PD-ABZ-610

Conservation of Fijian Forests: Building Conservation Landscapes into Forestry Operations & Forest Certification

Twelve Month Project Report: Highlighting the Second Quarter of June 1, 2003 to October 1, 2003

A Project of the Wildlife Conservation Society Supported by USAID/EAPEI Program

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PROGRESS IN SECOND QUARTER OF PROJECT (June 1, 2003 to October 1, 2003)

Summary of Second Quarter Results by Objective & Activity

Objective 1: Mapping Fijian Forests from a Biodiversity & Ecosystem Perspective

Activity 1.1. Biological provinces for Fijian plant and animal taxa.

- The biological province analyses for birds and reptiles and amphibians are complete. Report is attached.
- The plant analyses are almost complete, targeted field surveys on the genera of *Cyrtandra* and *Psychotria*, useful taxa as indicators of local endemism, are underway to refine the provincial lines suggested by mapping of localities in the flora. Roughly 200 plant species with ranges less than 1600 km^2 were identified. These are species of conservation concern. Geographic gaps in plant collecting have been mapped.
- The invertebrate analyses are nearing completion. Field sampling for invertebrates is complete for all major islands and mountain ranges and the species analyses in the lab are nearly completed. The land snail analyses should be completed this month.
- The freshwater fish analysis is complete. The report is attached.
- The synthesis of this biogeographic work will determine the level of representation of forest blocks necessary to conserve the full range of Fijian forest communities. Synthesis workshop is planned for January 2004.

Activity 1.2. Mapping Special Elements of Biodiversity for Protection with a Forest Reserve Network

- Heritage Tree Report completed and disseminated, Fijian Affairs Board is currently developing a Heritage Tree program that they will manage. Three heritage tree sites and communities have been identified to inaugurate the program. The report is attached.
- Priority sites for freshwater biodiversity have been identified in freshwater fish analysis.
- Plant species known from only 1-3 localities have been mapped.
- Important caves, montane thickets, and anchialine pools have been mapped.
- Priority sites for several locally endemic herps have been mapped.
- Last remaining dry forest sites surveyed and prioritized. New population of the critically endangered Fijian Crested Iguana was discovered in this process.

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Activity 1.3. Identifying minimum requirements for reserve size, configuration, and connectivity within reserve networks.

- Initial field work on masked shining parrot completed, additional nesting studies underway.
- Field work on giant forest honeyeater completed and paper is being developed.
- Alien species refuge fieldwork and analysis nearing completion. Eighty-six localities have been sampled so far. The results suggest that the activity of alien rats and mongoose on baits declines as one moves into more remote forests. After 5 km, activity levels on baits (1 night, 200 baits & 1 month, 200 wax baits, trees and ground) are zero, while 200 are typically taken in a single night at 1 km. This preliminary data suggests that remote forests may offer a refuge to native species (Fig. 1) that are sensitive to the depredations of rats and mongoose. Such areas may offer the only habitat within the larger islands where they can have positive reproductive rates–all other forested habitat would act as population sinks. A similar phenomenon is seen in North American deciduous forests for migratory songbirds and meso-predators like racoons. Given this initial data, it would be prudent to try to protect the remote nature of these "refuge" areas. Roads apparently allow rats and mongoose access to remote forests, so logging roads should be diverted away from such areas. An analysis of potential remote forests on Vanua Levu and Viti Levu was carried out using a 5 km inward buffer from the forest edge (Figs. 2, 3). A few of these areas are already identified as priority sites and landscapes, but no formal protection exists. Some may be too small to function as viable refugia over the long-term, and others are already targeted for logging. *This result, combined with information on local endemism and minimum-area requirements, may form a foundation for a certification strategy.* We are now conducting extensive field surveys in remote forests to assess if populations of sensitive species are higher in these areas. This is a significant finding for conservation on Pacific islands and has major implications for forest conservation on Samoa, New Caledonia, Vanuatu, and the Solomon Islands. We will submit the technical paper on this ground-breaking work to *Nature* or *Science*.

Figure 1. The rare pink-billed parrotfinch and endangered *Placostylus* landsnail are two native species sensitive to rat and mongoose predation.

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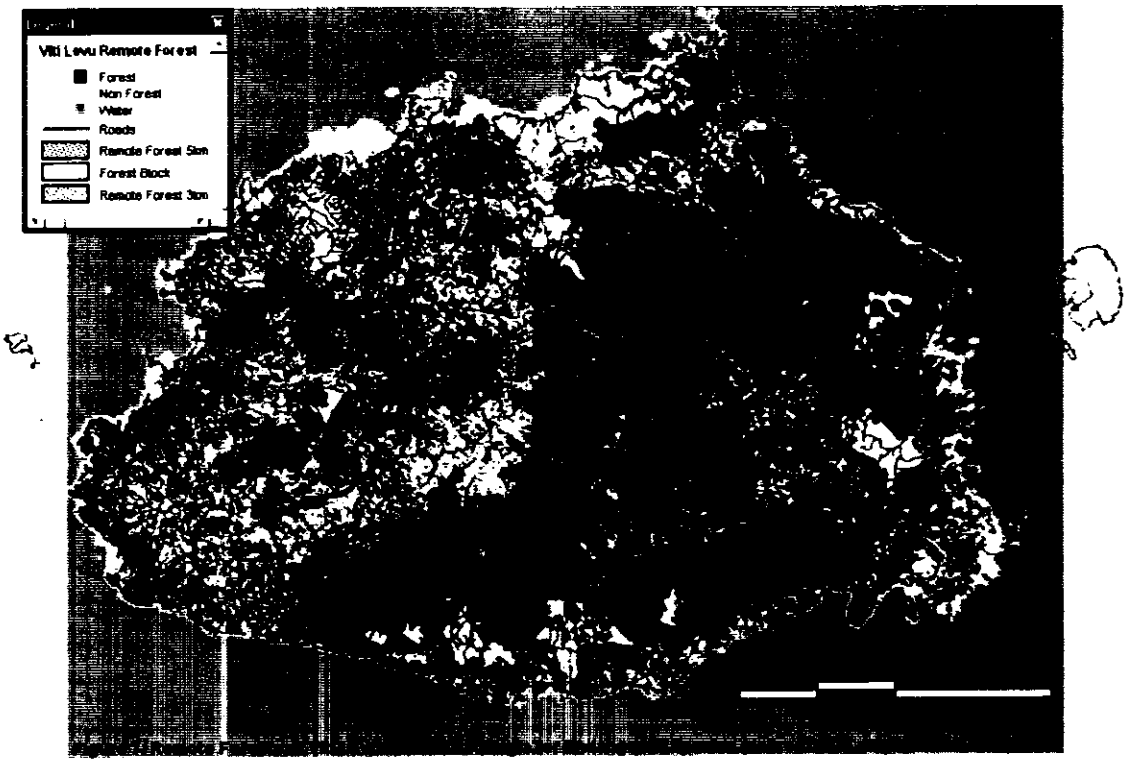

Figure 8. Remote Forests of Vanua Levu: Potential Refugia for Endangered Species (source: WCS, unpublished data).

