of results and lessons learnt, and for peer review.
14. The creation of the FEIG was a notable achievement that deserves recognition. The Project faced serious difficulties in defining the mechanism for administering the trust fund and in raising the US$10 million required to trigger the US$ 5 million from GEF. The decisions to create the Design Committee and to select the FAN, an experienced national entity, were wise. Finally, the decision of the GoE to provide fiscal resources to the trust was decisive and laudable.
15. The FEIG has great potential. It will be fundamental to ensure that it remains focused and that its proceeds are invested wisely in order to have a positive impact. Those in charge of the fund will need to analyze the risk that its resources are not enough to fund effective invasive species eradication and control initiatives, since these initiatives require levels of funding far beyond what the Fund can generate.
16. The FEIG is not the financial mechanism of the TCP. There are various mechanisms to finance the activities in place, like public sector budgets (through AGROCALIDAD or the GNP), allocating part of the revenues collected from entry fees into protected areas (as stipulated in LOREG), revenues from services (e.g., cargo inspections) and fundraising for specific projects. The implementation of an integrated system to manage invasive species requires a financial strategy that integrates the existing mechanisms (including the FEIG) and others that are necessary to cover prevention, control, eradication, research and CEPA efforts.
17. Considerable effort was taken to raise awareness and generate support for invasive species in the local community. CDF and GNP used a range of mechanisms and tools to raise community awareness. The Project managed to position the issue of invasive species within the local population and the agenda of the GoE. However, it did not successfully change the attitudes of the local population. Still, it should be acknowledged that the social and political dynamics that existed and the expanding population growth limited the Project's ability to have a greater impact. The GoE will need to facilitate a collaborative approach to identifying barriers and constraints to community engagement and support and to identify common goals and agreed mechanisms to advance invasive species management in the archipelago.
18. The Project was not able to create a positive image for itself within the local community. The image of the Isabela Project overwhelmed its other elements and achievements. The Project continues to be known as the "goat project".
19. The CIMEIs are a valuable and positive experience which facilitated the collaboration of local stakeholders. However, their purpose and roles need to be

clarified, and their efforts supported if they are to contribute to greater awareness and community support for invasive species management.

20. The Project contributed to the preparation, formalization and dissemination of the Total Control Plan for invasive species in Galapagos and other instruments of sectoral and local policy. However, the TCP was not ultimately positioned and internalized within Galapagos institutions.

Main lessons identified

The following lessons have been distilled from previous evaluations, publications and project reports, as well as from comments we received during this evaluation. They are essentially the opinions of others which we have attempted to summarise. As "key" lessons they are strategic in nature.

Design

1. When evaluating project proposals, it is essential to closely assess the execution capacities of the participating entities, and if necessary, to incorporate activities in the PRODOC to build the capacities of the executing agencies.
2. In the case of complex projects involving the participation of various executing agencies, it is necessary to evaluate whether or not there are adequate mechanisms to foster dialogue and constructive relationships among the executors.
3. It is not a good practice to organize projects within other projects. In the case of very complex projects, it would be better to plan implementation in phases, in order to achieve intermediate results which can sustain progress made toward the realization of goals of greater magnitude.
4. It is essential to ensure that the project's logical framework matrix is realistic, robust and includes SMART indicators. Also, there must be an adequate project monitoring and evaluation system in place (activities and outcomes), and that sufficient resources are allocated to ensure that the M&E system operates effectively.

Implementation approach

1. In large, complex, multi-agency projects such as this, leadership and collegiality are both important. Developing an appropriate governance and participation model, involving all four government agencies as well as other stakeholder organisations, would have led to greater impacts.
2. All projects need a "champion" to promote, encourage and facilitate support and action. Champions need to be guided by policies and supported by participating institutions.
3. Many of the activities initiated during the project were new to Galapagos agencies, and in some cases, anywhere. It was a "big ask" to expect systems to be created and impacts to be sustained encompassing all of the initiatives and activities. A number of systems were created (e.g., in support of ungulate and rodent eradications, biosecurity inspection protocols) which may need further support and wider application.
4. Some UNDP financial procedures were unduly restrictive and were inappropriate for executing a Project such as this. Greater flexibility to accommodate local situations would have made a difference.

5. Administrative procedures should be adjusted to the realities faced by project teams in the field without losing rigour or compromising transparency and accountability. Procedures manuals should be used that are adapted to the reality of the local area and can facilitate the fulfilment of administrative requirements.
6. When appropriate, it is often beneficial to help the executing agencies to become familiar with the administrative requirements, and if necessary, to build capacities to apply them correctly.
7. It was not a good practice to have a direct contract with one executing agency and to channel the rest through the PAU. This generated unnecessary friction and conflict
8. A participatory mid-term evaluation can be a very useful and powerful tool to facilitate the analysis of the problems that a project is facing, encourage the engagement and support of key stakeholders and to make adjustments in response to issues that were not anticipated during the design phase, or externalities affecting the performance of the project.
9. Changes to the Special Law for Galapagos, or other regulations and documents which underpin the Total Control system should be considered in consultation with project managers to ensure they are appropriate and implementable.
10. Rather than island size and the associated logistics of undertaking large-scale ungulate eradication operations, bureaucratic processes, financing, political will and stakeholder support will probably be the main challenges to future projects.
11. The use of helicopters, in association with other tools and techniques which were developed during the project, proved to be very cost-effective in controlling and eradicating ungulates. Further cost reductions as refinements continue to be made can be anticipated.

Political and institutional support

1. Managing invasive species requires strong political support, since many of the measures taken and decisions made will not be popular among some stakeholders and communities.
2. Political support for invasive species management, especially within the archipelago, is difficult to maintain. Local politicians can have a big influence on local community perspectives. It would be prudent to focus on local politicians as an important audience to which education and relationship building activities could be directed.
3. Consistent institutional support, collaboration and funding, and a commitment by project staff to achieve eradication objectives (an “eradication ethic”) were central to the success of eradication projects during and following the project. This ethic is still apparent amongst invasive species management practitioners in the Galapagos.
4. If eradication projects focused on invertebrates and plants received as much institutional support and funding as Project Isabela, further successes would have been achieved.
5. “Institutional complexities” can hinder progress, without a shared vision and strategic goals to unify participating agencies. In small communities ‘personality-driven’ policies can have both positive and negative impacts. Both were clearly evident during this Project.
6. The institutional arrangements for SICGAL have been inadequate to prevent the entry of invasive species into Galapagos, and should be revised. The legal-regulatory basis is insufficient for effective invasive species management; the

institution must be able to impose exemplary penalties on offenders. The funds available are meagre compared to what is needed to effectively manage the system. Finally, the institutional backing from the national office of SESA / AGROCALIDAD has been volatile and deficient.

7. The institutional framework and legal-regulatory basis of the CIMEIs were not sufficient for them to become effective, consistent and sustainable.

Financing

1. Project leaders must ensure there are real commitments (i.e. with documentary evidence) of counterpart contributions. In this case, the PRODOC listed many commitments that were not real, and later the executing agencies had to make great efforts to raise the required counterpart funding.
2. The participatory design of the trust fund, through the Design Committee, was a good experience that stimulated the involvement and support of key stakeholders and made the process more transparent.
3. In a complex project that requires setting up a trust fund, it is advisable to do so as soon as possible (from the beginning of the project), starting with establishing clear and precise policies and procedures for the administration and use of the resources.
4. An integrated system for the management of invasive species requires a financial strategy that ensures resources to cover all of the prevention, control, eradication, research and CEPA work.

Capacity Building

1. A focus on capacity building as part of Project Isabela, including technical advice from local and international specialists, resulted in GNP developing significant new capacity in a variety of invasive species management disciplines. This has, in turn, led to confidence within the organisation to tackle further projects (eradications of ungulates and rodents, in particular).
2. A more strategic approach to capacity building in the Galapagos might focus on invasive species where there is less information about their ecology, and few precedents for their successful management (e.g., invasive plants, invasive invertebrates - apart from ants).

