ORGANIZATION OF AMERICAN STATES
INTER-AMERICAN BIODIVERSITY INFORMATION NETWORK (IABIN)
ReefFix: An ICZM Coral Reef Restoration, Watershed Management and Capacity Building Demonstration Project for the Caribbean

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1. INTRODUCTION

Responding to the importance in the Americas of protection of biodiversity (the Americas houses 8 of the world's 25 biodiversity hotspots), the Inter-American Biodiversity Information Network (IABIN) was officially mandated by the Presidents of the countries in the Americas, at the Summit of the Americas on Sustainable Development, convened by the OAS in Santa Cruz de la Sierra, Bolivia, in December 1996. The Presidents reiterated their interest in IABIN in the Fifth Summit of the Americas held Trinidad and Tobago in 2009, by vowing to *promote the exchange of scientific knowledge on biodiversity, such as through the* ***Inter-American Biodiversity Information Network (IABIN).***

IABIN is an Internet-based forum for technical and scientific cooperation that seeks to promote greater coordination among Western Hemisphere countries in the collection, sharing, and use of biodiversity information relevant to decision-making and education.

The objective of IABIN is to promote sustainable development and the conservation and sustainable use of biological diversity in the Americas through better access to and management of biological information. While IABIN is envisioned as a distributed system of data providers in which the data are maintained and controlled by the provider, coordinated access to the integrated resources of the network is a key component of IABIN.

IABIN has 5 Thematic Networks, (i) Species-Specimens, (ii) Ecosystems, (iii) Protected Areas, (iv) Pollinators, and (v) Invasive Species, and a metadata catalogue (see www.iabin.net.)

This REEFfix exercise is a subproject within the Protected Areas Thematic Network (PATN), supported by the Government of Chile by a grant of US$93,500 and follows on three initiatives:

- The development of the Caribbean Protected Areas Database Initiative – CPADI (See Annex 1.)
- MPAGlobal Database and workshop where details can be found at: http://www.oas.org/dsd/Events/english/08.03.10.htm , and
- An extensive study completed in Montego Bay, Jamaica: (See: (i) Kent Gustavson, Richard M. Huber and Jack Ruitenbeek (eds). (2000) Integrated Coastal Zone Management of Coral Reefs: Decision Support Modeling. World Bank Discussion Paper, March. and (ii) Ruitenbeek HJ, Ridgley M, Dollar S, Huber RM (1999) Optimization of economic policies and investment projects using a fuzzy logic based cost-effectiveness model of coral reef quality: empirical results for Montego Bay, Jamaica. Coral Reefs. 18:381-392) (See Box 1.)

Box 1. Ecological Economic Decision Support Modeling for the Integrated Coastal Zone Management of Coral Reefs in Montego Bay Marine Park
Coral reefs are sometimes referred to as "canaries of the sea" because of their early warning ability to forecast near-shore oceanic stress. Because of their biological diversity, they are also called "rainforests of the sea". Coral reefs are vital to the well being of millions of people. Coral reef managers and government

officials trying to save their valuable national resources need management-related information on coral reefs. Research[1] presented is useful for decision support and training in integrated coastal zone management (ICZM). Ecological economic decision support models can play a critical role in the development of effective ICZM for the protection and restoration of coral reefs. Two streams of research: i) cost-effectiveness modeling of management interventions (i.e., a question of the "supply" of biodiversity as an economic asset) and, ii) marine system valuation (i.e., a question of the "demand" for biodiversity) are for Montego Bay Marine Park, Jamaica. Total benefits from the Montego Bay reefs are US$401 million NPV, with an estimated additional potential benefit of US$70 million NPV through pharmaceutical bioprospecting. Up to a 20% increase in coral abundance may be achievable through the use of appropriate policy measures with a present value cost of US$153 million over 25 years. Optimization requires a 13% improvement in coral reef abundance, requiring net expenditures of US$27 million. The expenditures include installation of a sediment trap, waste aeration, installation of a sewage outfall, implementation of improved household solid waste collection, and implementation of economic incentives to improve waste management by the hotel industry.

