Caribbean Research and Management of Biodiversity

Annual report

2009
Photos on front page:
- *Enneanectes boehlkei* (Roughhead triplefin) on a *Montastraea cavernosa* (Great star coral); Photo taken by Mark Vermeij.

- Yellow Crowned Night Heron, (*Nyctanassa violacea*); Photo taken by Bea Moedt.

Photo on next page:
- *Echinaster echinophorus* (Thorny sea star); Photo taken by Mark Vermeij
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**Appendix I  Publications & reports**
**Appendix II Board and Personnel**
From our director

As the new director of Carmabi Foundation, as of the 1st of April 2010, I am starting to get to know the work being done by the institute’s staff and personnel and all the projects they have been working on in 2009. This annual report gives an excellent overview of this work.

For starters I wish, and with me the entire Board of Directors, all Carmabi friends, associates and partners in research and nature conservation and management a prosperous and fruitful 2010. We hope to maintain these important contacts and collaborations with our partners. We also thank the government for their support, and in particular our commissioner Mr. Anthony Godett, who has been very involved in Carmabi’s work.

Several events during 2009 captivated the main public’s attention, mainly the arrival of the “Evil Weevil” (Red Palm Weevil) which illuminated the potential dramatic impacts of invasive species, as well as the prediction of the arrival of the feared Lionfish and its subsequent arrival to the Curaçao waters in September/October.

A total of 82 visiting scientists came to the island and our institute to contribute to the growing knowledge of our natural resources both under water and on land with their research projects, and 23 publications were released during the year illustrating the importance of the scientific work being done at Carmabi. One of the highlights of these publications is the Checklist of the birds of Aruba, Curaçao and Bonaire with the most recent update on all the bird species on these islands since the publication by professor Voous in the 80’s. The basic infrastructure for scientific studies at the institute was improved by a newly renovated and extended pier in 2009.

Popular activities like the pickup safari, the reintroduction of mountain bike rental and other monthly special activities resulted in an increase of visitor numbers in Christoffelpark of almost 9%. Our personnel had a full schedule dealing with visitor management and extensive maintenance work due to heavy rains in February 2009, which caused damage to infrastructure like roads, trails, signs etc.

The extensive Savonet Museum project reached a peak in 2009 with the completion of the restoration work on the plantation house, surrounding buildings and waterworks in the park area. The exhibition team is working full time on the completion of all materials for the permanent exhibitions. Ms. Ank Bijleveldt, the Dutch Secretary of State, and Ms. Emily de Jongh-Elhage, Prime Minister of the Netherlands Antilles visited Savonet in April to get an idea of the proceedings and future plans of the museum.

Carmabi also introduced 3 new websites during the year, with new and refreshing designs and detailed information for their respective focus groups. www.carmabi.org is now the portal website for basic information on the work done by the organization and a door to the other five websites of which
www.christoffelpark.org, for park visitors, and www.researchcentercarmabi.org, for visiting scientists, are the first two online. More will follow in 2010.

For the third year in a row Carmabi managed to survive financially after the government subsidy cut. With a very dedicated skeleton staff and the help of many volunteers and donors, to whom we are very grateful, Carmabi managed to have a break even end-of-year result in 2009.

What are the prospects and plans for 2010? In 2010 the Savonet Museum will open its doors. Also in 2010 we hope to commence the construction of the Knowledge Center that will provide accommodation for scientists from abroad that will visit Carmabi for research purposes and are often accompanied by groups of students. The Knowledge Center will also house state of the art laboratories and a new library.

Strategically, Carmabi has to reflect in 2010 on the ways in which Carmabi aims to reach its goals as summarized by our vision to become the leading institute in the Caribbean on Research and Nature Management.

Nature management will become increasingly important. Nature is part of the tourism product and tourism growth is driving economic growth. Tourists come for an experience that will enrich their life. Nature on Curacao is very often part of that experience. Nature is economics and economics means income for the peoples of Curaçao to sustain their living.

Our scientific research has already put Carmabi on the world map. The new Knowledge Center with cutting edge technology will increase the importance of coral reef research on Curacao within a world context. We should not forget that most reefs in the Caribbean have deteriorated a lot. The reefs of Curacao, although they have suffered too, are in a relatively good condition. This puts us in a position to offer a lot of research possibilities. Furthermore we can make good use of all generated knowledge to protect our reefs so that we will not loose the income generated by tourism and dive tourism in particular.

A condition to move forward on our goals will be to have sufficient funds for covering the recurrent costs up to the levels of before the subsidy cut and in addition covering the recurrent costs of present and new investments needed for implementing in an efficient and effective manner the government tasks mentioned above. In other words Carmabi needs to pull its green boots out of the mud first before it is able to start really moving in order to progress to the next level.

Ir. Paul Stokkermans
Director of Carmabi
## Mission and goals

Carmabi’s mission is to work towards a sustainable society, in which the sustainable management of nature leads to benefits that future generations can also enjoy. All parts of our community should be involved in this process.

Our primary goals are therefore:
- to conduct or facilitate research to support effective nature management, nature conservation, nature restoration, and nature development;
- the acquisition, conservation, protection, management, restoration and development of natural areas in the broadest sense, including objects or places of value to geology, history and/or archaeology;
- to create awareness within the community, especially school children, regarding the contribution they can make to achieve sustainable development on Curaçao.

## Sections

To achieve the goals of our organization, CARMABI is organized as follows:

1. Scientific Research, Academic Program & Consultancy
2. Christoffelpark
3. Small Conservation Areas Management
4. Marine Nature Management & Marine Park Visitor Center
5. Savonet Museum
6. Environmental Education
7. PR & Marketing
8. Library
9. Administration
10. Logistical Support & Laboratory Facilities
Eighty-two scientists visited Carmabi in 2009. In addition, 60 students stayed at Carmabi to participate in Coral Reef Ecology courses that were taught by various universities from the Netherlands and the United States. The number of visiting scientists in 2009 signals a positive trend (i.e., a 44% increase) in Carmabi’s visitation rate compared to 2008 when 57 scientists visited Carmabi (2007: 38). Most scientists in 2009 were from the United States (50.0%) followed by the Netherlands (31.7%), with Australia (10.0%) and Germany (7.3%) contributing all others. Not all scientists and students that came to Carmabi stayed at the Piscadera location. The annual occupancy rate was 22.7%, which is a 33.5% increase relative to 2008. A total of 1708 personal working days (i.e., one visiting scientist working one day) were achieved, which is almost double that of 2008 (994). An overview of visiting scientists (PI name + number of collaborators) is provided below:

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<tr>
<td>Dr. Maggy Nugues (+5)</td>
<td>Leibniz Center for Tropical Marine Ecology (ZMT), Germany</td>
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<tr>
<td>Prof. Dr. Rolf Bak</td>
<td>Netherlands Institute for Sea Research (NIOZ) / University of Amsterdam (UvA), The Netherlands</td>
</tr>
<tr>
<td>Dr. Fleur van Duyl (+3)</td>
<td>Netherlands Institute for Sea Research (NIOZ), The Netherlands</td>
</tr>
<tr>
<td>Dr. Henk van der Veer</td>
<td>Netherlands Institute for Sea Research (NIOZ), The Netherlands</td>
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<tr>
<td>Dr. Petra Visser (+4)</td>
<td>University of Amsterdam (UvA), The Netherlands</td>
</tr>
<tr>
<td>Dr. Jameal Samhouri</td>
<td>University of California, Los Angeles, USA</td>
</tr>
<tr>
<td>Dr. Scott Hamilton</td>
<td>University of California, Santa Barbara, USA</td>
</tr>
<tr>
<td>Prof. Dr. Sean Lema (+3)</td>
<td>University of North Carolina Wilmington, USA</td>
</tr>
<tr>
<td>Mr. Marcel Hoogesteeger</td>
<td>Hogeschool Zeeland, The Netherlands</td>
</tr>
<tr>
<td>Mr. Maarten van Schijndel</td>
<td>Hogeschool Zeeland, The Netherlands</td>
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<tr>
<td>Dr. Luciana C. Gusmão (+1)</td>
<td>Ohio State University, USA</td>
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<tr>
<td>Drs. Laurent Delvoye</td>
<td>The Netherlands</td>
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<tr>
<td>Dr. Dana Williams (+3)</td>
<td>National Oceanic and Atmospheric Administration (NOAA), USA</td>
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<tr>
<td>Dr. Ivan Nagelkerken, (+2)</td>
<td>University of Nijmegen, The Netherlands</td>
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<tr>
<td>Dr. Matthew Brandley, (+1)</td>
<td>Yale University, USA</td>
</tr>
<tr>
<td>Dr. Stuart Sandin (+2)</td>
<td>SCRIPPS Institution of Oceanography, USA</td>
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## Principal investigators & number of collaborators

<table>
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<tr>
<td>Drs. Ayana Johnson</td>
<td>SCRIPPS Institution of Oceanography, USA</td>
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<tr>
<td>Drs. Kristen Marhaver (+3)</td>
<td>Institution of Oceanography, USA</td>
</tr>
<tr>
<td>Drs. C. Huijbers (+3)</td>
<td>University of Nijmegen, The Netherlands</td>
</tr>
<tr>
<td>Dr. Dirk Petersen (+2)</td>
<td>Blijdorp Zoo, The Netherlands</td>
</tr>
<tr>
<td>Dr. Mark Schik</td>
<td>The Shedd Aquarium, USA</td>
</tr>
<tr>
<td>Drs. Nick Polato (+2)</td>
<td>Penn State University, USA</td>
</tr>
<tr>
<td>Dr. Mike Brittsan (+3)</td>
<td>The Columbus Zoo &amp; Aquarium, USA</td>
</tr>
<tr>
<td>Dr. Mitch Carl (+1)</td>
<td>Omaha’s Henry Doorly Zoo, USA</td>
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<tr>
<td>Dr. Mauricio Rodriguez-Lanetty (+1)</td>
<td>University of Louisiana at Lafayette, USA</td>
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<tr>
<td>Dr. Jasper de Goeij</td>
<td>Porifarma BV, The Netherlands</td>
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<tr>
<td>Prof. Dr. Ernesto Weil (+1)</td>
<td>University of Puerto Rico at Mayaguez, Puerto Rico</td>
</tr>
<tr>
<td>Dr. Sander Scheffers (+3)</td>
<td>Southern Cross University, Australia</td>
</tr>
<tr>
<td>Prof. Dr. Malcolm McCullogh</td>
<td>ARC Centre of Excellence for Coral Reef Studies, Australia</td>
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<tr>
<td>Drs. Rene Severens</td>
<td>The Netherlands</td>
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<tr>
<td>Drs. Pim Bongaerts (+3)</td>
<td>University of Queensland, Australia</td>
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<tr>
<td>Dr. Robert Elder</td>
<td>Woods Hole Oceanographic Institution, USA</td>
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<tr>
<td>Prof. Dr. David Meyer (+1)</td>
<td>University of Cincinnati, USA</td>
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<tr>
<td>Prof. Dr. Michael Lesser (+1)</td>
<td>University of New Hampshire, USA</td>
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## Coral Ecology classes (n= 4)

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<tr>
<td>Dr. Iliana Baums (+13)</td>
<td>Penn State University, USA</td>
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<tr>
<td>Dr. Petra Visser (+10)</td>
<td>University of Amsterdam (UvA), The Netherlands</td>
</tr>
<tr>
<td>Prof. Dr. Bruce Fouke (+18)</td>
<td>University of Illinois Urbana-Champaign, USA</td>
</tr>
<tr>
<td>Prof. Dr. Juan Sanchez (+19)</td>
<td>Universidad de los Andes, Colombia</td>
</tr>
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2.2 Scientific publications

Twenty-three publications appeared in peer reviewed scientific journals based on work that was conducted at Carmabi. Ten of those publications were authored or co-authored by Carmabi staff making 2009 a productive year in terms of Carmabi’s scientific output. Furthermore, 12 reports were produced by MSc students that did their master’s thesis’ project at Carmabi. (PDF’s of all these publications are available upon request by emailing Mark Vermeij at m.vermeij@carmabi.org).