Communication and collaboration

1. Good communication and collaboration between technical specialists allowed important synergies to develop between the UNF/UNFID-funded pilot projects (1999 – 2006) and GEF/UNDP projects (2002 – 2008). The working groups (vertebrates, invertebrates and plants) involving GNP and CDF staff in Outcome 3 were good examples of collaboration and communication
2. All participating agencies should take responsibility for contributing to collegiality and teamwork within the Project.
3. The Total Control Plan was an important document for promoting institutional support, when it was prepared. Unfortunately it was not adopted by the agencies that were expected to implement it. Strategies to guide its implementation would have been useful, especially if stakeholders such as the tourism industry and the health sector were to be fully engaged in their development and implementation.

4. Working more closely with farmers to improve techniques to control plant and invertebrate pests on rural lands could generate greater local support for invasive species management more generally, as well as environmental benefits.
5. More comprehensive, concerted and targeted efforts should be taken to inform and engage other sectors, such as the tourism industry which have strong interests in invasive species being effectively managed.
6. A lack of consistent institutional support for information dissemination was a problem during (and following) the Project. Several websites were created to allow wide access to authoritative information. Unfortunately, none of these sites were appropriately supported.

Ecological Aspects

1. The different challenges in effectively managing invasive plants and invertebrates, compared with ungulates and rodents were reinforced. There is a need for greater effort to develop methods to control or eradicate invertebrates and plants so that this can complement mammal eradications and enhance ecological outcomes.
2. A focus on different invasive taxa (invertebrates, vertebrates, plants) has raised awareness of the need to consider trophic relationships and community-level dimensions to conservation management. It also led to GNP staff developing interests and skills in managing different taxa (e.g., ants).
3. A focus on biological communities, ecosystems and whole islands may present opportunities to improve the effectiveness and efficiency of invasive species management, and to sustain conservation outcomes.
4. Biological control of key invasive plants, such as blackberry and quinine, may be the only effective measure which could potentially be applied in the Galapagos.

Recommendations

Corrective actions for the design, implementation, monitoring and evaluation of the Project

1. A high priority should be given to collating available information about the full range of activities and Outcomes arising from the Project, and to making this information available to local, national and international audiences (e.g., management agencies, donors). An authoritative and comprehensive web-based site, such as Bibliogalapagos should be resurrected and maintained as a key information resource.
2. Further effort should be taken to gather, analyse and disseminate information about the costs of invasive species management activities to provide an economic context for reported outcomes.
3. A high quality electronic final publication must be prepared to summarise the achievements and lessons of the Project. This publication should be in both Spanish and English languages and be easily accessible to local and international audiences.

Actions to reinforce initial benefits from the Project

4. Every effort should be made to maintain the impetus, to build on the capacity and support which has been created, and to achieve further impacts through the management of invasive species in the Galapagos

   A revitalised Total Control System for Galapagos should be launched, including commitments of political, institutional and stakeholder support. The Total Control System should include the elements of prevention, control, eradication, research, stakeholder involvement and adaptive management. Also it needs to consider detailed information on the costs and benefits of invasive species projects and activities so that management agencies and donors may consider their support for multi-year programmes. Furthermore, it should establish a peer review process through which all projects may be regularly evaluated to inform decision making.

   One of the participating government agencies should take the lead to ensure a revitalised Total Control System is quickly created, that appropriate governance and administration procedures are in place and that support for management and research programmes is maintained.

5. Prepare a Strategic Action Plan to underpin the revitalised Total Control System, and a Research Plan to guide decisions and activities over a 5–10 year period.

6. The current process for updating the LOREG should be used to provide adequate legal support to the revitalised Total Control System.

7. A more comprehensive and effective biosecurity programme (i.e., prevention) is urgently required. In particular the rigorous and consistent application of inspection and quarantine services at a single port facility at Guayaquil is a pressing need. It would be useful to evaluate the possibility of treating organic material to reduce significant risks associated with such material being imported to the archipelago.

8. CIMEIs are a key element of a revitalized Total Control System and therefore should be reorganized and provided with adequate institutional, legal and financing support to fulfil their objectives.

9. An archipelago-wide ungulate management plan should be prepared in consultation with community groups. This plan should set out agreed objectives in relation to feral goat, donkey and pig populations on relevant islands.

10. The GoE should develop and consistently maintain a communication programme focused on changing the attitudes and behaviours of local actors and promoting wider community support and involvement in the management of IS. The involvement of a wider set of sectoral groups should be facilitated recognising the mix of anticipated social and economic benefits – in addition to environmental ones. Information about the social and economic costs and benefits of managing invasive species should be disseminated and opportunities created for a wider set of public and commercial stakeholders to become engaged in supporting the revitalised Total Control system. Further involvement by the tourism and health sectors as partners in conservation and restoration programme should be encouraged.

11. The GoE should provide appropriate support for government agencies responsible for implementing the TCP, and in fulfilling their missions and goals in relation to IS management.

Proposals for future directions underlining main objectives

12. UNDP should support further investigations into the cost – effectiveness of eradications – of ungulates and other vertebrates, in particular, as this tool is increasingly being considered as an important step in the restoration of islands

around the world. Analyses would appropriately be focused on cost minimization and benefit maximization. Such information could be used to inform GEF's consideration for support of further eradication projects.

13. GoeE and donors should support further investigations and trials of (i) bio-control agents that may be used against key invasive plants and invertebrates in the archipelago and (ii) alternative biodiversity conservation strategies which recognise the on-going presence of introduced plants in some environments.
14. The conservation of Galapagos biodiversity is of significant international interest. Further mechanisms should be established to encourage and facilitate further inputs and support for invasive species management objectives, and for conservation goals from people and organisations worldwide.
15. The issue of funding CDF's on-going provision of scientific and technical services to partner agencies must be addressed. Partner agencies should contribute to ideas and initiatives to support CDF's continued provision of critical roles and services, perhaps including CDF being contracted by management agencies to undertake prioritised research, provide required scientific advice, or to develop specific tools.
16. A greater focus on biological communities and ecosystems, in addition to threatened and iconic species, is warranted. This could lead to significant advances in approach, and to more effective management programmes being developed.
17. The Government of Ecuador should consider launching a Galapagos Restoration Programme to build on Project results and advances in other sites. An international workshop could be held to develop a longer-term restoration strategy to guide the inputs of participating agencies and to inform stakeholders. This would be an appropriate way to acknowledge the important progress made during the Project.

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Abbreviations

ABG	Agencia de Regulación y Control de la Bioseguridad y Cuarentena para Galápagos (Agency for the Regulation and Control of Biosafety and Quarantine in Galapagos)
AECID	Agencia Española de Cooperación Internacional para el Desarrollo (antes AECI) (Spanish International Development Cooperation Agency)
AGECI	Agencia Ecuatoriana de Cooperación Internacional (Ecuadorian International Cooperation Agency - formerly INECI, now SETECI)
AGROCALIDAD	Agencia Ecuatoriana de Aseguramiento de la Calidad del Agro (Ecuadorian Agriculture Quality Assurance Agency - formerly SESA)
APR	Annual Project Report
CAPTURGAL	Cámara Provincial de Turismo de Galápagos (Provincial Chamber of Tourism of Galapagos)
CBD	Convention on Biological Diversity
CDF	Charles Darwin Foundation
CDF Inc.	Charles Darwin Foundation Inc. (NGO)
CDSS	Charles Darwin Scientific Station
CEPA	Communication, Education, and Public Awareness
CIMEI	Comité Interinstitucional para el Manejo de Especies Invasoras (Inter-institutional Committee for the Management of Invasive Species)
COP	Conference of Parties of the CBD
DAC	Dirección de Aviación Civil (Civil Aviation Department)
DAD	Darwin Animal Doctors
DSF	Darwin Scientific Foundation
FAN	Fondo Ambiental Nacional (National Environment Fund)
FOGOS	Friends of Galapagos Organizations
FUNDAR	Fundación para el Desarrollo Alternativo Responsable de Galápagos (Foundation for the Alternative Responsible Development of Galapagos) (NGO)

