



## 6 *Reduce Threats to International Coral Reefs*

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### *Introduction*

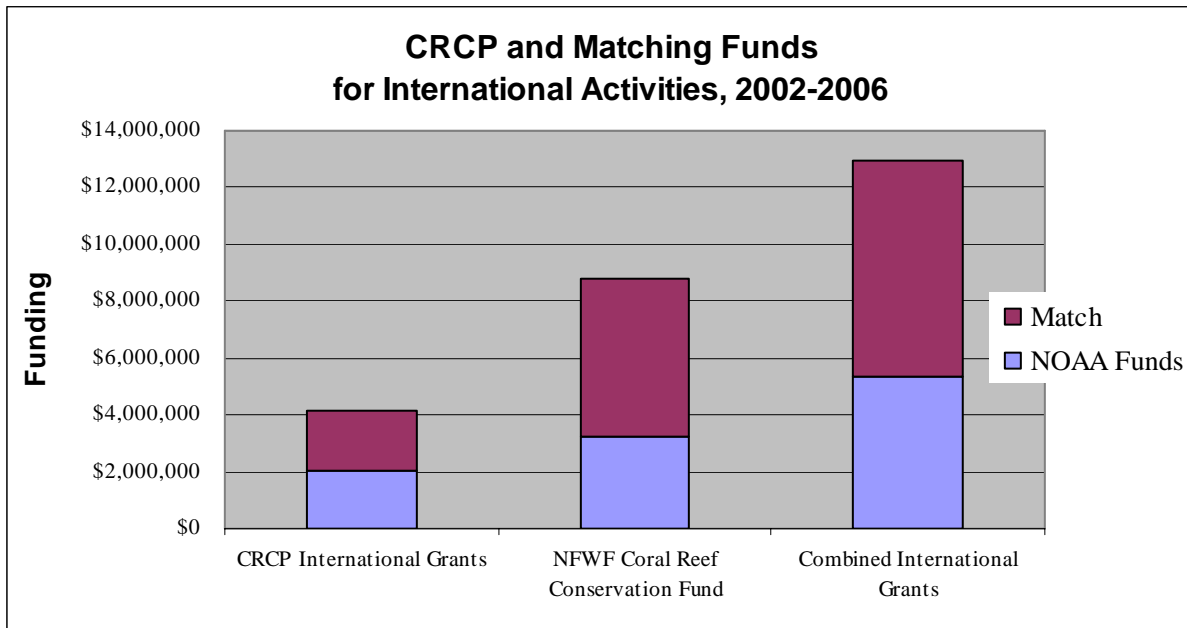
The U.S. has strong political and economic interests in protecting international coral reef ecosystems, particularly in the former Trust Territories of the Pacific Islands (the Freely Associated States (FAS) of Micronesia) and across the wider Caribbean region. Healthy marine ecosystems are critical to U.S. diplomatic and development strategies to promote economic and food security, social stability, democratic governance, improved human health, disaster and climate change mitigation, and biodiversity conservation in many countries. Coral reef ecosystems have great economic, social, and cultural importance to many nations and entire regions. These extremely valuable ecosystems constitute the economic base and future hope for sustained development in many countries, particularly small island nations.

The U.S. strategy to reduce international threats to coral reefs, as outlined in the U.S. National Action Plan to Conserve Coral Reefs and related documents of the international working group of the U.S. Coral Reef Task Force (USCRTF), calls for the U.S. government to collaborate with international partners to conserve international coral reefs and associated habitats while sustaining the human communities that depend on them.

In support of this strategy, the CRCP has embarked on a variety of international initiatives to build human and institutional capacity to support integrated coastal management, protected area management, reduction of land-based sources of pollution, and sustainable fisheries in coral reef nations. The CRCP addresses these issues through an assortment of collaborative partnerships, technical support and competitive small grants described in this category. The CRCP also supports a limited number of targeted international efforts through other categories.

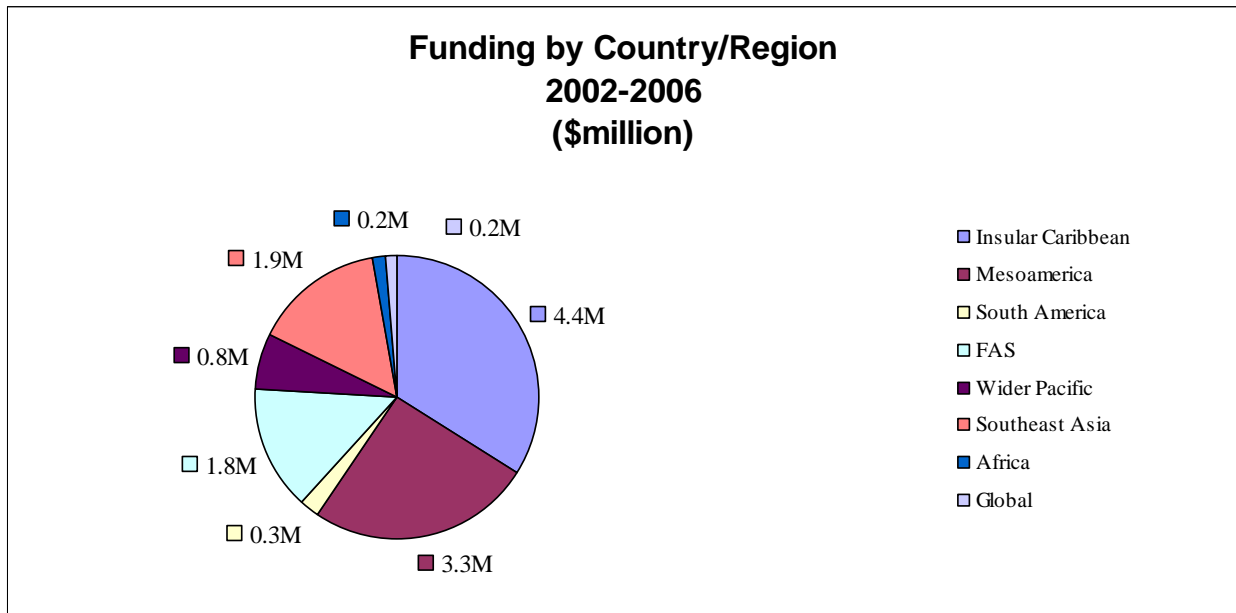
The greater part of the Program's international support (approximately 80% in total funding) has been delivered through two grant programs, the CRCP International Coral Reef Conservation Grants Program and the Coral Reef Conservation Fund. In 2002-2006, CRCP provided \$5.3M to these grant programs, which was leveraged by nearly \$7.6M in matching funds to support a range of activities that address global threats to coral reefs (see Exhibit III-6-1a). The ratio of non-CRCP matching funds to CRCP funds for the CRCP grants program was 1:1. The ratio of non-CRCP to CRCP funds for the NFWF Fund was 1.7:1 (see Exhibit III-6-1a).





