ANNEX VI

Threats and Remedial Measures (Sustainable Development Baseline and Incremental) Needed for Protection of the Biodiversity of the SCA

	MEASURES										
THREATS	CICM	National Parks	Detailed-scale zoning	Economic environ-mental assessment of projects	Monitoring and assessment	Mitigation actions and constructions	Inventories of biodiversity, and ecosystem health	Training, environ-mental education and awareness	Pilot experiences	Fishery reserves	Vigilance and control
Terrestrial:											
Construction of infrastruc-ture	x	x	x	x	x	x	x	x	x		x
Tourism	x	x	x		x		x	x			x
Poor control of public use	x	x						x			x
Quarries to extract con-struction mate-rials	x	x	x	x	x	x		x			
Marine:											
Local pollution	x	x	x	x	x	x	x	x	x		x
Construction of infrastruc-ture	x	x	x	x	x	x	x	x			x
Over-fishing	x	x	x	x	x			x		x	x

ANNEX VII
Benefits and description of proposed protected areas

Caguanes National Park	Comprises a group of small keys named Cayos de Piedra, Cayo Caguanes (a key attached to mainland), the sea interconnecting them and the coastal swamp. These keys are the sole examples of this type of key in Cuba because

25,547 ha	of their karstic dome-like structure. They have well-developed cave systems and generally well-preserved terrestrial and cave ecosystems. This area is of extremely high archaeological value. Fauna deserves special mention in its biodiversity because it is incredible for such a relatively small area; a fresh-water sponge – the only example of a well unique and local endemic family – has been reported for this park. Besides, there are other 16 local endemic species: *Trigaster cavernicola, Anopsicus cubanus, Anopsicus silvai, Pseudocellus silvai, Chiroptonyssus cubensis, Uroobovella decui, Antricola silvai, Tectumpilosum negreai, Cyathura specus, Cryptops cavernicolus, Basilia cubana, Orghidania torrei,* and 4 new species still under the description process. The park houses one of 8 populations (and one of the 2 populations of the SCA) of the endemic Cuban sandhill crane (*Grus canadensis nesiotes*), this species represents the southern limit of this bird genus that is very charismatic and threatened at both global and national level. In its marine area, this zone houses other conservation-concern species such as the manatee (*Trichechus manatus manatus*), the dolphin (*Tursiops truncatus*) and the American crocodile (*Cocodrilus acutus*), all three of which are threatened and of regional concern. Up to now, the fauna inventories that have been carried out have recorded – according to the database at CNAP – 248 vertebrate taxa (28 of which are mammals), 131 bird taxa, 27 reptile taxa, 5 amphibian taxa and 57 fish taxa. Concerning terrestrial invertebrates, which were previously inventoried, there are 263 generic and infrageneric taxa that can be broken down into 55 mollusks, 28 crustaceans, 128 insects, 45 arachnids and 7 from other groups. With regard to vegetation, mangroves predominate in extension and there are also plant formations consisting of microphyllous evergreen forests, semideciduous forests , swamp forests, coastal xeromorphic shrubs, swamp grasses, halophytic communities and vegetation complexes of rocky and sandy coast. The territory has a flora richness accounting for 186 taxa inventoried up to now (24 of them being endemic) that belong to 149 genera and 64 families of Cuban flora. The terrestrial taxa inventoried up to now total 697 with more than 100 endemic taxa, this ranks this park second in biodiversity and endemism at the specific level of the SCA after Cayo Coco, which is 10 times larger than the emerged part of Caguanes National Park.
Santa María-Guillermo National Park **25,700 ha**	Includes the most diverse and well-preserved coral ecosystems in the SCA, with good development and extension, as well as the most important emerged parts of two of the most conspicuous keys due to their terrestrial biodiversity. Cayo Guillermo features the highest coastal sand dunes in the country, as well as a microphyllous evergreen forest and coastal xeromorphic shrubs on sand and karst, all of them boasting high biological and mangrove diversity. In this key, 192 fauna species have been inventoried, of which 38 are endemic. Regarding flora, 186 species are known, 23 being endemic. Cayo Santa María is the key with the most endemic local fauna in the SCA after Caguanes. It also features a unique ecosystem in the SCA, the abrasive tectonic hills. Among local endemic fauna, the reptiles dwarf chipojo (*Anolis pigmaecuestris*) and *Anolis jubar santamariae*, the bird *Saurothera merlini santamariae* and the mollusks *Cerion santamariae, Cerion herrerai herrerai,* and *Ligus fasciatus santamariae* are worthy of special mention. This Park has 207 fauna taxa with 46 of which are endemic, and 18 flora taxa of which 17 are

