



**FINAL REPORT FOR THE PROJECT ENTITLED
*THE RESTORATION OF GLOBALLY IMPORTANT SEABIRD COLONIES IN THE PACIFIC***

GRANT 2006-30661

May 2009

SUMMARY

The project entitled *Restoration of Globally Important Seabird Colonies in the Pacific by the Removal of Rats and Other Invasive Predators* was initiated in December 2006 and completed in March 2009. The project was managed by BirdLife International through its Pacific Partnership Secretariat in Suva, Fiji, and implemented by the following in-country NGO Partners: in French Polynesia *Société d'Ornithologie de Polynésie MANU* (SOP-MANU), in New Caledonia *Société Calédonienne d'Ornithologie* (SCO), in Palau *Palau Conservation Society* (PCS), and in Fiji the *BirdLife International Fiji Programme*.

During the course of the project, operations to eradicate rats have been successfully implemented on 13 internationally and 3 nationally important seabird islands. The completion of these 16 operations represents a significant achievement for the BirdLife Pacific Partnership and an important contribution to seabird and biodiversity conservation in the region. Collectively these operations have created 306ha of predator-free island habitat, protecting breeding colonies for 17 species of seabird and many other native life-forms including uncommon and threatened landbirds, reptiles, invertebrates, and plants.

In achieving this, 60 islands and islets in the four countries have been surveyed for their seabird populations and the presence of invasive predators, which has led to the production of feasibility plans for 42 of them. This provides a sound basis for future restoration planning and priority setting in the region. The project also developed the capacity of 14 NGO staff members who have been trained through formal training programmes, on-the-job support, partner project staff interchange and technical advice provided by various national and international experts. This has not only enabled them to successfully implement a priority suite of eradications but similarly identify future seabird island restoration needs. The project has also created new networks and partnerships for further skills sharing.

This report includes a summary of achievements of the project which were previously reported in 2007 and 2008, with additional details of accomplishments for the period up to March 2009. Also included is a full financial report. This report has been compiled by Steve Cranwell (regional Programme Manager) and Don Stewart (Regional Director, BirdLife Pacific Partnership Secretariat), edited by Maaïke Manten (BL Programme Development Officer), with in-country contributions from Elenoa Seniloli and Nirmala Chand (the BirdLife Fiji Programme Project Officer and Finance Manager respectively), Lucie Faulquier and Anne Gouni (SOP-MANU Project Officer and Programme Director respectively), Julien Baudat-Franceschi (SCO Project Officer), Lukes Isechal and Mingrang Kloulechad (PCS Project Officer and Finance Officer respectively). The financial report was provided by the BirdLife International Finance and Administration Department in the UK.

Please note that all eradication planning documents, awareness materials, and reports associated with this programme are also available (not included in this report). NB Those from the French territories are predominantly in French.

PROGRAMME DESCRIPTION

Declining seabird populations are a global phenomenon attributed to anthropogenic influences including fishing practices, contaminants and oil spills, habitat loss and introduced predators. In the Pacific, the role of introduced mammals, particularly rats and cats, remains a dominant influence in the ongoing decline of island seabird breeding colonies. This is perhaps no more apparent than for the island nations and territories of French Polynesia, New Caledonia, Palau and Fiji which collectively host 38 of the 41 seabirds that breed within the tropical Pacific and 85% of the region's threatened seabirds, many of which are isolated to small islands and almost all in the presence of at least rats. Thus the eradication of mammalian predators from islands within these archipelagos presents a unique opportunity for making a significant difference for the protection and enhancement of nationally, regionally and globally important areas for seabirds.

The Pacific Partnership of BirdLife International is committed to the conservation of the region's seabirds and the eradication of introduced predators from seabird islands represents both a tangible and highly significant contribution. The restoration of globally important seabird islands among the four participant countries formed the primary purpose of this project (Grant 2006-30661). The process of planning and implementing these eradications provided 'demonstration models' for island restoration practices, and the sharing of information and skills facilitated capacity development of NGO partners and other conservation agencies. The project was designed to act as a catalyst for raising national (and regional) awareness and understanding of seabird conservation and specifically the threats and management options for alien invasive species.

Rodent eradication is a process largely pioneered and developed in New Zealand, with notable successes. The principles of this process are increasingly being applied globally and are equally relevant to other mammalian predators. The feasibility and ultimately success of these operations require a rigorous and dynamic planning process, addressing community and stakeholder needs, alongside technical, logistical, and political considerations in both the preparation and implementation. The project introduced (or enhanced) this understanding among all project Partners following a step-wise procedure of identifying the feasibility of eradication (and benefits of restoration), developing the subsequent planning including monitoring and biosecurity frameworks, and ensuring community and political support throughout.

Based on existing knowledge at the start of the project, the proponents identified the following sites for which restoration was considered a priority (site details are further described in the Grant proposal and 2007 report):

Fiji

The focus of the Fiji programme was on three sites within the Ringgold Island group (Nukubasaga 18ha, Naqelelevu 147ha, Vetauua 35 ha) and Namenelala Island (40ha). Ornithological knowledge of the Ringgold group was limited to a single survey identifying large booby, noddy, and frigatebird colonies. The project would initially confirm the status of seabirds and alien predators and restoration potential for these islands. Subject to community and landowner support (Namenalala is in private ownership), and depending on the feasibility and expected benefits of restoration, these islands would then be treated and rodents removed.

French Polynesia

Islands in the Gambier group support a high diversity (17 breeding species) and proportion of threatened seabirds within the French territory. Sites proposed included the Islands of Makaroa (25ha), Kamaka (50ha), and Agakautai (100 ha) all of which were identified to be of importance to the vulnerable Polynesian Storm Petrel and believed to have at least rats present.

The 1400ha Atoll of Tahanea in the Tuamotu group, was also proposed for restoration. Surveys determining alien predator and seabird distributions were considered to enable targeted eradication for at least part of the Atoll.

New Caledonia

Six Important Bird Areas (IBAs) comprising 33 islands and islets of significance to seabirds and with restoration potential were targeted. The two IBAs of the 'Great Reef of Koumac' and 'Cap Bayes Channel' contain approximately 20 islets considered to be of importance to seabirds. The project aimed to focus on priority islets of these two groups. In addition, the project would complete surveys and restoration assessments for the remote islands and island groups of 'Chesterfield reef', 'Walpole' 'Hunter' and 'Matthew' (all IBAs).