**Exhibit III-6-1a.** CRCP and Matching Funds for International Activities (via International Grants and Coral Reef Conservation Fund), 2002-2006

The percent distribution of total funds (CRCP and non-CRCP) by region is shown in Exhibit III-6-1b. The regions receiving the most funding during this period were the Insular Caribbean (34%; \$4.4M) and Mesoamerica (25%; 3.3M), accounting for nearly 60% of total funding through these grant programs.



**Exhibit III-6-1b.** CRCP Funding for International Activities by Country/Region





Although they share common objectives, the two grant programs employ different methods to promote international coral conservation. The NFWF Coral Reef Conservation Fund emphasizes solutions to localized threats to coral reefs and associated habitats. The CRCP International Coral Reef Conservation Grants Program supports the development of coral conservation and management strategies and their application at local to regional scales, often in conjunction with broader initiatives supported by partner agencies. Individual summaries of the two grants programs are provided in the grants section of this book. Key activities, outputs, and outcomes of these programs are also incorporated in three of the four subcategory discussions—General International, Increase Use and Effectiveness of MPAs, and Reduce Land-Based Sources of Pollution—summarized in other sections of this chapter.

The CRCP activities to address this category are organized under the following four subcategories:

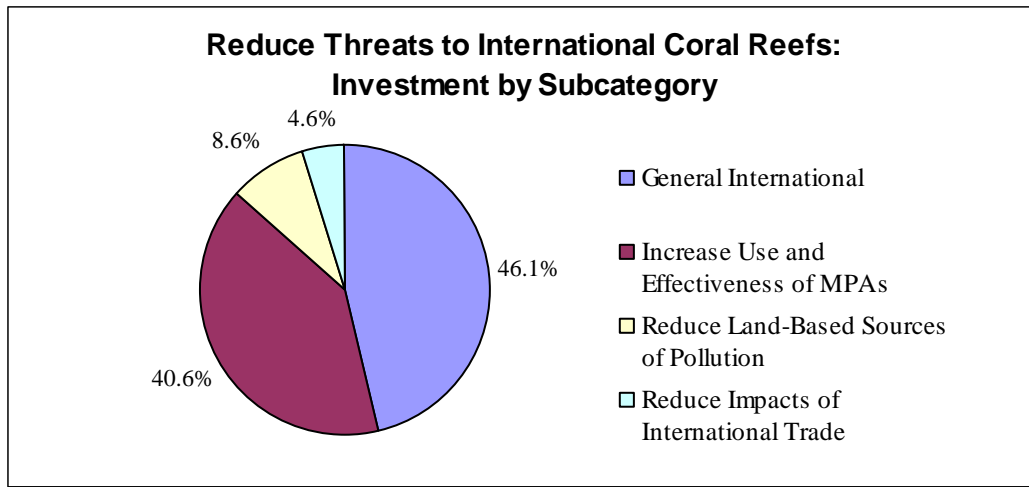
- General International
- Increase Use and Effectiveness of MPAs
- Reduce Land-Based Sources of Pollution
- Reduce Impacts of International Trade

Between 2002 and 2006, the CRCP provided \$6.4 million to support 193 projects in this category, and accounted for 5% of the overall CRCP funding and 15% of the overall number of projects (Exhibit III-6-2a).

<b>Exhibit III-6-2a Investments to Reduce Threats to International Coral Reefs 2002-2006</b>						
Spend Plan Category	Totals					
	Number of Projects	% of Category Projects	% of Total Projects	Funding	% of Category Funding	% of Total Funding
<b>Reduce Threats to International Coral Reefs</b>	<b>193</b>	<b>14.9</b>	<b>14.9</b>	<b>\$6,453,245</b>	<b>5.0</b>	<b>5.0</b>
General International	90	46.6	6.9	\$2,977,702	46.1	2.3
Increase Use and Effectiveness of MPAs	77	39.9	5.9	\$2,619,020	40.6	2.0
Reduce Land-Based Sources of Pollution	15	7.8	1.2	\$557,945	8.6	0.4
Reduce Impacts of International Trade	11	5.7	0.8	\$298,578	4.6	0.2

Exhibit III-6-2b shows the distribution of total investments in the subcategories listed in Exhibit III-6-2a.





**Exhibit III-6-2b.** Distribution of Investments by Subcategory, 2002-2006

In addition to the activities summarized in this chapter, since 2002 the CRCP has provided \$572,000 for initiatives in the Freely Associated States of Micronesia and \$253,000 to the Caribbean Marine Research Center on Lee Stocking Island in the Bahamas for a range of activities. These activities are discussed elsewhere in this document under the categories of Assess and Characterize U.S. Coral Reefs; Reduce Adverse Impacts of Fishing; Reduce Impacts of Pollution and Coral Disease; Improve Use and Effectiveness of MPAs; and Coral Reef Ecosystem Research.

***Subcategory: General International***

***a. Description of Subcategory***

Through its small grants programs, technical support, and collaborative partnerships, CRCP has supported a variety of initiatives to build local capacity to manage and conserve coral reef ecosystems around the globe. Chief among these are efforts to promote coral ecosystem monitoring as an essential component of the coastal management and decision-making process. Successful coral reef conservation requires adaptive management, which depends on monitoring programs that track trends in coral reef ecosystem health and reveal patterns in their condition. Coral ecosystem monitoring also plays a vital role in support of management strategies, such as the identification of no-take reserves, development of seasonal restrictions, or restoration of damaged habitats, by documenting the impacts of gaps in existing management schemes and illustrating the effectiveness of new measures over time.

In addition to bio-physical monitoring, the CRCP has encouraged international coral reef managers to incorporate socioeconomic analyses into management and decision-making through



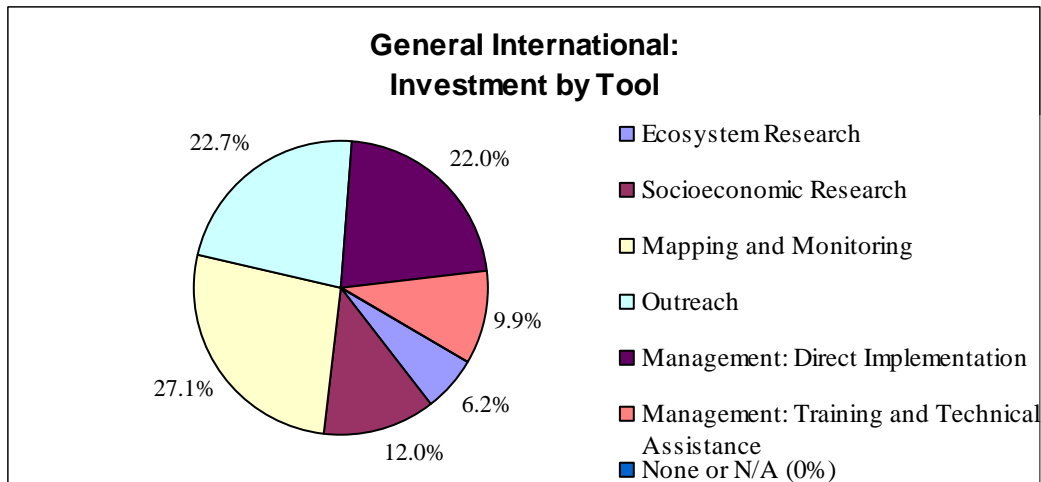


the Global Socioeconomic Monitoring (SocMon) Initiative. In recent years, resource managers have grown increasingly aware of the need to better understand the relationship between local communities and reefs, and incorporate this information (and the communities) in the design and implementation of reef conservation initiatives.