All publications resulting from work conducted at Carmabi are listed in Appendix I.

2.3 Free advice, public service and consultation

Several organizations, government departments and others received free advice and information from the Carmabi Science Department during the year. We assisted in 24 cases, both oral and written. Four consultancy studies were executed for international and governmental organizations.

2.4 Research and outreach

Carmabi has sought further collaboration with academic institutions around the world to jointly develop research programs aimed at further understanding the dynamics of present day reefs and provide resource managers with adequate information to further fine tune their management strategies. Carmabi is now part of a project team of 18 institutions from the USA, Europe and the Wider Caribbean. The proposal was submitted to and now funded by the European Union’s 7th Framework Program. It’s entitled; “Future of Reefs in a Changing Environment: an ecosystem approach to managing Caribbean coral reefs in the face of climate change (FORCE)”. Many administrative steps had to be undertaken in order to start a project this size and the FORCE project itself starts January 1st 2010 and will last for four years. On Curacao this project will largely focus on the ecology of microbes and phytoplankton in the water overlying reefs and how these functional groups are important to reef deterioration and health. Furthermore socio-economic studies will be conducted (as well as in a.o. Mexico, Honduras, Costa Rica en Barbados) to weigh the importance of factors such as e.g., poverty, corruption, lack of enforcement relative to “natural” factors when considering reef degradation.

A new project has started to monitor the distribution of the invasive lionfish that first appeared in Curacaosan waters in October 2009. In cooperation with LVV, VOMIL and Reefcare a plan was designed to start elimination of these invasive fish with the help of local dive operators. So far ~100 lionfish have been spotted and reported and some of these are now on “Lionfish.”
“Lionfish distribution on Curaçao”.

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display at Carmabi where they are being used for educational purposes. In addition to the fish’s distribution, additional studies have started to determine the direct and indirect ecological impact of this fish on native Curaçaoan fish communities.

In cooperation with IUCN and TNC, Carmabi aided in the development of a new protocol to assess the health of Caribbean reef systems. This new protocol adds more qualitative aspects of the reef community to commonly used quantitative assessment methods. The greater variety of factors allows for a better and more complete description of the ecological processes at a location. The protocol was tested in the Bonaire National Marine Park and the results will become available in the summer of 2010.

Drs. Laurent Delvoye volunteered as a guest researcher since June 2009. He mainly worked on the Dutch Caribbean Biodiversity Database with Drs. Stanley Criens entering data and providing illustrations. Furthermore, Delvoye refurbished all Carmabi microscopes and equipped them with new LED-illumination. His wife Annelies, who stayed with him for three months, helped facilitating visiting scientists during their stay at Carmabi. His activities then shifted towards research on coral diseases in cooperation with Dr. Mark Vermeij and large number of histological slides of several coral species affected by black band disease and various “white” diseases were produced. At home in the Netherlands those slides will be evaluated and the results of this study are expected by the end of 2010.

Carmabi continued its membership of the Association of Marine Laboratories in the Caribbean (AMLC, see: www.amlc-carib.org/) and NET-BIOME network (www.netbiome.azores.gov.pt/NetBiome). NET-BIOME stands for “NETworking for tropical and subtropical Biodiversity research in Outermost regions and territories of Europe in support of sustainable development”, a new network aimed at overcoming the lack of trans-regional funding and increasing the integration of research on biodiversity.

Carmabi is part of the oil-spill response team on Curacao (RAC/ REMPTEIC-Carib) and participated in a oil spill response exercise held at Piscadera in June 2009. Carmabi’s future role in this organization will focus on the designation of critical habitats that require special attention during oil spills.
2.5.1 Effects of nutrient enrichment on turf algal growth and the consequences for the dominant Caribbean reef building species Montastraea annularis.

For their Master’s project, students Sophie Vonk and Imke van Morselaar from the University of Amsterdam performed a research project at the Carmabi institute. They studied the effects of nutrient enrichment on turf algal growth and the consequences for the coral species Montastraea annularis. Turf algae are momentarily abundant and cover large parts of Curacao’s reefs. Competition between corals and turf algae is an important process on coral reefs, but there have been few experimental studies that have tested the outcome of competition between corals and turf algae, despite widespread assumptions that algae are generally competitive superior, especially in eutrophic conditions. They found that turf algae have a negative effect on coral growth under nutrient enriched conditions. Secondly, they found that corals growing next to turf algae have significant lower photosynthetic yields than corals growing next to crustose coralline algae. Their study provides evidence of the importance of turf algae in the structuring of coral reefs on the island Curacao.

2.5.2 The effect of herbivorous fish on coral-algal interactions.

MSc students Sarah Engelhard and Christine Hörnlein from the University of Amsterdam visited Carmabi in 2009 to study the effects of herbivorous fish (Scaridae sp., Acanthuridae sp.) on coral (Montastraea annularis) overgrowth by turf algae. In addition to opportunistic algal species that rapidly colonize dead coral skeletons, some algae are known to actively overgrow and kill living corals. Herbivory can prevent or slow down this process and is generally believed to prevent the overgrowth of corals by algae on reefs worldwide. Overfishing and subsequent shifts from coral to algae coverage are also well known from the Caribbean. Preliminary analysis of benthic coverage along the coast of Curacao showed an overall 28% turf algal coverage on reefs along the coast of Curacao which is high compared to an overall coral cover of 17%. The experiment was designed to determine the impact of reduced herbivorous fish abundance on the interactions between corals and turf algae (<10mm) in the Caribbean. Therefore underwater cages were used to exclude fish on spots with a clear turf coral interaction to create a non-grazing area. Algae growth and fish behavior were monitored by using a camera. The study showed a reduction of canopy height due to grazing activity but no change in the rate of overgrowth.
in the absence/presence of herbivorous fish. This outcome stays in contrary to experiments with macro algae and shows the necessity to do further research and gain more knowledge about turf algae systems in order to find a solution to the “overgrowing” problem.

2.5.3 Coral growth in Curaçao during the last interglacial interval (MIS 5e): a time of global warming and sea level rise

Corals, like trees, record the history of their growth with annual rings. In corals, the annual growth rings are found in their calcium carbonate (limestone) skeletons, and can tell us how fast the skeleton grew and whether growth was constant or fluctuated. Coral skeletons also contain isotopes of carbon or oxygen and trace elements that signal environmental changes that might have controlled their growth. In Curaçao, the limestone cliffs (see picture at right, which shows Tanya Del Valle besides a limestone cliff) that ring the coastline were formed as coral reefs during a period of global warming about 125,000 years ago when the Earth’s continental glaciers melted and sea level rose worldwide. These cliffs contain exceptionally well-preserved fossil corals that formed reefs around the island even more extensive than those living today, yet they contained mostly the same species. Tanya Del Valle and David L. Meyer (University of Cincinnati) measured the growth rates of these fossil corals from their annual rings and compare to the same species living on Curaçao’s present-day reefs. Using Curaçao’s natural heritage of some of the best-preserved fossil coral reefs in the world, we hope to answer questions about the effects of global warming and rising sea level on coral growth before the modern human era with its unique contributions of development, pollution, ocean warming and acidification induced by burning of fossil fuels. The past as recorded in fossil corals can be a key to understanding how coral reefs will respond to the changes in the oceans we are seeing now and predicted to continue into the foreseeable future.

2.5.4 Conserving the endangered Elkhorn coral.

A team of scientists and public aquarium professionals worked at Carmabi in August 2009 to collect thousands of gametes of the endangered Elkhorn coral during the annual mass spawning. About one thousand juvenile corals were placed back in the reef of Curacao as part of a pre-study to evaluate the possibility to start a large-scale research project from this year 2010. The project is led by the Rotterdam Zoo (Netherlands) and the Columbus Zoo & Aquarium (USA) in collaboration with several universities and public aquaria in the USA and in Europe. Important collaboration partners are Carmabi and the Curacao Sea Aquarium. Scientists of the Pennsylvania State University (USA) further investigated the influence of elevated sea temperature on the development of coral larvae. The Elkhorn coral together with the
Staghorn coral have been the first corals to be listed as critically endangered under the IUCN Red List in 2008. Curacao has some of the last remaining populations of both species which are still reproducing and therefore might be of vital importance for the persistence of these species.

2.5.5 Biodiversity Database Netherlands Antilles

The beta-version of the “Dutch Caribbean Biodiversity Explorer” has been made available which overviews all known species of the Netherlands Antilles. This project was made possible in part through financial support of the “Prins Bernard Culture Fund Netherlands Antilles”. While the website is still a work in progress due to the large number of species that occur on our islands, a beta-version is currently available at http://www.dcbiodata.net/explorer/. This database intends to overview the existing information on the ecology and distribution of a wide variety of species (e.g., birds, plants, butterflies, corals) known from both the windward as the leeward islands of the Netherlands Antilles. Through on-line access, information from this website can be used by a variety of user groups from students to policy makers. At present the database overviews information on 6000 species, whereas the total number of species on these islands is estimated 50000. A section is also included that describes the most important ecosystem types on the islands. With this database Carmabi hopes to contribute to a more complete cataloguing of the island’s biodiversity.