Figures 2 & 3. Remote forests of Viti Levu, Vanua Levu, and Taveuni may function as a last refuge for many native species that are sensitive to the depredations of rats and mongoose. Remote forests may form the core of a forestry certification strategy.

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Activity 1.3. Preparation and analysis of GIS database.

- The following data layers have been obtained or developed and are available for analyses: forest cover, logging roads, logging concessions, plantations, forest function maps by Forestry Department, primary & secondary roads, province boundaries, district boundaries, landowner units, villages & towns, forest reserves, nature reserves, & conservation areas, primary & secondary watersheds, rivers & streams, localities for locally endemic plants, collecting sites for all plants in Fiji Flora, sampling sites for all research projects, digital terrain model & topography, soils, rainfall, and geology. We employ MapInfo and ArcView Spatial Analyst as our GIS software.

Activity 1.4. Field-research station established.

- Two good sites near Suva were surveyed and extensive negotiations with landowners were conducted. Landowner politics have stalled the effort and we are considering reallocating resources to other priority activities, even though a field station would be a very good thing for certification and research efforts here. The field station would have linked to a forest conservation area that we hoped would act as a catalyst for other landowner commitments, especially as they would pertain to logging within a certification scheme.

Objective 2: Forest Conservation Landscapes

Activity 2.1. Mapping intact, degraded, and altered forests of Fiji. This data layer is critical for assessing the conservation status of different forest types and distinct biological provinces, and ultimately for designing reserve networks and determining priority forest blocks.

- We have mapped forest cover, watersheds, primary and secondary roads, logging roads, logging concessions, digital terrain models, forest function classifications, pine and mahogany plantations, villages & towns. We are nearing completion of a slope analysis and an ecosystem service analysis by watershed. The forest buffering has been completed for the rat and mongoose refuge analysis.

Activity 2.2. Threats and Opportunities to Fijian forests will be mapped and analyzed.

- A threat datalayer based on roads, slope, elevation, forest cover and fragmentation, and concessions is nearing completion. An opportunity layer based on land ownership, remoteness, forest block size, terrain, and concessions is also being developed. These layers will inform the final synthesis workshop to develop a proposed conservation landscape, which will act as the foundation for landscape certification.

Activity 2.3. Conservation landscapes for Fijian forests workshop.

- WCS conducted a workshop and wrote the report for the Fiji Profile for the Critical Ecosystem Partnership Fund which provides funding for terrestrial biodiversity projects in the region.

- A Forest Certification and Conservation workshop and fieldtrip is planned for January. Forestry is sponsoring the event and has assisted in developing a list of 40 participants from Forestry, the forestry industry, and government agencies.
- Conservation landscape synthesis workshop planned for late January, 2004.

Objective 3: Addressing Landscape Issues in Forestry Practices and Certification Guidelines

Activity 3.1. Preliminary analysis of the efficacy of different approaches for implementing the proposed conservation landscape.

- Two analyses completed. Lemeki Lenoa is one of the key individuals for certification efforts here in Fiji and establishing a working relationship with him has been very important. Reports attached.

Activity 3.2. Informal workshops with representatives of the forestry sector, natural resource agencies, ecotourism board, NGOs, Fijian Affairs Board, and the Native Land Trust Board to discuss relative merits of different approaches for implementing a conservation landscape.

- Biodiversity Strategy Action Plan Meeting attended and invited to participate in advisory committee
- Presentation given to Forestry Certification Committee.
- Presentation given to Forestry Practice Standards Working Group.
- WCS is NGO representative to the Fiji CITES Scientific Authority.
- Meeting with Forestry Stewardship Council (FSC) Office in Washington, D.C. to discuss collaboration on certification efforts for Fiji forestry and specifics on certification on plantation forests. Meetings with WWF-US Forest Program (Bruce Cabarle, Director) and discussed collaboration with their USAID grant for finding markets for certified products. One goal was to identify other certification groups, companies involved or interested in certification, and new advances in certification approaches.
- Project update given to U.S. Ambassador.
- Project presentation given to other regional NGOs and South Pacific Region Environment Program representatives in Samoa.

Activity 3.3. Forest Heritage Awareness Campaign

- Pilot Forest Conservation & Certification Awareness Program for priority forest villages in Namosi, Viti Levu completed. Ten villages and schools in Namosi received presentations and materials. Draft report nearing completion.

Objective 4: Building capacity of government staff, local communities and staff of timber companies to address landscape-scale issues related to resource sustainability and biodiversity conservation

Activity 4.1. Seminars on forest conservation, designing forest conservation landscapes, and forestry practices at the site and landscape-scale which are relevant for forest conservation and forest certification. (Please refer to Activity 2.3)

Activity 4.2. Monitoring system with which to periodically check on the status of different forest types, biological provinces, key species, and conservation landscapes.

- Initial discussions with Forestry and Environment held regarding long-term monitoring of forests and biodiversity. The CEPF and NBSAP workshops had discussions relating to monitoring, as well.

Summary of Second Year Approach

The proposed conservation landscape will be completed in January. This will be reviewed by local specialists and then presented to Forestry, the Environment Department, and the Provincial Offices. The first meeting of the new Forestry Department Certification Board will take place in February and we are working to develop a presentation and become a member of this board. The upcoming certification workshop will introduce conservation and certification issues to forestry staff and industry workers. Presentations will also be given to Fiji Hardwoods, who manage the important mahogany estate. The project will contribute to forest conservation in five major ways:

- First, the conservation landscape map will identify priority forests that should be reconsidered for reclassification during the upcoming revision of the Forestry Department's Forest Function map. The classifications on this map determine which forest areas can have logging licenses issued. We know, at a minimum, that we will argue that core remote forests should be reclassified as strict conservation areas and that road building should be prohibited within an effective bugger zone.
- Second, we will work with Fiji Hardwoods to have the mahogany plantations certified. Fiji Hardwood is interested in certification, particularly as it relates to the development of new mahogany plantations. Mahogany is such an important economic force in Fiji that any certification effort will help propel certification programs for native forests.
- Third, we will identify several high priority forests and work directly with communities there to integrate their proposed logging operations into a certification scheme. We believe this activity can catalyze conservation commitments from landowners over much larger areas, and that linking adjacent "conservation areas", perhaps along mountain ridgelines, can effectively produce landscape-scale conservation areas.
- Fourth, the data and analyses that we have produced, and the conservation and certification principles that we have presented, should help infuse a greater awareness of conservation issues and approaches into all aspects of Fiji's forestry and environment programs.
- Fifth, many Fijians have had opportunities to conduct field research and be involved in this forestry and conservation program, and they have been exposed to the conservation principles underlying our approach. In our experience, many of the students and staff we have worked with will have a major influence on forest policy and conservation in the future, and their decisions will be informed by their association with this project.

In summary, we have created a solid foundation for a functional and effective certification program to be established in Fiji over the next several years.

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Appendix 1. Summary of WCS and Partners Matches for June 1, 2003 to October 1, 2003

!NEW MATCHES IN *ITALICS*!