Between 2002 and 2006, the CRCP provided \$3M to support 90 projects in this subcategory. This subcategory accounted for 46% of funding within the category and 2% of overall CRCP funding; and 47% of projects in the category and 7% of overall CRCP projects (Exhibit III-6-2a). The distribution of funds by tool for this subcategory is shown in Exhibit III-6-3a and -3b.

Exhibit III-6-3a General International Investments by Tool														
Tool	Number of Projects	Funding	Number of Projects	Funding	Number of Projects	Funding	Number of Projects	Funding	Number of Projects	Funding	Number of Projects	% of Total Subcategory Projects	Funding	% of Total Subcategory Funding
	2002		2003		2004		2005		2006		TOTALS 2002-2006			
Ecosystem Research	0	\$0	0	\$0	2	\$105,000	0	\$0	2	\$79,477	4	4.4	\$184,477	6.2
Socioeconomic Research	2	\$73,625	3	\$83,500	1	\$45,000	3	\$126,500	1	\$29,586	10	11.1	\$358,211	12.0
Mapping and Monitoring	6	\$185,155	5	\$147,200	4	\$114,840	5	\$187,290	6	\$173,831	26	28.9	\$808,316	27.1
Outreach	3	\$55,000	2	\$24,200	4	\$156,066	6	\$176,759	5	\$264,717	20	22.2	\$676,742	22.7
Management: Direct Implementation	4	\$103,171	3	\$85,224	4	\$121,500	4	\$192,285	3	\$152,732	18	20.0	\$654,912	22.0
Management: Training and Technical Assistance	2	\$55,000	2	\$50,000	3	\$65,450	3	\$58,444	2	\$66,150	12	13.3	\$295,044	9.9
None or N/A	0	\$0	0	\$0	0	\$0	0	\$0	0	\$0	0	0	\$0	0
<b>TOTAL</b>	<b>17</b>	<b>\$471,951</b>	<b>15</b>	<b>\$390,124</b>	<b>18</b>	<b>\$607,856</b>	<b>21</b>	<b>\$741,278</b>	<b>19</b>	<b>\$766,493</b>	<b>90</b>	<b>100</b>	<b>\$2,977,702</b>	<b>100</b>



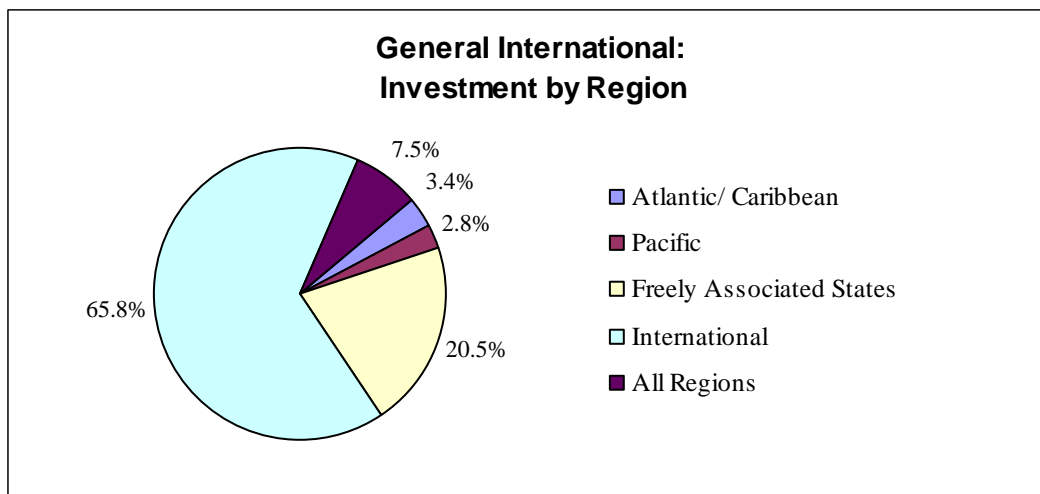


**Exhibit III-6-3b.** Distribution of Investments by Tool, 2002-2006

The distribution of funds by region for this subcategory is shown in Exhibits III-6-4a and -4b.

<b>Exhibit III-6-4a General International Investments by Region</b>														
Region	Number of Projects	Funding	Number of Projects	Funding	Number of Projects	Funding	Number of Projects	Funding	Number of Projects	Funding	Number of Projects	% of Total Subcategory Projects	Funding	% of Total Subcategory Funding
	2002		2003		2004		2005		2006		TOTALS 2002-2006			
Atlantic/ Caribbean	1	\$20,513	1	\$14,200	2	\$35,225	0	\$0	1	\$30,000	5	5.0	\$99,938	3.4
Pacific	0	\$0	0	\$0	2	\$27,500	1	\$47,250	1	\$9,763	4	4.0	\$84,513	2.8
Freely Associated States	2	\$43,000	0	\$0	5	\$230,816	4	\$165,161	4	\$171,789	15	15.0	\$610,766	20.5
International	13	\$352,483	11	\$335,924	13	\$309,315	15	\$474,867	14	\$487,747	66	66.0	\$1,960,336	65.8
All Regions	2	\$55,955	3	\$40,000	1	\$5,000	2	\$54,000	2	\$67,193	10	10.0	\$222,148	7.5
<b>TOTAL</b>	<b>18</b>	<b>\$471,951</b>	<b>15</b>	<b>\$390,124</b>	<b>23</b>	<b>\$607,856</b>	<b>22</b>	<b>\$741,278</b>	<b>22</b>	<b>\$766,493</b>	<b>100</b>	<b>100</b>	<b>\$2,977,702</b>	<b>100</b>





**Exhibit III-6-4b.** Distribution of Investments by Region, 2002-2006

CRCP also supports management capacity-building efforts through its two small grants programs. These include support for installation and maintenance of mooring buoys to protect sensitive coral reef resources from anchor damage and to identify MPA boundaries (see the Anchors Away! program below); community education and awareness initiatives; and efforts to restore damaged coral reefs, seagrass, and mangrove habitats.

### ***b. Activities***

Since 2002, the CRCP has provided approximately \$2,977,702 to a range of international initiatives which leverage NOAA capabilities and respond directly to local needs, as expressed by site-based practitioners, to build capacity for coral reef conservation and management. Additional activities funded by the CRCP but not discussed below include the establishment of a global coral disease database; development of a web-based coral management consultation system; and support for resource managers and decision makers to attend international forums to share experiences and identify gaps and priorities for future management action.