GC	Galapagos Conservancy
CGG	Consejo de Gobierno de Galápagos (Galapagos Government Council)
FE	Final Evaluation of the Project
FEIG	Galapagos Invasive Species Control fund
FEIG-OU	Operating Unit of the FEIG
GEF	Global Environment Fund
GIS	Geographic Information System
CISGP	Galapagos Invasive Species Control Project
GNP	Galapagos National Park[45]
GNPD	Galapagos National Park Directorate [46]
GoE	Government of Ecuador
GPS	Global Positioning System
HACT	Harmonized Approach to Cash Transfers
IC	Island Conservation (ONG)
IDB	Inter-American Development Bank
INECI	Instituto Ecuatoriano de Cooperación Internacional (Ecuadorian Institute of International Cooperation - later AGECI)
INEFAN	Instituto Ecuatoriano Forestal y de Áreas Naturales y Vida (Ecuadorian Forestry and Natural Areas and Wildlife Institute – merged with MAE in 1999)
INGALA	Instituto Nacional Galápagos (ahora CGG) (National Galapagos Institute – now CGG)
IS	Exotic Invasive Species
IUCN	International Union for Conservation of Nature
KfW	Kreditanstalt für Wiederaufbau (Reconstruction Credit Bank)
LogFrame	Logical Framework
LOREG	Ley Orgánica de Régimen Especial de Galápagos (Organic Law of the Special Regime for Galapagos)

[45] The initials GNP are normally used to refer to the protected area, and GNPD is used to refer to the administration of the area. In this document, GNP and GNPD are used synonymously.
[46] The initials GNP are normally used to refer to the protected area, and GNPD is used to refer to the administration of the area. In this document, GNP and GNPD are used synonymously.

M&E	Monitoring and Evaluation
MAE	Ministry of the Environment
MAG	Ministry of Agriculture and Livestock, now MAGAP
MAGAP	Ministry of Agriculture, Livestock, Aquaculture and Fishing (formerly MAG)
MSG	Project Management Support Group
MTE	Mid-Term Evaluation
NEX	National Project Execution
NGO	Non-Governmental Organization
PAU	Project Administration Unit in Galapagos
PC	Project Coordinator
PCT	Total Control Plan
PDF	Project Development Facility
PFE	Pre-Final Evaluation
PIR	Project Implementation Report
PISA	Project Isabela
PRODOC	Project Document
PSU	UNDP Program Services Unit
SC	Steering Committee
SENPLADES	Secretaría Nacional de Planificación y Desarrollo del Ecuador (National Secretariat of Planning and Development of Ecuador)
SESA	Servicio Ecuatoriano de Sanidad Agropecuaria (Ecuadorian Agricultural Health Service, now AGROCALIDAD)
SETECI	Secretaría Técnica de Cooperación Internacional (Technical Secretariat of International Cooperation, formerly AGECI)
SICGAL	Sistema de Inspección y Cuarentena de Galápagos (Galapagos Inspection and Quarantine System)
SNEM	Servicio Nacional de Erradicación de la Malaria (National Malaria Eradication Service)
STAP	Scientific and Technical Advisory Panel of the GEF
TAG	Project Technical Advisory Group

TOR	Terms of Reference
UCIGAL	Unidad de Coordinación de las Islas Galápagos (Galapagos Islands Coordination Unit of the Ministry of Environment, based in Quito)
UNDP	United Nations Development Program
UNDP-CO	Ecuador Country Office of the United Nations Development Program
UNESCO	United Nations Education, Science and Culture Organization
UNF	United Nations Foundation
US$	United States Dollar
USAID	United States Agency for International Development
USFQ	Universidad San Francisco de Quito
WWF	World Wildlife Fund

Definitions

Adaptive management	Adaptive management is a structured, iterative decision making process to reduce uncertainty over time through systematic monitoring (Holling, 1978)
Agricultural Quarantine	A set of sanitary and phytosanitary measures that are intended to prevent the entry, establishment and dissemination of pests and diseases that affect plants and animals.
Alien Invasive Species	Refers to invasive species whose introduction and/or dispersion threatens biological diversity (Decision VI/23 of the COP to the CBD)
Alien species or introduced species	A species, subspecies or lower taxon, introduced outside its natural past or present distribution; includes any part, gametes, seeds, eggs, or propagules of such species that might survive and subsequently reproduce(Decision VI/23 of the COP to the CBD)
Assumptions	Hypotheses about factors or risks which could affect the progress or success of a development intervention (OECD, 2010).
Biological diversity or Biodiversity	Biological diversity means the variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems (CDB).
Development objective	Intended impact contributing to physical, financial, institutional, social, environmental, or other benefits to a society, community, or group of people via one or more development interventions.
Ecological Restoration	Ecological restoration is the process of assisting the recovery of an ecosystem that has been degraded, damaged, or destroyed (Society for Ecological Restoration International).
Effectiveness	The extent to which the development intervention's objectives were achieved, or are expected to be achieved, taking into account their relative importance (OECD, 2010[47]).
Efficiency	A measure of how economically resources/inputs (funds, expertise, time) are converted to results (OECD, 2010).
Ex post evaluation	The evaluation of a development intervention that is conducted

[47] OECD. 2010. Glossary of Key Terms in Evaluation and Results Based Management. OECD Publications. Paris, Francia: 37pp.

	once the intervention has concluded.
External evaluation	The evaluation of a development intervention conducted by entities and/or individuals outside the donor and implementing organizations (OECD, 2010).
Finding	A finding uses evidence from one or more evaluations to allow for a factual statement (OECD, 2010).
Goal [of the Project]	The higher-order objective to which a development intervention is intended to contribute.(OECD, 2010).
Horizontal logic	Relates to the measurement of the effects of, and resources used by the project through the specification of key indicators, and the sources where they will be verified [48].
Impacts	Positive and negative, primary and secondary long-term effects produced by a development intervention, directly or indirectly, intended or unintended (OECD, 2010).
Independent evaluation	An evaluation carried out by entities and persons free of the control of those responsible for the design and implementation of the development intervention (OECD, 2010).
Indicator	Quantitative or qualitative factor or variable that provides a simple and reliable means to measure achievement, to reflect the changes connected to an intervention, or to help assess the performance of a development actor (OECD, 2010).
Intentional Introduction	An introduction made deliberately by humans, involving the purposeful movement of a species outside of its natural range (Decision VI/23 of the COP to the CBD)
Introduction	The movement by human agency, indirect or direct, of an alien species outside of its natural range (past or present). (Decision VI/23 of the COP to the CBD)
Invasive species management	A spectrum of activities aimed at reducing the negative impacts of invasive species. Prevention (or “biosecurity”) is the preferred objective which usually involves less cost and risk than other objectives, and invasive species impacts are avoided. Eradication is the next preferred objective provided criteria for successful eradication can be met. Control is the least-preferred objective. It involves limiting the numbers of a pest population to a prescribed level, or containing it within a defined area - or both. Impact mitigation involves actions to protect specific attributes from invasive species when managing the invasive species itself is not possible (e.g., protecting bird nests from mammalian predators).