2.5.6 Climate change and local pollution impacts on Curacao reefs

Southern Cross University (Australia) researcher Dr. Sander Scheffers and his team (Cyril Gyri from Uni. Bremen, Prof. Malcolm McCulloch (Uni. Western Australia) and 2 research technicians (Paul Kelly & Lea Taylor) visited CARMABI to look at the condition of the reefs from a long term perspective. Corals are recorders of a variety of environmental and climatic factors such as rainfall and temperature (combined: a measure for cyclone intensity), but also CO2 induced ocean acidification. This information is recorded in their skeleton and as corals grow like trees, information is recorded annually or even monthly. Climate change induced rapid ocean acidification is especially bad as the tiny coral polyps’ skeleton will dissolve with increased acidity (CO2). However, local impacts (such as elevated nutrients) might have an additional adverse or possibly short term positive effect to coral growth. Too make the issue even more complex; different species react differently to certain sets of stressors. We looked at 150 yr old corals (from just before the industrial revolution till now) from all along the southwest coast which we drilled with sophisticated pneumatic drill sets. After drilling, the hole in the coral is filled with a cement plug. Experience shows that the coral then grows over the cement plug and in 6 months nothing of the initial intrusion is visible. Preliminary results were presented at ScoobaDoo.
2.5.7 Free-living Symbiodinium: The mysterious stage of the symbiont of the reef

Reef ‘health’ increases when established corals are capable of fast growth and high numbers of new recruits arrive. A very important step towards successful recruitment occurs when coral larvae successfully acquire their symbiotic obligate dinoflagellates (Symbiodinium spp.). Therefore, it is vital to understand the presently unknown reservoirs of free-living symbionts as most coral larvae obtain their symbionts from the environment rather than their parent. Camila Granados-Cifuentes, Nelson Manrique-Rodriguez and Mauricio Rodriguez-Lanetty (Laboratory of Integrative Marine Genomics and Symbiosis, University of Louisiana at Lafayette, USA) have set out to do just that on the reefs of Curacao. They also focus on the question whether free-living symbionts are affected by local and global changes from natural and anthropogenic stressors. The purpose of this research is to contribute and improve on the understanding of the ecology of free-living Symbiodinium and to determine the potential of these free-living dinoflagellate symbionts to establish symbiotic associations with reef corals and other invertebrates. Different spatial and temporal sampling methods are being employed to add these components to the ecology of free-living Symbiodinium. The spatial component comprises between and within reef site variation. The temporal component consists of sampling during different time of the year. Molecular techniques are intensively used during this research (e.g., denaturing gradient gel electrophoresis –DGGE–, and quantitative real-time PCR–qPCR). The researchers expect that at the end of this study, they will show how the free-living Symbiodinium reservoirs will be important for management and conservation since these reservoirs may play a fundamental role in the coral reef ecosystem e.g.

2.5.8 Bird Conservation Studies

This year three Carmabi publications on birds and their protection in the Netherlands Antilles were published. In a large colorful edition published by Birdlife International a synoptic overview is given of the most important bird areas (IBA’s) of the Americas. This new overview draws together the results many years of ornithological research in the Dutch Caribbean, much of which was conducted by, or in association with Carmabi. We are grateful to the editor Christian Devenish of Birdlife International and the many contributors who made this publication possible, which highlights both problems and solutions and should make a valuable addition to the book collections of policy makers, managers and researchers alike. Carmabi also contributed to a chapter of a comprehensive regional inventory of the breeding seabirds of the Caribbean. The new volume,
In 2009, the Island Territory of Curaçao’s UNESCO Cultural Landscape World Heritage Nomination Committee appointed Carmabi to conduct a study to document the local ties between island culture and the plantation past. The study was completed in November and not only provides a new synthesis of past research but also new insights into the cultural significance of nature and the plantation past to the inhabitants of the island. A dominant theme throughout the plantation era was the scarcity of water and how to deal with this problem. The focus was on choosing drought-resistant and often native crops and cultivation systems, and on the widespread use of water catchment and water harvest systems. Aridity, and the limitations it meant to the development of a plantation economy, is seen to have had several important consequences to society. Due to the overall marginality of agricultural enterprise, the Curaçao plantation differed greatly from the general West Indian production crop plantation, most importantly in that it did not significantly serve as a final destination for, or “consumer” of those enslaved. The use of slave labor on the land was simply not lucrative. Instead, the Curaçao plantation became closely integrated with, and in support of, the hub function that the Willemstad served in the international trade in African slaves. The marginal conditions for agriculture forced the population to be more self reliant upon nature, to be socially tolerant and creative, and gives local meaning to saying “poverty is the great equalizer”. The interdependence of different social layers of society upon each other, likely helped stimulate creolization, and economic and geographic
mobility of the population at an early stage in history. The economic and social diversification, adaptation and integration skills which were thus developed are particularly valuable in times of large-scale societal change and no doubt helped pave the way to the multi-ethnic, multilingual, tolerant, diverse, and prosperous society we know as Curaçao today.

2.5.10 The function of microbes living in association with sponges

From April to June sponge experiments were conducted in the aquarium building of CARMABI by Diana Vasquez, a master student of the University of Amsterdam doing her internship with Dr Fleur C. van Duyl of the Royal Netherlands Institute for Sea Research on Texel, NL. The encrusting cavity sponge Halisarca caerulea harbours high abundances of microorganisms, that are present in the ‘tissue’ of the sponge. We investigated the role of these microorganisms for the functioning of the host (the sponge). We found that up to 15% of these microbes are nitrifiers. Sponge associated nitrifying microorganisms are chemoautotrophs, meaning that they can assimilate CO2 even in the dark. The energy needed here for is obtained from the oxidation of poisonous ammonia and nitrite to harmless nitrate. Our preliminary results from incubations of sponge fragments in gastight incubators with magnetic stirrers show that the CO2 fixation by the sponge microbes increases with ammonia additions until saturation (>10uM and <100uM). Ammonia concentrations in reef water are usually low (<1 uM). After experimenting with feeding the sponge with different N-containing organic and inorganic substrates we found that it is most likely that the sponge provides its associated nitrifying microorganism mainly with waste products (ammonia) generated through the digestion of organic matter consumed by the sponge host. This is a remarkable finding and suggests that there exists a symbiotic relation between sponge nitrifiers and the sponge host.

2.5.11 The relationship between inland bays, parrotfish and algal abundance

Maarten van Schijndel and Marcel Hoogesteger visited Carmabi as students from the Hogeschool Zeeland for an internship for their study Water Management. During this internship they investigated the distribution of parrotfish in relationship to two inland bays, Piscadera and Spanish Water. These bays have a nursery function for several kinds of parrotfish that live on the coral reefs around Curaçao. Because of this nursery function they assumed that there are more parrotfish around the bays than far from the bays which likely structure benthic communities differently across space. The main food for the majority of parrotfish are algae that can be harmful to the coral reef, and especially juvenile corals. The hypothesis of the study was therefore to test whether inland bays provided more parrotfish to nearby reefs, which in turn would reduce local algal abundances. This could mean that there are more corals in areas where
parrotfish are more abundant, especially juveniles which are necessary to replace adult corals that died due to a variety of reasons (e.g. disease, storms). This study is important because scientists did a lot of research to the relation between two of these organisms, but never as to whether the herbivore-algae dynamic is to some degree driven by the presence of inland bays.

2.6 Research: Long term developments
Carmabi is currently actively investing to upgrade its research facilities and capabilities to provide the island of Curaçao with a modern biological station that will support and can improve existing management strategies of the island’s natural resources. Recent developments have increased local awareness of the loss of natural areas and the need to protect such areas to preserve the island’s identity. As such, the plans to upgrade Carmabi’s laboratories and accommodations for visiting scientists (aka “science tourism”) have solidified and been approved by all required authorities. This means that construction of the new facilities will start early 2010. Lastly, one staff member of Carmabi, Dr. M. Vermeij is now (part-time) employed by the University of Amsterdam to oversee research projects of their students and teach the course “Tropical Marine Ecology” at Carmabi.

2.7 Carmabi Science Center Progress
The conditions required and plans for the new building for the Carmabi Science Center on the Carmabi premises at Piscadera Bay made major strides this year. In May the property on which Carmabi’s main building at Piscadera stands was transferred to the foundation by government in long lease for 40 years (“erfpacht”). This means that Carmabi is now “owner” of its land and finally in a position to legally apply for building permits on the property. The principal design for the new building was drafted after ample consultation with the staff and approved by Carmabi, and the architectsbureau Broos and van Werkhoven was commissioned to finalize the drawings and submit this to government for building permits. The Department of Public
2.8 Facilities improvements

The availability of good facilities is critical for the effective functioning of both Carmabi personnel and visiting researchers. In this respect two projects were completed in 2009. In January the “directors terrace” was completed and taken into use. This is a small new terrace area next to the kitchen and which commands a good view over the beach and the cove of Piscadera. It has already proven to serve an important function as a casual meeting area and is used daily as a place for Carmabi staff and visitors to exchange ideas and plan their mutual work.

This year the Carmabi pier was fully restored to its former glory since it was first partially destroyed in 1988 during hurricane Joan. For years the pier had been deficient but functional. However, in October of 2008 the hurricane Omar wiped it clean away. For Carmabi the pier has always been of great importance as a “launching platform” for marine research and throughout the years has received daily use by Carmabi staff and visitors.

The presence of a good pier is now even more important in light of the Curaçao Marine Park Visitor Center and the Science Center, for both of which funding is available and implementation plans are in an advanced stage. Carmabi is grateful to the many different companies that helped sponsor this project, which would not have been possible without their generous support. The six largest sponsors were CUROIL, Percy Henriquez Fonds, Papagayo Beach and Lounge Resort, Floris Suite Hotel, FirstCaribbean International Bank, Kompania di Tou Korsou and the CPA. Other sponsors to which Carmabi is grateful are: Albert Heijn, Centrum Supermarket, Farminpex NV, Girobank NV, Hotel Otrabanda, Indian Caves BV, Kooyman NV, Land & Marine BV, Orco Bank NV, The Trader Restaurant and Party Service and Friends of Carmabi.
Ecological disaster looms for the Washington-Slagbaai National Park, Bonaire

As a spin off to the reforestation project in October, Carmabi conducted goat counts for more than 25 kilometers of transects in the Washington-Slagbaai National Park. The survey indicates the presence of minimally 6000 goats in the park. This amounts to about 1 goat per hectare.

By comparison the Christoffel Park in Curaçao, where goat eradication is a structural part of the management program.

To survive under the dismal conditions present in the park, the goats have been attacking the bark of large candelabra tree cacti with alarming frequency, dooming large numbers of these critical food trees to a premature death. These trees are a key food source for the endangered Bonaire parrot locally named “Lora”, bats, birds and reptiles, especially during the dry season when most other vegetation is bare. The excessive goat numbers and scarcity of food has also meant that the goats now further target seedlings of rare plants, leading to further endangerment of many rare species and even the most basic ecological recovery of the park.

To avert a total ecological disaster, it is necessary to urgently and effectively address the goat problem, which had been signaled and described in a study by professor Bruce Coblentz in 1980 already.

Stinapa Bonaire is aware of the problem and is seeking answers but has so far not been able to find effective solutions. One important precondition has recently been achieved though. This is a new fence closing the Slagbaai portion of the park off from the Washington side. Whereas the Washington side is encumbered by traditional goat grazing rights for descendants of the former owner of Washington, namely Boy Herera, the Slagbaai section has no such encumbrance. This means that goats are owned by STINAPA Netherlands Antilles, and can freely be culled by their owner. Helping Stinapa Bonaire with the goat issues in the Washington-Slagbaai Park will be an important focus for Carmabi and STINAPA Neth. Ant. in 2010.