This support is divided primarily into three key themes which are summarized in the following pages:

- Bio-physical Monitoring
- Socio-economic Monitoring
- Outreach and Capacity-building for Coral Conservation and Management





## ***Bio-physical Monitoring***

### ***Global Coral Reef Monitoring Network***

NOAA has enjoyed an enduring partnership with the Global Coral Reef Monitoring Network (GCRMN), an international program which aims to improve the management and sustainable conservation of coral reefs by assessing the status and trends in the reefs and how people use and value the resources. Since 2002, CRCP has provided over \$150,000 to GCRMN initiatives for the development of coral management tools, including manuals, equipment, databases, training, and networking support.

### ***Monitoring Support for the Freely Associated States of Micronesia***

NOAA and its partners have sought to respond to a variety of site-specific and regional needs to promote effective coral reef conservation in the Freely Associated States of Micronesia (the Federated States of Micronesia, the Republic of the Marshall Islands, and the Republic of Palau). To help build coral reef system monitoring capacity in the region, CRCP provided \$150,000 for the chief scientist at the Palau International Coral Reef Center (PICRC) to build the Center's profile, explore funding alternatives to implement projects, and advance science and capacity-building efforts in the region. NOAA has also provided training and technical assistance to local groups to build capacity, evaluate key areas for conservation, and develop and implement effective coral conservation measures in support for the Micronesia Challenge. NOAA and the Japan International Cooperation Agency have co-funded a Coral Reef Monitoring Coordinator to oversee monitoring activities in the FAS. Since 2004, CRCP has provided over \$185,000 for these efforts.

### ***Integrated Coral Observing Network Stations in the Wider Caribbean***

NOAA's Coral Reef Watch Program uses meteorological and oceanographic monitoring stations to validate satellite-monitored high sea temperature data, provide near real-time and long term monitoring, and analyze conditions that may lead to coral bleaching. CRCP has supported the installation of Integrated Coral Observing Network (ICON, formally the Coral Reef Early Warning System - CREWS) stations at coral reef sites around the Caribbean, including \$40,000 for stations in Belize and the Cayman Islands.

### ***International Coral Grants***

Between 2002 and 2006, NOAA's two international coral grants programs contributed approximately \$319,000 and leveraged an additional \$446,000 in matching funds to support the implementation of bio-physical monitoring initiatives in eight countries.







## ***Socio-economic Monitoring***

### ***Support for Global Socioeconomic Monitoring Initiative***

The NOAA Global Socioeconomic Monitoring (SocMon) Initiative facilitates community-based socioeconomic monitoring of coral reef areas in five regions worldwide. SocMon provides local communities and management authorities with the tools they need to undertake basic socioeconomic assessments through provision of regional monitoring guidelines, workshop trainings, and technical assistance. Since 2003, over 40 sites have undertaken socioeconomic assessments using the SocMon protocol.

Since 2002, the CRCP has supported six major international SocMon projects, primarily focusing on the Pacific region, Southeast Asia, and the Caribbean, including Latin America.

Between 2002 and 2006, NOAA's two coral grants programs contributed nearly \$426,000 and leveraged an additional \$410,000 in matching funds to support socioeconomic monitoring initiatives in more than ten countries. The majority of this support was provided by the NOAA International Coral Reef Conservation Grants Program, which supports projects that: use socioeconomic assessments in coastal management at individual sites; conduct capacity building in socioeconomic assessments; and promote implementation of new regional guidelines to help managers better understand the communities whose activities affect marine protected areas and who are affected by MPA management decisions

## ***Outreach and Capacity-building for Coral Conservation and Management***

### ***Coral Reef Conservation Fund***

Through the NFWF Coral Reef Conservation Fund, the CRCP has responded directly to local practitioner needs to support a range of coral conservation and management initiatives. Under this category the Fund has awarded over \$1,630,000 and leveraged over \$2,640,000 in matching funds to more than forty capacity building and outreach initiatives in over twenty countries since 2002. Key themes include outreach and education, stakeholder and community-based management, and enforcement of local management regulations. Many grants support a combination of these themes.

### ***Anchors Away! Program***

A subprogram of the NFWF Coral Reef Conservation Fund, developed as part of the White Water to Blue Water Initiative, the *Anchors Away!* program awards competitive grants to install and maintain mooring buoys to protect sensitive coral reef resources from anchor damage and to identify MPAs in the Wider Caribbean Region. *Anchors Away!* grants are also required to include an education component aimed at resource managers, dive operators, local coral reef





stakeholders, and others engaged in anchoring. Since 2002, *Anchors Away!* has awarded \$474,507 to 13 projects in nine countries in the Wider Caribbean region.

**c. Funding Recipients and Partners**

To carry out the projects in this subcategory, the CRCP partnered with the NOAA offices and external partners listed in Exhibit III-6-5.

Exhibit III-6-5 General International Funding Recipients and Partners		
NOAA Offices	Academic Institutions	Non-Governmental Organizations
<ul style="list-style-type: none"> <li>• NOS - International Programs Office</li> <li>• NOS - Office of Response and Restoration</li> <li>• NMFS - Habitat Conservation Office</li> <li>• NMFS - Office of Protected Resources</li> <li>• NMFS - Ecosystem Assessment Division</li> <li>• OAR - Atlantic Oceanographic and Meteorological Laboratory</li> </ul>	<ul style="list-style-type: none"> <li>• Florida Institute of Technology</li> <li>• University of Guam</li> <li>• University of Miami/RSMAS</li> <li>• University of the West Indies</li> <li>• University of Zamorano, Honduras</li> </ul>	<ul style="list-style-type: none"> <li>• Global Coral Reef Monitoring Network</li> <li>• Reef Check</li> <li>• ReefBase</li> <li>• Coral Reef Degradation in the Indian Ocean (CORDIO)</li> <li>• Global Environment Facility</li> <li>• The Nature Conservancy</li> <li>• Palau International Coral Reef Center</li> <li>• The Nature Conservancy</li> <li>• Conservation International-Philippines</li> <li>• Pacific Regional Environment Programme</li> <li>• WorldFish Center</li> </ul>





#### ***d. Outputs***

Examples of key products of CRCP efforts in this subcategory are listed below.

#### ***Bio-physical Monitoring***

##### ***Global Coral Reef Monitoring Network***

Reef Check's five-year report of global coral monitoring results, "The Global Coral Reef Crisis: Trends and Solutions," was released in August 2002 at the World Summit on Sustainable Development in Johannesburg, South Africa. The report is based on data collected by thousands of Reef Check volunteer divers in over 50 countries and territories and was a major scientific documentation of the dramatic worldwide decline in coral reef health in the last decade.