[48] Source: European Commission 2001. Project Cycle Management Handbook. Second Edition. Evaluation Unit of the EuropeAid Cooperation Office. March 2001:45

Key Stakeholder	Stakeholders are individuals, groups, institutions and other entities which have an interest in the outcome of the GEF-funded project. The term also applies to those who are potentially negatively affected by the project (UNDP, 2011)[49] [50].
Logical Framework	Management tool used to improve the design of interventions, most often at the project level. It involves identifying strategic elements (inputs, Outcomes, outcomes, impact) and their causal relationships, indicators, and the assumptions or risks that may influence success and failure. It thus facilitates planning, execution and evaluation of a development intervention (OECD, 2010).
Mid-term evaluation	Evaluation that is carried out in the middle of the project implementation period.
PDF	Proposal Development Facility for preparing GEF projects. Full-scale projects can request a PDF-A for the initial design, with a ceiling of US$25,000, and for complex projects, a PDF-B of up to US$350,000 for project design and preparation.
Protected Area	This is a geographically defined area that has been designated or regulated and administrated in order to achieve specific conservation goals (CBD).
Purpose	The publicly stated objectives of the development program or project (OECD, 2010).
Relevance	The extent to which the objectives of a development intervention are consistent with beneficiaries' requirements, country needs, global priorities and partners' and donors' policies (OECD, 2010).
Results	The Outcome, outcome or impact (intended or unintended, positive and/or negative) of a development intervention (OECD, 2010).
SMART	Acronym for the summary of criteria that objectives, outcomes and indicators should have: Specific, Measureable, Attainable, Realistic and Time-bound
Sustainability	The continuation of benefits from a development intervention after major development assistance has been completed. The probability of continued long-term benefits. The resilience to risk of the net benefit flows over time (OECD, 2010).
Terms of Reference	Written document presenting the purpose and scope of the evaluation, the methods to be used, the standard against which

[49] UNDP. 2011. UNDP Evaluation Guidance for GEF-financed projects. Version for External Evaluators. Final Draft. 17 March 2011: 39 pp.
[50] In the Spanish version of this report, "stakeholders" is translated as "actores claves."

	performance is to be assessed or analyses are to be conducted, the resources and time allocated, and reporting requirements. Two other expressions sometimes used with the same meaning are “scope of work” and “evaluation mandate” (OECD, 2010).
Total control of invasive species	The total control of species is understood to be the following set of activities: 1. Prevent the introduction into the Province of Galapagos of any species, variety, or genetic modification of flora or fauna, including microorganisms that are not autochthonous to Galapagos, except by specific authorization granted according to this Law. 2. Prevent the dispersion of said species, varieties and modified forms throughout the archipelago, except by specific authorization granted according to this Law. 3. Prevent human interference with the distribution of native species of Galapagos province within the archipelago and of genetic varieties within each species; 4. Detect and eradicate new species introduced into the Galapagos Province and the spread of already introduced species to new areas. 5. Prevent the possession, cultivation, raising or release into the environment of exotic species, except for those permitted by law; 6. Eradicate those species that are already introduced, except for those that are permitted by law; and, 7. Education and train residents of the province of Galapagos so that they can participate in control efforts. The restrictions described above apply to entire organisms and any part of an organism capable of reproducing, including eggs, seeds, in vitro cultivations, cuttings, tissues or live samples of any kind (LOREG Glossary, article 73).
Unintentional Introduction	All other introductions which are not intentional(Decision VI/23 of the COP to the CBD)
Vertical logic	Identifies what the project intends to do, clarifies the causal relationships and specifies the important assumptions and risks beyond the project manager’s control.[51]

[51] Source: European Commission 2001. Project Cycle Management Handbook. Second Edition. Evaluation Unit of the EuropeAid Cooperation Office. March 2001:45

Tables

Table 1. Project Budget as indicated in the PRODOC.

PROJECT OUTPUTS	TOTAL	GEF FULL (US$) Million[32]	Co-financing (US$) Million	
Output 1: Prevention	3.53	0.95	UNF	0.28
			SESA	0.20
			USAID	0.01
			BID	2.07
			CDF	0.01
Output 2: Planning and Research	4.17	1.88	CDF	1.59
			WWF	0.70
Output 3: Control and Eradication	10.52	7.21	CDF	1.00
			SPNG	0.94
			UNF	1.37
Output 4: Financial Sustainability	17.66	6.64	CDF	0.06
			UNF	1.08
			Priv. Sect.	9.88
Output 5: Public awareness	1.55	0.80	WWF	0.20
			UNF	0.26
			BID	0.29
Output 6: Sectoral Planning	5.71	0.82	BID	1.34
			Priv. Sect.	1.05
			PL-480	1.00
			AECI	1.20
			UNDP	0.20
			UNFPA	0.10
TOTAL	43.13	18.30		24.83

Table 2. Animal (vertebrate and invertebrate) eradication or control projects undertaken during the Project.

Project	Reported results
Project Isabela	Feral goats & donkeys eradicated from Pinta, Santiago & northern Isabela (2006).
Eradicate Rock doves from urban areas; San Cristobal & Isabela	Eradication success declared (2005)
Mitigate the impacts of rats on tortoise reproduction on Pinzon	An archipelago-wide strategy to eradicate introduced rats was developed (2007). An eradication of rats from Pinzon is planned (2012).
Feral cat eradication, Baltra	Eradication success declared (2004)
Eradicate black rats from Santiago Islets.	Hand-baiting operation failed (2002). Aerial eradication operation undertaken after the Project (2011).
Eradicate tilapia from “El Junco” Lagoon, San Cristobal	Successful eradication operation undertaken in 2007. Surveillance continues.
Rat control at petrel breeding colonies, Santa Cruz, Floreana and San Cristobal.	No information available.
Define the impacts of rats on mangrove finch breeding, Isabela	Rat control regimes improved and mangrove finch breeding success increased (after the Project).
Control of introduced tree frog in southern Isabela	Eradication unsuccessful, the frog is now established in three islands. Little information available.
Eradication of the mosquito Aedes aegypti from Santa Cruz and San Cristobal	Eradication unsuccessful
Eradication of fire ants on Isabela Island	No information available
Eradication of little fire ants from Marchena	Eradication successful but further population was discovered.
Eradication of tropical fire ant from Champion Islet	Project unsuccessful due to incomplete delimitation of population, and inconsistent support.
Experimental control of black fly, San Cristobal	Initial investigations, research and trials undertaken. The project was discontinued. We were informed that it is being revived and led by CGG.

Table 3. Detailed list of 30 plant eradication projects in Galapagos. Source: Gardner et al, 2010.

Table 2. The details of 30 plant eradication projects in Galapagos. Projects are ranked according to a numeric eradication effort score.