The sharp contrast of vegetation that is protected versus that not protected from goat grazing, near Pos Nobo, Washington-Slagbaai Park.
3.1 Management

We contracted two new rangers for the park ranger department, Mr. Nelson Hooi and Mr. Djurick Marsera. Together with Mr. Pedro Andrea, the head ranger they performed all the maintenance work in the park including the trail and car route maintenance in 2009. However Mr. Marsera was involved in a severe motor cycle accident in September, a few weeks after signing his new contract. As of December 2009 projections for his full recovery are not too optimistic.

Heavy rains in February flooded a large part of the Northern side of the park for 3 months, resulting in damages to road and trail systems. The park even had to be closed for an entire day, but the waterfalls made for fantastic specially organized waterfall hikes. Nevertheless, the extensive rains dictated the workload for the rest of the year as damage repair took up a lot of time. The full restoration of the Savonet plantation house and other structures and buildings dictated much of the dynamics in the center part and front desk of the park. Construction noise and dust influenced the work atmosphere for employees and visitors. To make visitors aware of the reasons behind all the ongoing renovation and construction work, they were provided with information on the project in the form of flyers and signs. This proved to work since visitor numbers never decreased, but increased instead. Extra security measures were also implemented to prevent visitors from entering buildings while these were being restored.

A workshop was organized to ensure that front desk office personnel were fully familiar with the new daily financial reports and client satisfaction. A new financial control mechanisms was installed to comply with existing government regulations.

The former restaurant exploiter ended his contract with us as of the first of January, to explore other possibilities on the island.

3.2 Activities and events in 2009

Our activities are becoming well known on the island. Visitor numbers increased through the organization of more and a greater variety of (special) activities. Camping was popular once again and we organized several camping trips in 2009 on different locations. Normally we camp at Boka Grandi, but because off all the water in the salina causing an overload of mosquitoes we changed the location to the Northern coast line in front off the caves during the full moon. To vary the activities we invited mr. Chris Jager from Etacarinae, a local amateur astronomy club, who brought his telescope to show the stars and moon and provide information on astronomy.

Activities now organized by the outdoor center are: deer spotting trips; bird watching trips; safari’s and special safari’s; sleepovers/ camping; moon walks; vacation activities; teambuilding; survival walks; several types of kids parties;
traditional Easter climb; full moon mountain climbs; jungle tours

In 2009 we organized a total of:

<table>
<thead>
<tr>
<th>Activity</th>
<th>#</th>
</tr>
</thead>
<tbody>
<tr>
<td>Safari</td>
<td>103x (510 persons)</td>
</tr>
<tr>
<td>Deer spotting tour</td>
<td>12x (90 pers)</td>
</tr>
<tr>
<td>Mountain bike rental</td>
<td>135x</td>
</tr>
<tr>
<td>Vacation activities</td>
<td>17x (815 pers)</td>
</tr>
</tbody>
</table>

### Activity

<table>
<thead>
<tr>
<th>Activity</th>
<th>#</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teambuilding</td>
<td>2x (38 pers)</td>
</tr>
<tr>
<td>Camping</td>
<td>(24 persons)</td>
</tr>
<tr>
<td>Water hike</td>
<td>2x ( +/- 500 pers)</td>
</tr>
<tr>
<td>Sunrise mountain hike</td>
<td>2x (51 persons)</td>
</tr>
<tr>
<td>full moon deer spotting</td>
<td>1x</td>
</tr>
<tr>
<td>Savonet Museum preview tour</td>
<td>3x ( +/- 100 pers)</td>
</tr>
</tbody>
</table>

#### 3.3 Visitor Statistics 2009

Although overall tourist numbers decreased in 2009 for the island of Curacao, the number of visitors to the Christoffelpark increased by 8.9%. The percentage is less than the increase in 2008 due to decreased number of local visitors in 2009 (1342 less visitors than in 2008, when the park celebrated its 30 year anniversary which was heavily advertised on local radio stations). The number of tourists increased with 4139 visitors, which is likely caused by the distribution of a new brochure for the park and the development of a new website.

<table>
<thead>
<tr>
<th>Year</th>
<th>Local visitors</th>
<th>Tourists</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>2006</td>
<td>10156</td>
<td>12468</td>
<td>22624</td>
</tr>
<tr>
<td>2007</td>
<td>9270</td>
<td>18111</td>
<td>27381</td>
</tr>
<tr>
<td>2008</td>
<td>11173</td>
<td>20117</td>
<td>31290</td>
</tr>
<tr>
<td>2009</td>
<td>9831</td>
<td>24256</td>
<td>34087</td>
</tr>
</tbody>
</table>
3.4 Park upgrading

During the entire year the park center (where the front desk and other visitor facilities are located) was used for restoration activities of the Savonet plantation buildings.

### 3.4.1 Outdoor center

The outdoor center activities in the park were diversified with the mountain bike rental facilities we reintroduced in 2009. Thanks to a donation of ENNIA, we were able to acquire 6 new mountain bikes with all necessary accessories. Visitors now have several ways to explore the park, including bikes.

### 3.4.2 Visitor facilities

The Savonet Museum project also provided necessary funds for a complete renovation of the restrooms in the park and the restaurant area. The upgrade in facilities was well received by visitors and tour operators. The restrooms can already be used, whereas the restaurant area will be opened at the same time as the museum itself. Since the museum will be partly accessible by wheelchair, we also built a new restroom for people in wheelchairs and also a diaper changing room for families with small kids.

The restaurant was closed during the entire year. Refreshments and small snacks were available to visitors. The new restaurant kitchen is twice as big as its predecessor and the outdoor concession area has been improved. The restaurant will reopen in 2010.

### 3.4.3 Gift certificates

New gift certificates were introduced in 2009, including annual membership certificates and Pickup safari certificates. Banco di Caribe used a number of these certificates during one of their car sale campaigns in which car buyers also got a Christoffelpark gift certificate.

3.5 5th Tourism Human Resources Conference

Assistant manager Cyrill Kooistra participated in this conference in May 2009, which was organized by the Caribbean Tourism Association (CTA). Part of the conference was a workshop called: Executive Coaching and Team Building Techniques to Create a World Class Workforce and also included group discussions with Human Resource Management experts offering practical solutions to possible workforce related difficulties.
3.6 Pr & marketing park

In 2009 we based our marketing efforts on our 2008 marketing plan which focusses on social networking, visibility of all special and regular activities and image building.

3.6.1 New Brochure
A market survey from 2008, showed that the visiting tourists were sufficiently familiar with the park’s existence. However most of the recipients mentioned that they were largely unfamiliar with most of the activities organized in the park. Brochures are the most effective way to reach the ever changing pool of tourists and potential visitors on the island. Brochures can be put on display and handed out at the hotels, car rental companies, or at the tourist booth in Punda where information is provided about attractions of the island. In 2009 we focused on the development and design of a new Christoffelpark brochure with basic information on the park, trails and car routes as well as specially organized activities. The new brochure resulted in an increase in pickup safari’s and overall visitor number. All brochures were printed on FSC certified paper.

3.6.2 New website
Up till July of 2009 Carmabi had 1 website www.carmabi.org combining all information on attractions, activities, research, research facilities, education and much more. The broad work spectrum of the foundation with a large number of focus groups made the accessibility of the information difficult. For example, tourists had to sieve trough science and education material before arriving at information about deer spotting tours. Hence we decided to develop 5 new websites in addition to the www.carmabi.org site that each focused on education, research, the marine park, the Savonet Museum and Christoffelpark respectively. As of October 2009 Christoffelpark has its own site (www.christoffelpark.org). Visitors will find up-to-date information on opening hours, park history, personnel, and information on regular and special activities, schedules, news and much more.

The development of the website was financed by the Percy Henriquez Fund and designed and built by the local company Dragonfly Media.

3.6.3 Social networking
Following the international popularity of social networking and its potential for marketing purposes, Christoffelpark started its own Facebook page (http://www.facebook.com/pages/Curacao-Dutch-Caribbean/Christoffelpark-Curacao/107419611605 ) in September 2009. By the end of 2009, 1250 people were fans of this page. Regular updates on events, special activities and pictures proved to be popular and the response from fans was positive.

Christoffelpark now also has an account on...
Youtube, the largest online video network. After uploading the existing marketing video, the idea is to include short documentaries about park activities in the future, as well as information on the natural resources and other items that are of interest to potential visitors or returning enthusiasts. The videos are also included on the Christoffelpark website.

3.6.4 Mailinglist
The mailing list once again proved its usefulness by providing the park with a direct communication tool to reach potential visitors and regular clients and followers of Carmabi. About 75 people signed up for the mailing list, which now includes about 725 addresses.

3.6.5 Flyers and advertisements
About 10 ad’s were produced and distributed in 2009 including monthly overviews of regular activities, special activities (e.g., the waterfall hikes) and a special ad for the Savonet Museum preview tours in October and November.

We advertised in local newspapers for the new gift certificates, annual membership opportunities, summer vacation activities and pickup safari’s.

We also bought advertisement space in the following publications:

- **Big Red Restaurant guide**
The park advertises in this publication every year which is distributed throughout the year and can be collected for free. We now have a half page advertisement in the To do section.

- **Yellow Visitors Guide**
Now also available for Curacao, this well known European Yellow Visitors Guide format includes publications on cities such as Amsterdam, London etc. The Curacao publication focuses on people who visit the island as a vacation destination and on people who start living on the island and are looking for practical information on restaurants, car rentals, shops, hotels, tours and other business and tourism related items. Christoffelpark and Savonet Museum are featured with an ad and an article in the section on attractions the island has.

- **Expedition Paradise**
This monthly publication focuses on Dutch visitors interested in inside information on happenings on the island. The Christoffelpark logo is featured on the Curacao map, which can be found in the center of the publication overviewing the location of attractions and restaurants on the island.

- **Curacao Road map**
We have a yearly advertisement on this map which can be bought at all the major bookstores, and souvenir shops on the island including the Christoffelpark shop.

- **Budget Rent a Car Discount booklet**
Budget rent a car develops a discount booklet for
their clients every year offering visitors a variety of discounts in shops, restaurants and attractions. Christoffelpark provided two discount coupons in 2009 for a free excursion guide when buying an entrance ticket and a US$10 discount on a Pickup Safari for 4 persons.

3.6.6 Other efforts

**Article Dolfijn FM magazine**
Dolfijn FM, a local radio station on the island publishes a magazine every Friday called Dolfijn FM magazine. In August they focused on the park by publishing an interview with park manager Michelle da Costa Gomez.

**Radio visits**
Christoffelpark was featured in several radio programs on Radio Paradise FM. Park Manager Michelle da Costa Gomez visited Dolfijn FM for a live interview about her work and Christoffelpark.

**Liveincuracao.com**
This website features information on the island on business opportunities, restaurants, activities, events, attractions, and always includes our activities online.

**Hotel, apartment & car rental visits**
We visited almost all hotels, apartments/resorts and car rental companies on the island to distribute the new Christoffelpark brochures.