The Australian Institute of Marine Science (AIMS) publication, "Methods for Ecological Monitoring of Coral Reefs," was released in Okinawa at the 10th International Coral Reef Symposium in June 2004. The aim of this book is to help managers of coral reefs select appropriate ecological monitoring programs, protocols, and methods for their coral reef management needs.

The AIMS publication, "Status of Coral Reefs of the World: 2004," is a two-volume compendium that documents how human activities continue to be the primary cause of the global coral reef crisis. The report details new initiatives aimed at reversing this degradation by conserving the biodiversity, economic value, and beauty of coral reefs.

The AIMS publication, "Status of Coral Reefs in Tsunami-Affected Countries: 2005," a rapidly prepared, yet comprehensive report on impacts to reefs in the Indian Ocean following the December 2004 tsunami. The report found that most coral reefs in the region escaped serious damage and could recover naturally within 5 to 10 years if human impacts are managed effectively, and that cumulative effects of anthropogenic stresses remain the major threat to Indian Ocean coral reefs.

##### ***Monitoring Support for the Freely Associated States of Micronesia (FAS)***

Since 2005, CRCP has supported two scientists and a monitoring coordinator at the Palau International Coral Reef Center (PICRC) to lead monitoring activities and build capacity throughout Micronesia. They have developed monitoring programs, worked with regional partners to build capacity, assisted PICRC research staff, and prepared research proposals for outside funding.

With support from the CRCP, coral reef monitoring workshops were held in the summers of 2005 and 2006 in Palau to build capacity and expand coral ecosystem monitoring in the FAS. The two-week trainings included intensive classroom and field sessions on coral and fish





taxonomy, reef monitoring techniques, sampling design, statistical analyses, database management and reporting. Follow-up retreats were held in the summer of 2007 in each FAS jurisdiction to expand current monitoring activities.

### ***International Coral Grants***

Coral reef ecosystem monitoring was supported by the NOAA International Coral Reef Conservation Grants Program in 2002 and produced the following outputs:

- Spreadsheets of raw bio-physical Reef Check monitoring data for Indonesia and East Africa
- A report on the development of a national coral reef monitoring network in the Solomon Islands

The implementation of and training for bio-physical monitoring is a key theme of many grants supported by the NFWF Coral Reef Conservation Fund. Some examples include:

- In 2002 the Palau International Coral Reef Center (PICRC) developed and applied survey methods to examine fish populations at established monitoring sites and conduct surveys of fish markets, exports, and subsistence fisheries to determine effects of commercial and subsistence harvesting.
- In 2002 the College of the Marshall Islands initiated a long-term national, community-driven coral reef monitoring and assessment program to educate local people and lay the foundation for the development of a reef management program for the Rongelap and Mili Atolls.
- In 2005 the Ocean Research and Education Foundation conducted a training workshop in Barbados for 12 reef practitioners (from three Caribbean countries) in the application of the Atlantic and Gulf Rapid Reef Assessment (AGRRA) protocol for assessing the condition of coral reef communities.

### ***Socio-economic Monitoring***

#### ***NOAA Global Socioeconomic Monitoring Initiative***

Outputs and accomplishments that were a direct result of CRCP funding include:

- Production of regional SocMon guidelines for the Caribbean and Southeast Asia (including both English and Spanish versions of the Caribbean guidelines).
- Numerous trainings on the guidelines, including two in Southeast Asia, three in the Spanish-speaking Caribbean, and four in the English-speaking Caribbean.





### *International Coral Grants*

Since 2002, the NOAA International Coral Reef Conservation Grants Program has funded sixteen grants to promote the SocMon methodology and establish socio-economic monitoring programs in the Caribbean and Southeast Asia. Products delivered by these grants include seven reports and one article describing the establishment of SocMon programs in urban areas (Lapu Lapy City, Philippines), remote sites (e.g., Glover’s Reef Atoll, Belize), and sites in the Spanish-speaking Caribbean (Colombia), Indonesia, Jamaica, and Thailand. All reports described how monitoring results would be incorporated into adaptive management.

### *Outreach and Capacity-building for Coral Conservation and Management*

Through the NFWF Coral Reef Conservation Fund, the CRCP has supported a combination of initiatives to build local capacity and raise community awareness of the value of coral ecosystems. Examples include the following:

- In 2003, the Bay Island Conservation Association supported outreach and enforcement objectives for Utila Bay, Honduras by:
  - Presenting weekly classes at local schools.
  - Speaking with dive shops, restaurants, resorts and fishers.
  - Initiating an Atlantic and Gulf Rapid Reef Assessment (AGRRA) coral monitoring program.
  - Coordinating marine patrols with local authorities to enforce regulations and ensure the use of mooring buoys at dive sites.
- In 2005, the Fondation pour la Protection de la Biodiversité Marine supported education and stewardship activities on Haiti’s Arcadins coast by:
  - Presenting conflict resolution classes to approximately 1,000 people to communicate the conservation and management needs of watersheds and coral reefs.
  - Developing a pamphlet in Creole explaining the economic losses caused by the destruction of coral reefs.
  - Supporting field activities, such as beach cleanups and mangrove plantings.

### *Performance Metrics*

Examples of performance metrics for subthemes are listed below. Performance is primarily evaluated at the project level.

### *Bio-physical Monitoring*

Publication of periodic reports on the global status of coral reefs of the world. Results to date:





- GCRMN published biennial reports from 2000-2004. GCRMN changed the periodicity of subsequent reports to potentially three-year intervals with additional special reports as appropriate.
- GCRMN published a special “Status of Coral Reefs in Tsunami-Affected Countries: 2005”, whose translation into Thai was supported by NOAA. An additional publication on the impact of Caribbean bleaching in 2005 is scheduled for publication in 2008.
- The Republic of Palau, the Republic of the Marshall Islands, and the Federated States of Micronesia submitted coral reef ecosystem monitoring data and local threats to coral reef conservation to NOAA’s State of the Reefs Report: 2005.

### ***Socio-economic Monitoring***

Publication of regional SocMon protocols in at least two regions and their promotion and implementation through annual grants programs. Results include:

- The GCRMN with its partners has published three SocMon protocols in the Caribbean (also translated into Spanish), SE Asia, and East Africa.
- Over twenty SocMon projects have been implemented during 2002-2004 through the multiple NOAA international funding mechanisms.

### ***e. Outcomes***

CRCP support for activities in this subcategory have had a number of significant impacts. Examples are listed below for each subtheme.

### ***Bio-physical Monitoring***

#### ***Global Coral Reef Monitoring Network***

The “Status of Coral Reefs of the World” reports have been used directly in the formulation of The Intergovernmental Panel on Climate Change (IPCC) reports on the impacts of climate change on coral reefs and related ecosystems, and in documents produced by the United Nations Environment Programme (UNEP), the United Nations Development Programme (UNDP), and the International Coral Reef Initiative. They are heavily cited in coral reef research reports and reviews, frequently as the justification for undertaking research or remedial action on damaged or threatened coral reefs. The “Status of Coral Reefs of the World: 2004” report was a direct catalyst for the formulation of the *Micronesian Action Plan*, released at the ICRI General Meeting in April 2007. Additionally, National Public Radio and other U.S. news media have cited these reports in news items and radio documentaries. Finally, most nodes of the GCRMN have reported increased monitoring of their coral reefs in response to the need to produce regular status reports on the status of their reefs.