Palau

In Palau the project targeted the Southwest Island group located 300km from the southern end of the main Palauan island, comprising the islands of Sonsorol, Merir, Pulo Anna, and Fanna. Fanna was the focus of an eradication programme, while the restoration potential would be assessed for the other three islands.

PROGRAMME OUTCOMES

The primary expected outcome for the project was the protection of internationally important colonies of breeding and migratory seabirds through the eradication of alien invasive predators from 11 sites and up to 18 islands and islets (4 Fiji, 4 French Polynesia, 2 New Caledonia and 1 Palau). The following results were anticipated to achieve this outcome:

1. Eighteen surveys including 4 sites in Fiji, French Polynesia and Palau each, and 6 in New Caledonia. Surveys are a critical first step in the eradication process. Understanding what seabirds are present and the significance of these colonies alongside a site's physical characteristics, predator suite, and presence of non-target species, in tandem with community and 'political' acceptance collectively enables an evaluation of the restoration benefits and potential for eradicating target species.

2. Feasibility assessments on these same 18 islands. Feasibility assessments determine the sites for which eradications are considered possible and inform the subsequent eradication planning process. This constitutes the preparation of an operational plan and describes in detail the methodology, implementation process and timeframes for all aspects needed in eradicating the target species. The preparation of island biosecurity and monitoring plans are also included as part of the eradication planning process.

3. Local support for restoration action and sustainability. Almost all islands targeted in the project are owned by indigenous landowners. The support of these communities is critical in not only gaining consent for activities anticipated but is also the basis for achieving lasting protection. In addition, local authorities have responsibilities associated with activities on islands, and the support of these agencies is equally critical to the success and sustainability of an eradication operation.

4. Capacity development. At the start of the project, previous eradication experience was either low or non-existent among the 4 NGO Partners. There was a need for technical capacity for in country conservation professionals in a range of island restoration disciplines including seabird and alien species survey and monitoring techniques, eradication planning and implementation practices which this project aimed to address.

5. Awareness raising. Seabird conservation in the Pacific is generally hindered by a lack of knowledge and understanding of the issues and opportunities associated with protecting seabirds and seabird islands. The project aimed to produce a range of media information, awareness materials, community, and public engagements to enhance the understanding and support of local communities, government, and other conservation NGOs.

In summary, the following outcome and results were anticipated at the start of the project:

Outcome: eradication of alien invasive predators from 11 priority Pacific islands.

Results:

1. seabird and introduced predator surveys for 4 sites each in Fiji, French Polynesia, and Palau and a further 6 in New Caledonia (total 18)
2. feasibility studies and operational, biosecurity and monitoring plans for these same sites, leading to eradication action on 11 sites and up to 18 islands
3. support of landowners and other key project stakeholders
4. development of NGO and government capacity in the four participating countries
5. production and dissemination of awareness materials and information

PROGRAMME ALTERATIONS

Between project inception and project completion, the following main changes were made to the project design.

1. Extension of project period with three months (no cost)

As a result of contractual and staffing difficulties at the start of the project (as explained in previous reports), project inception was delayed across the four countries by 4-8 months. Thanks to the hard work of all implementing partners once the project got underway, and with a no-cost three-month extension granted by the David and Lucile Packard Foundation, the project was completed in March 2009.

2. Islands proposed for eradication

A range of issues including island size, complexity, cost, project timeframe and organisational capacity resulted in changes having been made to some islands originally identified as the original focus of this project (see the 2007 programme report for details). As a result, the following islands were included in the actual project:

Fiji: Instead of three, seven of the Ringgold Island group islands were treated during a unique aerial operation (using a helicopter), all of them identified as important seabird islands as a result of the project's surveys. The island of Namenalala had to be excluded from the project as the landowners of Namenalala remained unconvinced that rodent eradication would benefit the island's seabird population and would not harm a native ground bird 'friendly ground dove'. As an alternative, the island of Mabualau, five miles off the south-east coast of the main island of Viti Levu, was surveyed and consequently a rat eradication operation was carried out as part of this project.

French Polynesia: The four sites initially proposed for action in French Polynesia were Makaroa, Kamaka and Agakautai, all three in the Gambier group, and Tahanea atoll in the Tuamotu group. However, a desk-based feasibility study which included consideration of logistical and associated cost-related criteria indicated that eradication at these sites was likely to be problematic and not achievable within the available resources and timeframe. As an alternative to these, the project focused on four other sites which were also high priority seabird islands and feasible to be treated within the project time frame: two motu of Ua Huka in the northern region of the Marquesas group (Motu Teuaua and Motu Hemeni), and two motu in Rangiroa, in the northwestern Tuamotu group (Utuhou and Taerere).

New Caledonia: The six sites originally proposed for eradication in New Caledonia remained unchanged: the Great Reef of Koumac and Cap Bayes Channel, and the four remote sites of Matthew, Hunther, Walpole and the Chesterfield group.

Palau: The islands nominated for Palau remained relevant: Sonsorol, Merir, Pulo Anna, and Fanna. The focus for eradication action remained Fanna, however, some delays occurred in project implementation due to logistical, political and cultural problems.

No other alterations were made to the project design.

PROGRAMME ACCOMPLISHMENTS

All five results of the programme were achieved:

1. Surveys and eradication feasibility assessments were carried out for **66 islands and islets** (planned: 18) in four countries [8 in Fiji, 26 in French Polynesia, 28 in New Caledonia (with 2 sites including 19 islets) and 4 in Palau].
2. Operational, biosecurity and monitoring plans were produced for **16 islands and islets** [8 in Fiji, 4 in French Polynesia, 3 in New Caledonia, 1 in Palau], supporting eradications for the same **16 islands**.
3. Local support and buy-in was obtained **at all sites** where actual eradication action was implemented.
4. **14 NGO staff** were trained in eradication planning and implementation [5 in Fiji, 3 in French Polynesia, 1 in New Caledonia and 5 in Palau], with additional capacity developed across local communities, government agencies and other relevant organisations in four countries.
5. **Targeted awareness raising materials** were produced for site and national communications in all four countries. This included posters, leaflets, newsletters, media and web based information and two television documentaries.

Country-specific achievements are listed below.