**Tourism booth @ Punda & CTB headquarters**
The Curacao Tourist Board manages a booth in downtown Punda where visitors to the island can obtain information about attractions, tours and other interesting things to do. Our PR assistant is at the booth every week to hand out flyers and provide tourists with information. She also paid weekly visits to the CTB headquarters to provide this frequently visited location with necessary brochures.

**Press releases**
Several press releases were send out to local newspapers and radio stations about activities and events organized in the park and updates in opening hours during specific festive days.

**Hof van Heden television program (Willem Mouissie)**
Willem Mouissie, a Dutch film and documentary maker with strong ties to the Dutch Caribbean launched the idea to make 6 feature documentaries about the islands of the Dutch Caribbean in which nature and its management would play a major role. The overall goal is to erase the negative image many people in Holland have of these islands. The idea was supported by the Dutch Caribbean Nature Alliance and financial support was sought. The film crew including Willem, as the main cameraman and director, visited all islands of the Dutch Caribbean including Curaçao in November. Together with park manager Michelle da Costa Gomez, Museum manager Leon Pors and assistant manager Cyrill
Kooistra the team visited spectacular locations in Christoffelpark, Shete Boka and the caves on the San Pedro plains. The documentaries will be featured in April 2010 on Dutch national television after which they will also be featured on local Curacaonian channels.

### 3.7 Maintenance

In February heavy rains including one night with more than 25mm of rain in just a few hours resulted in floods and water flowing through the gullies (rooij) in the park, overflowing trails and roads on its path towards the salina. The latter filled up and broke so the water flowed through Boka Grandi and into the sea. The rains also broke parts of the paved car routes in certain areas, making repairs necessary. Picknick tables were overturned and got stuck into the sand, signs were destroyed and the water proved to be fertile grounds for massive amounts of mosquito’s, and small aggressive praga’s. This provided us with a lot of repair work on the paved roads in the park and clean up work at Boka Grandi. Hiking trails were flooded for subsequent months, and as soon as they were accessible rangers opened up the hiking trails again and marked all the routes with new signs. Rangers also assisted Willemstad N.V, who worked on the restoration of the Savonet complex, by controlling the vegetation around the structures. Major maintenance work was done on the parks pickup’s used in maintenance work.

All buildings in the park’s center were completely restored as part of the Savonet Museum project. The front desk was moved to a new wooded cabin, which will later be used as the main office for the outdoor center’s activities and events.

### 3.8 Wildlife management

#### 3.8.1 Preparations Bird Monitoring workshop DCNA

Birds, when properly monitored, can give important information on the state of nature in (protected) areas. Following the success of the bird monitoring workshop and subsequent monitoring effort on the islands of St. Maarten, Aruba and Bonaire, it’s the intention to organize a similar course on Curacao to implement monitoring programs for birds in the parks. In 2009 first preparations were made and the course will be held in January 2010.

#### 3.8.2 Deer reserve maintenance

The former deer reserve needs maintenance to facilitate observation and subsequent monitoring work of the large number of deer that visit water sources in this area. Before each rainy season, we open up the paths and trails to reach the observation platform, drinking spots and the principal feeding grounds to provide the deer with additional feeding opportunities. We found a total
of 2 dead deer in the park in 2009, a small number compared to the 5 reported in 2008. Both animals were male.

There were several reports on mothers with young in the park including various sighting of mothers walking with twins.

### 3.8.3 Planting of rare and endemic plant species

Throughout the year, with external funding (see also the adopt-a-tree segment), several species of rare and/or endemic flora were planted on various locations in the park.

Plantings included Kibrahacha (*Tabebuia billbergii*), Mangel di sabana (*Coccoloba swartzii*), Palu di sia korá (*Bursera simaruba*).

### 3.8.4 Cactus survey

A larger number of dying columnar cacti were observed in the park by well known “bat scientist” Dr. Sophie Petit. These cacti are keystone species for the island and as such very important to the terrestrial island ecology. To determine whether the die-offs only occur in certain areas of the park, a small survey was conducted to determine the status of cacti throughout the park and in other natural areas such as the San Pedro plains and the St. Joris bay. In all surveyed areas die-offs were observed showing the same symptoms as those observed on cacti inside the park. An official survey is scheduled for 2010 to map and monitor the dying of columnar cacti in specific areas. Manager Michelle da Costa Gomez co-authored an article with Dr. Sophie Petit entitled “Suspicious malady of an ecologically important cactus species”, which was published by the Cactus and succulent journal in February 2009. The article urges other cactus and succulent specialists who encounter similar problems with cacti to come forward.

### 3.8.5 Goat Management

14 goats were shot during regular patrols in the park throughout the year of which 9 were female and 5 male. More goats were observed during patrols however the numbers remain small and the animals were spotted in difficult to reach areas and too far to be accurately shot.

### 3.9 Miscellaneous

#### 3.9.1 Frog hunting

During a regular patrol through the park after opening hours, Carmabi personnel observed a frog on the main road, which could not be identified as one of the known frog species on the island. Certain sounds in the park indicated the presence of a possible unknown species. However during subsequent searches for the elusive animals we did find frogs of the species *Pleurodema brachyops*, known locally as the Dori but there were no signs of other species. The sounds, which
were first identified as possible frog sounds, were confirmed to be the noise of an unidentified cricket species.

### 3.9.2 Antillean militia volunteer in Christoffelpark
In January the Antillean militia gave us a welcome hand in the maintenance of roads and trails. The volunteers assisted our park rangers by trimming bushes along about 2 km of trails.

### 3.10 Sponsors

#### 3.10.1 Percy Henriquez Fund
The Percy Henriquez fund assisted us this year by providing the funds necessary for the design and launch of the new Christoffelpark website www.christoffelpark.org and all other websites of Carmabi. We’d like to thank them for their support for this improvement.

#### 3.10.2 Newspapers and radio
All local newspapers on the island and radio stations such as Paradise FM and Radio Z-86 provided us with much needed coverage on activities and events in the park as well as all other important news. They helped out by publishing press releases without extra cost. We hereby like to thank all the newspapers and radio stations that contributed to making the park’s activities a success.

#### 3.10.3 Dushi Bida
Thanks to Ryan de Jongh and his team producing the popular daytime TV program Dushi Bida on TV11, we were able to appear on television almost every week in 2009 to provide information on nature related items and park activities. A big thanks for their support.

### 3.11 DCNA Management Success
In January we sat with Mr. Duncan McRae, consultant for the Dutch Caribbean Nature Alliance (DCNA) for the Management Success of Nature Parks. These sessions are held every year to survey several key criteria and compare them from year to year so the success of the management of the nature parks can be assessed. The strong and weak points in the organization are analyzed and reported in order to improve management decisions in the years to come.

### 3.12 Interns and volunteers
A total of 3 Dutch interns worked for the Christoffelpark. Their work included the production of newsletters, ad’s, visitor surveys, and helping with activities.
3.13 Tour Operators

In 2009 we secured a business contract with Fun Bini Tours, a local tour operator operating on the cruise line market, from which the park hardly benefited in the past. Fun Bini is the first tour operator that made the park the main attraction in a new tour offered to cruise lines, which visit the island. As of October we started welcoming the first guest that are offered a combination tour of visiting the restored Savonet plantation buildings and enjoying a small safari through the park. Once the museum is open, the tour through the museum will be the main attraction of this trip to the western side of the island.

Other tour operators include the park in their trips but generally focus more on stay-over tourists. These operators are Peter Trips, Curaçao Actief, Yellow Jeep Safari and TMC.

3.14 FROMMERS code of conduct

www.frommers.com is a well known international company which produces travel guides for tourists, and offers deals on travel arrangements, destinations etc. They also provide travelers with tips and troubleshooting for travel destinations. In 2009 we worked with Frommers correspondents to develop a CODE OF CONDUCT FOR WILDLIFE TOURISTS AND CRITERIA FOR EVALUATING WILDLIFE TOUR OPERATORS.
Update of management plan sent to the Island Government of Curacao

On March 3 Carmabi sent the report Beheersplan Parke Nashonal SheteBoka: Conserverings- en beheersaspecten (author: J. A. De Freitas; March 2009) to the island Government of Curaçao. This was done in order to comply with the requirements based on the five year management contract between Carmabi and the Island Government of Curaçao.

Repairs

Significant repairs and replacements (parking boom, reception facility, toilets and platforms) were carried out this year by Carmabi technicians.

Road map

This year just like last year 10,000 copies of the Shete Boka park road maps were printed with the help of sponsors. This year we received sponsoring from Breezes Hotel, Curaçao Tourist Board, GiroBank, Insel Air and Kooyman. We thank them for their support!

Market research projects – student reports (projects supervised by John de Freitas)

Two student reports were finished this year. The surveys were done in two different periods among the tourists visiting this conservation area. The first survey was done by a group of students from the Van Hall Institute (The Netherlands):


In this survey a relatively short questionnaire was handed out to tourists visiting this conservation area. The main purpose was to determine the possibility to increase the entrance fee for tourists if new product offerings were introduced. The level of satisfaction of these visitors with the present products and other characteristics of the Shete Boka Park was also researched.


The results of this survey show the strengths of the SheteBoka national park and also indicates the possibilities to improve the products offered by the park.
This research was done by a student from the University of the Netherlands Antilles. The graduation thesis of this student was selected as the best graduation thesis of the Business Administration Section of the Faculty of Social Sciences and Economics (SEF). For this occasion drs. John de Freitas (staff member Carmabi) appeared with Helianthe in the Telecuraçao program ‘Mòru Bon Dia’. There was ample opportunity in the program to talk about the results of the survey. We thank Aileen Looman for the opportunity given to Carmabi!

Product offerings
The Shete Boka Park aims for local support for the park and nature conservation by means of income generation and employment for local residents. Therefore residents living in the vicinity of the park are engaged in the operation of the concession facility and the parks’ daily activities. The concession facility has been decorated with extensive thematic artwork (see photo).

The park organized a number of full moon walks and the Shete Boka Off Road Tour. In addition to the offroad aspect and enjoyment of the spectacular panoramas, the Shete Boka Off Road Tour offers the participants an opportunity to become acquainted with the basic principals of tropical ecology and nature conservation. The tour thus aims at a better understanding and knowledge of the parks landscape ecological features and natural elements in a fun and interactive way.

4.2 Daaiibooi

4.2.1 Financial analysis of possible product improvements and development of the conservation area Daaiibooi

A student (Isardae Margarita) of the Accountancy section of the Faculty of Social Sciences and Economics of the University of the Netherlands Antilles did her graduation thesis on the financial analysis of possible product improvements and product development possibilities. The analysis was based on the results of a survey held among the visitors of the beach. Written questionnaires were used in the survey.