	endemic, totaling 396 taxa and 62 endemic. It has important sites for turtle nesting, threatened species at world and national levels. The values of this Park, the (relative) small size of these two main keys, their values and the fact that both constitute developing resorts is an important element that has been taken into account to prioritize it in the strategy for protected areas in the SCA.
Central an Western Cayo Coco Ecological Reserve **29,900 ha**	Is the second largest key in the Cuban archipelago, where terrestrial ecosystems of the Cuban keys have reached more maturity. Up to now, it has the highest figures for biodiversity and endemism in the Cuban keys. Due to its values and the high tourism pressure, it has been prioritized in the strategy for protected areas in the SCA. In this reserve, it is possible to appreciate vegetation types such as semideciduous forests, microphyllous evergreen forest, and coastal xeromorphic shrubs on karst and sand, among others. It houses 619 fauna taxa with 98 being endemic, and 385 flora taxa with 28 endemic, all of them totaling 1004 taxa and 126 endemic. There are some very well preserved reefs and there is much development of different mangrove types. In this key, there are permanent regional reference stations for reefs, mangroves and sea-grass beds, these stations belong to the regional project CARICOMP.
Máximo River Fauna Refuge **19,800 ha**	This zone located to the south of Cayo Guajaba has the largest nesting colony of Rose Flamingo (*Phoenicopterus ruber ruber*) in the world, with figures higher than 40 000 nests and an estimated 100 000 member population. Besides the nesting site located in Máximo River mouth, in the coastal mainland, this fauna refuge also includes the main local trophic sites (food, drinking areas, sleeping areas) of this colony, they cover up to southwestern Cayo Sabinal. This area also houses significant populations of other aquatic birds, as well as manatees and American crocodiles.
Lanzanillo-Pajonal Fauna Refuge **11,200 ha**	It houses the second largest manatee population known in the country, being an endangered species, it is of global and national concern. Mangroves predominate and there are coral reefs suitable for diving.
Maternillo-Tortuguilla Ecological Reserve **5,500 ha**	It has a most complete mosaic of coastal and marine ecosystems in the third largest Cuban key. In its underwater part, it includes developed and well-preserved front coral reefs that rank among the best in the keys and mangroves. It has important breeding sites for queen conch (*Strombus gigas*). It is a good example of Cayo Sabinal biodiversity that has 286 flora taxa with 25 endemic, and 239 fauna taxa with 69 endemic, amounting to 525 taxa and 94 endemic. It features abundant bird fauna, including migratory species. A higher level of study should result in the identification of many more species and endemics.
Central Cayo Fragoso Fauna	It houses the only population of rat hutia (*Capromis auritus*), an endangered Cuban vertebrate locally endemic to this

Refuge **3,600 ha**	key. This refuge also features a unique ecosystem in the keys: the beautiful tidal deltas within the mangroves. It has abundant bird fauna, including migratory species. The key has extensive well-preserved wetlands. Coral reefs are very attractive and well preserved.
Cayo Cruz del Padre Fauna Refuge **6,300 ha**	It is rich in mangroves and coral reefs that are most diverse, beautiful and in an excellent state of conservation, (reef crest and fore reef). It houses abundant bird fauna, including migratory species.