Fiji

1. Surveys

In the months leading up to December 2008 the BirdLife Fiji Programme completed extensive seabird and alien species surveys of the Ringgold islands (7), and Mabualau island. Large red-footed and brown booby, black and brown noddy, and frigatebird colonies for five of the 8 islands confirmed these to be of international importance and the remaining three of national significance to seabirds. Ground nesting seabirds (with the exception of the larger bodied Brown Boobies) were notably absent which was anecdotally attributed to the effects of Pacific rat being present on all islands, at exceptionally high densities on some.

2. Feasibility studies, operational planning and eradication action

Eradication feasibility assessments were documented for all eight sites, concluding that rat eradications were feasible. Physical characteristics of some of the Ringgold islands (size and terrain) meant eradication would only be possible by aerial methods; subsequent investigations confirmed that a local helicopter company (Island Hoppers) in Fiji could be trained in aerial baiting and the necessary equipment acquired and operation could be conducted within the project budget.

Operational and biosecurity plans were prepared for Mabualau and the Ringgold group. These were led by the two Project Officers (PO) at the BirdLife Fiji Programme, Elenoa Seniloli, and Ronel Jit, supported by the Pacific Partnership Secretariat Programme Manager (PM), Steve Cranwell. After the resignation of Ronel Jit in 2008 (who left Fiji), Tuverea Tuamotu took over the position part-time which meant that the PM had to play a substantially greater role in the Fijian component of the programme. Peer review of project plans was undertaken primarily by the PM with assistance from the Pacific Invasives Initiative (PII). A workshop arranged by the Secretariat for all project Partners in conjunction with regional partners, PII and the Pacific Invasives Learning Network (PILN) and the NZ Department of Conservation (DoC), facilitated (among other activities) additional peer review of project plans and provided an opportunity to discuss them with technical experts. The workshop, held in New Zealand, was attended by Elenoa Seniloli and Steve Cranwell. Overall, the planning and organisation of the two Fijian operations required a substantial commitment with many technical, logistical, and community issues needing to be resolved, which turned out to be quite challenging within the infrastructural and capability constraints of a developing nation. However, by June 2008 all preparations were complete.

Ringgolds: In a month long operation, a team of four BirdLife staff (including the PM), a New Zealand consultant with eradication expertise, a botanist, a research student, a film crew and 16 local people carried out the operation. The initial phase involved the preparation of each of the 7 Ringgold islands to receive bait. This included the establishment of warning signs, protection of village water supplies and chickens, securing bait storage areas, preparing the helicopter operational area, and the collection of baseline monitoring data on seabirds, vegetation, lizards, landbirds, and crabs (not all indicators were assessed on every island). Gaining the understanding of island residents of the need to eliminate alternative food sources proved something of a challenge, but the required waste disposal practices were eventually adopted. In mid June, a helicopter applied brodifacoum pellets to all seven Ringgold islands at a rate of 15kg/ha, followed by a second application 10 days later (at a rate of 10kg/ha). Rat numbers were observed to decline rapidly and within a few days of the operation were at non-detectable levels. Since then, island residents and visitors continue to report that no rats have been observed. The outcome of the eradication attempt will be formally assessed and confirmed for all 7 islands in July 2009.

Mabualau: The Mabualau island operation was led by Elenoa Seniloli. In conjunction with the island landowners, Elenoa collected baseline data on seabirds, vegetation and lizards and hand spread bait over the island in two applications. A rat assessment conducted in December failed to detect any rats; a repeat assessment in June 2009 will confirm the result of the operation which is expected to declare the island formally rat-free.

3. Consultation and programme support

Landowner, community and stakeholder consultations were (and remain) a major component of the Fiji island restoration programme. All eight islands treated are owned by indigenous Fijian communities requiring a variety of engagements nationally, regionally and locally to establish an understanding and support for the eradications and to facilitate input, agreement and consent for the operations. Key national and regional agencies include the Native Land Trust Board and the Provincial Councils which facilitated administrative processes and raised awareness of the project and its progress within the chiefly hierarchy. At the local level, four distinct village groups have landownership entitlements for the Ringgold islands, while Mabualau has one with a number of villages adjacent to the island with interests in the island. For both sites, a 'steering committee' was established to represent landowner and other stakeholder interests. This was particularly effective for Mabualau where regular meetings, attended by the PO, facilitated the project's development. The Ringgold communities tended to be less 'unified' which required the Fiji Programme to organise consultations with individual village groups or communicate through the Provincial Council district representative. Although this was a time consuming and often protracted process, eventually these engagements resulted in consent and full support for the operations and widespread understanding of the projects conservation opportunities and needs. The participation of landowning communities in field activities (survey and eradication) and particularly the involvement of senior representatives generated considerable support and ownership for the restoration of all islands. In Mabualau, the landowners placed a tabu (local protection status) on the island, and an interest has been expressed in securing nationally recognised protection status for all islands. A recent grant from the UK Darwin Initiative awarded to the BirdLife Fiji Programme will facilitate this process for all nine seabird islands which have so far been restored by the BirdLife Fiji Programme (the seven Ringgold islands, Mabualau and Vatu-i-ra).

The support of government agencies has also been critical to the project's implementation. Key to this has been:

- the Fiji Department of Environment: helped facilitate various government processes such as securing a bait import permit from the Ministry of Agriculture and the waiver of bait import duties from the Ministry of Finance.
- the Fiji Quarantine Department, particularly to support intra-island biosecurity controls: presently the Quarantine Department's focus is on international borders, however they are supportive of the national work and have expressed interest in collaboration. This partnership has been recognised in the biosecurity awareness materials produced for the project.

4. Capacity development

At the project's inception, the BirdLife Fiji Programme employed two staff with previous eradication experience, one of whom (Elenoa Seniloli) was directly associated with the restoration programme. An additional Project Officer was recruited in early 2007 but left again, for family reasons, in 2008. Tuverea Tuamotu subsequently took up the vacant position. All (three) project staff as well as two other Fiji Programme officers have been trained in various aspects of eradication planning and implementation. This training consisted of:

- on the job learning with technical support from local and regional expertise (BirdLife Secretariat, DoC, PII, PILN, Island Conservation)
- formal training workshops (Pohnpei rodent eradication training, New Zealand eradication planning and biosecurity workshop, Island Species Led Action workshop)
- skill sharing and exchanges between BirdLife Partners,

Collectively these opportunities developed substantial technical capacity and information networks.