This REEFfix study continues these 3 initiatives by conducting 3 valuation methodologies applied to several case study sites:

IABIN ReefFix: An ICZM Coral Reef Restoration, Watershed Management and Capacity Building Demonstration Project for the Caribbean					
Country	**Marine Park**	**Lead Contact**	**Status**	**IABIN Focal Point IABIN Focal Point email**	**Consultant**
Jamaica	Montego Bay Marine Park Trust	Omar Ebanks Operations Manager Montego Bay Marine Park Trust MBMPT Office: (876) 952-5619 manager@mbmp.org	Workshop completed January 13-15, 2009	Dionne Newell Zoology.nhd@cwjamaica.com;	Brian L. Zane
Bahamas	Moriah Harbour Cay National Park in Exuma situated between Little & Great Exuma.	Janeen Bullard Parks Planner and Community Liaison Officer Bahamas National Trust P.O. Box N 4105 Nassau, Bahamas Tel: 242-393-1317 Fax: 242-393-4978 and LaKeshia Anderson Assistant Fisheries Officer Department of Marine Resources phone: (242)393-1014 ext. 229 fax: (242)393-0238	Workshop Completed April 27-29, 2009	Mr. Phillip Weech pswbest@hotmail.com bestnbs@hotmail;	Olethea Gardiner Msc., Consultant, BEST Commission
DR	National Park	Ing. Héctor Iván	Workshop completed	Marina Hernández	Enrique

[1] Gustavson, K., Huber, R.M. and J. Ruitenbeek (eds.) (2000) Integrated Coastal Zone Management of Coral Reefs: Decision Support Modeling, Work in Progress for Public Discussion. World Bank, Washington, D.C.

	of the East.	González Brioso Héctor Iván González Brioso [deoleo66@hotmail.com]	February 10-12, 2009	marina_hernandez@hotmail.com; recursos.geneticos@medioambiente.gov.do;	Pugibet Bobea, Msc. Marine Biologist Centro de Investigación en Biología Marina (CIBIMA), Universidad Autónoma de Santo Domingo (UASD).
Haiti	Carocol Mangrove park or Arcadins Coast and Islands	Lucienna Exil Responsible of Coastal and Water Ecosystems Ministry of Environment 181 Haut-Turgeau Port-au-Prince, Haiti Tel: (509) 37 17 05 07 (509) 34 61 48 80 Email: exillucienna@yahoo.fr	Redesigned program to complete action plan to establish Carocol Mangrove park as Haiti's first marine park.	Dimitri Norris dimitrinorris@hotmail.com	Jean W. Wiener [jeanw@foprobim.org]
Workshops 2010					
St. Vincent	Tobago Cays	Hayden Kevin K. Billingy Superintendent of Rivers, Beaches and Recreation Sites National Parks, Rivers and Beaches Authority Jaycees Building Stoney Grounds P.O Box 195 St. Vincent West Indies Tel: 1-784-453-1623 Fax:1-784-453-1622	Workshop tentative dates January 11-12, 2010	Edmund Jackson Coordinator Environmental Services Ministry of Health and the Environment Environmental Health Complex, Kingstown (784) 456-1991, (784) 485-6992, (784) 457-2684 svgenv@vincysurf.com ; mohesvg@vincysurf.com	David Gill Meridian Environmental Consulting Agency (MECA) Chapel Road #1 Paynes Bay St. James Barbados BB24008 oceancurrents @gmail.com
Grenada	South Coast of Grenada encompassing several marine parks.	Roland A. Baldeo Fisheries Dept. Roland Baldeo [rolandbaldeo@hotmail.com]	Workshop Wednesday Feb 17-18, 2010	Jocelyn Paul, Planning Office, Planning Division, Ministry of Finance jpcop4@hotmail.com	Jerry Mitchell mitchell.jerry@gmail.com
Dominica	TBD	Jullan Defoe [defoe15@hotmail.com] Fisheries Liaison Officer **Tel:** 767-448-0140 **Fax:** 767-448-0140	Workshop tentative dates March 2-3, 2010	Lloyd Pascal Head of Unit Environmental Coordinating Unit Ministry of Agriculture and the Environment Roseau (767) 448-	Arun "Izzy" Madisetti Independent Marine Researcher Director Images