4.2.2 Management activities

Clean-ups
A number of activities were carried out to make it more pleasant for visitors to visit the popular Daaiibooi beach. The coral stones thrown on the beach during ‘Omar’ and that made access to certain parts of the beach difficult were removed by a caterpillar and put in a more secluded part...
of the conservation area. The appearance of the parking place was also improved by cutting the branches of the indigenous trees and shrubs that were planted on and along its edges. This was done by Carmabi personnel that also trimmed away branches along the asphalt road leading directly to the beach area and its surroundings. In these activities Carmabi also received help from de Kustwacht and Selikor. For these activities Carmabi made use of two wheelbarrows that were donated by Building Depot. We thank all these organizations for their help!

Letter of request to police station
In June a letter of request was sent to the officer in command of the police station of Tera Kora/Barber to provide effective help in case the operator of the snack might ask for their support in restoring order and public safety.

4.3 Hermanus and Jeremi
For these two areas a number of meetings were held by staff member drs. John de Freitas with the Curaçao Tourist Board (CTB), Stichting MonumentenZorg, Department of Public Works (DOW), and the British Consulate (the latter specifically for the area of Jeremi which can be considered an English heritage site) in order to get support and develop ideas on how to create nature related activities and infrastructure in these areas.

4.4 Kueba di Yëchi & Kueba di Ratón
Both Kueba di Yëchi and Kueba di Ratón were checked by Carmabi personnel on the state of the bars, which block the entry to the caves for the general public, and also on the presence of the bat species for which the caves are protected. The bars were in place, no recent access by people could be detected and the numbers of the bats are relatively stable.

Other management activities
Meetings were also held by staff member drs. John de Freitas with the Curaçao Tourist Board (CTB) and Department of Public Works (DOW) in order to work on possible product improvements and increased support from the tourist sector for such improvements in addition to new products. DOW produced two drawings of what the beach area would look if the ideas were to be realized.

Renovation of management contract with the Island Government
On September 12 CARMABI 2008 submitted a request for the renewal of the existing management contract it has with the island government and that is due to expire on April 24, 2009.
5.1 Restoration phase

We are proud to announce that the Savonet plantation complex has been restored to its former glory! In December all keys were transferred to our key locker and the contractor and subcontractors removed their temporary offices, storage containers and all other equipment. The next phase can commence. Willemstad N.V. did a wonderful job, and we consider their foreman, Mr. Henk Langefeldt, an honorary member of the Savonet team. He will be missed by our team!

Some elements of the plantation still need work, such as the Sorghum covers the restaurant roofs, but all left-over tasks will be completed in time before the grand opening of the museum in April 2010.

5.2 Project Management

Coordinating this project proved to be a complex task. Although Techcon was contracted to ensure the overall quality of the project and to act as a general “watch dog”. In addition Carmabi coordinator, Mr. Leon Pors, had a full time job coordinating all details leading to the most effective layout of the restored buildings and the future museum that will be housed there. Lots of, seemingly trivial, details popped up over the year that required decision-making. What type of key system to use? Telephone system: where and how to place the wiring without too much visual clutter? Oops, twice a week the island’s power grid went down … we need a back-up generator. The list of such details and project adaptations became very long, to the chagrin of some… Carmabi, as project owner, had the last say in all details, and we therefore were forced to really think everything thoroughly through, with an eye to the future sustainable exploitation of the entire complex. In any case, the current results prove we did a good job, phfew!

Every two weeks all parties met for official evaluation sessions and for planning purposes. Carmabi’s Mr. Pors was responsible for the final audit of all invoices and other financial claims before submitting them to Usona for payment.

Some ad hoc showcasing…

Lots of people contacted us with questions on the restoration process, and even urged us to allow them to take a peek on the premises. We therefore organized a few “sneak preview” excursions, which were quite successful.

5.3 Museum implementation and endeavors

Felix de Rooy has been on the Island since mid-November to direct all audio-visual productions that will be used in the museum. Editing of the video-productions has started, and we are relieved that Felix is happy with “our man”, Leon Pors, as an editor. In between editing sessions some
additional footage was shot of topics related to life at Savonet in the past, but also on the Santeria religion. In the meantime a lot of work is done in the Netherlands, where René Wissink, in collaboration with several subcontractors, is performing magic on the design and building of all display cases, info-panels etc. The examples of those design elements look beautiful, so we are convinced that the “real-world” implementation will exceed our expectations.

One of the more advanced components of the museum implementation will be the “podcatcher” system. This audio player system allows us to present all audiovisuals in different languages. Each future museum visitor can obtain (for a refundable fee) one of the podcatchers in his or her preferred language. The unit looks like a cell phone, and will play relevant audio after pointing a sensor towards an infrared cell alongside the video screens or other info-spots. We are currently experimenting with this system in order to achieve perfect synchronization with the video productions.

The opening date of the cultural history component of the museum (housed in the “landhuis” and surrounding storage buildings) is planned for mid April 2010. The natural history component (housed in the former storage building, the “magasina”) will follow at the end of May 2010.

5.4 Ank Bijleveldt & Emily de Jongh Elhage visit Savonet Project

On the 21st of April we received a very special group of visitors at Savonet. We were quite honored to give both Ms. Ank Bijleveldt, the Dutch Secretary of State, and Ms. Emily de Jongh-Elhage, Prime-Minister of the Netherlands Antilles, a tour on the premises of Savonet. They were accompanied by a group of representatives of the local government, representatives of the Netherlands, USONA and - of course - the press. Because the entire project, both the restoration and museum implementation, is subsidized by the Netherlands, Ms. Bijleveldt was quite interested to see what the substantial financial injection of about 6.5 million Antillean guilders produced so far. Although we were not in fear of a “negative evaluation” we were happy to note that both she and the Premier were impressed by the work done so far.

5.5 Sponsors

One sponsor that unfortunately slipped through the 2008 loop, but whose contribution will surely benefit us from the beginning of 2010 onwards, is Kooyman N.V. All new air-conditioning units at the newly restored “Kas di Vito” – the future museum shop – and our future office spaces at the Savonet Museum have been generously donated by them, 4 units in total! A warm – air conditioning cooled – thanks!
This year Carmabi spent much effort on the initiative to upgrade the marine park legislation for Curaçao, and important progress was made. The coral reefs of Curaçao have suffered greatly in recent years. Not only are they undergoing a rapid long-term decline due to the cumulative effects of chronic stress, but they also suffered from major damage caused by the hurricane Omar in 2008 and are now experiencing the invasion of the Lionfish, a non-native fish species that is spreading rapidly throughout the Caribbean. The reef ecosystem is undergoing rapid changes and is under such excessive stress that one must seriously fear for irreversible degradation. Therefore, rapid and effective action is urgently required.

With this in mind, in 2007 the Island government of Curaçao appointed Carmabi as the coordinator for the coral reef legislation effort, which had been lingering for more than 10 years in government department hands. In 2007 the Curaçao government also installed the Green Team to help jump-start various initiatives, including the marine park legislation initiative. The Green Team is not a special interests platform but a working group, the membership of which is as follows: the tourism foundation, CTB, the island legal department, AJZ, de island agricultural department, LVV, the island urban planning department, DROV, the hotel and tourism association, CHATA, the local chapter of Friends of the Earth, Amigu di Tera, a local management foundation, stichting Uniek Curaçao, Carmabi and finally Green team honorary member Ryan de Jongh. After final edits were made, and the resulting draft approved by a majority of votes, on the 1st of December the new concept legislation “Verordening Mariennatuurbeheer en –bescherming” was submitted to the Curaçao Executive Council.

Associated with this project milestone, Carmabi also launched an awareness campaign designed to inform the public and stakeholders about what the new legislation will mean in practical terms. The topic at hand was presented and discussed in a series of five different newspaper articles, which appeared both in the Dutch and Papiamento language newspapers. Carmabi made four radio presentations, fielding questions by the radio audience. In addition, four power point slide shows were held for the fishing and general public, at Westpoint and Piscadera Bay, and one television appearance was made as invitee to the program “Dushi Bida” on Flamingo TV, the local Channel 11.

The awareness campaign will be culminated early 2010 in the form of a colorful booklet summarizing the total effort and key information, so that this can be handed out to top government representatives and elected officials.
Ryan the Jongh did it again! In 22 days he managed to kayak all the way from St. Maarten back to his home island: a distance of over 1600 kilometers. Some of the Carmabians were at the St. Maarten Yacht Club on December 5th to wish him luck. On December 26th we welcomed him again on Bonaire, and accompanied by his “official life saving sailing vessel” the “Monsoon” (with Mark Vermeij on board as Carmabi representative for the entire trip, and Michelle da Costa Gomez for the last leg), and the sailing yacht “Nature’s eye” – skippered by the Carmabian Leon Pors - the home stretch was completed on December 27th. The reception was not as massive as in 2007, but that might be explained by the fact, that Ryan always comes in way before his projected time of arrival! Ryan has done the ultimate for nature and will continue doing so, because the word on the street is that the Clear Water Challenge 4 is already in preparation!
## C8 Environmental Education

### 8.1 Target groups
- Students in the age range of 4-18 years (school related)
- Teachers
- Parents
- Adults
- Youngsters in general

### 8.2 Subscriptions
For the fourth year in a row we personally visited all schools on the island to provide the possibility to subscribe to our environmental program. Mrs. Retty Schoop and Mrs. Sonaly Rijnschot provided information about the different projects to teachers and directors of the schools and presented the schedules and course materials.

### 8.3 Educational programs and projects for schools

<table>
<thead>
<tr>
<th>Theme</th>
<th>Level</th>
<th>Place</th>
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<tbody>
<tr>
<td>1. Mondi Misterioso (Mysterious Woods)</td>
<td>Foundation Based Education (Former kindergarten and 1st and 2nd grades of elementary school)</td>
<td>Kabouterbos/Christoffelpark</td>
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<tr>
<td>2. Nos ta Palunan den Mondi (We are trees in the Woods)</td>
<td>Foundation Based Education (Former kindergarten and 1st and 2nd grades of elementary school)</td>
<td>Kabouterbos/</td>
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<td>3. Domestic animals and care</td>
<td>Foundation Based Education (Former kindergarten and 1st and 2nd grades of elementary school)</td>
<td>School visits</td>
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<td>4. Bats of Curacao</td>
<td>3rd, 4th and 5th age level of Foundation Based Education (1st, 2nd and 3rd grades of elementary school)</td>
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<tr>
<td>5. Reptiles</td>
<td>3rd, 4th and 5th age level of Foundation Based Education (1st, 2nd and 3rd grades of elementary school)</td>
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<td>6. Relationship between nature and culture</td>
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<td>Christoffelpark</td>
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<tr>
<td>7. Adaptations to climate factors</td>
<td>5th grade of elementary school</td>
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<tr>
<td>8. Coastal ecology</td>
<td>6th grade of elementary school</td>
<td>Daabooi</td>
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<tr>
<td>9. Sea Turtles</td>
<td>(on request) 6th grade of elementary school</td>
<td>Shete Boka</td>
</tr>
</tbody>
</table>
8.4 Turtle lesson box

Together with a Dutch intern Carmabi NME created a new lesson box with a sea turtle theme for the higher grades of Foundation Based Education. The lesson box contains a complete lesson plan for teachers, diverse activities for students in the areas of science, arts, languages, life philosophy and social sciences. The lesson box will be available to schools for a period of 1 week per class and can be used to prepare for a turtle themed expedition to Shete Boka.