BirdLife International – Fiji	
Darwin Project (bird surveys throughout Fiji)	$60,000
National Biodiversity Strategy Action Plan Workshop	$3,000
University of the South Pacific	
Koroyanitu Field Survey & Training Course	$3,000
Sovi Basin Field Survey & Training Course	$18,000
PABITRA Field Trip to Wabu	*$14,000*
WCS	
Conservation of the Fijian Giant Longhorn Beetle	$25,000
Gau Forest Survey and Conservation of the Fiji Petrel Assessment	$5,000
Small Grant to The National Trust for Fiji Yadua Taba Dry Forest Conservation and Restoration Project	$1300
Field visit and consultation with WCS Asia-Pacific Director and Assistant Director	$7,000
WCS South Pacific Program Director consultations	
University of Hawaii, USFWS Pacific Forestry Division	$4,000
Forest Certification specialists (WWF, WRI, TNC, CI, FSC, etc.)	$4,000
Salary for Program Director	$65,000
WCS South Pacific Program operation costs	$50,000
WCS South Pacific Program operation costs	*$15,000*
World Wildlife Fund	
Fiji Marine Ecoregion Workshop (forest watershed analyses)	*$25,000*
Wetlands International – Oceania	
Watershed and fish surveys (assessment of freshwater biodiversity and ecosystem services)	$20,000
Republic of the Fiji Islands Government	
Ministry of Fisheries and Forests Certification Working Group	*$10,000*
SOPAC	
GIS data analyses and datasets	*$10,000*
Critical Ecosystem Partnership Fund	
Fiji's Terrestrial Conservation Priorities Analysis and Workshop	*$40,000*
PREVIOUS TOTAL	**$427,000**
NEW MATCH TOTAL	**$531,000**

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Appendix 2. Summary of Fiji Forest Project

This 2-year project evaluates the conservation status of Fiji's natural forests and explores the utility of landscape-scale forestry certification as a tool for conservation of natural forests. We work with landowners, government agencies, scientists, and the forestry sector to gain a better understanding of the conservation requirements of the wildlife and ecosystems of Fiji's forests, and to evaluate if the current and proposed forest reserve network effectively achieves conservation goals. This project has many different facets – from assessing the rarity of plant species to looking at the conservation value of forest certification based on landscape-scale conservation strategies. We work together with a wide range of organizations, resource agencies, industries, and local communities on different activities of the project.

The tropical forests of Fiji are among the most distinctive in the world. Many of the plants and animals of Fiji appear to be derived from communities associated with the ancient landmass of Gondwana. These include one of the most primitive flowering plants in the world, *Degeneria*, relict elapid snakes and iguanas, and a large variety of invertebrates whose taxa are only known to occur from ancient landmasses. Like Madagascar and New Caledonia, the plants and animals of Fiji suggest that the islands are a long-isolated remnant of a continental fauna. Fijian forests also contain a wealth of endemic species spawned from the long isolation of the archipelago. This combination of features makes Fijian biodiversity highly distinctive at a global and regional level.

Today, deforestation from agriculture and settlement in the lowlands, and exploitation of remaining native forests for timber and plantations have brought natural forest cover to around 40 percent. In coming decades, demand for timber and wood products, both internationally and domestically, is projected to increase dramatically. In order to assist in the implementation of the National Biodiversity Strategy (NBSAP) and to promote the rational use of renewable resources, WCS is initiating a project that will gather further scientific information on the wildlife and habitats of Fijian forests and work together with the government, landowners, and the forestry sector to ensure that an adequate network of conservation areas is secured. Specifically, we intend to help contribute to information gaps identified in the NBSAP, and to explore the utility of forestry certification guidelines that help achieve landscape-level conservation and renewable-resource goals.

Conservation Across Landscapes and the Role of Forest Certification

Because the pace of deforestation and logging is rapid, and remaining blocks of forests are increasingly broken into smaller blocks, there is a limited window of opportunity to develop a long-term, landscape-scale conservation strategy for Fijian forests through the implementation of the NBSAP. This strategy should effectively address conservation goals at the landscape level, as well as help refine management guidelines for production forests, plantations, and protected natural forests to ensure that they conserve biodiversity, maintain ecological services, and meet the needs of local peoples and economies. Fiji is interested in accessing more international markets for its timber products by making them more attractive through a robust certification process. A major

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aim of this project is to integrate landscape-scale conservation and renewable resource issues into certification guidelines. If successful, Fiji's wood products would be recognized as one of the very few operations in the tropics where this has been accomplished. This would represent a major selling point for international markets.

The Fiji National Code of Logging Practices specifies operational details concerning logging equipment, construction of roads, skid trails and landings, protection of watercourses, equipment safety, and training. Environmental concerns are largely focused on reducing erosion through slope restrictions, stream buffers, and road-building guidelines. Forestry certification efforts, spearheaded internationally by the Forest Stewardship Council, have also made great advances in identifying forestry practices that are compatible with reducing environmental damage at local scales. The problem, however, is that guidelines for logging practices and certification requirements for logging operations typically do not address landscape-scale requirements for the conservation of biodiversity or ecological services. In order to design effective conservation and resource landscapes, several important questions dealing with landscape-scale patterns and processes need to be fully addressed including:

- How much habitat area is required to maintain viable populations of the most area-sensitive native species? How important are remote forests to maintain native species that are particularly sensitive to rat predation?
- How much habitat area is required to maintain populations of these species to ensure their ecological function, such as seed dispersal or pollination, is maintained throughout the ecosystem? (Note: Species densities for functionality may be greater than for viable populations).
- What kind of replication of conservation areas is necessary to maintain the long-term persistence of wide-ranging species in Fiji?
- Can forestry operations be designed to reduce the impact of habitat fragmentation on sensitive species? Which species are most sensitive to fragmentation?
- Are there certain forestry practices that should be avoided or encouraged to promote the persistence of non-timber forest products in harvested areas and across whole landscapes?
- How should forested watersheds be managed to maintain critical ecological services, such as flood control or persistent stream flow?
- What level of connectivity between forest blocks is necessary to maintain landscape-scale movements of key species and gene flow, seed dispersal, and pollination among populations of harvested species? How wide should corridors be to be effective? What level of habitat degradation is acceptable?
- How important are lowland forests to various focal species (e.g., shining parrots) and how should altitudinal habitat corridors be designed to maintain seasonal movements or provide access to lowland cyclone refugia from mobile species?
- How should forestry operations and conservation areas be designed to minimize the spread of alien species into natural forests?

It is these kinds of issues that will ultimately determine the fate of many species and ecological processes across landscapes, and the sustained renewal of natural resources

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and ecosystem services for Fijians. We hope to help bridge the gap between forestry codes and certification and new approaches in designing effective Forest Resource and Conservation Landscapes. Such landscapes, which map forestry production zones, core conservation areas, buffers zones, and habitat corridors, are the most cost-effective way to ensure that extinction is halted and natural forests continue to provide renewable resources and ecological services into the future. A successful strategy for Fijian forests can act as a model for other forest situations throughout the Pacific and beyond. Close collaboration between the Wildlife Conservation Society, the forestry sector, Fijian biologists, and local communities is critical to accomplish this work and to ensure the results are implemented on the ground.