				2577, (767) 448-2577, agriext@cwdom.dm	Dominica www.imagesdominica.com skype: a.madisetti tel: 1-767-614-1102
T&T	TBD		Workshop dates TBD	Ms. Robyn Cross Environmental Programme Officer III (Biodiversity) Environmental Management Authority 8 Elizabeth St. St. Clair, Port of Spain (868) 628-8042, (868) 628-9122, rcross@ema.co.tt	Howard P. Nelson #8 St. Anns Road St. Anns Port of Spain Trinidad, West Indies phone: 1 868 788 5291 howien@hotmail.com
Barbados	Folkstone Marine Reserve	John Nicholls Folkstone Marine Reserve and Marine Museum in Barbados	Workshop tentative dates December 15-16, 2009.	Mr. Lionel Nurse Permanent Secretary Ministry of Housing, Lands and Environment SP Musson Building First Floor Hincks Street Bridgetown, St. Michael Barbados 1-(246) 467-5700, 1-(246) 437-8859 nurselil@gob.bb | sinclert@gob.bb |	David Gill Meridian Environmental Consulting Agency (MECA) Chapel Road #1 Paynes Bay St. James Barbados BB24008 oceancurrents @gmail.com
St. Lucia	Soufriere Marine Management Area	Mr. Thomas Nelson of the Ministry of Agriculture, Lands, Forestry and Fisheries. tomfinch90@hotmail.com; Nadia CAZAUBON Project Officer Soufriere Marine Management Association **Tel**: 758-459-5500/ 5904 **Fax:** 758-459-7799 smma@candw.lc	Workshop tentative dates December April 15-16, 2009.	Mr. Hubert Emmanuel Permanent Secretary Ministry of Agriculture, Lands, Forestry & Fisheries Sir Stanislaus James Bldg. (5th Floor); Waterfront Castries Work: (758) 468-4103(758) 453-6314 ps@slumaffe.org	TBD

For this exercise, Dionne Newell, IABIN Focal Point for Jamaica and member of the IABIN Executive Committee is keeping the Caribbean Focal Points in the IABIN Council informed.

Scope of Work: A Marine Database Specialist consultant will be hired in each country based on a short list as indicated by the IABIN Focal Point. The consultant is expected to work with the other IABIN Partners to make technically operational and sustainable the network working with the different Thematic Networks (TNs) and their Coordinating Institutions (CIs), Focal Points, and local, regional and global partners.

The consultant will:

1. Check in with appropriate Ministry and the IABIN Focal Point and brief them on this IABIN activity
2. Work with the appropriate Ministry and IABIN Focal Point to gather tourism, fisheries, and bio-physical and socio-economic data decide on the marine park that already has a (i) management plan with significant data and maps on visitation, (ii) an entry fee, and (iii) lots of different kinds of tourism that visit the park (e.g. dive tourism, day boating, etc)
3. Compile necessary data on GIS, maps, ecosystems in and around the marine park, tourism, and fisheries data.
4. Complete the 2 methodologies developed by the World Resources Institute (see http://www.wri.org/map/marine-protected-areas-world, http://www.wri.org/project/reefs-caribbean, http://www.wri.org/project/valuation-caribbean-reefs, (download tourism and fisheries here) and http://www.buccooreef.org/economic.html e.g. "A tool to guide the economic valuation of goods and services from coral reefs") and other valuation data (see values attached).
5. Using a Google map of the case study site with a 1 hectare grid overlay, complete the third methodology called ecosystem value transfer (See annex #2).
6. Once the three databases are filled out, support a 3 day workshop with in-country marine park managers and policymakers to analyze and confirm the data and field trip to the marine park.
7. The workshop will cover all expenses, and the in-kind resources that are indicated in the budget are for the time of the ministry and any NGO that might be helping out in this valuation exercise.
8. Work in a team to specify/highlight predictability and develop standard and protocol for the tool to be interactive with other value added tools developed by IABIN where possible and effective,