Species	*Growth Form*[#]	*Island*[*]	*Eradication Cost Estimate (USD)*	*Start Date*	*Cost to Date (USD 2008)*	*Net Area (ha)*[**]	*Gross Search Area (ha)*[**]	*Eradication Score*	*Main Reason for Failure*
Sapindus saponaria	T	Santiago (I)	2,000	2003	500	1	1	9	Insufficient time
Aristolochia elegans	C	Santa Cruz (A)	250	Not started	0	1	1	11	No permission
Cryptostegia grandiflora	C	Santa Cruz (A)	650	2006	370	1	1	11	Insufficient time
Lantana montevidensis	S	Santa Cruz (I)	100	Not started	0	1	1	11	No permission
Cenchrus pilosus	H	Santa Cruz (I)	100	2005	200	1	1	14	Eradicated
Persea americana	T	Santiago (I)	2,000	2003	1,500	1	1	15	Insufficient time
Acacia nilotica	T	Santa Cruz (I)	600	2006	250	1	1	16	No permission
Pueraria phaseoloides	C	Santa Cruz (A)	1,600	1996	1,600	1	1	17	Eradicated
Rubus adenotrichos	C	Isabela (I)	6,000	2001	6,000	1	5	105	Insufficient time
Lantana camara	S	Isabela (I)	?	Not started	0	1	10	260	Incomplete distribution
Rubus adenotrichos	C	Santa Cruz (I)	2,549	1999	2,549	1	41	861	Eradicated
Casuarina equisetifolia	T	Santa Cruz (A)	18,650	Not started	0	10	150	1,050	No permission
Rubus megalococcus	C	Santa Cruz (A)	5,436	2000	5,436	1	100	2,100	Eradicated
Syzygium jambos	T	Floreana (I)	11,000	2007	4,000	1	200	2,800	Insufficient time
Solanum quitoense	S	Santiago (I)	45,960	2006	200	4	300	6,000	Insufficient time
Citrus spp.	T	Santiago (I)	45,960	2006	5,000	20	1,000	7,000	Insufficient time
Furcraea hexapetala	S	Floreana (I)	40,000	2007	16,000	5	400	9,200	No permission
Aristolochia odoratissima	C	Santa Cruz (A)	?	2002	55,670	40	470	13,160	No control technique
Leucaena leucocephala	T	Santa Cruz (I)	60,000	Not started	0	?	500	17,000	Incomplete distribution
Leucaena leucocephala	T	Floreana (I)	62,000	2007	8,000	6	500	17,000	Insufficient time
Rubus glaucus	C	Santa Cruz (A)	100,000	2000	37,989	40	580	24,940	Insufficient time
Rubus ulmifolius	C	Santa Cruz (A)	14,500	2002	6,690	2	860	26,660	Insufficient time
Citharexylum gentryi	T	Santa Cruz (A)	200,000	2000	128,325	330	750	29,250	No permission
Rubus niveus	C	Santiago (I)	800,000	2006	50,000	105	1,000	50,000	Persistent seed bank
Syzygium jambos	T	Isabela (I)	?	Not started	0	600	5,180	72,520	Incomplete distribution
Rubus niveus	C	Floreana (I)	312,000	2007	48,000	140	1,600	80,000	Persistent seed bank
Furcraea hexapetala	S	Isabela (I)	?	Not started	0	?	5,180	119,140	Incomplete distribution
Leucaena leucocephala	T	Isabela (I)	30,000	Not started	0	30	5,180	160,580	Incomplete distribution
Cinchona pubescens	T	Santa Cruz (A)	8,000,000	Ongoing	0	11000	11,000	242,000	Too expensive
Rubus niveus	S	Isabela (I)	?	1998	39,300	200	5,180	259,000	Persistent seed bank

[#]T = tree; S = woody shrub; C = creeper with woody base; H = herbaceous. [*]Letters in parentheses indicate whether attempt will result in single island (I) or whole archipelago (A) eradication. [**]To the nearest hectare, with minimum value of 1 ha.

Table 4. Invasive species eradicated and eradication projects initiated during the Project using GEF as well as co-executor funding.

Species eradicated	Island/site
Feral goat	N. Isabela, Santiago, Pinta, Rabida, Espanola, Pinzon, Baltra, Pinta, Santa Fe, Marchena
Feral pig	Santiago
Feral cat	Baltra
Feral donkey	N. Isabela, Santiago & Floreana
Black rat	Marielas (2 islands)
Feral dog	Isabela, Floreana & Santa Cruz
Rock dove	Santa Cruz, Isabela & San Cristobal
Wasmannia auropunctata (Little fire ant)	Isabela, Santiago
Solenopsis germinata (Black ant)	Champion , Las Marielas,
Tilapia	San Cristobal
Rubus adenotrichus	Santa Cruz
Rubus megalococcus	Santa Cruz
Cenchrus pilosus	Santa Cruz
Pueraria phaseoloides	Santa Cruz
Aedes aegypti	Santa Cruz, San Cristobal

Table 5. Use of GEF resources between 2001 and 2011.

	Outcome	Total	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
1	Inspection and Quarantine	195,779.99	-	-			54,734.93	1,932.45	26,241.12	-	2,153.79	65,186.50	45,531.20
2	Research	324,293.89	-	-	11,771.88		4,962.92	217,880.94	26,712.35	40,465.80		22,500.00	
3	Pilot Projects	2,535,769.05		90,412.95	98,217.00		1,800,330.25	481,682.92	496.00	253.32		64,376.61	
4	Trust Fund	5,538,327.95			24,838.62		27,533.56	74,994.43	51,496.10	5,359,354.25	110.99		
5	Communication and participation	314,716.25			37,859.05		59,404.45	25,934.19	26,172.77		383.16	164,818.63	144.00
6	Sectoral Planning	469,063.53		48,739.43	47,825.72		66,388.54	118,518.83	53,428.53	134,162.48			
7	Project Management Unit	4,204,315.69	4,019.92	169,965.63	145,713.51	2,805,831.61	243,658.93	213,776.52	183,903.37	177,764.20	124,482.69	46,317.52	88,881.79
8	UNDP TRAC contribution	121,320.93		-	-	52,243.84	19,915.55	18,984.93	30,176.61				
9	UNDP Operations	279,701.70	180.33	46,089.62	159,810.10		3,896.10	76,989.47	(7,563.92)				
10	CDF Subcontract	4,410,203.75	23,368.00	913,465.00	1,144,058.00		663,233.00	1,108,420.45	483,533.86		51,895.71	22,229.73	
	TOTAL	**18,393,492.73**	**27,868.25**	**1,268,672.63**	**1,670,093.88**	**2,858,075.45**	**2,944,058.23**	**2,339,115.13**	**874,596.79**	**5,712,000.05**	**179,026.34**	**385,428.99**	**134,556.99**

Notes:

UNDP-TRAC contribution = UNDP counterpart funds used for monitoring.

UNDP Operations = GEF funds administered by UNDP.

Contract with the CDF, includes elements from various Project outcomes.

Table 6. Sources of financing for the Project.

Name of Partner or Contributor (including the Private Sector)	Nature of Contributor	Amount used in Project Preparation (PDF A, B, PPG)	Amount committed in Project Document	Additional amounts committed after Project Document finalization	Estimated Total Disbursement to 30/06/2011	Expected Total Disbursement by end of project
GEF Contribution		350.000	18.300.000	-	18.650.000	18.650.000
Cash Cofinancing – UNDP managed						
UNDP (TRAC)	UN Agency		200.000		119.482	119.482
	UNFPA		100.000		-	-
Cash Cofinancing – Partner Managed						
	UNF		2.992.000		990.000	990.000
	Government			4.000.000	4.000.000	4.000.000
	PNG			1.000.000	1.000.000	1.000.000
	German government			3.500.000	3.500.000	3.500.000
	CI			730.000	730.000	730.000
	Galapagos Conservancy			476.713	476.713	476.713
	Private sector			67.991	67.991	67.991
In-Kind Cofinancing						-
	PNG		942.000	9.762.338	10.704.338	10.704.338
	INGALA			300.000	300.000	300.000
	SESA		195.000	870.000	1.065.000	1.065.000
	BID		3.703.000		1.943.000	1.943.000
	USAID		1.011.000		1.011.000	1.011.000
	AECID		1.200.000		1.200.000	1.200.000
	WWF		895.000	255.000	1.150.000	1.150.000
	FCD		2.666.000	1.570.000	4.236.000	4.236.000
	Private sector		10.928.000			-
	MAE			18.444	18.444	18.444
Total Cofinancing		**-**	**24.832.000**	**22.550.486**	**32.511.968**	**32.511.968**
Total for Project 2011		**350.000**	**43.132.000**	**22.550.486**	**51.161.968**	**51.161.968**

*Valores de BID y WWF están certificados con cartas
Otros valores vienen del PIR 2009-2010
Aportes de Cash Cofinacing están certificadas por FAN.

Valores superiores a lo planificado
Valores inferiores a lo planificado

Figures

Figure 1. Protected areas and colonized areas of Galapagos.