### ***International Coral Grants***

With support from the NOAA International Coral Reef Conservation Grants Program, the Marine Environment and Resources Foundation achieved the re-design of the Philippines Department of Environment and Natural Resources-Protected Areas and Wildlife Bureau database to make it more a dynamic and updated monitoring tool.

A 2002 National Fish and Wildlife Foundation (NFWF) Coral Reef Conservation Fund grant helped the Palau International Coral Reef Center (PICRC) to build capacity to monitor essential fish habitats. According to PICRC, this work provided a lasting impact, helping the Center better understand the need to consider subsistence as well as commercial fisheries as components of over-harvesting. Managers now focus more on MPAs since they protect both subsistence and commercial fisheries. The Center also believes that NFWF-supported brochures, posters, and talk shows used to inform the public about the importance of fish in maintaining coral reefs, and in the recovery of Palau's reef from the 1998 bleaching, helped create public support for the recent harvest restriction of the two most popular and expensive fish in Palau, the Napoleon wrasse and bumphead parrotfish.

Due to the success and publicity received by the government and local communities, another 2002 NFWF grant, which supported community monitoring as a precursor to initiating a management plan for the Rongelap and Mili Atolls, was replicated and expanded in three other atolls. In many other atolls, there are efforts to survey the marine resources using methods designed and modified during the NFWF project. The accomplishments of this project (capacity building, research on status of reefs and resources, and conservation planning) attracted interest from the Nature Conservancy and became an example of a national commitment to conservation. As a consequence, the Republic of the Marshall Islands is now part of the Micronesia Challenge striving to reach the Millennium Development Goals in the Micronesia region of realizing conservation of at least 30% of marine resource areas in the Pacific by 2015.

### ***Socio-economic Monitoring***

#### ***NOAA Global Socioeconomic Monitoring Initiative***

The availability of SocMon guidelines has enabled local communities to undertake socioeconomic monitoring using a clear, simple set of standard guidelines. Development and dissemination of these guidelines for the Caribbean, Spanish-speaking Caribbean, and Southeast Asia have formed the bases for establishment of socioeconomic monitoring programs in these regions. Trainings on the guidelines have focused on how socioeconomic information can be useful for coral managers, which socioeconomic variables are most important to monitor, and how to actually collect this information. Since development of the guidelines and trainings on the guidelines, numerous local communities have undertaken socioeconomic monitoring based on the guidelines, which allows results from the monitoring to be compared across sites. Results of the monitoring are used by local communities and management authorities for adaptive





management and to understand the impacts of resource changes on livelihoods of people living near coral reefs.

The NOAA International Coral Reef Conservation Grants Program supported the development of socio-economic monitoring manuals for Southeast Asia and the Caribbean: “Socioeconomic Monitoring Guidelines for Coastal Managers.” These actions catalyzed worldwide establishment of the SocMon methodology. On a local scale, a number of management decisions have been developed or adapted as a result of the NOAA international grants support. SocMon approaches and methods were formally adopted by the local government unit, Lapu Lapu City, Philippines as well as by public and private project partners in a project completed by the Coastal Dynamics Foundation. The Nature Conservancy (TNC) also implemented a socio-economic project to monitor stakeholder perceptions to improve MPA management effectiveness in Indonesia. Results demonstrated the lack of awareness of mangrove ecosystem benefits. Therefore, TNC developed an outreach program to inform communities on the benefits of mangroves.

### *Program Highlight: Conservation Education in Micronesia*

In 2005, Rare and the Conservation Society of Pohnpei (Micronesia) initiated a Pride conservation education campaign to increase awareness of Pohnpei’s marine environment and build support for its sustainable use. The campaign addressed the threat of over-harvesting inside local MPAs, and used the mangrove crab, or “Elimoang,” as its flagship species. The Elimoang campaign increased knowledge and support for MPAs dramatically among local communities. By the end of the project, the percentage of fishermen talking about the importance of the marine environment and MPAs to their neighbors increased from a pre-campaign baseline of 22% to 82% post-campaign. The percentage of fishermen who believe it is “important” that hunting/fishing in the MPAs not be allowed also increased, from 30% pre-campaign to 100% post-campaign. The campaign was also successful in getting two new MPA communities to join Pohnpei’s MPA Network, in helping to develop a new community sponge farming business, and in garnering community and UNESCO support for a new biosphere reserve. The UNESCO biosphere reserve program designated And Atoll to be the second Micronesian biosphere reserve in 2006.

### *Outreach and Capacity-building for Coral Conservation and Management*

Through the NFWF Coral Reef Conservation Fund, the CRCP has yielded the following outcomes:

- In 2003, the Bay Island Conservation Association supported marine patrols, environmental education activities, and the establishment of an AGRRA monitoring program and database. Monitoring has been carried out continuously since this time and resulting data will support future management. Data also supported the temporarily closure of three dive sites due to visitation pressure. The project also influenced the adoption of a Code of Conduct by divers and visitors and the use of better practices by dive shops. Important outcomes of these efforts include the establishment of a small no-take zone for lobsters and conchs and a successful restoration of staghorn (*Acropora*







*cervicornis*), elkhorn (*A. palmata*) and lettuce (*Agaricia agaracites*) corals that were damaged from boat anchorages.

### ***Program Highlight: Developing a Management Strategy in Fiji***

In 2004, the Wildlife Conservation Society (WCS) facilitated community and stakeholder leadership to develop a comprehensive management strategy for the Namena MPA (Fiji). Over the course of two years the MPA concept grew from the villagers' traditional idea of protected fishing grounds into a network of ecologically-important protected areas throughout the immediate coastal and marine zone of the Kubulau district. Through partnerships with NGOs and developing community and government MOUs, WCS facilitated the plan development process and collected the biological and socio-economic data upon which the plan is based. The plan was created through discussions, presentations, surveys, and meetings of stakeholders (Council of Chiefs, government, and community members). Approximately 36% of the community fishing ground is now designated 'no-take' and anecdotal evidence suggests larger fish have returned.

## ***f. Challenges***

Please see the Coral Grants chapter for challenges specific to the two NOAA coral grants programs.

### ***Bio-physical Monitoring***

It has been difficult for the international community (participating authors and donors) to maintain the pace of biennial global status reports. Hence, the international coral community has decided to extend the time frame between reports (3-4 years) while producing additional specialized studies as appropriate and when funding is available. This will create its own set of problems since it is difficult to maintain a global network of contributing unpaid authors when the status reports are published quadrennially.