The National Biodiversity Strategy Action Plan (NBSAP) for Fiji was recently passed by the Fijian Parliament. This is an important step for conservation in Fiji, and the WCS forest project is viewed by the Fijian Government as a contribution towards implementing the NBSAP. Our objectives and activities all fall within the scope of the NBSAP. We are coordinating with the Department of the Environment to ensure that project priorities and activities are closely linked with those of the NBSAP.

Project Leaders
Linda S. Farley (Project Director), Alexander Patrick (Project Coordinator), David M. Olson (Program Director)

Other Staff
Lice Cokanasiga is a project intern. We are also working with fifteen USP students and four University of the South Pacific professors on various sub-projects. Three Foresty Department staff and one Department of the Environment staff are also working with us on various projects. We also have seven field and research assistants.

Collaborators and Other Institutional Affiliations
Fiji Department of the Environment, Conservation Unit; Ministry of Fisheries and Forests; Fijian Affairs Board; Provincial Offices; Ministry of Tourism; Ministry of Education; National Trust for Fiji; University of the South Pacific; Fiji Hardwoods; WWF; SOPAC; SPC; SPREP; Native Land Trust Board; BirdLife Fiji; Wetlands Oceania; University of Illinois; New Zealand Landcare Research; Bishop Museum; Ministry of Lands; Critical Ecosystem Partnership Fund, Conservation International

Project Duration
October 1, 2002-October 1, 2004

Approved Budget
$400,000 USD
$600,000 WCS & Partner Match (please refer to accompanying summary of matches to date)

APPENDIX 3. DETAILED DESCRIPTION OF FIRST-YEAR PROJECT ACTIVITIES

Objective 1: Mapping Fijian Forests from a Biodiversity & Ecosystem Perspective

Activity 1.1. Working together with regional biodiversity specialists and students, we will develop a consensus map of biological provinces for Fiji that will provide a guide for minimum representation for forest reserves. This activity will involve a synthesis of existing data and targeted field research for forest types and several key taxa including plants, invertebrates, reptiles and amphibians, birds, and freshwater fish. We anticipate that some field research will be necessary due to the lack of distributional data for many taxa of Fijian forests. This analysis will also highlight high priority forests in Fiji that require special conservation attention, and provide training opportunities for students and natural resource agency staff.
Results/Output anticipated: We will conduct two local workshops with regional experts and students. These are intended to introduce and, after the research is concluded, review proposed biotic provinces intended to be used for assessing the ability of existing reserves to represent Fijian forest communities. Consensus maps of biogeographic provinces and sub-provinces for biota of Fijian forests will be developed. Bioregionalization maps for several taxa including plants, forest floor invertebrates, birds, herps, and freshwater fish will also be proposed. Different forest types, including distinct cultural ecosystems, will be mapped. These studies can result in scientific papers on the richness, endemism, and distribution patterns of Fijian forest taxa being submitted to peer-reviewed journals by researchers and students.
Collaborators: Regional Herbarium of the South Pacific, Institute of Applied Sciences, University of the South Pacific (USP); Department of Geography (USP), Department of Biology (USP); BirdLife Fiji; Wetlands International-Oceania; SOPAC; University of Illinois; Ministry of Fisheries and Forests; Department of the Environment; local landowners; Bishop Museum

Activity 1.2. Mapping Special Elements of Biodiversity for Protection with a Forest Reserve Network
Results/Output anticipated: This analysis maps out special biodiversity features that should be considered for inclusion within a reserve network. These include old-growth groves of *Dakua* (*Agathis macrophylla*) and *Yaka* (*Dacrydium nidulum*) (Fijian Heritage Trees), caves with unusual fauna, karst (limestone) and ultramafic soils, freshwater lakes, or populations of rare or endangered species. Mapping these features will require consulting with specialists and reviewing existing information, workshops with local communities and natural resource agency staff to identify heritage trees, and some targeted field surveys. Forests with particular cultural significance will also be identified and mapped. We have conducted the Heritage Tree workshop in March.
Collaborators: Regional Herbarium of the South Pacific, Institute of Applied Sciences, University of the South Pacific (USP); Department of Geography (USP), Department of Biology (USP); BirdLife Fiji; Wetlands International-Oceania; Ministry of Fisheries and Forests; Department of the Environment; local landowners; SOPAC; Bishop Museum; Fijian Affairs; Department of Tourism.

Activity 1.3. Identifying minimum requirements for reserve size, configuration, and connectivity within reserve networks. We will work with students, researchers, agency staff, and forestry sector staff to estimate the size and connectivity of reserves that is necessary to make them viable over the long-term. This activity asks how much forest is enough to maintain viable populations of key species, how linked do forest blocks need to be, and how should reserves be designed to reduce the impact of alien species.
Results/Output anticipated: This activity will look at the minimum-area requirements for area-sensitive species such as the Masked Shining Parrot, the Giant Honeyeater, and metapopulations of *Agathis* trees. We will also measure the ability of forest specialist species, such as the honeyeater and parrot, to disperse across non-forest habitat. The presence and nature of seasonal and altitudinal migrations of birds and insects will also be assessed. We will investigate the relative impact of alien species, such as rats and mongoose, within remote forests and near roads, and the nature of the spread of invasive plants such as *Meremia*. We will also look at aspects of forest structure (e.g., the presence of large trees) that will enable sensitive species, such as parrots and endangered giant longhorn beetles, to survive into the future. We

anticipate that at least 6 technical papers will result from this activity, as well as a series of recommendations regarding reserve size, configuration, and connectivity.
Collaborators: Regional Herbarium of the South Pacific, Institute of Applied Sciences, University of the South Pacific (USP); Department of Geography (USP); BirdLife Fiji; Dick Watling; New Zealand Department of Wildlife; Ministry of Fisheries and Forests; Department of the Environment; local landowners; SOPAC.

Activity 1.4. Preparation of GIS database for biological layers. The information produced from the representation mapping, special element mapping, and reserve design guidelines needs to be standardized and developed into a tractable GIS database for the subsequent design of conservation landscapes for Fijian forests.
Results/Output anticipated: Working with a GIS team at SOPAC, we will input data from the various studies on biodiversity patterns and develop a useful GIS database. This database will ultimately be available to all potential users. SOPAC is providing data and technical services.
Collaborators: SOPAC;Regional Herbarium of the South Pacific, Institute of Applied Sciences, University of the South Pacific (USP); Department of Geography (USP), Department of Biology (USP); BirdLife Fiji; Wetlands International-Oceania; Ministry of Fisheries and Forests; Ministry of Lands; Department of the Environment; local landowners; Bishop Museum

Activity 1.5. This activity will establish a basic field-research station in the mountains behind Suva. In order to facilitate field research associated with this program, there is a need to have a field research facility in good natural forest that is relatively near Suva, the capital (where USP and government offices are located). We have identified several candidate localities near Suva.
Results/Output anticipated: The field station will consist of a small building with lab benches, basic cooking facilities, piped water, road access, and a system of trails for research projects. Negotiations with landowners, cost estimates, and design are underway.
Collaborators: Regional Herbarium of the South Pacific, Institute of Applied Sciences, University of the South Pacific (USP); Department of Geography (USP), Department of Biology (USP); BirdLife Fiji; Ministry of Fisheries and Forests; Department of the Environment; local landowners.