Outputs of this training programme included: the development of all eradication planning documents (feasibility, operational, monitoring, and biosecurity), public awareness materials, and many public presentations and media engagements. Elenoa Seniloli, led the implementation of the Mabualau operation and key parts of the Ringgold operation were implemented by the Fiji staff. The knowledge gained and practices applied by the BirdLife Fiji Programme constitute a best practice which is highly transferable throughout the region.

Additionally at least 30 local people from local communities associated with the islands treated have been trained by the POs and other experts in survey and eradication techniques and biosecurity practices. These skills helped develop an understanding and ownership for the project, both of which are critical in sustaining a pest free status and ultimately achieving the restoration vision for these sites.

5. Awareness

The two combined projects (Grant 30661 and Grant 30662) raised the profile and knowledge of seabird conservation issues both nationally and internationally. Key messages communicated to a variety of audiences included: the identification of seabirds in Fiji, the location of breeding colonies, threats to these colonies, and conservation actions. Awareness materials produced during the project include a leaflet on the location and protection of seabird islands, a seabird poster, an eradication fact sheet, and an island biosecurity sticker. Together they have provided supporting information at community and school presentations. Materials were primarily used at the project sites but a survey posted to all schools in Fiji (in association with Grant 30662) allowed for a wider circulation of these materials to key audiences.

Project activities have also generated tremendous interest from national and international media, which was substantially added to through the involvement of Anton Oliver (ex NZ All Black Rugby Captain). The project has been profiled through at least 16 national press releases (some having been picked up regionally), 3 national and 2 regional radio interviews, 3 television shows (including a national news feature) and two television documentaries, one being developed in association with Fiji TV and a second with the Secretariat for the Pacific Community (SPC). The SPC film crew participated in the Ringgolds operation obtaining footage for the documentary. The project has also been profiled regionally and globally through the BirdLife International website and publications (Sea Change) and a number of PII and PILN newsletter circulations. Some of this publicity covered the regional restoration programme (i.e. in all four countries).

The positive impact of the awareness and publicity project result has been demonstrated through the involvement of local people in seabird conservation projects, including active participation in restoration, survey, monitoring and biosecurity activities. On Naqelevu (the only inhabited Ringgold island), the resident community has adopted the biosecurity plan actions, implementing checks on visiting boats. BirdLife staff have also been contacted by other island landowners with requests for seabird surveys and eradication advice for introduced predators on their islands. Some interest has been shown by holiday resorts in island restoration; a survey and eradication assessment was undertaken independently by Secretariat staff at a privately owned island in the Yasawa island group. Two resorts within close proximity of Mabualau have expressed interest in the Ringgold and Mabualau sites as opportunities for visitors (seabirdwatching). If successful, tourism would provide an added incentive to landowners to protect their

islands in the long term. Additionally the Secretariat is frequently contacted for a variety of seabird conservation advice including support for seabird surveys and management actions throughout the Pacific region.

Annex 1 illustrates aspects of the project in Fiji.

French Polynesia

1. Surveys

Seabird and introduced predator surveys were completed for the four sites originally proposed for restoration: the three Gambier islands Makaroa, Kamaka and Agakautai, and the Tahanea Atoll. The Gambier surveys confirmed all three sites as having severely degraded seabird populations attributable to the presence of Black and or Pacific rats. Surveys were unable to confirm the presence of threatened *Procellariiformes* (comprises the majority of sub-surface and surface nesting seabirds particularly vulnerable to introduced predators), however it is highly possible they are present (but in low numbers) and would respond positively to the removal of rats. Of the three islands Kamaka was identified as the only one where a ground based operation could be possible. However, the island's size, dense vegetation, and difficulties associated with access and sustaining a workforce still made such an option problematic and would potentially compromise an eradication. Due to topographical constraints, Makaroa and Agakautai are considered only possible as aerial operations. The feasibility and options for eradicating rats from these three sites has been documented.

An investigation of 9 other islands in the Gambier group has given preliminary information on seabird and alien predator species. Although a high level of seabird diversity, particularly among *Procellariiformes*, is still considered present, this was difficult to substantiate due to the limited time and detectability of these cryptic species, unknown seasonal breeding patterns and the probable low numbers as a result of introduced predators. The predator suite is varied and included at least one of two species of rat on all but two islands and cats, pigs, and domestic stock among others (the latter only present on large inhabited islands). The eradication of predators is considered possible for many if not all sites and a priority given the importance of these islands to seabirds in French Polynesia. Local authorities and communities indicated strong support for such an initiative; however with a range of interests between islands, the importance of extensive community consultation in developing an eradication programme for these islands was highlighted. SOP-MANU, the implementing Partner in French Polynesia, hopes to commence with such a programme in the near future.

A survey of Tahanea Atoll confirmed the presence of a diverse pan-tropical seabird fauna and threatened endemics such as the endangered Tuamotu sandpiper and other land birds.

The Atoll's size (1400ha) prevented a complete survey, but rats were noted to be present on all motu assessed. The resulting eradication feasibility report identified motu as being insufficiently isolated to prevent future reinvasion (particularly by Black rat) and recommended the treatment of the entire Atoll. An operation of this scale noted as requiring aerial treatment and substantial funding. Restoration is considered important (but of lower priority for seabirds) and warrants further survey to inform a complete feasibility assessment and as appropriate development of eradication planning.

Following these surveys and the conclusion that it was not feasible to treat these four sites during the project's timeframe and within its financial scope, alternative sites had to be quickly confirmed. An information review identified the island of Teuaua (Marquesas archipelago) and three motu of Rangiroa Atoll (Tuamotu archipelago) as hosting internationally important seabird populations that would benefit from the eradication of alien species and where such action was considered achievable within the project scope. Subsequent field surveys of Teuaua and Rangiroa Atoll confirmed their conservation significance and the presence of introduced predators.