8.5 2010-2011

Carmabi Foundation will celebrate its 55th year of existence in 2010. A large range of special activities will be organized throughout the year to celebrate this event. For the education department this will mean a special educational program for schools in which certain aspects of nature will be highlighted through materials provided for science
9.1 Trip around Curacao
In January 2009 Carmabi staff members including director Dr. Dolfi Debrot, together with Mr. Ryan de Jongh (well known for his kayak trip around the island in 2007), Mr. Dino Daal from CTB and Mr. Eugene Rhuggenaath, - commissioner for tourism affairs of the Executive Council of Curacao, joined Mr. Curd Evertz on a trip around the island. During the trip, following the same route as the kayak trip Ryan de Jongh made in 2007, the entire group talked about marine related issues, the need for legislation to protect the natural environment both in the sea as on land and the best way to assess these issues through various paths.

9.2 Assistance Dierenbescherming book “Nos bestianan”
The local animal protection foundation (Stichting Dierenbescherming) produced 4 nature books entitled: our animals; our birds; our plants; and our coral reefs of Aruba, Bonaire and Curaçao. The books are very successful and have been reprinted various times. The last reprint of our animals, also featured new pictures which Carmabi provided to the Stichting Dierenbescherming to achieve their goals.

9.3 Press releases

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<th># in Papiamentu</th>
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<tr>
<td>Christoffelpark other</td>
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<tr>
<td>Total</td>
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“Mr. Dino Daal (CTB), Ryan de Jongh, mr. Dolfi Debrot (director Carmabi) and mr. Eugene Ruggenaath (former commissioner of Tourism) during the trip.”

“Mr. Curd Evertz, captain.”
9.4 New websites

In 2009 3 new websites were established for Carmabi to make information access by target groups easier. The design of the websites, done by Dragonfly Media, is fresh and colorful with lots of pictures of nature both terrestrial and marine. There is now a general website for Carmabi, www.carmabi.org, a website for Christoffelpark, www.christoffelpark.org, and a website for the research station, www.researchstationcarmabi.org. In 2010 three more website will be established: www.savonetmuseum.org; www.carmabi-educatie.org; www.curacaomarinepark.org.

9.5 Newsletter

Two Biná newsletters were published in 2009.

9.6 Brochures

A new brochure was developed for Christoffelpark to actively promote the new activities and other facilities in the park. The brochure is printed on FSC paper and distributed to all hotels, tourist booths and car rentals.
10.1 Recruiting a new director

In view of the planned departure of the present Director, Dr. Debrot, by the end of January 2010, efforts to recruit a successor were a key activity during the second half of the year. By the end of the year the selection and negotiation process was practically complete and had resulted in the selection of Mr. Ir. Paul Stokkermans as the new Carmabi director.

Mr. Stokkermans has been with the Curaçao Service of Economic Affairs (Dienst Economische Zaken) for the last 12 years, where he was especially encharged with the coordination of the Multi-year Economic Program (Meerjaren Economisch Programma) and the economic projects of the Social Economic Initiative (Sociaal Economisch Initiatief), representing a budget of more than 140 million guilders. In this capacity he was involved in various large projects of Carmabi, including the recent renovation of the Christoffelpark road system, the Savonet Open Air Museum, which will open its doors by mid 2010, the Carmabi Science Center and the Marine Park Visitor Center.

Mr. Stokkermans comes from an agricultural background and earned an “Ir.” title from the Hogere Tuinbouwschool in Den Bosch, the Netherlands, as well as a Master’s degree in Agricultural Development from the University of London. He began his career in 1981 teaching horticulture in Curaçao. He spent 6 years in Botswana, Afrika, in agricultural education and agricultural consulting for a Botswana national agricultural NGO’s network. Subsequently, after three years in Saba het returned to Curaçao in 1997, where he has since been with DEZ.

With the appointment of Mr. Stokkermans as the new director, the board of Carmabi is choosing for a new track. Whereas until now the director had always been from a scientific background and with scientific responsibilities, in the future the director is meant to dedicate himself fully to management and organizational issues in a growing and diversifying organization.

10.2 Finances

Whereas the prospects to make ends meet and cover costs seemed pretty bleak at the beginning of the year, by the end of 2009, it was possible to close the books with a small positive balance. This was due in large part to the influx of several consultancies and an important fundraising effort during the year. Carmabi is grateful to both its institutional and private consultancy clients, as well as to the many sponsors, without whom the year would have ended with a loss.
10.3 Record reforestation activities
This year Carmabi sold a record number of rare and native trees for various reforestation and landscaping projects on Curacao and Bonaire. The three largest orders were for trees for the new golf course at the Sta. Barbara estate in Curacao, for a DCNA planting project in Curacao and a STINAPA reforestation project in Bonaire, totalling sales/sponsoring of more than 500 native and rare trees during 2009. Carmabi is grateful to all those who made this possible, including VIP.com, which sponsored 30 rare trees for the Christoffelpark.

The plantings on Bonaire took place during the weekend of 2-5 October. Volunteers of STINAPA Netherlands Antilles and Stinapa Bonaire planted some 153 rare native trees in the Washington-Slagbaai Nationaal Park Bonaire and on Klein Bonaire. This project, which included two evening presentations to the interested public in Bonaire, was generously sponsored by the Prins Bernhard Culture Fund of the Netherlands Antilles and Aruba.

10.4 Newsworthy

“Part of the 102 baby turtles (hawksbills) that came out of a nest at Blauwbaai last year October. Photo: Rogier Lemmens.”
11.1 DCNA

11.1.1 Management Success Project
The Park management success project is one of the flagship projects of DCNA and the annual data collection is taking place in the last couple of years through a visit by consultant Duncan MacRae to the park management organizations on each of the Dutch Caribbean islands. This year Duncan MacRae visited Carmabi on January 19 and 20. In the last couple of years Duncan MacRae has also produced a draft report that the park organizations can use in their reporting requirement to DCNA. DCNA in turn uses these reports to comply with their reporting requirements to BZK. This is based on an agreement DCNA has with BZK (Dutch Ministry of the Interior) in order to receive an annual donation of one million euro to be put into a Trust Fund and cover operational costs of DCNA. The reporting requirements for BZK include technical and financial reports and an audit letter that all have to be submitted in the first half of the year. The deadline for the delivery of the audit letters and audited financial statements is the June 1st, 2009. The Trust Fund has been set up as an endowment fund and will be used to cover the basic management costs of a terrestrial and marine park on each island. That moment has come when a total amount of 24 million euro has been deposited in the fund.

The data collection is based on the following subjects and key questions:

<table>
<thead>
<tr>
<th>Key questions</th>
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<tr>
<td>Achievements</td>
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<tr>
<td>What have been the outputs from the year in terms of administration, monitoring and research, information-education-outreach, working with constituents, law enforcement, travel and training.</td>
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<tr>
<td>Human Resources</td>
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<tr>
<td>Who are the staff what are their qualifications and experience?</td>
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<tr>
<td>Core Management</td>
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<tr>
<td>Where has staff time been spent on core management tasks: administration, monitoring and research, information-education-outreach, working with constituents, law enforcement, travel and training.</td>
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<tr>
<td>Volunteers And Interns</td>
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<tr>
<td>How much volunteer and intern time has been spent on the Protected Area and where has the time been spent?</td>
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<tr>
<td>Outsourcing</td>
</tr>
<tr>
<td>What have consultants and external staff been used for?</td>
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</table>
11.1.2 DCNA Board Meeting attendance

This year John de Freitas attended two DCNA Board meetings as Carmabi delegate. These were: May 12-14 (Saba) and December 8-10 (Curaçao).

Main results of DCNA Board Meeting held on Saba (May 12-14, 2009)

• Vogelbescherming funded DCNA’s bird monitoring workshops held in October and November 2008. Bird outreach materials have been developed with draft species list, ID cards and bird guides underway.

• DCNA received 8,000 Euro from Travel Foundation Netherlands to develop and implement a dive staff training course.

• DCNA and the six islands were represented by MCB Bank in their annual report. Carmabi staff members Dolfi Debrot and John de Freitas wrote parts of the section on Curacao.
• Review of management plans
Management Plans: Duncan MacRae will assist STINAPA with the review of the management plan for Bonaire Marine Park and an updated plan for the Washington Slagbaai National Park. Duncan MacRae is developing a format to start reviews of management plans. Jimmy Mijer would like to have a management plan for FPNA (Aruba), John de Freitas indicated that Carmabi is also looking to review the management plan for Christoffel Park and include the new museum they are finalizing.

• Vogelbescherming will ask David Wege to visit Aruba, St. Maarten and Curacao in order to officially present copies of the IBA Caribbean book to the decision makers there.

• Nationale Postcode Loterij Beneficiary status of DCNA
One of the main topics of the Fundraising Committee is how to meet and exceed NPL (Nationale Postcode Loterij) expectations. The representative of IUCN-NL present at the meetings states that it is important to profile the NPL as the charity organization. Putting the NPL logo on all communication materials is a good start. Also networking/cooperating with existing beneficiaries is important to NPL and mentioning NPL whenever possible.

• Land purchase
There is a possibility to apply for special project funding from NPL. The DCNA Secretariat was told that a request for land purchase might be received favorably. At the last Board meeting the topic of land purchase had already been raised. Therefore DCNA Secretariat developed a discussion paper on land purchase. The Board was asked to re-evaluate the criteria for land purchase options. One criterion is missing:
DCNA’s aim is to support one Marine Park and one Land Park on each island and that this should be the highest priority. Therefore a St. Maarten terrestrial land park is priority number one for land purchase. St. Maarten will write a proposal to apply for special project funding of NPL. Emilio Wilson Estate Foundation is responsible for the implementation and reporting on the land purchase application to NPL special projects in 2009.

• Non Park / NGO Board members
In November 2009 a Board seat will become vacant for a non-park NGO member from the Leeward islands as the two terms of Uniek Curaçao comes to an end. This type of board member replaces what was originally termed a Nature Forum representative. Frensel Mercelina from Uniek Curaçao, currently filling this board seat, is unfortunately not present to join this discussion.

DCNA has developed a discussion paper to discuss the appointment of new non-park NGO Board members. The Board needs to decide on criteria for selecting new board members who “…represent non-governmental, not-for-profit organizations whose primary objective
is managing conservation areas or conserving endemic, threatened or endangered species that are indigenous to the Dutch Caribbean.” (‘non-park NGO representatives’ for short) in addition to or to replace the criteria set out in the amended Articles of Incorporation and in the Operational Manual for “Nature Forum nominees”. The discussion paper sets out a number of criteria for such non-park NGO representatives in order of priority. Board agrees on the criteria set out in the discussion paper.