2. OBJECTIVE

GOAL The ICZM (Integrated Coastal Zone Management) Capacity Building Program component will assist the IABIN Caribbean Protected Areas Database Initiative – CPADI through a REEFIX activity in several case study sites that transfers information between OAS CARICOM Member States specific to ICZM and marine parks.
PURPOSE ReefFix is an ICZM tool that has multi-level linkages that trains participating countries in ecosystem valuation methodologies and management techniques to restore coral reef, mangrove ecosystems, and watersheds through integrated marine park management.
OUTPUTS Strengthen management frameworks that regulate coastal activities and develop a plan for adaptation to coral reef and mangrove responses to climate change effects. Outputs will be: 1) improved ecosystem valuation technical capacity of individual Caribbean countries to collect and manage their protected areas data in a way that meets their specific needs and context; 2) improved individual country's protected areas data management systems based on output from several case study sites; 3) Centralized data management system for the Caribbean region (drawing from protected areas databases where they exist or from other sources of protected areas information) which serves as a regional node for input to the Americas Database on Protected Areas and the World Database on Protected Areas (WDPA). 4) Capacity building activities in ICZM

3. JUSTIFICATION

Compared to just a few decades ago, the ever-increasing number and strength of forces affecting coastal ecosystems, including mangroves, require coastal managers to respond and adapt to ensure the sustainability of valued ecosystem services and products. One of the major challenges in the Caribbean

region is strengthening the resilience of coastal ecosystems to the climate change-induced sea level rise and temperature increases (See Box 2.).

Box 2. Key findings from Reefs at Risk in the Caribbean Authors: Lauretta Burke, Jon Maidens and contributing authors: Mark Spalding, Philip Kramer, Edmund Green, Suzie Greenhalgh, Hillary Nobles, Jonathan Kool. 2004

- **Nearly two-thirds of coral reefs in the Caribbean are threatened by human activities.** Integrating threat levels from all sources considered in this analysis (coastal development, watershed-based sediment and pollution, marine based threats, and overfishing), the Reefs at Risk Threat Index identified about one-tenth of Caribbean coral reefs at very high levels of threat, one-third at high threat, one fifth at medium threat, and one-third at low threat.
- **An estimated one-third of Caribbean coral reefs are threatened by coastal development.** This includes sewage discharge, urban runoff, construction, and tourist development.
- **Sediment and pollution from inland sources threaten about one-third of Caribbean coral reefs.** Analysis of more than 3,000 watersheds across the region identified 20 percent of coral reefs at high threat and about 15 percent at medium threat from damage caused by increased sediment and pollution from agricultural lands and other land modification.
- **Marine-based threats to coral reefs are widespread across the Caribbean.** Our indicator of marine-based damage and pollution identified about 15 percent of Caribbean reefs as threatened by discharge of wastewater from cruise ships, tankers and yachts, leaks or spills from oil infrastructure, and damage from ship groundings and anchors.
- **Overfishing threatens over 60 percent of Caribbean coral reefs.** Fishing above sustainable levels affects coral reefs by altering the ecological balance of the reef. The removal of herbivorous fish, which consume algae, facilitates algal overgrowth of corals. Declines in coral cover and increases in algal cover have been observed across the region. This analysis identified about one-third of Caribbean reefs at high threat from overfishing pressure and about 30 percent at medium threat.
- **Diseases and rising sea temperatures threaten to damage coral reefs across the Caribbean region.** Diseases have caused profound changes in Caribbean coral reefs in the past 30 years, with very few areas unscathed by disease, even reefs far removed from human influence. In addition, coral bleaching episodes-the most direct evidence of stress from global climate change on Caribbean marine biodiversity-are on the rise.
- **Ineffective management of protected areas further threatens Caribbean coral reefs.** With the growth of tourism, fisheries, and other development in coral reef areas, marine protected areas (MPAs) are an important tool for safeguarding coral reefs. At present, over 285 MPAs have been declared across the Caribbean, but the level of protection afforded by MPAs varies considerably. The Reefs at Risk Project found only 6 percent of MPAs to be rated as effectively managed and 13 percent as having partially effective management.
- **The coastal communities and national economies of the Caribbean region are poised to sustain substantial economic losses if current trends in coral reef degradation continue.** Coral reefs provide valuable goods and services to support local and national economies, and degradation of coral reefs can lead to significant economic losses, particularly in the coastal areas of developing countries, through loss of fishing livelihoods, malnutrition due to lack of protein, loss of tourism revenues, and increased coastal erosion. Analyses carried out by the Reefs at Risk project indicate that Caribbean coral reefs provide goods and services with an annual net economic value in 2000 estimated at between US$3.1 billion and US$4.6 billion from fisheries, dive tourism, and shoreline protection services.