Teuaua, one of two 5ha islets (motu), is situated near the coast of Ua Huka in the northern region of the Marquesas group. The area is collectively an Important Bird Area and supports a diversity of threatened and globally important sea and landbirds, including the only population of Iphis Monarch and Ultramarine Lorikeet. Together, the two uninhabited islets of Motu Teuaua and Motu Hemeni have the most important

Sooty tern colonies in French Polynesia which surveys confirmed in excess of 75,000 pairs on Teuaua (qualifying it as a seabird IBA). Alien species surveys identified a large Pacific rat population on Teuaua but they were not detected on nearby Hemeni and are believed to be absent there. Rats were observed to prey on Tern eggs and thought to be similarly affecting young chicks which, given the density of rats, posed a significant threat to the Tern colony. Eradicating rats from the island was confirmed to be possible although not without challenges with vertical 10m cliffs ringing the island.

Rangiroa Atoll is located approximately 300 km south of Tahiti in the northwestern Tuamotu group. The Atoll comprises about 400 motu (islets) and total land area of 7900 hectares. The Atoll has been identified as a seabird IBA hosting a diverse seabird fauna including eleven breeding species. The Atoll is also important for a number of threatened endemic landbirds and breeding turtles. For many of these species, motu in the south of the Atoll are of particular importance and included the three sites targeted for alien species eradication by this project. The southern area has been a focus of restoration efforts by MANU since 2004 and with the support of the Department of Environment motu have been strategically cleared of rats. Surveys of seven motu confirmed Tiarao, Hiuveru and Hiveu as priorities for restoration with Black and Pacific rats effecting breeding tern, booby, noddy, and tropic bird populations. Treatment of these 3 motu would also provide safe habitat for the Critically Endangered terrestrial Polynesian Ground-dove which is present on adjacent rat free motu.

Opportunistic seabird and predator surveys were also conducted for Tikehau Atoll located in the Tuamotu group and Nuku Hiva in the Marquesas Islands. The 'Tikehau' survey focused on two islets (Motu Puarua and Motu Oeoe) which were identified as supporting nationally important seabird communities but do not qualify as IBAs. Alien species surveys did not detect the presence of any seabird predators including rats. The significance of these islets were brought to the attention of the local communities including the management of a nearby resort. The two islets Motu mata'ua and Motu Nui were found to have species of breeding and roosting seabirds. The small colonies were a likely result of the exceptionally large rat populations. Although community interest in an eradication was high, to do this was determined not to be feasible due to the close proximity to Nuku Hiva and the certainty of rats reinvading.

All together, a total of 26 islands and motu were surveyed during this project, which is 22 more than originally planned. These surveys produced considerable seabird and alien species data which have been compiled in two databases: the BirdLife World Bird Database, which maintains a global record on the status of seabird colonies, and an invasive mammal database developed by the French Polynesian Project Officer. This latter database contains an inventory of seabird predators for all French Polynesian islands and will be used to inform management decisions within MANU and in sharing the information among other conservation organisations.

2. Feasibility studies, operational planning and eradication action

The analysis of survey results and the sites' physical characteristics, biodiversity values, presence of invasive species, community support, eradication methods, non-target species and possible re-invasion risks were documented in feasibility assessments for eight islands/motu. In four cases, eradication was not considered feasible within this project; however, eradication of rats was considered feasible for the island of Teuaua and three motu of Rangiroa Atoll. Subject to suitable preparations (operational planning, logistical support and biosecurity implementation) both operations were expected to have a high probability of success.

Operational and biosecurity plans including monitoring outcomes were prepared for these four islands and motu. The planning process was supported by a number of regional and international experts including input from the BirdLife Pacific Secretariat, French restoration ecologists from the University d'Orsay, Paris, and participation by the Project Officer in a specifically convened workshop in New Zealand (with the NZ Department of Conservation Island Eradication Advisory Group, PII and PILN) to peer review and support discussion with experts over planning decisions. A monitoring framework identifying key indicators and standardized data collection techniques was identified for each site. Assessing seabird responses (to predator free environments) and assessing the presence of alien species is a consistent application for all sites (and projects) with the inclusion of other indicators being determined on a site by site basis. On Teuaua, a monitoring protocol was introduced to assess Tern responses to the rat eradication

but also the effects of egg harvesting by local people. In consultation with the community it was agreed that the information collected would be applied in determining a sustainable level of annual egg take.

The three motu of Rangiroa (Tiarao, Hiuveru and Hiveu) and Teuaua were treated for rats by MANU with two applications of Brodifacoum pellets and block baits at one week intervals in December 2008 and February 2009 respectively. The bait application for Teuaua was originally planned for October 2008 at the end of the Tern breeding period. However, large numbers of Terns were still nesting at the time and the operation would create an unacceptable level of disturbance and potentially expose birds to the risk of poisoning; hence it was rescheduled for February 2009. Both operations were led by the Project Officer, supported by MANU staff and several people from the local communities including the mayor and staff from the Service du Développement Rural (SDR). All indications immediately after and since suggest the eradication attempt has been successful.

Baseline monitoring data has been collected for all species at the four sites and given the density and probable effect of rats it is expected a significant response will be detectable for at least some sites within 2-3 years. Wherever possible the islands will be monitored annually for the next 5 years. Biosecurity plans have been implemented at each site and include information signage and surveillance station controls. For Teuaua bait stations have been established on wharves on Ua Huka to reduce the risk of accidental incursions by boats visiting the island. Island communities and landowners are the key to biosecurity, and they have all readily accepted and are actively engaged in implementing biosecurity measures. The SDR have also agreed to maintain the controls on Ua Huka.

3. Consultation and programme support

Building community support and raising awareness around the significance of seabird islands and threats to these has been an important function throughout the project. MANU have achieved this in a number of ways including engaging community leaders and institutions such as the church, which have a pivotal role in securing community support. Presentations given by MANU to schools and at public gatherings provided a common understanding of the issues facing seabird islands and benefits of managing these sites and were further supported by seabird posters and leaflets on threats and biosecurity (prepared by MANU). School children have been particularly enthusiastic and often ended up championing the need to change behaviour that was negatively affecting seabirds, encouraging peers and elders to adopt biosecurity measures.

The remote location of the islands meant local community involvement in the planning phase was predominately restricted to survey and associated island visits nevertheless this enabled feedback on project plans and input into project decision making. Local ownership of the project was and remains high, facilitated greatly by the island communities' direct involvement in logistical support services, surveys, monitoring and the eradication, and the desire to keep these islands rat (and other pests) free. Local people were trained in survey, monitoring and eradication techniques with substantial emphasis placed on developing their knowledge and understanding of biosecurity; various awareness materials were provided to support this. In order to maintain a rat-free status, communities have accepted the need for vigilance and individual responsibility in addressing island biosecurity needs. This is particularly acute for Teuaua where they understand the removal of rats may positively affect their ability to harvest Tern eggs.