ANNEX VIII

Migratory birds in the SCE

WINTER RESIDENTS

Accipiter striatus velox
Actitis macularia
Ammodramus savannarum pratensis
Anas acuta bahamensis
Anas americana
Anas clypeata
Anas discors
Anas strepera
Arenaria interpres morinella
Asio flameus flameus
Aythya affinis
Aythya collaris
Bombycilla cedrorum
Botaurus lentiginosus
Calidris mauri
Calidris minutilla
Calidris pusilla
Caprimulgus carolinensis
Ceryle alcyon alcyon
Circus cyaneus hudsonius
Charadrius melodus melodus
Charadrius semipalmatus semipalmatus
Dendroica caerulescens caerulescens
Dendroica caerulescens cairnsi
Dendroica coronata coronata
Dendroica discolor discolor
Dendroica dominica dominica
Dendroica magnolia
Dendroica palmarum palmarum
Dendroica tigrina
Dendroica virens
Dumetella carolinensis
Falco columbarius columbarius
Falco peregrinus anatum
Gallinago gallinago delicata
Geothlypis trichas trichas
Guiraca caerulea caerulea
Haematopus palliatus palliatus
Helmitheros vermivorus
Hylocichla mustelina
Icterus galbula
Larus argentatus
Larus delawarwnsis
Limnodromus griseus griseus
Limnothlypis swansonii swansonii
Mergus serrator serrator
Mniotilta varia
Pandion haliaetus carolinensis
Parula americana
Passerculus sandwichensis savanna
Passerina ciris ciris
Passerina cyanea
Pheucticus ludovicianus
Piranga rubra rubra
Pluvialis squatarola squatarola
Polioptila caerulea caerulea
Rhynchops niger
Seiurus aurocapillus aurocapillus
Seiurus motacilla
Seiurus noveboracensis notabilis
Setophaga ruticilla ruticilla
Sphyrapicus varius varius
Sterna caspia
Sterna forsterii
Sterna hirundo hirundo
Tachycineta bicolor
Tringa flavipes
Tringa melanoleuca
Tringa solitaria solitaria
Vireo flavifrons
Vireo griseus griseus
Vireo griseus noveboracensis
Wilsonia citrina

IN TRANSIT

Calidris fuscicollis
Catharus minimus minimus
Catharus ustulatus swainsoni
Contopus sordidulus
Contopus virens virens
Numenius americanus americanus
Numenius phaeopus hudsonicus
Oporornis formosus
Phalaropus lobatus
Piranga olivacea

Dendroica castanea
Dendroica fusca
Dendroica pensylvanica
Dendroica striata
Dolichormyx oryzivorus
Elanoides forficatus forficatus
Hirundo rustica erythrogaster
Icteria virens virens
Icterus spuriun spurius
Protonotaria citrea
Spizella pallida
Vermivora celata
Vermivora chrysoptera
Vermivora peregrina
Vireo crassirostris
Vireo gilvus gilvus
Vireo olivaceus olivaceus
Vireo philadelphicus

ACCIDENTAL

Eudocimus ruber

VAGRANTS

Coereba flaveola bahamen

ANNEX IX

Key Recommendations And Lessons Learned From The Independent Evaluation Of The Pilot-Phase Project

The table below lists the main recommendations made by the evaluators of the pilot-phase project (see pp 30-31 of the Evaluation) and their impact on design of a consolidation phase project.

Key recommendations		***Impact on design***
A scientific basis should be developed for assessing the role of the S-C ecosystem in regional ecosystem processes affecting biodiversity in the Caribbean.		Activities under Component B will include aspects relevant to regional ecosystem processes as part of inventories and rapid environmental assessments.
During a second phase biodiversity reference collections should be consolidated and strengthened.		Component B, second bullet. Reference collections will be strengthened based on inventories and environmental assessments, prioritised by special protection needs or existing or potential threats. To be financed by sources other than GEF.
A Phase Two project should strengthen the tradition of 'citizen science' that is already present in Cuba.		The project builds on and incorporates the *citizen science* approach and activities to integrate local stakeholders into project activities.
Project activities in the mainland portion of the S-C ecosystem should be limited to sites of known importance of biodiversity and to priority sources of stress to the internal waters and the islands of the archipelago.		See Component D in text, Component 4 in Project Planning Matrix for details; project will carry out priority activities in habitat restoration and pollution control. This component to be financed by the GoC and other, non-GEF sources.
Information systems need to be developed by a full range of institutions that more forcefully promote direct electronic access to standardised databases.		The project will develop or strengthen existing information systems of the institutions involved primarily in the Council on Integrated Coastal Management (CICM). To be financed by sources other than GEF.
A major feature of Phase Two should be the formalisation and implementation of the major resource management policies and tools recommended by the regional Strategic Plan (SP).		*Please see the following rows marked "SP" for details.*
SP	Application of environmental analysis and planning methodology to future development of SCA	The project will carry out more detailed zoning and planning in prioritised areas, using inventories and rapid environmental assessments effected in areas of globally significant biodiversity and information from the pilot phase (Component B).
SP	Restoration of degraded areas, particularly those damaged by organic loading from sugar refineries	See Component D in text, Component 4 in Project Planning Matrix for details; project will carry out priority activities in habitat restoration and pollution control. This component to be