The board approved seeking a new Board member candidate from a non-park, non-governmental organization. The candidate should preferably come from an organization on Aruba that is involved in promoting/establishing a marine protected area on Aruba. Fundacion Parque Nacional Arikok will cooperate with DCNA Secretariat to find more information on marine protected area management organization as candidate for next Board meeting. If such an organization does not exist then we go on to the next criteria.

- Next steps in bird conservation
Discussion took place on next steps in bird conservation. DCNA only works on multi-island projects but this is problematic for Bonaire with their endemic parrot, the lora. The representative of Stinapa-Bonaire requested that the DCNA Secretariat also give adequate attention to this kind of one-island projects. DCNA’s director explains that VBN specifically wanted to fund and treat the Lora project separately from the work they are funding with DCNA. However the lora work can be integrated into DCNA’s bird conservation theme in future. Park management organizations should come up with island projects where a template can be developed and then copied to other islands.

Main results of DCNA Board Meeting held on Curaçao (December 8-10, 2009)

- A bird monitoring workshop will be held upon request of the Christoffel park on Curaçao in January (18-22) 2010.

- Necessary input from all park organizations to help comply with Nationale Postcode Loterij beneficiary status of DCNA
At the Board Meeting quite some time was devoted to make it clear to the park organizations that quite some effort would be needed by all in order to comply with the necessary promotion on all islands of the NPL. DCNA’s secretariat would send all the details about the recommended set of promotional activities that need to be undertaken by the park organizations.

- International year of biodiversity
2010 is the international year of biodiversity. The United Nations has declared in the past the 22nd of May as international biodiversity day. It was
agreed by all the park organizations that all the Dutch Caribbean park management organizations (member of DCNA) would organize an open house on that date and focus on a topic of biodiversity. Each park organization is free to select their topic. DCNA has a budget to help the parks to cover costs of making banners, posters and panels.

- Carmabi receives endorsement by DCNA for submitted draft legislation for marine nature management and conservation for Curaçao. Carmabi –through the Green Team- submitted in the first week of December the draft legislation for the management and protection of the island’s coral reefs. In order to emphasize the urgency of the request Carmabi made a presentation during the December Board Meeting in which the relevant details on the process and draft law were given. At the end of that presentation Carmabi asked the other nature management organizations that form the board of DCNA to endorse Carmabi’s request to the Island Council of Curaçao. This endorsement was made in the form of a letter of support addressed to the Island Council in which this council was asked to urgently pass such legislation.

- Research possibilities
It was concluded that the research possibilities (obligations) that ensue from the international treaties to which the Dutch Antilles have to adhere, present opportunities for setting up research projects on the islands.

All park organizations were asked to produce a list of research and monitoring priorities for the park management organizations. Dr. Pieter Ketner has been asked by the Dutch Ministry of LNV to draw up a research program for the BES Islands. LNV will use that input to formulate the objectives for its 2010-2015 research program.

- Other decisions approved by the Board
The park management organizations will be kept abreast by the secretariat of possible consultancy jobs DCNA would like to have done. DCNA will use a number of criteria in order to select the most suitable consultant for the job.

- The presentations given by the park management organizations of the six islands on ‘issues, obstacles, solutions’ concerning the park organizations managed by each island have resulted in a number of issues that will be compiled by L. Buth (VOMIL). This compilation will be discussed during the next Board Meeting as part of the revision of the biennial update of DCNA’s vision document.

- DCNA’s secretariat will try to communicate more intensively with the park management organizations.

- Activities organized by Carmabi
Carmabi organized an excursion in the Christoffelpark for the participants in the afternoon of the first day of the meetings (December 8th). This activity was considered a big success by the participants. A tree planting
activity was organized in the afternoon of December 10th in two areas in the vicinity of Landhuis Savonet: 25 small trees were planted of a total of 125 small indigenous trees that form the carbon compensation scheme supported by DCNA since the Saba Board Meeting last year. These plants serve to offset the carbon dioxide emissions caused by the distances travelled by airplane by the participants coming from the other islands and Holland. The Christoffelpark management will plant the remainder of the 125 plants over time when more personnel is available.
A big thank you to all who helped Carmabi in 2009 by sponsoring.

- Percy Henriquez Fonds
- Rotary Club Willemstad
- VIP.com
- ENNIA Insurance
- Maduro & Curiel’s Bank Kompa Leon
- Green Initiative
- Curacao Breezes Hotel
- Curacao Tourist Board
- GiroBank
- Insel Air
- Kooyman B.V.
- Kustwacht
- Selikor
- Building Depot
- CUROIL
- Percy Henriquez Fonds
- Papagayo Beach and Lounge Resort
- Floris Suite Hotel
- First Caribbean International Bank, Kompania di Tou Korsou
- CPA
- Albert Heijn
- Centrum Supermarket
- Farminpex NV.
- Girobank NV
- Hotel Otrabanda
- Indian Caves BV
- Land & Marine BV
- Orco Bank NV
- The Trader Restaurant & Party Service
- Friends of Carmabi.
- Drukkerij de Curacaose Courant
- Budget Rent a Car
- Artsen laboratorium
- Destination Curacao
- DCNA
- Xerox docucentro
- Curacao Tourist Board (CTB)
- Prins Bernhard Cultuur Fonds
- Elizabeth Stichting
- Rene Severens
- Dhr. R. Oehlers
- Mevr. Agatha Gomez
- H. Schippers
- Sandra Pikeur Eliz
- Joanne Asston
- Mediquip
- Lucia C. Gusmao
- Sanne Cornelis
- Bruce Fouke
- Better Deals N.V.
- Dr. W. Isa
- Nick Polato
- Peter Bongers
- Sixta Ricardo

Volunteers and interns
- Antilliaanse millitie
- Ans Bronneberg
- Joanne Rich
- Reginald Rosario
- Ryan de Jongh
- Mark Fraites
- Laurent Delvoye
- Annelies Delvoye
- Linda McCallum
- Jessica Hermsen
- Saskia Smits
- Claudia Slagen
- Sanne Cornelis
- Jeroen van de Belt
- Irene Vriezen
- Jorel Helderman
Peer reviewed scientific publications


<table>
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<tr>
<th>No.</th>
<th>Author(s)</th>
<th>Year</th>
<th>Title</th>
<th>Journal and Volume/Pages</th>
</tr>
</thead>
</table>

**Scientific reports**


**Other publications**
- Biná : Newsletter of the Carmabi foundation, 6th


Appendix II

Board and personnel

Left/retired
January: Alejandra Haddocks, administrative assistant
February: Ericson Rosinie, ranger
June: Mirjam Aarts, biologist
August: Iris de Snaijer, assistant visitor center
December: Stanley Criens, biologist

New personnel
February: Miriam Pieternelle, assistant financial controller
March: Nelson Hooi, park ranger
September: Djurick Marsera, park ranger

2009
The board and personnel list as of the 31st of December 2008, is as follows:

Board
Ir. Dito Abbad, chairman
MsC. Peter Bongers, treasurer
MsC. Jeff Sybesma LLM, secretary
Dr. Miguel Goede, board member
Mr. Erwin Koense, board member

Carmabi ambassador in the Netherlands
Mr. André Cohen Henriquez

Management
Dr. Adolphe O. Debrot, director

Logistical support section
MsC. Stanley Criens, coordinator of the department
Mr. Carlos Winterdaal, technical assistant
Mrs. Sisline Rosalia, janitor
Mrs. Annelies Delvoye, volunteer

Administration
Mrs. Esmeralda van de Water, Financial Controller
Mrs. Miriam Pietermelle, assistant financial controller

Library
MsC. Stanley Criens, librarian

Scientific Department
Dr. Mark Vermeij, head of the section
MsC. John de Freitas, senior researcher
MsC. Leon Pors, researcher
MsC. Stanley Criens, researcher
MsC. Miriam Criens, Biodiversity Database
Dr. Laurent Delvoye, volunteer

Nature management section
Mrs. Ing. Michelle da Costa Gomez, manager

Christoffelpark
Mr. Cyril Kooistra, assistant manager and activities and events coordinator
Mr. Wolter Samboe, ranger activities and events
Mr. Mark Fraites, freelance ranger activities and events
Mrs. Alice Cijntje, front desk officer
Mrs. Rachel Tokaai, assistant front desk officer and assistant PR and marketing
Mr. Oswald Ricardo, ranger security
Mr. Pedro Andrea, Chief ranger
Mr. Nelson Hooi, park ranger
Mr. Djurick Marsera, park ranger
Mr. Mark Paul Wisman, freelance ranger
Mrs. Araceli Ersila, assistant front desk officer

Marine Park
Mrs. Iris de Snaiijer, semi-volunteer Marine
Park Visitor Center
Mr. Ryan de Jongh, volunteer, Honorary Staff
Member

Savonet Museum
MsC. Leon Pors, coordinator

Kabouterbos
Mr. Cyrill Kooistra, manager

Shete Boka Park
Contracted to Frederik Winkel

Hato caves
Contracted to Indian Caves N.V. (Mrs. M. Vrolijk)

Daabooi
Contracted to Kees van Dongen

Hermanus
Mr. Wim van Ginkel, volunteer

Environmental education section
MsC. Leon Pors, head of the section
Mrs. Ing. Michelle da Costa Gomez, education
staff member
Mr. Cyrill Kooistra, education assistant

(Semi) Volunteers education section
Mrs. Clarette Schoop
Mrs. Sonaly Rijnschot
Mr. Reginald Rosario
Mrs. Ruthlyn Bernadina
Mrs. Stella van den Wind
Mr. Djurick Marsera
Mrs. Xiomara Flemming

Consultancy department
MsC. John de Freitas, manager
## Appendix II
### Board and personnel

<table>
<thead>
<tr>
<th>Name</th>
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<tbody>
<tr>
<td>Adolphe (Dolfi) Debrot</td>
<td>Mark Vermeij</td>
<td>Leendert (Leon) Pors</td>
<td>Michelle da Costa Gomez</td>
<td>Esmeralda van de Water</td>
<td>Ryan de Jongh</td>
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<tr>
<td>John de Freitas</td>
<td>Cyrill (Tio Cyril) Kooistra</td>
<td>Miriam Pietermelle</td>
<td>Rachel Tokaai</td>
<td>Syslin Rosalia</td>
<td>Joanne Rich</td>
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<tr>
<td>Carlos Winterdaal</td>
<td>Alice Cijntje</td>
<td>Pedro (Nini) Andrea</td>
<td>Sonaly (Naly) Rijnschot</td>
<td>Araceli (Celine) Ersilia</td>
<td>Stanley Criens</td>
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<td>Walter (Wòti S) Samboe</td>
<td>Oswald (Wòti R) Ricardo</td>
<td>Nelson (Sonny) Hooi</td>
<td>Reginald (Pietje) Rosario</td>
<td>Annelies Delvoye</td>
<td>Wim van Ginkel</td>
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<td>Mark Fraites</td>
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*Image of board and personnel members.*
Appendix II
Board and personnel

Dito Abbad  Peter Bongers  Jeff Sybesma  Miguel Goede  Erwin Koense

Andre Henriquez