Objective 2: Forest Conservation Landscapes

Activity 2.1. Mapping intact, degraded, and altered forests of Fiji. This data layer is critical for assessing the conservation status of different forest types and distinct biological provinces, and ultimately for designing reserve networks and determining priority forest blocks. We will access this data and analyze it within the context of major forest types, biological provinces, and intact watersheds for ecosystem services. We will also identify the larger remaining blocks of forest, those with the greatest core area to reduce impacts of alien species, and those areas that are best for intact altitudinal transects and forest corridors among larger forest blocks. Key cultural forest ecosystems will also be mapped.
Results/Output anticipated: This activity will result in several reports and maps that assess the conservation status of different forest types and biological provinces, identify larger blocks of remaining forest and larger core areas, and map intact altitudinal transects and corridor areas. A technical paper will be associated with this work and all analyses and data will be available to interested users.
Collaborators: SOPAC; Regional Herbarium of the South Pacific, Institute of Applied Sciences, University of the South Pacific (USP); Wetlands International-Oceania; Ministry of Fisheries and Forests; Department of the Environment.

Activity 2.2. Threats to Fijian forests will be mapped and analyzed. We will analyze the remaining forest cover of Fiji and assess the conversion and degradation potential of different forest areas on the basis of their timber value, accessibility to logging operations (e.g., steep slopes, road access), sensitivity to climate change, and forest classification. Opportunities for conservation will also be mapped and analyzed. This will entail an analysis and mapping of land tenure, forest classifications, ecotourism potential, plantation and alternative crop assessments, forest restoration potential, and non-timber forest product potential.

Results/Output anticipated: A map and report on the projected threats and opportunities for conservation within Fijian forests will be developed. A technical paper associated with this analysis will also be produced.
Collaborators: SOPAC;Regional Herbarium of the South Pacific, Institute of Applied Sciences, University of the South Pacific (USP); Department of Biology (USP); BirdLife Fiji; Wetlands International-Oceania; Ministry of Fisheries and Forests; Department of the Environment; local landowners.

Activity 2.3. A workshop to design a conservation landscape for Fijian forests will be conducted after key data layers, such as biological provinces, minimum-area guidelines, and threat and opportunity maps, become available.
Results/Output anticipated: We hope to review the results of the different activities discussed above and work towards designing a conservation landscape for Fijian forests that will contribute to the implementation of the NBSAP. Different alternative landscapes can be developed that achieve different levels of conservation goals. A report, map, and digital database will be produced and made widely available. The foundation for this key workshop will be the NBSAP and project results from 2003.
Collaborators: Regional Herbarium of the South Pacific, Institute of Applied Sciences, University of the South Pacific (USP); Department of Geography (USP); Department of Biology (USP); SOPAC; BirdLife Fiji; Wetlands International-Oceania; University of Illinois; Ministry of Fisheries and Forests; Department of the Environment; local landowners; Bishop Museum

NOTE: The balance of investments will shift towards Objectives 3 and 4 in FY2004 as implementation and training become the major focus of the program.

Objective 3: Addressing Landscape Issues in Forestry Practices and Certification Guidelines

Activity 3.1. We are conducting an initial analysis of the efficacy of different approaches for implementing the proposed conservation landscape.
Results/Output anticipated: We are assessing the relative value of different approaches for an on-the-ground and long-term strengthening of the forest reserve system based on the proposed conservation landscape of this project. These approaches, or incentives, include certification of forestry operations and products, reclassification of forest classes for high priority areas, forest plantations (pine, mahogany, native trees spp.) in buffer and degraded areas to take pressure off of natural forests, carbon credits, non-timber forest products and alternative crops, ecotourism projects and economic benefits of a reserve system to ecotourism as a whole, trust funds, support through partnerships with religious denominations, and targeted efforts to work with landowners of high priority forests, etc. The results of this analysis will determine the focus and level of effort on different approaches for the project. A report will be available in early 2003.
Collaborator: Ministry of Fisheries and Forests; Department of the Environment; Lemeki Lenoa; Dick Watling; Cedric Schuster (consultants); Fiji Hardwoods; Robinson Timber.

Activity 3.2. Informal workshops with representatives of the forestry sector, natural resource agencies, ecotourism board, NGOs, the Native Land Trust Board, etc., to discuss relative merits of different approaches for implementing a conservation landscape. This body will act as an informal steering committee and facilitate communications with the government, forestry sector, NGOs, and academic groups.
Results/Output anticipated: Reports from the workshops of early 2003 will be used to guide activities and investments in later stages of the project.

Activity 3.3. A modest Forest Heritage Awareness Campaign will be developed to raise awareness of the inherent natural and cultural value of Fijian forests. An awareness program for schools is being developed and will be first presented in the Namosi Province where high priority forests occur. The education curriculum is being developed in coordination with the Department of Environment, Department of Education, and the Ministry of Fisheries and Forests. A video aired on Fiji One TV and conservation songs created by Delai Dokidoki and Black Rose are most useful for reaching communities throughout Fiji. This

effort offers a context for communities who may be later approached to discuss establishing conservation areas on their land. This linkage to familiar programs is important for the success of conservation work with local landowners. We are working with the The National Trust for Fiji, the Department of the Environment, and MAFF on this campaign.
Results/Output anticipated: The education program is being developed at the moment. Short TV clip on the cultural and natural value of Fijian forests, two popular songs on forest conservation by the two most popular groups in Fiji.
Collaborators: The National Trust for Fiji; Ministry of Education; DokiDoki; Ministry of Fisheries and Forests; Department of the Environment; Provincial Offices; Fijian Affairs.

Objective 4: Building capacity of government staff, local communities and staff of timber companies to address landscape-scale issues related to resource sustainability and biodiversity conservation

Activity 4.1. We will conduct a series of seminars on forest conservation, designing forest conservation landscapes, and forestry practices at the site and landscape-scale that are relevant for forest conservation and forest certification. All the activities described above, from the field research, various analyses, and workshops will help raise awareness, build-capacity, and train Fijian students, government staff, forestry industry staff, ecotourism staff, and NGO staff about goals and approaches of forest conservation. We hope these lecture seminars will be conducted in partnership with agencies, universities, industry, and NGOs. Three field trip seminars will also be given to illustrate forest conservation principles. Students and staff from agencies will be engaged in preparing and delivering these seminars.
Results/Output anticipated: Four lecture seminars on forest conservation and three field trip seminars will be conducted before the end of 2003. Notes from each of these seminars will be available.
Collaborators: Regional Herbarium of the South Pacific, Institute of Applied Sciences, University of the South Pacific (USP); The National Trust for Fiji; Department of Geography (USP), Department of Biology (USP); BirdLife Fiji; Wetlands International-Oceania; Ministry of Fisheries and Forests; Department of the Environment; local landowners.