		financed by the GoC and other, non-GEF sources.
SP	Restoration of depleted fisheries through licensing and inspections and the creation of fisheries reserves	See Component D in text, Component 4 in Project Planning Matrix for details; project will produce analysis and proposal for fisheries reserves. This component to be financed by the GoC and other, non-GEF sources.
SP	Designation of large areas of the archipelago as national parks and reserves	The project will establish eight protected areas for a total of 127,547 ha (Component A).
SP	Utilisation of the rich base of environmental information in an impact assessment process and environmental inspection system	The base of information will be strengthened by activities under Component B, and will be systematically fed by the environmental monitoring system established as part of this project. This information will be directed to the CICM and will inform the impact assessment process and inspection system of the institutions involved therein.
SP	Expansion of the ongoing environmental monitoring system	The project will establish a network of small monitoring stations to be financed by GoC, GEF, C21 and Canadian sources.
SP	Adoption of construction and waste treatment technologies appropriate to a nature-based form of tourism development	See Component 4 in Annex II, Project Planning Matrix, under *List of Activities of each component* for details. This component to be financed by the GoC and other, non-GEF sources.
A top priority is to analyse how such a process of formalisation and adoption of the strategic plan can best occur within the rapidly evolving context of environmental management in Cuba.		As a result of the Evaluation and a follow-on visit, the Strategic Plan was adopted formally by the Ministry of Science, Technology and the Environment as the strategy for biodiversity conservation and sustainable development for the SCA. This strategic plan will guide the activities of the CICM.
Careful attention must be given to securing stable financing for the sustained implementation of such policies and practices.		The project will train staff and carry out four case studies aimed at achieving internalisation of the costs of environmental variables and biodiversity conservation in development plans and programmes. The National Environment Fund, under development, will provide a mechanism, along with standard budgetary allocations, to finance policies and programmes over the long-term.
Lessons emerging from the pilot-phase project should be applied to protection of biodiversity in other areas of Cuba.		The project will organise events at the national and regional levels to explain and discuss experience, goals, and objectives of the SCA project and potential for similar activities in other high-priority areas of Cuba.
A second phase should promote and participate in collaboration and exchange within the Caribbean region.		The project will organise events attracting international participants to analyse and discuss biodiversity conservation and sustainable use in the SCA and similar ecosystems (Component 3

	in PPM). Systematic contact and exchange of information and expertise will be promoted with other GEF coastal zone projects in the Caribbean and elsewhere.
Techniques of resource economics should be applied to region to assist in determining economic viability and sustainability of tourism in the SCA.	See Component B, text of proposal, last bullet.

Paragraph 55 of the text of the proposal lists Lessons Learned from the pilot phase project. Of these, the most relevant are reflected in project design as follows:

- "For many participants this project offered the first opportunity to participate in a cross-sectoral planning process and to experience a methodology for proceeding from information synthesis to problem definition and selection of a management strategy." The Evaluation highlighted the fact that the pilot phase project lacked a logical sequencing of activities; this was reflected in the simultaneous implementation of information synthesis, problem definition and early implementation activities. The project proposed here deliberately adopts the Policy Cycle framework developed by GESAMP (and its logical sequencing), as well as the principles of coastal management, which include stakeholder participation, strategic issue-driven programme focus and decisionmaking, and integrated approaches and methods.

- "As the project matured, it became clear that new institutional frameworks with supporting policies and regulations would be required to successfully implement the SCE management strategy. This makes the project proposed here a first opportunity to apply the policy reforms being designed as a national response to UNCED's Agenda 21 to a specific geographic site and a specific set of management issues. " This project proposes the establishment of the Council on Integrated Coastal Management, as the legal authority over all aspects of sustainable development and biodiversity conservation in the Sabana-Camaguey Archipelago.

- "Several participants reflected that the pilot project strongly reinforced the idea that public education and public engagement must be at the core of the implementation phase of the strategic plan." This project recognises that these are ongoing activities and proposes to build and improve upon the successful education and awareness-raising activities of the pilot-phase project. While the pilot-phase carried out a series of activities in this area, this project will ensure that biodiversity components are successfully integrated into formal and non-formal educational and awareness programmes.

- "Finally, the participants in the pilot project became very aware that the issues posed by biodiversity conservation and sustainable development in the S-C ecosystem will be successfully met only through a sustained effort extending out over many years." This lesson is reflected in the activities in the proposed project aimed at ensuring long-term institutional and financial sustainability, as well as popular support for biodiversity conservation.