From the project's inception, the Government's conservation agency (DIREN), the Ministry of Agriculture (Service du Développement Rural; SDR), researchers (ALIENS), and other key members of the alien species and seabird conservation networks were involved in the project's development. These contacts provided in kind technical support (and in the case of DIREN financial support) to the project, including with regards to site selection, surveys, restoration methods, implementation and monitoring. DIREN now recognises MANU as the premiere agency in French Polynesia capable of delivering mammalian eradication for island conservation outcomes.

4. Capacity development

With eradications previously conducted by SOP-MANU in 2006 and 2007, there was existing knowledge within the organisation (mainly with the SOP-MANU Executive Director) for the eradication of mammalian predators. This experience, together with additional guidance provided by the BirdLife Pacific

Secretariat, PII, PILN, ALIENS and other (inter)national expertise, was used to support the PO in the project implementation. Training has been provided through a combination of on the job learning, exchanges with other BirdLife Partners and formal training workshops. Examples include:

- Two weeks on-the-job field work training by experts in seabird identification and census techniques. This also provided an introduction to the customs and traditions associated with island community consultations.
- Attendance at a Pacific Invasives Learning Network meeting which provided an introduction to other alien species programmes, managers, field staff and contacts throughout the region.
- Participation in the New Zealand rodent eradication workshop where MANU staff received formal training in the eradication process, biosecurity planning and management, and associated field applications. Part of the workshop also focused on the peer review of project eradication plans with input from technical experts.
- Skills sharing and participation in SCO's baiting of the Northern lagoon islets in New Caledonia (see section on New Caledonia).
- Participation in a SOP-MANU led eradication workshop conducted by the Executive Director. The event consisted of a morning of eradication theory and an afternoon of field activities, and of a bait consumption monitoring exercise the following day.
- Training from French researchers (from the group 'ALIENS', Assessment and Limitation of the Impacts of Exotic species in Nationwide insular Systems) who provided technical assistance and support to the Teuaua field operation. In addition the group collected field data aimed at quantifying ecosystem responses to the removal of alien species.

This has enabled the PO to develop all eradication planning documentation (feasibility, operational, monitoring, and biosecurity plans), public awareness materials, public presentations, and fulfill media engagements. Additionally 2 other SOP-MANU staff have been trained in eradication planning and implementation methods. Local involvement in the project has been high particularly during the implementation phase with in excess of 20 people participating in logistical support services, surveys, monitoring and the eradication operations. In addition to developing knowledge and skills in eradication, biosecurity and survey methods, an enhanced understanding of the threats to seabirds has been developed among these island communities. For Teuaua this has resulted in an agreed harvesting regime to ensure the breeding Tern colony is sustainably managed (see '2').

5. Awareness

In addition to producing a number of awareness materials (posters and leaflets), MANU also maintained a profile of the restoration programme nationally through its newsletter (Te MANU), press articles, radio interviews, and communications with government and the MANU board of Directors. Project presentations at the Pacific Science Intercongress held in Papeete, Tahiti, in early March 2009 also enabled the Project Manager to profile MANU's work to an international audience and contributions to the Pacific Invasives Initiative and Pacific Invasives Learning Network newsletters have built a regional profile.

Annex 2 illustrates aspects of the island restoration programme in French Polynesia.

New Caledonia

1. Surveys

Determining the predator suite and seabird communities for the islets of the northern lagoon IBAs (Northwest Islets also known as the Great Reef of Koumac IBA, and Northeast Islets also known as Poindimié IBA/Cap Bayes Channel) was the focus for SCO in identifying priority sites for restoration. Of the 20 islets of importance to seabirds (in the two IBAs) the Project Officer completed sea and landbird surveys for 19 and cat and rodent surveys on 10. The latter was assisted by experts from the NZ DoC who provided field advice on survey techniques and considerations for evaluating eradication needs and feasibility. Pacific or Black rat were confirmed for 4 of the 10 islets surveyed. Of these, 3 were identified as the highest priority for eradication because of the seabird populations present. Little fire-ants are a widespread invasive species in New Caledonia and are known to prey on a number of vertebrate and invertebrate species. Their effect on breeding seabirds is not well understood but a survey to determine

their distribution among target islands was considered useful to a subsequent monitoring plan. Surveys of all ant species were conducted by an entomologist for 11 islands. A botanist from the North Province (regional administration) completed botanical surveys of 18 islands providing baseline information on native and introduced plant communities.

Four further sites (Chesterfield Islands, Walpole, Matthew, and Hunther) were included in the project for survey and assessment of restoration potential. These four sites are very remote and expensive to access, requiring multi day charters. For Walpole, Matthew, and Hunther, physically accessing the island is only possible in calm sea conditions. An opportunity to survey the Chesterfield Islands occurred early in 2007 prior to the appointment of the Project Officer. SCO staff and affiliated researchers completed seabird and alien species surveys of the group identifying rodents (recently confirmed to be Pacific rat) on one island (Ile Longue). Matthew and Hunther were visited on two occasions but for extremely limited periods as access was only possible in association with the French army. Seabird data were collected for both islands including a new record confirming White-throated Storm-petrel as breeding on Matthew. No rats were detected on Matthew and the presence of breeding Storm-petrels further validated their absence. Pacific rats were detected on Hunther and new breeding information was obtained for 14 species of seabird. There was no opportunity to access Walpole. The 70m high vertical cliffs ringing the island require a helicopter to access the 80ha plateau above which can only be done by the Army or the Navy; however there was no opportunity during the project term to do so.

2. Feasibility studies, operational planning and eradication action

A comprehensive feasibility study was completed for all 20 of the Northern lagoon islets. Consideration was given to seabird communities, social/community interests and the restoration potential associated with each site. This exercise identified the islets of Table, Tiam'bouène and Double as the highest priorities. Eradication needs have also been documented for Walpole, Matthew and the Chesterfield group (the three remote sites with introduced rodents). The removal of mice from Ile Longue (Chesterfield group) was considered to be achievable as a ground based operation and a priority due to the absence of mammalian predators elsewhere in the group. Eradication of rats from Hunther and Walpole would benefit seabird communities but would require substantial investment to secure the financial support and technical competency to conduct aerial operations. Of the two sites, Walpole is considered the highest priority because of the presence of, seabirds for which no predator free habitat exists (Goulds Petrel; vulnerable) and the island is closer to Noumea providing some logistical and cost benefits. Hunther (as is Matthew) also the top of a territorial dispute between France and Vanuatu.