Given the geographical distances and coral reef area coverage in Micronesia, there are insufficient funds to cover staff, supplies, and training. Biophysical monitoring in this region will continue to be challenged by the amount of support and the number of trained individuals. These groups are grateful to NOAA for building their existing monitoring programs and look forward to continued partnership and assistance.

### ***Socio-economic Monitoring***

Institutionalization of the SocMon approach is a challenge for local sites. Further, it is difficult for a small grants program to provide additional funding support for implementing recommendations for adaptive management resulting from SocMon. Cost effective monitoring of small grants programs is a challenge.

A challenge to a comprehensive global program for socioeconomic monitoring remains gaps in capacity for data assessment. Many sites have undertaken monitoring but lack ability to properly





analyze and report back on the results. As a result, there are a number of sites for which data has been collected but the results have not been used at the local level, nor have site reports been transmitted to the regional or global level.

### *g. Future Directions*

#### *Bio-physical Monitoring*

GCRMN will seek new opportunities for visibility of its periodic reports, particularly in 2008, International Year of the Reef. As funding and technical resources permit, GCRMN will also publish specialized reports addressing emerging issues at global and regional levels.

The ecosystem monitoring program in Micronesia is operated and managed as a regionally-coordinated program after three years of NOAA support, building partnerships, and providing training. The FAS monitoring teams will continue their monitoring efforts with the help of partners and report to NOAA, GCRMN, and local government authorities.

#### *Socio-economic Monitoring*

Identification of a sustainable source of funding for the SocMon Initiative, rather than piecemeal funding through individual grants, is a key step for ensuring longevity of the SocMon program. SocMon will continue to seek new means to facilitate incorporation of SocMon results into management. Additionally, more emphasis will be placed on quantifying socioeconomic trends at the regional and global levels. It is hoped that socioeconomic monitoring will, at some point, catch up to biophysical monitoring in terms of site coverage and standardization of methods, which will allow greater comparison between sites. As of 2006, sites are now required to report their results to the Global Socioeconomic Monitoring Database, housed at WorldFish Center.

### *Subcategory: Increase Use and Effectiveness of MPAs*

#### *a. Introduction to Subcategory*

Broad expectations are placed on marine protected areas to protect biodiversity and ecosystem function, reduce poverty, and provide for healthier coastal communities with a strong foundation for economic growth. However, MPAs are severely challenged in achieving these objectives, for example, by insufficient financial and technical resources, lack of trained staff, or lack of data for management decisions. Performance evaluation plays a critical role in providing for and demonstrating long-term positive impacts on biodiversity and the human communities that depend on these resources. Management effectiveness is the degree to which a protected area is used to achieve its goals and objectives. Assessing management effectiveness is a way to document how the management of a protected area influences its success. Evaluating





management effectiveness should ultimately lead to improved project planning, accountability, and adaptive management.

NOAA actively encourages MPA performance evaluation and adaptive management strategies at the site and national system level. Through the MPA Management Effectiveness Initiative (MPA-MEI), NOAA and its partners have worked with MPA managers and experts around the globe to develop tools to review MPA goals and objectives, select performance measures, develop an evaluation process, and support for conducting such evaluations. Support was initiated within NOAA through the CRCP and with funding from the Packard Foundation, and the NFWF Coral Reef Conservation Fund gave high priority to this theme in 2004-2006. Additionally, in 2005 the NOAA International Coral Reef Grants Program launched a three-year effort to encourage regional approaches to further marine reserves in the Caribbean and Southeast Asia. This program was amended in 2006 to focus on development of MPA networks within these same regions.

Between 2002 and 2006, the CRCP provided \$2.6M to support 77 projects in this subcategory. This subcategory accounted for 41% of funding within the category and 2% of overall CRCP funding; and 40% of projects in the category and 6% of overall CRCP projects (Exhibit III-6-2). The distribution of funds and effort by tool for this subcategory is also shown in Exhibits III-6-6a and 6b.

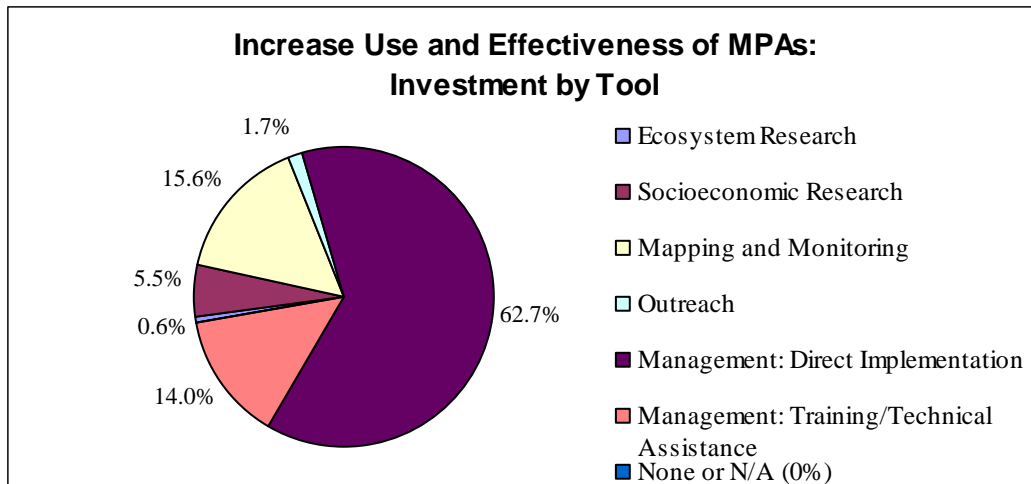




**Exhibit III-6-6a  
Increase Use and Effectiveness of MPAs  
Investments by Tool**

Tool	Number of Projects	Funding	Number of Projects	Funding	Number of Projects	Funding	Number of Projects	Funding	Number of Projects	Funding	Number of Projects	% of Total Subcategory Projects	Funding	% of Total Subcategory Funding
	2002		2003		2004		2005		2006		TOTALS 2002-2006			
	Ecosystem Research	0	\$0	1	\$15,000	0	\$0	0	\$0	0	\$0	1	1.3	\$15,000
Socioeconomic Research	1	\$24,200	1	\$20,000	3	\$54,000	0	\$0	2	\$46,715	7	9.1	\$144,915	5.5
Mapping and Monitoring	2	\$44,000	2	\$65,200	1	\$45,500	4	\$132,395	2	\$120,230	11	14.3	\$407,325	15.6
Outreach	2	\$45,000	0	\$0	0	\$0	0	\$0	0	\$0	2	2.6	\$45,000	1.7
Management: Direct Implementation	7	\$210,012	4	\$115,300	12	\$498,400	11	\$417,463	9	\$399,833	43	55.8	\$1,641,008	62.7
Management: Training and Technical Assistance	4	\$155,000	2	\$29,000	4	\$107,937	2	\$51,335	1	\$22,500	13	16.9	\$365,772	14.0
None or N/A	0	\$0	0	\$0	0	\$0	0	\$0	0	\$0	0	0	\$0	0
<b>TOTAL</b>	<b>16</b>	<b>\$478,212</b>	<b>10</b>	<b>\$244,500</b>	<b>20</b>	<b>\$705,837</b>	<b>17</b>	<b>\$601,193</b>	<b>14</b>	<b>\$589,278</b>	<b>77</b>	<b>100</b>	<b>\$2,619,020</b>	<b>100</b>





**Exhibit III-6-6b.** Distribution of Investments by Tool, 2002-2006

### *b. Activities*

In the initial phase of the NOAA MPA Management Effectiveness Initiative (2002–2004), eighteen MPAs, in an equal number of countries on four continents, tested indicators and methodologies and ran pilot programs to evaluate the effectiveness of their management performance. Of these, seven coral sites ran pilots through NOAA grants, and additional coral sites were supported by WWF and Packard Foundation. Over 90% of all the sites reported that the experience was a successful one and that they will implement, to some degree, the MPA-MEI methodology for future evaluations.