Source: Galapagos National Park Management Plan

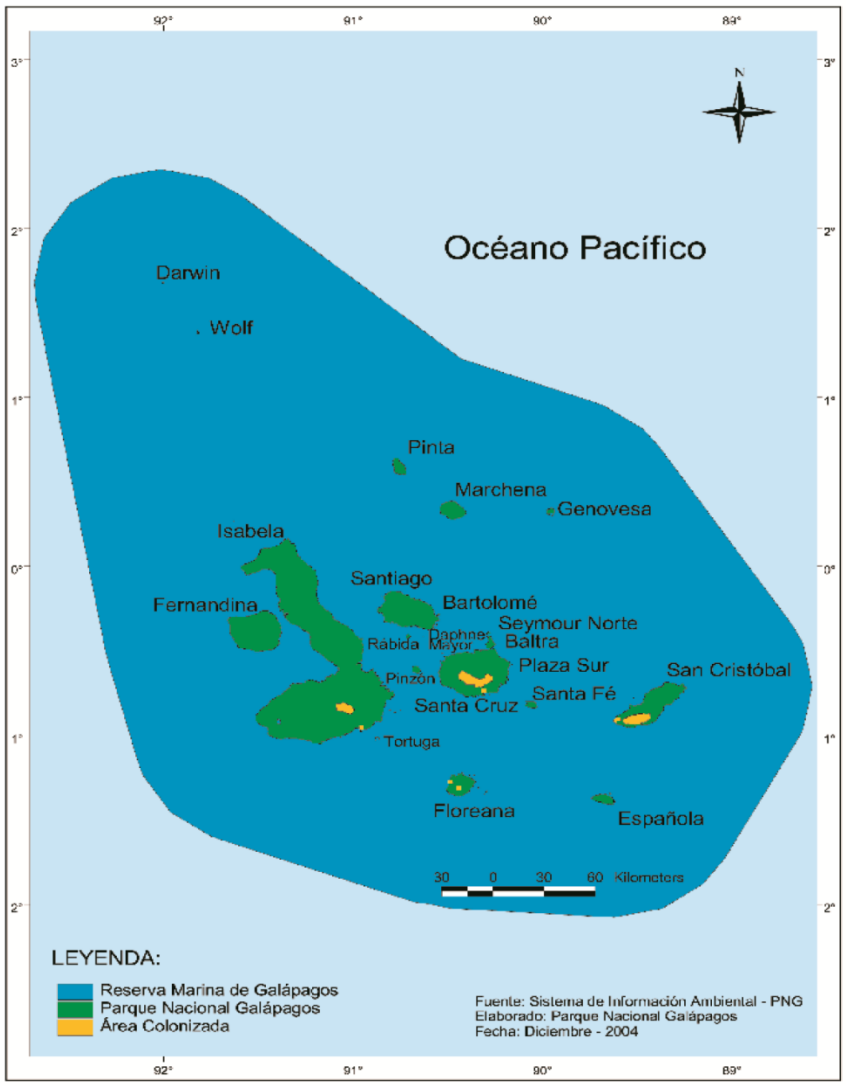
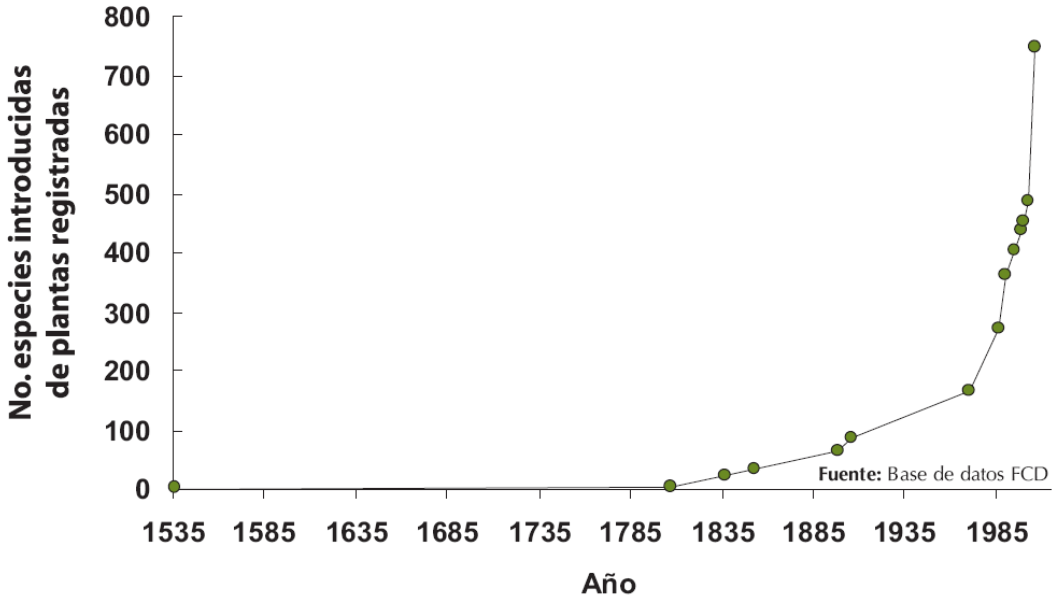


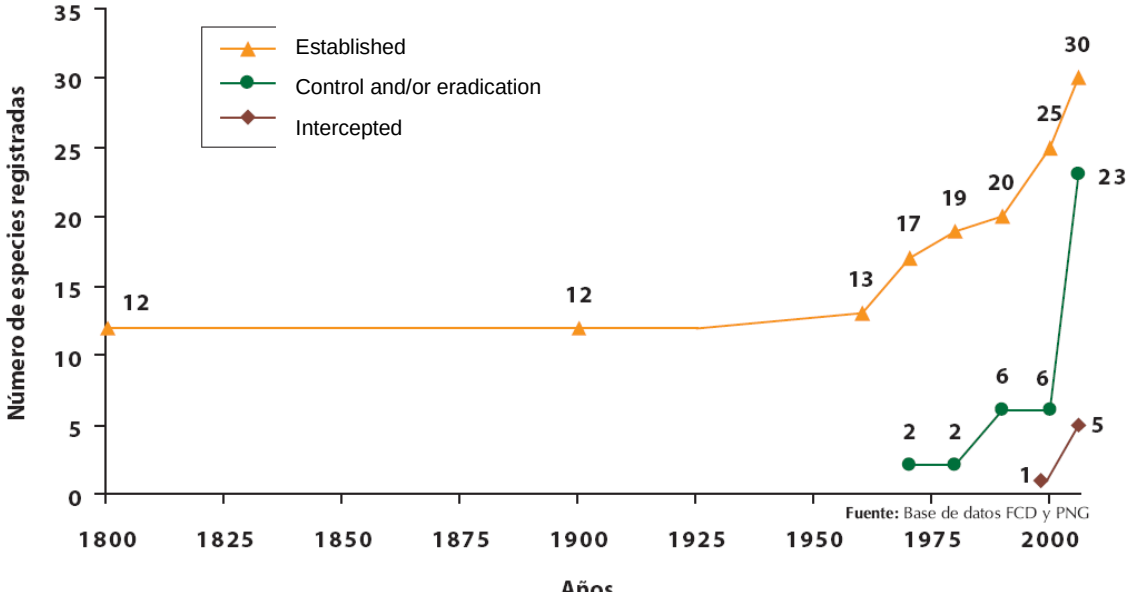
Figure 2. Records of invasive plant and vertébrate species.

Number of introduced plant species recorded



Source: Tye et al., (2007)

Number of species registered



Note: * species controlled and/or eradicated on one or various islands or islets, not at the archipelago level.