Activity 4.2. We will develop a system with which to periodically check on the status of different forest types, biological provinces, key species, and conservation landscapes. This monitoring system will be useful for conservation planning and evaluation for forest certification for particular operations in the future.
Results/Output anticipated: A modest monitoring system will be proposed, with a focus on monitoring high priority forests and checking on selected logging operations. The system will be predictive, inexpensive, low technology, and uncomplicated. A draft system will be developed by the end of 2003 and responsible parties and long-term support identified.
Collaborators: SOPAC; USP; Ministry of Fisheries and Forests; Department of the Environment.

Species	Endemic (E) or Native (N)	Latitude (degrees + minutes S)	Longitude (degrees + minutes) note: not decimal degrees
Brachylophus fasciatus	N	16.24	179.22E
Brachylophus fasciatus	N	16.37	178.36E
Brachylophus fasciatus	N	16.40	179.55E
Brachylophus fasciatus	N	16.40	178.42E
Brachylophus fasciatus	N	16.45	179.45W
Brachylophus fasciatus	N	16.46	179.33E
Brachylophus fasciatus	N	16.48	178.32E
Brachylophus fasciatus	N	16.48	178.19E
Brachylophus fasciatus	N	16.52	179.51W
Brachylophus fasciatus	N	16.69	179.52W
Brachylophus fasciatus	N	17.27	179.58E
Brachylophus fasciatus	N	17.32	178.14E
Brachylophus fasciatus	N	17.37	177.52E
Brachylophus fasciatus	N	17.39	178.48E
Brachylophus fasciatus	N	17.41	178.48E
Brachylophus fasciatus	N	17.44	178.02E
Brachylophus fasciatus	N	17.57	177.43E
Brachylophus fasciatus	N	17.58	178.34E
Brachylophus fasciatus	N	18.03	178.38E
Brachylophus fasciatus	N	18.05	178.22E
Brachylophus fasciatus	N	18.07	177.25E
Brachylophus fasciatus	N	18.09	178.15E
Brachylophus fasciatus	N	18.09	177.31E
Brachylophus fasciatus	N	18.23	178.07E
Brachylophus fasciatus	N	17.58	179.17E
Brachylophus fasciatus	N	18.50	178.37E
Brachylophus fasciatus	N	18.56	178.30E
Brachylophus fasciatus	N	18.58	178.23E
Brachylophus fasciatus	N	19.07	178.02E
Brachylophus fasciatus	N	19.07	178.00E
Brachylophus fasciatus	N	17.15	179.08E
Brachylophus fasciatus	N	18.57	179.48W
Brachylophus fasciatus	N	17.01	179.16W
Brachylophus fasciatus	N	17.14	178.56W
Brachylophus fasciatus	N	17.15	178.57W
Brachylophus fasciatus	N	17.16	179.10W
Brachylophus fasciatus	N	17.17	179.10W
Brachylophus fasciatus	N	17.45	179.21W
Brachylophus fasciatus	N	17.41	178.40W
Brachylophus fasciatus	N	18.13	178.45W
Brachylophus fasciatus	N	18.17	178.43W
Brachylophus fasciatus	N	18.26	178.30W
Brachylophus fasciatus	N	18.18	179.16W
Brachylophus fasciatus	N	18.37	178.30W
Brachylophus fasciatus	N	18.51	178.52W
Brachylophus fasciatus	N	19.06	178.33W
Brachylophus fasciatus	N	17.45	177.07E
Brachylophus fasciatus	N	17.36	178.40E
Brachylophus fasciatus	N	17.47	179.26E

Brachylophus fasciatus	N	18.32	177.37E
Brachylophus vitiensis	E	16.49	178.19E
Brachylophus vitiensis	E	17.20	178.09E
Brachylophus vitiensis	E	17.21	178.02E
Brachylophus vitiensis	E	17.45	177.07E
Brachylophus vitiensis	E	17.37	177.06E
Brachylophus vitiensis	E	17.07	176.58E
Brachylophus vitiensis	E	17.17	177.07E
Brachylophus vitiensis	E	16.47	177.32E
Brachylophus vitiensis	E	17.52	177.25E
Brachylophus vitiensis	E	17.07	177.20E
Brachylophus vitiensis	E	17.07	177.15E
Candoia bibroni	N	16.25	179.22E
Candoia bibroni	N	16.40	178.42E
Candoia bibroni	N	16.48	178.19E
Candoia bibroni	N	16.48	179.02E
Candoia bibroni	N	16.50	179.50W
Candoia bibroni	N	16.52	179.57W
Candoia bibroni	N	17.25	177.47E
Candoia bibroni	N	17.41	178.48E
Candoia bibroni	N	17.41	178.00E
Candoia bibroni	N	17.42	177.40E
Candoia bibroni	N	17.56	178.37E
Candoia bibroni	N	17.57	177.43E
Candoia bibroni	N	18.05	178.24E
Candoia bibroni	N	18.07	177.25E
Candoia bibroni	N	18.09	178.15E
Candoia bibroni	N	18.09	177.31E
Candoia bibroni	N	18.13	177.47E
Candoia bibroni	N	18.23	178.07E
Candoia bibroni	N	17.58	179.17E
Candoia bibroni	N	18.58	178.22E
Candoia bibroni	N	17.15	179.08E
Candoia bibroni	N	17.14	178.56W
Candoia bibroni	N	17.12	177.07E
Candoia bibroni	N	16.47	177.32E
Cryptoblepharus eximius	E	16.36	179.09E
Cryptoblepharus eximius	E	16.45	179.40W
Cryptoblepharus eximius	E	16.48	178.19E
Cryptoblepharus eximius	E	16.49	178.19E
Cryptoblepharus eximius	E	17.20	178.09E
Cryptoblepharus eximius	E	17.22	178.02E
Cryptoblepharus eximius	E	17.27	179.58E
Cryptoblepharus eximius	E	17.40	177.26E
Cryptoblepharus eximius	E	17.41	178.48E
Cryptoblepharus eximius	E	17.43	177.26E
Cryptoblepharus eximius	E	17.46	177.10E
Cryptoblepharus eximius	E	17.57	177.43E
Cryptoblepharus eximius	E	18.09	178.15E
Cryptoblepharus eximius	E	18.13	177.47E
Cryptoblepharus eximius	E	18.58	178.22E
Cryptoblepharus eximius	E	19.07	178.02E