Box 3. Grenada Commits to expand marine and terrestrial parks under effective management to 25% of the Country by 2020.

Inspired by the Micronesia Challenge, In Curitiba, Brazil on March 31, 2006, the nation of Grenada pledged to put 25 percent of near-shore marine and 25 percent of terrestrial natural resources under effective conservation by 2020. The Declaration, approved by Grenada's Cabinet, will lead to a nine-fold increase in protection of Grenada's marine environment and more than double protection of its terrestrial environment.

Grenada now joins the Bahamas, which in 2005, during the 10 Year Review of the Barbados Program of Action meeting, committed to set aside at least 20% of its productive marine bank areas as marine protected areas

The Grenadian coral reef bank marks the southern end of the Caribbean Windward Islands. Lying about 100 miles north of Venezuela, this bank starts on the Reindeer Shoals and extends north, encompassing the Grenadines, a chain of over 20 islands and numerous cays shared both by Grenada and St. Vincent and the Grenadines. In September 2004, Hurricane Ivan caused loss of life and significant damage amounting to almost three times Grenada's annual Gross Domestic Product, severely affecting the economic, social and natural fabric of the country. Over 90% of Grenada's wildlife, forested lands, watersheds and mangroves were devastated, and sea grass beds, coral reefs and beaches were significantly damaged.

Islands are home to more than 500 million people and represent one quarter of the nations of the world, 16 percent of the planet's known plant species and more than half of the world's tropical marine biodiversity. Thirty percent of the world's coral reefs are severely damaged and, without immediate action 60 percent may be lost by 2030. Half of the species in the world that have become extinct have been island species. Without immediate action, islands face continued damage to species, biodiversity and human inhabitants' way of life. Source: The Nature Conservancy.

Caribbean Countries have requested technical assistance to achieve the commitments laid out in the WSSD Plan of Implementation and the CBD targets. A critical component of this technical assistance is the availability of appropriate and adequate data with which to establish robust baselines and monitor progress towards the goals.

Ecosystem services are the benefits people obtain either directly or indirectly from ecological systems. The process of identifying and quantifying ecosystem services is increasingly recognized as a valuable tool for the efficient allocation of environmental resources (Heal et al., 2005; Millennium Ecosystem Assessment, 2003). By estimating and accounting for the economic value of ecosystem services, social costs or benefits that otherwise would remain hidden can potentially be revealed and vital information that might otherwise remain outside of the economic decision making calculus at local, national, and international scales can be internalized (Millennium Ecosystem Assessment, 2005).

Needed is a better understanding of ecosystem services. Through several case studies, a framework for the spatial analysis of ecosystem service values (ESVs) will be illustrated. Thanks to the increased ease of using Geographic Information Systems (GIS) and the public availability of high quality land cover data sets (in this case through Google Maps), bio-geographic entities such as forests, wetlands and beaches can now more easily be attributed with the ecosystem services they deliver on the ground.

Box 4. Oceans as 'Blue Carbon' Sinks alleviate Climate Change
Maintaining and Recovering Marine Ecosystems-the Wider Benefits

Seagrasses to Salt Marshes are effective Carbon Capture and Storage Systems. A combination of reducing deforestation on land, allied to restoring the coverage and health of these marine ecosystems could deliver up to 25% of the emissions reductions needed to avoid 'dangerous' climate change. An ecosystem approach to the management of coastal areas will enhance natural carbon sink capacity.