Source: Jiménez et al., (2007)

Figure 3. Administrative arrangements of the Project

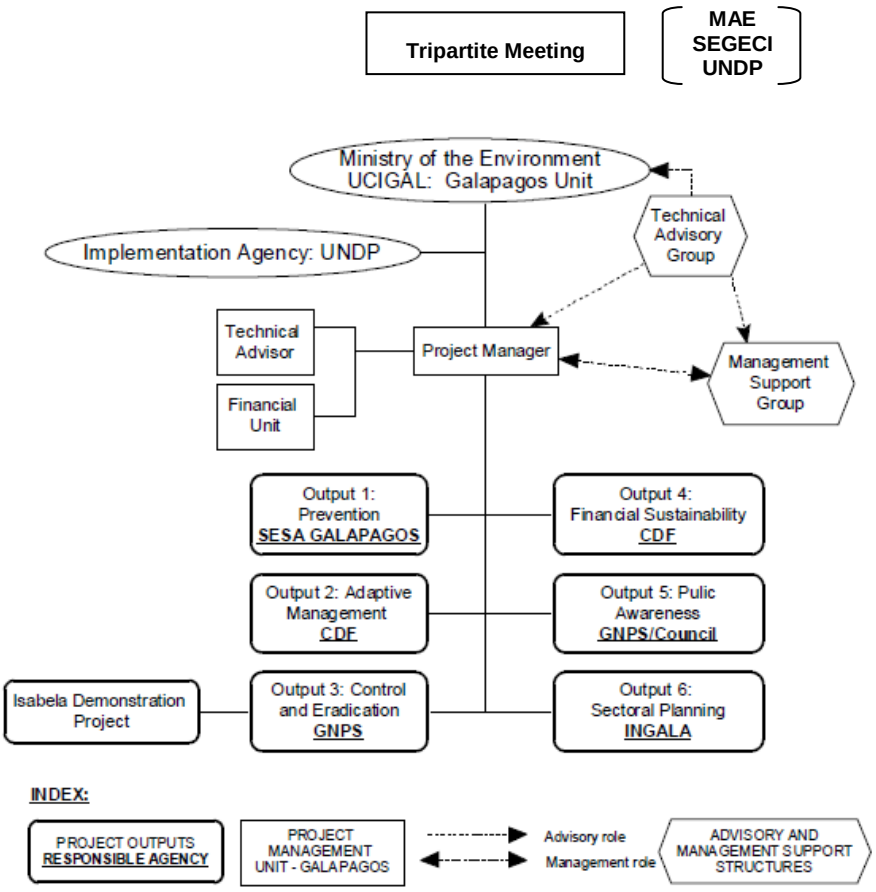


Figure 4. Components of the model used as reference for identigying if there is an integrated and sustainable invasive species management system.

Note: next to each component (circles) are the elements that it should have. The black box indicates the component's relationship with the Project Outcomes.

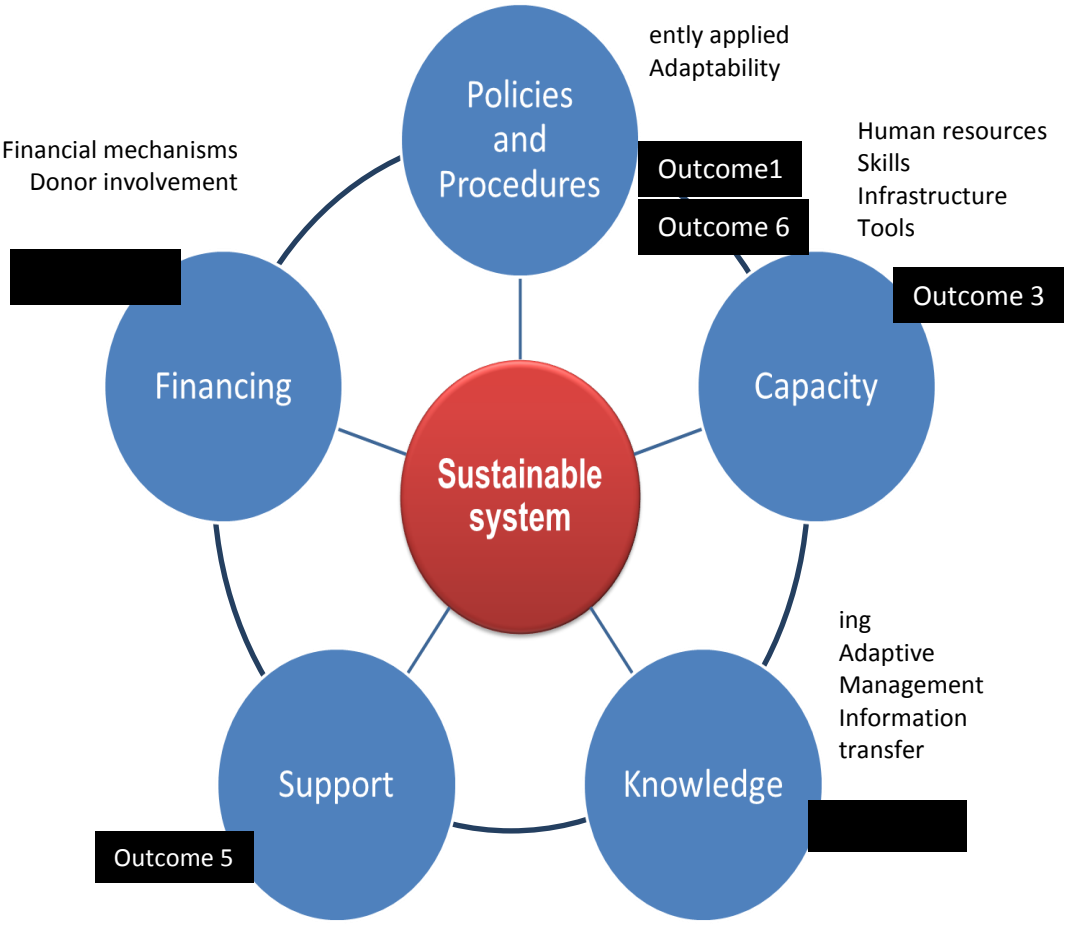


Figure 5. Flow of spending of GEF funds throughout the life of the Project.