In conjunction with DoC, the PO for New Caledonia completed operational planning for the lagoon islets of Table, Tiam'bouène and Double. This described methods for a ground-based bait application and dealt with associated issues including mitigation techniques for birds potentially vulnerable to the bait (Beach Thick-knee, Vulnerable) and managing public use of the islands. Monitoring indicators were identified for each island, building on vegetation, seabird, and ant data collected during the surveys. A biosecurity plan was developed with an emphasis on making recreational users aware of the rat-free status of islands and practices for preventing incursions. The biosecurity plan was prepared in conjunction with the North Province authority who in association with SCO is intending to develop a conservation strategy for both Northern lagoon IBAs. Planning decisions were peer reviewed through an eradication planning workshop held in NZ with DoC experts and attended by all project Partners. Additional comments were also provided by the SCO Board, the BirdLife Pacific Partnership Secretariat, and PII.

A network of tracks to facilitate the bait application was cut and marked for each island and bait stations established on the island margin to prevent bait exposure to Beach Thick-knee. Public warning and information signs were erected on the islands and local hospitals briefed on the bait and operation timing. Genetic samples were also collected from rats on each island. This provides the ability to determine if rats detected in the future are from the original island population (failed eradication) or another site (biosecurity breach). The practice has been applied to all islands in the programme. From early September 2008 two applications of Brodifacoum pellets at 10 day intervals were applied to all three islands. This was completed with the assistance of local people and the SOP-MANU PO and BirdLife Secretariat PM. Subsequent visits confirmed no deaths among non-target species nor identified any live rats. Formal monitoring conducted at six month intervals will confirm the ultimate eradication result by March 2010.

3. Consultation and programme support

Information sharing with stakeholders and the participation of the indigenous landowning community of the Northern lagoon islets, as well as the regional authority Province Nord, has been integral to the project's success. Province Nord provided strong support to SCO making a variety of field equipment and storage space available including office space and technical expertise (botanist). In association with SCO the Province is also developing a management plan for the Northern lagoon area, seeking to integrate island conservation needs including biosecurity with recreational and landownership interests. Fifteen consultative meetings were held to facilitate project understanding, obtain stakeholder support and develop planning needs.

4. Capacity development

Developing the technical and organisational capacity of the PO and SCO in New Caledonia has been a key feature of the project. With the support of the BirdLife Secretariat, PII, PILN and national expertise, SCO staff developed skills in alien species survey, eradication planning, implementation methods, and biosecurity practices. This has been achieved through a combination of on the job learning, experience-exchanges with other BirdLife Partners and formal training workshops. Examples include:

- Participation in seabird and predator surveys and eradication feasibility assessments for the Ringgold Islands in Fiji
- On site technical assistance and training from DoC experts in predator survey techniques, feasibility assessments and eradication planning for the Northern lagoon islets
- Training in consultation practices with indigenous communities and co-management processes, provided by the French Human Sciences researcher Patrick Daquino
- Participation in the New Zealand workshop receiving formal training in the eradication process, biosecurity planning and management, and associated field applications. Part of the workshop also focused on the peer review of project eradication plans with input from technical experts
- Participation in the SOP-MANU baiting of Teuaua islet (French Polynesia)

This set of training opportunities enabled the PO to develop all eradication planning documentation (feasibility, operational, monitoring, and biosecurity plans), public awareness materials, public presentations, and media engagements. Two New Caledonian students were involved in field activities providing them with training in survey and island conservation practices. The SCO Board was included in planning consultations which will facilitate their ability to determine future restoration strategies. Indigenous communities participated in planning and eradication implementation and obtained an enhanced understanding of seabird conservation and management practices. This knowledge will allow them to make informed landuse decisions. Specifically, 3 local people were extensively involved in survey and eradication activities for the Lagoon islets.

5. Awareness

Recreational use of the Northern lagoon islets is a popular activity among local residents. However in general, their knowledge of seabird and conservation values associated with these sites is low. An awareness campaign was aimed at improving understanding of the significance of seabird communities on these islands and threats to these colonies. Public presentations included profiling seabird conservation at community events, site visits hosted by SCO members, and the production of supporting awareness materials. Information signs have been established on rat-free islands and at boat launching sites. The project and seabird conservation was also publicised nationally through 7 press release articles, a television news item, and 3 radio interviews. Regionally the restoration programme has been profiled in PII and PILN newsletters, and BirdLife International communication networks. An information booklet on the seabird and conservation values of the Northwest IBA has been produced by a student and was circulated as part of the projects awareness materials.

Annex 3 illustrates aspects of this project in New Caledonia.

Palau

1. Surveys

The Palau Conservation Society (PCS; the implementing Partner in Palau) conducted seabird and predator surveys for all four islands within the Sonsorol state of the Southwest island group (Sonsorol, Merir, Pulo Anna, and Fanna). The only mammalian predators identified were rats, with Pacific and or Black rat confirmed on all islands. Breeding seabird colonies are present throughout Fanna (an IBA) supporting thousands of pairs of Noddys, Boobys and Great Frigatebirds.

2. Feasibility studies, operational planning and eradication action

Feasibility studies were carried out for all four islands with eradication considered feasible for all islands, however Sonsorol, Merir, and Pulo Anna were identified as more complex than Fanna. Sonsorol, Merir, and Pulo Anna are inhabited and regularly visited for extended periods by Taiwanese and Indonesian fishermen who are believed to harvest birds and are considered a high risk to the reintroduction of rodents. Sonsorol is the largest island in the group at 140ha which in combination with a dense vegetation cover, established community, domestic livestock and other eradication complexities indicated an aerial treatment would be necessary. Until recently this was not an option as no helicopters were present in Palau. As a result, Fanna was identified as the priority site for restoration. Notwithstanding the substantial challenges associated with logistics and access to Fanna, the preparation and implementation of an operation was considered within the capacity of the Palau Conservation Society and as having a high probability of success.