Coastal waters account for just seven percent of the total area of the ocean. However, the productivity of

ecosystems such as coral reefs, and these blue carbon sinks mean that this small area forms the basis of the world's primary fishing grounds, supplying an estimated 50% of the world's fisheries. They provide vital nutrition for close to three billion people, as well as 50% of animal protein and minerals to 400 million people of the least developed countries in the world.

The coastal zones, of which these blue carbon sinks are central for productivity, deliver a wide range of benefits to human society. These include filtering water, reducing effects of coastal pollution, nutrient loading, sedimentation, protecting the coast from erosion and buffering the effects of extreme weather events.

- Coastal ecosystem services have been estimated to be worth over US$25,000 billion annually, ranking among the most economically valuable of all ecosystems.
- Much of the degradation of these ecosystems not only comes from unsustainable natural resource use practices, but also from poor watershed management, poor coastal development practices and poor waste management.
- The protection and restoration of coastal zones, through coordinated integrated management would also have significant and multiple benefits for health, labor productivity and food security of communities in these areas.

Key Findings from the UNEP Rapid Assessment Report

- Of all the biological carbon, or green carbon captured in the world, over half (55%) is captured by marine-living organisms - not on land - hence the new term blue carbon.
- Marine-living organisms range from plankton and bacteria to seagrasses, saltmarsh plants and mangrove forests.
- The ocean's vegetative habitats, in particular, mangroves, salt marshes and seagrasses, cover less than 1% of the seabed.
- These form the planet's blue carbon sinks and account for over half of all carbon storage in ocean sediment and perhaps as much as over 70%.
- They comprise only 0.05% of the plant biomass on land, but store a comparable amount of carbon per year, and thus rank among the most intense carbon sinks on the planet.
- Blue carbon sinks and estuaries capture and store between 235-450 Teragrams (Tg C) or 870 to 1,650 million tons of CO2 every year - or the equivalent of up to near half of the emissions from the entire global transport sector which is estimated annually at around 1,000 Tg C, or around 3,700 million tons of CO2, and rising.
- Preventing the further loss and degradation of these ecosystems and catalyzing their recovery can contribute to offsetting 3-7% of current fossil fuel emissions (totaling 7,200 Tg C a year or around 27,000 million tons) of CO2 in two decades - over half of that projected for reducing rainforest deforestation.
- The effect would be equivalent to at least 10% of the reductions needed to keep concentrations of CO2 in the atmosphere below 450 ppm needed to keep global warming below two degrees Celsius.
- Combined with action under REDD, halting the degradation and restoring lost marine ecosystems might deliver up to 25% of emission reductions needed to keep global warming below two degrees Celsius.
- Unlike carbon capture and storage on land, where the carbon may be locked away for decades or centuries, that stored in the oceans remains for millennia.

Source:
http://www.unep.org/Documents.Multilingual/Default.asp?DocumentID=599&ArticleID=6342&l=en&t=long

3. TASKS

The IABIN Marine Database Specialist will compile data and fill out 3 databases, one developed as part of this study that will formulate a decision framework designed for spatially explicit value transfer that will be used to estimate ecosystem service flow values and to map results for one of 4 case studies to be completed representing a diversity of spatial scales and locations.

Three separate methodologies will be utilized:
1.) Two methodologies developed by the World Resources Institute (see http://www.wri.org/project/valuation-caribbean-reefs e.g. "A tool to guide the economic valuation of goods and services from coral reefs") and other valuation data (see values attached as annex 2.) and,
2.) A third methodology developed by Troy, Austin and Matthew A. Wilson, *Mapping ecosystem services: Practical challenges and opportunities in linking GIS and value transfer.* Ecological Economics 60 (2006)435-449. For this valuation method, a unique typology of land cover and aquatic resources will be developed and relevant economic valuation studies will be queried in order to assign estimates of ecosystem service values to each category in the typology (See Annex 2.) The result will be a set of unique standardized ecosystem service value coefficients broken down by land cover class and service type for each case study. GIS analysis (Google maps) will be used to map the spatial distribution of each cover class at each study site. Economic values will be summarized and mapped for each marine park.