Cryptoblepharus eximius	E	19.07	178.00E
Cryptoblepharus eximius	E	17.01	179.16W
Cryptoblepharus eximius	E	17.16	179.10W
Cryptoblepharus eximius	E	17.41	178.40W
Cryptoblepharus eximius	E	17.45	179.21W
Cryptoblepharus eximius	E	18.17	178.43W
Cryptoblepharus eximius	E	18.53	178.37W
Cryptoblepharus eximius	E	18.51	178.52W
Cryptoblepharus eximius	E	18.57	178.28W
Cryptoblepharus eximius	E	18.57	179.48W
Cryptoblepharus eximius	E	18.36	179.52E
Cryptoblepharus eximius	E	19.09	179.46E
Cryptoblepharus eximius	E	17.45	177.07E
Cryptoblepharus eximius	E	18.32	177.37E
Emoia campbelli	E	17.49	178.00E
Emoia concolor	E	16.14	179.46E
Emoia concolor	E	16.36	179.09E
Emoia concolor	E	16.48	178.19E
Emoia concolor	E	16.49	178.19E
Emoia concolor	E	16.50	179.50W
Emoia concolor	E	16.50	179.59E
Emoia concolor	E	17.20	178.09E
Emoia concolor	E	17.22	178.02E
Emoia concolor	E	17.25	177.47E
Emoia concolor	E	17.27	179.58E
Emoia concolor	E	17.41	178.48E
Emoia concolor	E	17.43	177.26E
Emoia concolor	E	17.45	178.34E
Emoia concolor	E	17.51	178.12E
Emoia concolor	E	17.56	178.37E
Emoia concolor	E	17.58	177.37E
Emoia concolor	E	18.05	178.24E
Emoia concolor	E	18.06	178.29E
Emoia concolor	E	18.09	178.15E
Emoia concolor	E	18.09	177.31E
Emoia concolor	E	17.58	179.17E
Emoia concolor	E	18.05	179.21E
Emoia concolor	E	18.50	178.37E
Emoia concolor	E	19.07	178.00E
Emoia concolor	E	19.07	178.02E
Emoia concolor	E	17.15	179.08E
Emoia concolor	E	17.01	179.16W
Emoia concolor	E	17.16	179.10W
Emoia concolor	E	17.45	179.21W
Emoia concolor	E	17.41	178.40W
Emoia concolor	E	18.17	178.43W
Emoia concolor	E	18.39	179.52E
Emoia concolor	E	18.57	179.48W
Emoia concolor	E	19.09	179.46E
Emoia concolor	E	17.46	177.10E
Emoia concolor	E	18.32	177.37E
Emoia concolor	E	17.12	177.07E

Emoia concolor	E	17.00	177.25E
Emoia cyanura	N	16.48	178.19E
Emoia cyanura	N	16.49	178.19E
Emoia cyanura	N	16.50	179.50W
Emoia cyanura	N	16.50	179.59E
Emoia cyanura	N	16.52	179.51W
Emoia cyanura	N	17.25	177.47E
Emoia cyanura	N	17.41	178.48E
Emoia cyanura	N	18.05	178.22E
Emoia cyanura	N	18.09	178.15E
Emoia cyanura	N	18.09	178.00E
Emoia cyanura	N	17.58	179.17E
Emoia cyanura	N	19.07	178.02E
Emoia cyanura	N	17.15	179.08E
Emoia cyanura	N	18.39	179.52E
Emoia cyanura	N	18.57	179.48W
Emoia cyanura	N	19.09	179.46E
Emoia cyanura	N	17.41	178.40W
Emoia cyanura	N	18.13	178.45W
Emoia cyanura	N	18.17	178.43W
Emoia cyanura	N	18.53	178.37W
Emoia cyanura	N	18.51	178.52W
Emoia cyanura	N	17.37	177.06E
Emoia impar	N	16.37	178.36E
Emoia impar	N	16.49	178.19E
Emoia impar	N	16.50	179.59E
Emoia impar	N	17.41	178.48E
Emoia impar	N	18.09	178.00E
Emoia impar	N	19.07	178.07E
Emoia impar	N	17.15	179.08E
Emoia impar	N	18.39	179.52E
Emoia impar	N	18.57	179.48W
Emoia impar	N	19.09	179.46E
Emoia impar	N	17.01	179.16W
Emoia impar	N	17.16	179.10W
Emoia impar	N	17.14	178.56W
Emoia impar	N	17.41	178.40W
Emoia impar	N	18.13	178.45W
Emoia impar	N	18.17	178.43W
Emoia impar	N	18.37	178.30W
Emoia impar	N	18.53	178.37W
Emoia impar	N	19.06	178.33W
Emoia impar	N	19.07	178.25W
Emoia impar	N	17.07	177.15E
Emoia mokosariniveikau	E	16.36	179.09E
Emoia nigra	N	16.36	179.09E
Emoia nigra	N	16.46	179.33E
Emoia nigra	N	16.50	179.50W
Emoia nigra	N	16.50	179.59E
Emoia nigra	N	16.52	179.51W
Emoia nigra	N	17.41	178.48E
Emoia nigra	N	17.49	178.00E

Emoia nigra	N	18.03	178.38E
Emoia nigra	N	17.58	179.17E
Emoia nigra	N	17.15	179.08E
Emoia nigra	N	17.23	179.08E
Emoia nigra	N	17.07	177.15E
Emoia parkeri	E	16.50	179.59E
Emoia parkeri	E	17.41	178.48E
Emoia parkeri	E	17.42	172.40E
Emoia parkeri	E	17.44	178.02E
Emoia parkeri	E	17.49	178.00E
Emoia parkeri	E	17.51	178.12E
Emoia parkeri	E	17.57	177.43E
Emoia parkeri	E	17.58	177.37E
Emoia parkeri	E	18.02	177.34E
Emoia parkeri	E	18.05	178.24E
Emoia parkeri	E	18.58	178.23E
Emoia parkeri	E	19.07	178.02E
Emoia parkeri	E	17.15	179.08E
Emoia parkeri	E	18.32	177.37E
Emoia trossula	E	16.41	179.52W
Emoia trossula	E	16.48	178.48E
Emoia trossula	E	16.49	178.48E
Emoia trossula	E	16.50	179.50W
Emoia trossula	E	16.50	179.59E
Emoia trossula	E	17.41	178.48E
Emoia trossula	E	17.41	178.00E
Emoia trossula	E	17.58	179.17E
Emoia trossula	E	19.07	178.02E
Emoia trossula	E	18.58	178.22E
Emoia trossula	E	17.15	179.08E
Emoia trossula	E	18.39	179.52E
Emoia trossula	E	17.16	179.10E
Emoia trossula	E	17.45	179.21E
Emoia trossula	E	17.41	178.40E
Emoia trossula	E	18.13	178.45E
Emoia trossula	E	18.17	178.43E
Emoia trossula	E	18.53	178.37W
Gehyra mutilata	N	16.50	179.59W
Gehyra mutilata	N	17.41	178.48E
Gehyra mutilata	N	18.06	178.29E
Gehyra oceanica	N	16.14	179.53E
Gehyra oceanica	N	16.22	179.33E
Gehyra oceanica	N	16.24	179.22E
Gehyra oceanica	N	16.24	179.05E
Gehyra oceanica	N	16.25	179.22E
Gehyra oceanica	N	16.25	179.05E
Gehyra oceanica	N	16.45	179.40W
Gehyra oceanica	N	16.49	178.19E
Gehyra oceanica	N	16.52	179.51W
Gehyra oceanica	N	16.58	179.57E
Gehyra oceanica	N	17.01	179.16W
Gehyra oceanica	N	17.15	179.08E