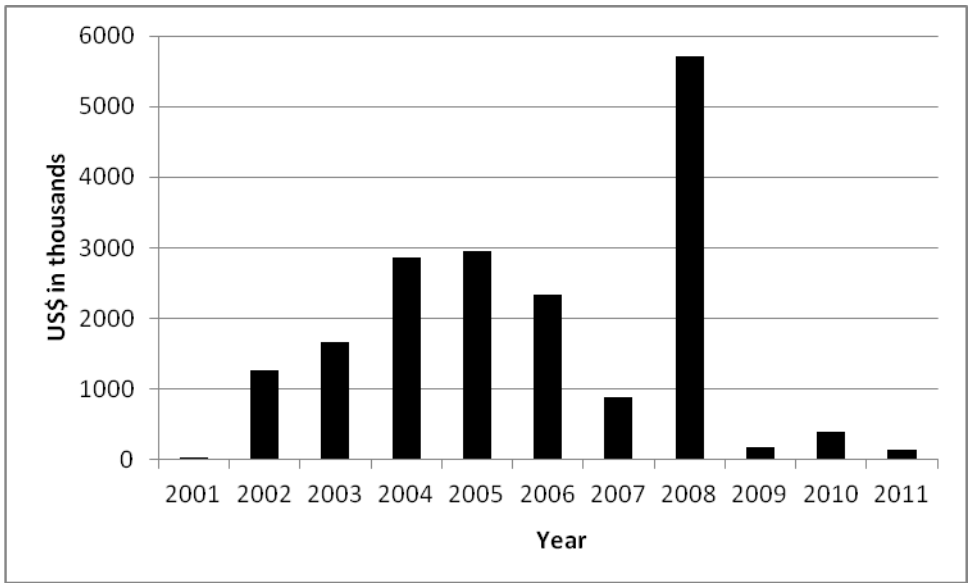
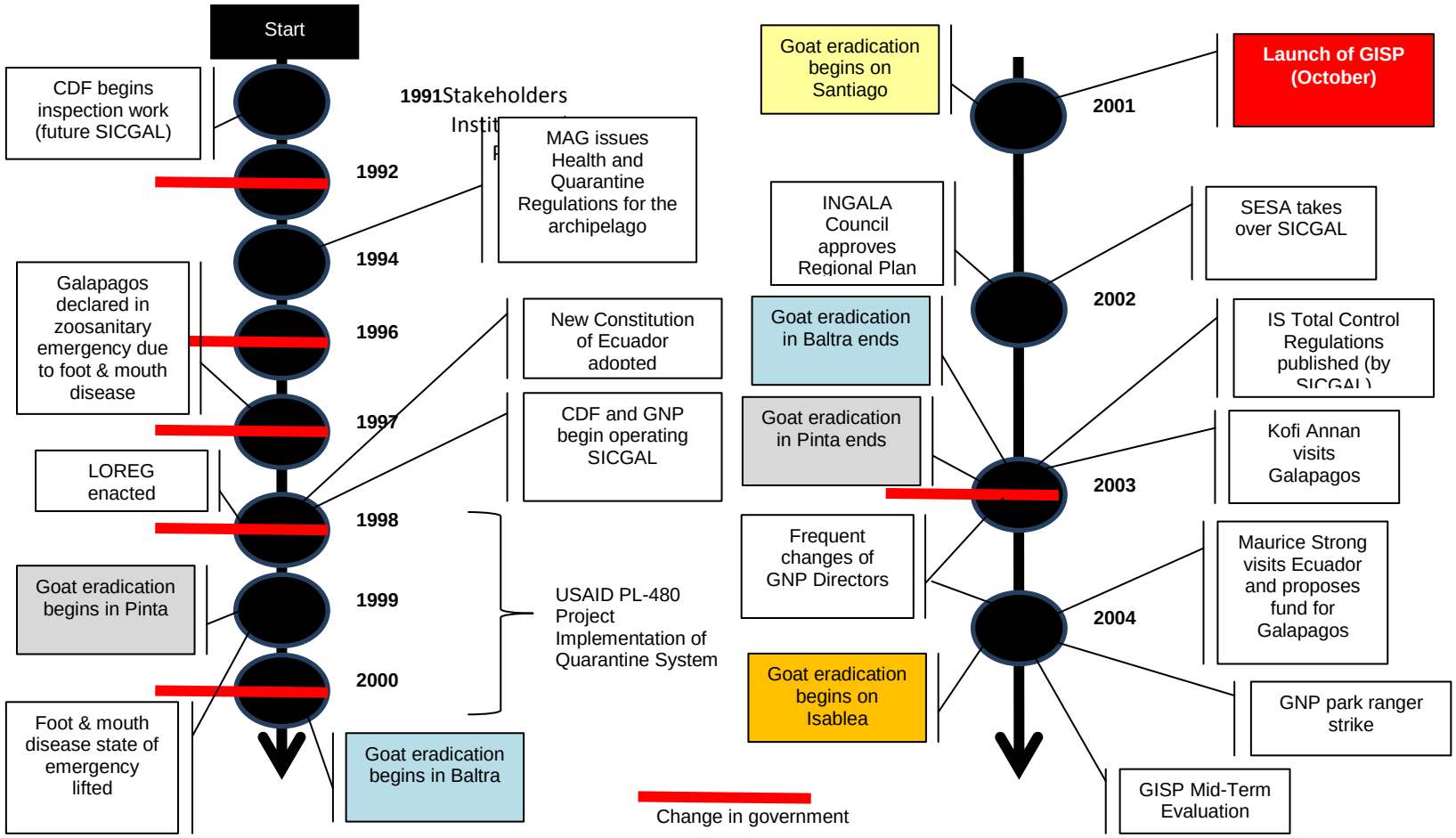
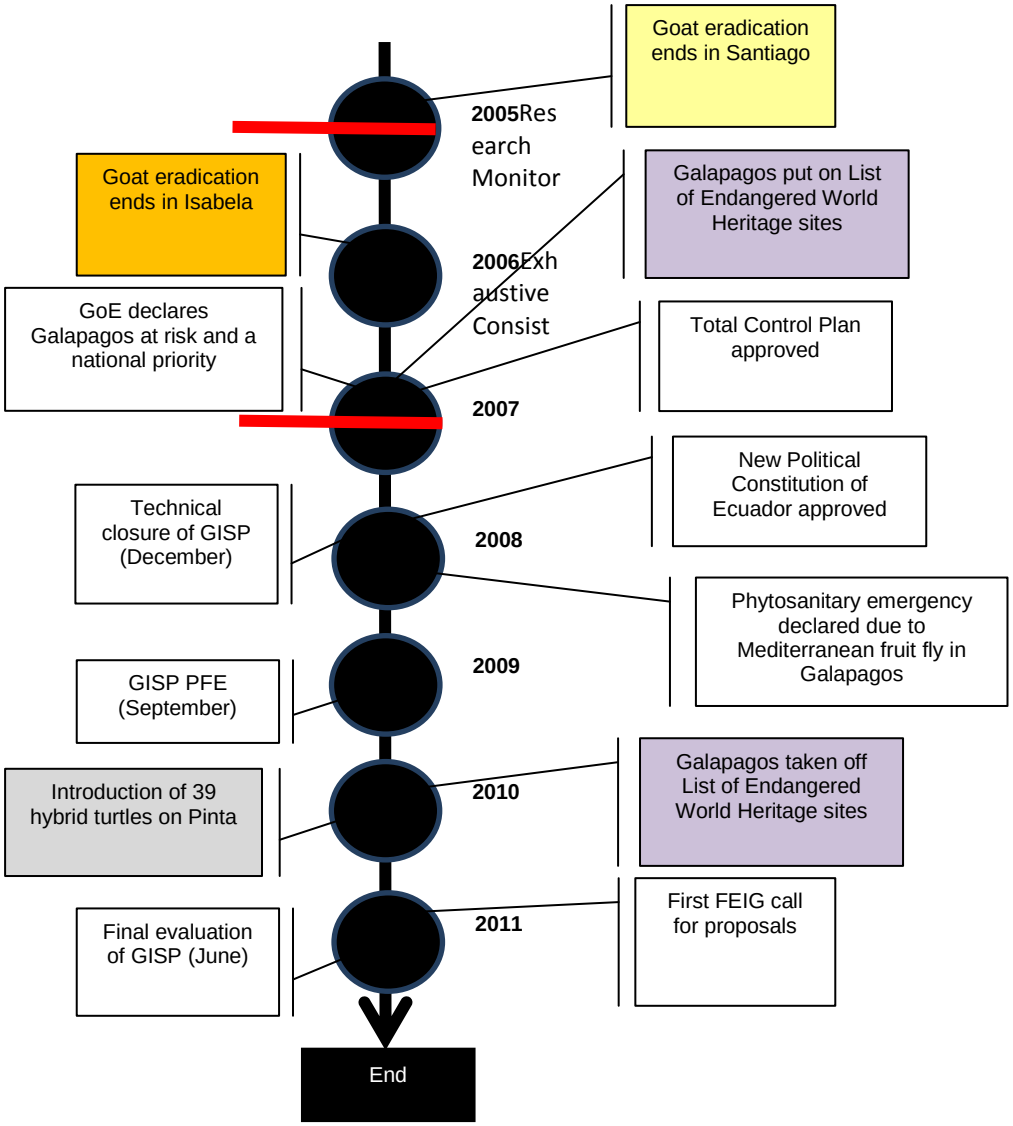


Figure 6. Timeline of main events related to the Project.




Goat eradication ends in Santiago
2005Research Monitor
Goat eradication ends in Isabela
Galapagos put on List of Endangered World Heritage sites
2006Exhaustive Consist
GoE declares Galapagos at risk and a national priority
Total Control Plan approved
2007
New Political Constitution of Ecuador approved
Technical closure of GISP (December)
2008
Phytosanitary emergency declared due to Mediterranean fruit fly in Galapagos
2009
GISP PFE (September)
Galapagos taken off List of Endangered World Heritage sites
Introduction of 39 hybrid turtles on Pinta
2010
First FEIG call for proposals
Final evaluation of GISP (June)
2011
End

Annexes