Drawing on lessons learned during the implementation of the case studies, the Countries will then present some of the practical challenges that accompany spatially explicit ecosystem service value transfer. They will also explore how variability in the site characteristics and data availability for each project limits the ability to generalize a single comprehensive methodology.

Finally, as work from case study sites develops, observations on current trends and expected future directions in spatially explicit ecosystem value transfer will be explored, and the relevance of this data for value added products, decision tools, and socio-economic and biophysical policymaking.

Annex 1. Concept Note and Terms of Reference
For the development of the Caribbean Protected Areas Database Initiative - CPADI

I. INTRODUCTION AND RATIONALE

Vast volumes of data on protected areas (PAs) have been collected in the past and are stored in different formats and often using incompatible standards. In addition, although the knowledge and technology for managing PA data are well developed, many countries still lack the capacity and funding to collect and manage their own data and databases. In the context of the Caribbean region, a recent study undertaken by UNEP-WCMC for the InterAmerican Biodiversity Information Network has identified a wide range of scenarios of data standards and management, ranging from countries with no data collection or management systems to others with well-developed and functional PAs databases.

Building and improving the technical capacity of these countries to collect, gather and manage their information on protected areas would enable them to get a better picture of their protected areas sites and system and to track progress on the improvement of conservation *in situ.*

In order to address this need, the concept of the Caribbean Protected Areas Database Initiative – CPADI – was developed during a meeting with IABIN protected areas representatives of the Caribbean countries, promoted by the IABIN and the GEF CAM in April 2008 in Ocho Rios, Jamaica. This meeting (http://www.oas.org/dsd/Events/english/08.03.10.htm) included participation of representatives from the Bahamas, Barbados, Dominican Republic, Jamaica, St Kitts and Nevis, Saint Lucia and Trinidad and Tobago. With support from the UNEP-WCMC, the countries' representatives have elaborated this Terms of Reference which aims to seek financial and technical support for the development and implementation of the following objectives:

II. OBJECTIVES

The three stated objectives of the Caribbean Protected Areas Database Initiative – CPADI are:
1) To improve and develop technical capacity of individual Caribbean countries to collect and manage their protected areas data in a way that meets their specific needs and context;
2) To help develop or improve, when appropriate, individual country's protected areas data management systems;
3) To develop a centralized data management system for the Caribbean region (drawing from protected areas databases where they exist or from other sources of protected areas information) which serves as a regional node for input to the Americas Database on Protected Areas and the World Database on Protected Areas (WDPA).

The CAPADI is an initiative to be developed under the scope of the InterAmerican Biodiversity Network and in close coordination with the World Database on Protected Areas, managed by the United Nations Environment Programme World Conservation Monitoring Centre (UNEP-WCMC). While not all Caribbean countries were present at the generation of this concept note, we anticipate that this initiative is open to all Caribbean countries and participation by all is encouraged and welcomed.

III. CAPADI Management

The main goal of the CPADI is to improve the protected areas data management in the Caribbean region in close coordination with other regional and global existing efforts. In order to facilitate this process the CPADI will be managed by a Working Group (WG) composed of:

1. A representative(s) of the national protected area agency, or an organization acting on its behalf;

2. A representative(s) of the Protected Area Thematic Network of the InterAmerican Biodiversity Information Network;
3. A representative(s) of the United Nations Environment Program World Conservation Monitoring Centre;
4. A representative(s) of the Organization of the American States (OAS)

The appointed representative(s) of the national protected area agency would preferably have to meet the following criteria:

- Have direct involvement with the management of protected areas data on behalf of the country;
- Be familiar with the IABIN process or willing to engage/learn;
- Demonstrate appreciation of protected areas data and relationship to biodiversity.

The WG might also consider including representatives from other organizations, institutions or initiatives. This person would need to be identified by a member of the WG and should offer considerable contribution to the development of the CPADI. In order to be become part of the WG, he/she must meet these criteria and agreement reached by all the members of the WG.