Gehyra oceanica	N	17.20	178.09E
Gehyra oceanica	N	17.25	177.47E
Gehyra oceanica	N	17.27	179.58E
Gehyra oceanica	N	17.37	179.00E
Gehyra oceanica	N	17.37	177.26E
Gehyra oceanica	N	17.41	178.40W
Gehyra oceanica	N	17.41	177.26E
Gehyra oceanica	N	17.41	178.48E
Gehyra oceanica	N	17.56	178.40E
Gehyra oceanica	N	17.57	177.43E
Gehyra oceanica	N	17.58	177.37E
Gehyra oceanica	N	17.58	178.34E
Gehyra oceanica	N	18.02	177.34E
Gehyra oceanica	N	18.02	178.28E
Gehyra oceanica	N	18.03	178.38E
Gehyra oceanica	N	18.05	179.21E
Gehyra oceanica	N	18.06	178.29E
Gehyra oceanica	N	18.09	177.31E
Gehyra oceanica	N	18.09	178.15E
Gehyra oceanica	N	18.13	177.47E
Gehyra oceanica	N	18.17	178.45W
Gehyra oceanica	N	18.18	179.16W
Gehyra oceanica	N	18.37	178.30W
Gehyra oceanica	N	18.50	178.37E
Gehyra oceanica	N	18.53	178.37W
Gehyra oceanica	N	18.56	178.30E
Gehyra oceanica	N	18.57	178.28W
Gehyra oceanica	N	18.57	179.48W
Gehyra oceanica	N	18.58	178.23E
Gehyra oceanica	N	19.06	178.33W
Gehyra oceanica	N	19.07	178.25W
Gehyra oceanica	N	19.07	178.07E
Gehyra oceanica	N	19.09	179.46E
Gehyra oceanica	N	18.23	178.07E
Gehyra oceanica	N	17.45	177.07E
Gehyra oceanica	N	17.40	177.06E
Gehyra vorax	N	16.48	179.02E
Gehyra vorax	N	16.49	179.52W
Gehyra vorax	N	16.50	179.59E
Gehyra vorax	N	17.41	178.48E
Gehyra vorax	N	17.51	178.12E
Gehyra vorax	N	17.58	178.34E
Gehyra vorax	N	18.05	178.24E
Gehyra vorax	N	18.06	178.29E
Gehyra vorax	N	17.58	179.17E
Gehyra vorax	N	18.58	178.23E
Gehyra vorax	N	17.15	179.08E
Hemiphyllodactylus typus	N	16.48	178.32E
Hemiphyllodactylus typus	N	17.01	178.03E
Hemiphyllodactylus typus	N	17.27	177.47E
Hemiphyllodactylus typus	N	17.51	178.12E
Hemiphyllodactylus typus	N	17.57	177.43E

Hemiphyllodactylus typus	N	18.05	178.22E
Hemiphyllodactylus typus	N	18.06	178.29E
Leiolopisma alazon	E	20.39	178.45W
Lepidodactylus gardineri	E	12.30	177.07E
Lepidodactylus manni	E	17.01	178.03E
Lepidodactylus manni	E	17.37	178.00E
Lepidodactylus manni	E	17.37	177.26E
Lepidodactylus manni	E	17.40	177.39E
Lepidodactylus manni	E	17.41	178.48E
Lepidodactylus manni	E	17.43	177.38E
Lepidodactylus manni	E	17.44	178.02E
Lepidodactylus manni	E	18.03	177.21E
Lepidodactylus manni	E	18.05	178.22E
Lepidodactylus manni	E	18.06	178.29E
Lepidodactylus manni	E	18.06	177.20E
Lepidodactylus manni	E	18.58	178.23E
Lepidodactylus manni	E	19.07	178.02E
Lipinia noctua	N	16.22	179.33E
Lipinia noctua	N	16.45	179.45W
Lipinia noctua	N	16.48	178.19E
Lipinia noctua	N	16.50	179.59E
Lipinia noctua	N	17.37	178.00E
Lipinia noctua	N	17.41	178.48E
Lipinia noctua	N	17.42	177.40E
Lipinia noctua	N	17.43	177.24E
Lipinia noctua	N	17.57	177.43E
Lipinia noctua	N	18.05	178.24E
Lipinia noctua	N	18.06	178.29E
Lipinia noctua	N	18.11	178.02E
Lipinia noctua	N	17.58	179.17E
Lipinia noctua	N	19.07	178.07E
Lipinia noctua	N	17.15	179.08E
Lipinia noctua	N	18.39	179.52E
Lipinia noctua	N	18.57	179.48W
Lipinia noctua	N	19.09	179.46E
Lipinia noctua	N	17.15	178.57W
Lipinia noctua	N	17.41	178.40W
Lipinia noctua	N	18.13	178.45W
Lipinia noctua	N	17.45	177.07E
Nactus pelagicus	N	16.22	179.33E
Nactus pelagicus	N	16.58	179.57E
Nactus pelagicus	N	17.27	179.58E
Nactus pelagicus	N	17.37	177.52E
Nactus pelagicus	N	17.41	178.48E
Nactus pelagicus	N	17.45	178.34E
Nactus pelagicus	N	17.51	178.12E
Nactus pelagicus	N	17.57	177.43E
Nactus pelagicus	N	18.06	178.29E
Nactus pelagicus	N	18.09	177.31E
Nactus pelagicus	N	18.23	178.07E
Nactus pelagicus	N	19.07	178.02E
Nactus pelagicus	N	17.15	179.08E

Nactus pelagicus	N	18.17	178.43E
Nactus pelagicus	N	18.39	179.52E
Nactus pelagicus	N	18.57	179.48W
Nactus pelagicus	N	19.09	179.46E
Ogmodon vitianus	E	17.44	178.02E
Ogmodon vitianus	E	17.51	178.12E
Ogmodon vitianus	E	17.58	177.37E
Platymantis vitianus	E	16.25	179.22E
Platymantis vitianus	E	16.36	179.09E
Platymantis vitianus	E	16.50	179.50W
Platymantis vitianus	E	16.50	179.59E
Platymantis vitianus	E	16.52	179.51W
Platymantis vitianus	E	17.39	178.48E
Platymantis vitianus	E	17.41	178.48E
Platymantis vitianus	E	17.56	178.37E
Platymantis vitianus	E	18.06	178.29E
Platymantis vitianus	E	18.05	179.21E
Platymantis vitiensis	E	16.25	179.22E
Platymantis vitiensis	E	16.36	179.09E
Platymantis vitiensis	E	16.50	179.50W
Platymantis vitiensis	E	16.50	179.59E
Platymantis vitiensis	E	16.52	179.51W
Platymantis vitiensis	E	17.37	178.00E
Platymantis vitiensis	E	17.39	178.48E
Platymantis vitiensis	E	17.41	178.48E
Platymantis vitiensis	E	17.41	178.00E
Platymantis vitiensis	E	17.44	178.02E
Platymantis vitiensis	E	17.51	178.12E
Platymantis vitiensis	E	17.56	178.37E
Platymantis vitiensis	E	18.06	178.29E
Platymantis vitiensis	E	18.05	179.21E

Species left out

Bufo marinus
Emoia caeruleocauda
Hemidactylus frenatus
Hemidactylus garnotti
Lepidodactylus lugubris
Ramphytophlops braminus