An eradication plan was developed by the PO (Lukes Isechal) and informed by a technical survey commissioned by PCS and conducted by Island Conservation (IC). The report listed a number of technical needs for the operation, including methods for distributing bait through the dense vegetation cover and identified the island's high crab density as a potential significant bait competitor. With no previous empirical data quantifying sowing rates and eradication results in the presence of high crab numbers, there was little information to determine an optimal rate. This issue was discussed between PCS, IC, DoC and the BirdLife Secretariat PM and it was agreed that 50kg/ha (two applications of 25kg/ha) would be adequate to ensure all rats would be lethally exposed. Monitoring activities were identified to assess this. Biosecurity needs were also identified in the operational plan and notably included actions to prevent the spread of yellow crazy ant from the population centre of Koror to Fanna.

As for all eradications there were numerous preparations in advance of departure for the operation. For Fanna, logistical challenges mainly related to the remoteness of the project site and the absence of reliable transportation options. The Sonsorol State agreed to support the operation and in early March 2009 made their boat available to transport the implementation team and equipment to the island. The operation was led by Lukes Isechal and supported by a team of 17 people comprising 5 PCS staff, the BirdLife Secretariat PM, and 12 people from the communities of Sonsorol and Koror. A team of 5 people had been present on the island previously to cut and mark the 35kms of track needed to distribute the bait. On arrival the project team completed the remaining portion of this sizeable task. By mid March island preparations were complete and team members were briefed and trained in the baiting procedures. Over a two day period 1000kgs of Brodifacoum bait was spread over the entire island and repeated 7 days later. This occurred in optimal weather conditions and rat activity was observed to decline rapidly. Monitoring confirmed bait was still available three nights after application which is a significant indicator to the probability of all rats having been lethally exposed. The island will be assessed for rat presence in March 2010 to confirm the eradication result.

3. Consultation and programme support

An extensive consultative process was a key component in the restoration of Fanna. This was largely achieved through the formation of a management committee comprising community representatives who provided feedback to the project team. This group will also develop a conservation plan for Fanna (and the Southwest Islands) and have focused on the significance of the island as an Important Bird Area, the areas tourism potential, and the biosecurity measures that need to be in place to prevent the reintroduction of rats and other invasive species. This process is expected to be completed by the end of 2009.

At the start of the month long operation the neighboring community on Sonsorol were briefed on the operation and particularly the post-eradication biosecurity needs.

State support for the project was provided in a number of ways notably from the Bureau of Agriculture and the Environmental Quality Protection Board, which assisted with biosecurity controls and the importation of rodenticide and technical advice on public health issues and storage.

4. Capacity development

Prior to this project the PO, and PCS as an organisation, had no experience in alien species eradication. Through a range of formal training, skills sharing exchanges, and on the job learning the PO has had the opportunity to develop substantial technical and practical skills in eradication processes, field techniques, seabird surveys and monitoring. Similarly the involvement of a large number of PCS staff in the operation (and aspects of planning) has provided for increased institutional capacity. Training provided included:

- Participation in the technical survey of Fanna, supported by Island Conservation, providing training in a range of techniques for detecting and quantifying alien species and other biodiversity and technical considerations to eradication
- Participation in the New Zealand workshop providing formal training in the eradication process, biosecurity planning and management, and associated field applications. Part of the workshop also focused on the peer review of project eradication plans with input from technical experts.
- Participation in an eradication training workshop held in Guam detailing planning and field practices.

The development of local and regional information networks, e.g. through the BirdLife Secretariat and Partnership, PII, PILN, IC, and DoC, provided PCS with access to a range of expertise that assisted in skills development and supported project implementation. As a result, the PO and other PCS staff completed the survey and eradication assessments for all four islands in Sonsorol state, the planning process and the eradication operation for Fanna, and established a national profile for seabird conservation and island restoration. The project also identified remaining capacity gaps that need to be filled through new partnerships or future capacity building activities. The experience gained through this project has provided PCS with a sound foundation for future island restoration programmes.

The involvement of local people and government agencies in the project has led to an increased understanding of seabird conservation and alien species management practices among these target groups. Training was provided in eradication techniques, surveys, and island biosecurity. This collaborative approach has engendered strong support for the programme and triggered requests from indigenous communities for assistance in restoring other islands in Palau, including Sonsorol island and Kayangel Atoll, both of which PCS are now progressing.

The level of community and organisational engagements associated with this operation was noted as having a positive benefit in establishing support networks and building partnerships, this process enabling expectations to be understood and managed.

5. Awareness

Knowledge of seabird conservation issues is very limited in Palau. To address this, PCS sought to raise awareness through a variety of communication networks. Press releases and radio interviews have profiled both the project and associated messages nationally, and regionally with information made available to various alien species and conservation networks. Locally, printed materials, including leaflets on threats to seabird islands, were prepared and used in support of the PCS schools education programme 'Ridge to Reef'. This programme has integrated island conservation principles into the school curriculum.

Annex 4 illustrates aspects of the island restoration programme in Palau.

ANNEX 1: IMAGES FROM FIJI



Ringgold islands

Red-footed Booby

Black-naped Tern



Building a chicken shed on Qelelevu, to protect non-target species

Loading the helicopter bucket during the Ringgold operation



The Ringgold crew including New Zealand rugby sporting personality

Seabirds on Mabualau island

ANNEX 2: IMAGES FROM FRENCH POLYNESIA



Teuaua cliffs, bringing up the bait



Training in baiting procedures



Tern colony Teuaua



Cutting baiting lines Rangiroa Atoll



Community awareness meeting



Rangiroa Atoll and Motu Tiarao and motu Hiveu

ANNEX 3: SOME IMAGES FROM NEW CALEDONIA



Northern lagoon islands



The camp during the baiting operation



Spreading the bait (Table Island)



Sooty Tern colony Chesterfield Islands



Hunther – Pacific rat present among seabird colonies



Walpole; plateau above restricted to helicopter access which wasn't possible during the project

ANNEX 4: IMAGES FROM PALAU



Unloading the bait on Fanna Island



Isolating alternative food sources for rats during the bait operation



Team briefing prior to the baiting operation



Applying bait following Health&Safety guidelines



**Lukes Isechal (PO) and Yalap Yalap (PCS),
Brown Boobies, Fanna**



Team photo