The CPADI Working Group will be led by a coordinating institution appointed by all members. This working group will be responsible for the following tasks:

- To identify CPADI lead coordinating institution;
- To review documents, i.e. existing survey[2] on available databases and data sources for his/her country and provide comments on its accuracy and update;
- To assist with identification of all sources of protected areas data and information from Caribbean countries;
- Inform the Working Group of estimation of time required and staff needed to undertake the tasks required for the CPADI;
- To participate in the design of the work plan for Phases 2 and 3 of the CPADI;
- To commit to overall objectives of CPADI Working Group and ensure necessary work time is available for work plan;
- To notify the working group/focal point when commitment can no longer be maintained;
- To monitor implementation of project;
- To regularly communicate progress to the IABIN focal point;
- To provide the CPADI working group the identification of country-specific data fields or format;
- To agree on region-wide standards and format for protected areas data and data management;
- To participate actively in the development of guidelines for PA data management in the region.

The Working Group will work primarily via email, telephone and web conferences. Meetings of the WG are subject to participant and funding availability.

IV. DELIVERABLES AND TIMETABLE

The activities of the CPADI will be undertaken into the three following phases:

PHASE 1 – Identification of data needs and gaps for the individual Caribbean countries[3].

[2] Identify available databases and data sources about protected areas in IABIN sub regions to support the protected areas thematic network, available at http://protectedareas.iabin.net/index.php?option=com_docman&task=view_category&Itemid=97&subcat=4&catid=34&limitstart=0&limit=5

[3] Members of the CPADI

PHASE 2 – Strengthening individual country capacities on protected areas data management.

PHASE 3 – Development of a Mechanism or Database for the Caribbean region for Protected Areas Data Managed, integrated to the Americas and the World Database on Protected Areas.

The deliverables with the approximate target dates for Phase 1 are outlined below. The specific activities and timeframe for Phase 2 and Phase 3 will be determined based on the review of the data management gaps and needs undertaken on Phase 1.

PHASE 1 – Identification of data needs and gaps for the individual Caribbean countries.

1. To review the existing survey on available databases and data sources for each individual country; By end May 2008
2. To identify the current needs and gaps on protected areas data management for each individual country; By mid June 2008.
3. To identify the technical and personal requirements as well as actions needed for strengthening individual country capacities on protected areas data management; By mid June 2008.
4. To identify the technical and personal requirements as well as actions needed for developing a Mechanism or Database for the Caribbean region for Protected Areas Data Managed; By mid June 2008
5. Develop a work plan with estimated budget for strengthening individual countries capacities on protected areas data management to be developed on Phase 2. By early July 2008.
6. Develop a work plan, including a terms of reference for all participants, with estimated budget for strengthening individual countries capacities on protected areas data management to be developed on Phase 2. By early July 2008.

Annex 2.

Ecosystem Service Values by Cover Type for marine Parks and Environs in the Caribbean					
Land Cover	Ave.$/ha/yr	Lower Bound	Upper Bound	Area (ha)	Total ESV Flow
Disturbed and Urban Beach					
Beach	88,000	77,000	99,000		
Beach near dwelling	117000	140,000	94000		
Coastal & Riparian Forest	1826	5542	13,000		
Freshwater Stream	1595	1231	939		
Freshwater Herbaceous Swamp	72,787	32000	96000		
Grassland/pasture	118	118	118		
Near shore aquatic habitat	16, 283	4630	27935		
Coral Reef environ	100,000				
Mangrove	37,500				
Mangrove	500,000	200,000	900,000		
Mangrove restoration		225	216,000		
Caribbean tourism reefs are estimated to be worth US$1 million per square kilometer, based on the cost of maintaining sandy beaches and the value of attracting snorkelers and scuba divers.					
The annual economic values of mangroves, estimated by the cost of the products and services they provide, have been estimated to be between USD 200,000 -- 900,000 per ha. The range of reported costs for mangrove restoration is USD 225 -- 216,000 per ha.					