In a second phase (2004–2006), the MPA-MEI worked in numerous countries with NOAA support through CRCP and NFWF with three MPAs (in Mexico, Ecuador, and Italy) to develop and implement an MPA evaluation using the MEI methodology. The evaluation programs and training for the managers and staff of these MPAs were the most emphasized results of this phase. Italy designed a method to evaluate the effectiveness of all the government-managed MPAs using this methodology.

NOAA worked with the World Wildlife Fund (WWF) and the World Conservation Union (IUCN)-World Commission of Protected Areas (WCPA) to develop draft MPA management effectiveness guidelines and convene a workshop (held in Hawai'i in September 2003) to review the guidebook and discuss its implementation at pilot MPA sites. The project team published the guidebook to provide MPA managers and practitioners with tools to develop assessments and measure effectiveness indicators.

In 2003, 20 pilot MPAs around the world field-tested the draft guidebook on evaluating MPA effectiveness. Twelve sites completed projects reports and we received interim reports from one





site; of these thirteen reports, seven were from coral MPA sites, including Guam. The guidebook and MPA site results were presented at the 2003 World Parks Congress.

In Southeast Asia a regional meeting of over 30 MPA and fisheries experts was held in May 2003, sponsored by NOAA, IUCN, and others to prioritize regional needs to further MPAs. The workshop established five priority issues for action in the management of MPAs. Input from experts on these issues formed the backbone of the Regional Action Plan to Strengthen a Resilient Network of Effective MPAs in SE Asia: 2002-2012. The resulting Regional Action Plan for Marine Reserves helped define priority funding needs for the NOAA International Coral Reef Conservation Grants Program.

The marine action plan for the Caribbean convened a regional expert workshop in Miami in June 2004 that resulted in the development of a marine reserve enhancement plan, including the identification of priority project proposals to implement the plan. The resulting enhancement plan helped define priority funding needs for the NOAA International Coral Reef Conservation Grants Program.

It is important to note that, in addition to the MPA-MEI and regional and national system planning efforts discussed in this section, CRCP also supports the development of coral MPAs around the globe through the NFWF Coral Reef Conservation Fund. Since 2002, the Fund has provided \$816,000 and leveraged an additional \$1,475,000 to 25 projects in seventeen countries to support the development and improvement of coral MPAs.

***c. Funding Recipients and Partners***

To carry out the projects in this subcategory, the CRCP partnered with the NOAA offices and external partners listed in Exhibit III-6-8.

<b>Exhibit III-6-8            Increase Use and Effectiveness of MPAs            Funding Recipients and Partners</b>	
NOAA Offices	Non-Governmental Organizations
<ul style="list-style-type: none"> <li>• NOS - International Programs Office</li> </ul>	<ul style="list-style-type: none"> <li>• IUCN - World Commission on Protected Areas (WCPA) Marine</li> <li>• WWF International</li> <li>• The David and Lucille Packard Foundation</li> </ul>





#### *d. Outputs*

Since 2005, the MPA-MEI has been used as an instrument for MPA management effectiveness evaluation, training and outreach worldwide. Due to demand for different regions and MPA managers and practitioners, the guidebook “How is Your MPA Doing?” is now available in five languages (English, Spanish, French, Italian, and Chinese Mandarin) and soon will be available in Tagalog, Korean, and Vietnamese.

More than 1000 hard copies of the English version of the guidebook have been distributed to MPA managers, practitioners, and experts worldwide. A new reprint of 1000 copies of each of the English and Spanish versions will be distributed among Latin American countries and other partners worldwide. Electronic versions of the guidebook and support materials and reports have been distributed in CD format.

A major funding priority of the NOAA International Coral Reef Conservation Grants Program is support for projects that adapt the “How is Your MPA Doing?” handbook to strengthen and achieve site goals and objectives. Since 2002 the program has awarded \$780,000 and leveraged an additional \$800,000 for 16 management effectiveness projects in over a dozen countries. Most of these sites are in coral ecosystems.

#### *Performance Metrics*

A major performance measure for the MPA-MEI was the development of a methodology for MPA management effectiveness that can be applied in coral reef areas by 2004. Responses to this measure are as follows:

- Methodology was published in 2004.
- Methodology was piloted in 12 coral MPAs.
- Methodology has been implemented in at least 6 coral MPAs.

A major performance measure for MPA Regional Network Support was to develop Caribbean and SE Asian regional approaches to MPA network design by 2004. Responses to this measure are as follows:

- In 2003, Caribbean developed a priority-setting agenda for regional approaches to MPA network design including priority projects, 3 of which were funded by NOAA through the CRCP competitive process.
- SE Asia developed a priority-setting agenda for its regional approach to MPA network design in 2004.





### *e. Outcomes*

At a policy level, NOAA's international management effectiveness partnerships and grants have contributed to giving new focus on effectiveness and adaptive management, following the global debate in the NGO community (World Parks Congress) and Convention on Biological Diversity.

Today the MPA-MEI is a recognized methodology widely requested to promote MPA management effectiveness and train MPA staff and practitioners with tools and methodologies to design and implement an MPA performance evaluation program. Though originally intended to be used by existing MPAs, the instrument is now also commonly used in the design phase for new MPAs. The MPA-MEI guidebook has become a common source of consultation for MPA managers and practitioners, and in some countries, for the general public and general protected area experts who need methodologies to evaluate the effectiveness of conservation measures.

At the MPA scale, the MPA-MEI has served to help incorporate the socioeconomic and governance dimension to MPA management. Before this experience, the practices within MPAs were focused on biological and physical data and monitoring. The MPA-MEI encouraged MPA staff to get involved with local communities and authorities in order to educate the public, obtain consensus and support for decision about the MPA, and to obtain financial support to develop evaluation programs that integrate different stakeholders.

NOAA's outreach has encouraged and in some cases supported publication of the Guidebook in four languages (English, Spanish, French, and Mandarin). Translations in three other languages (Korean, Vietnamese, and Tagalog) are currently underway. With these translations, the MPA-MEI will target an important portion of the MPA-related world. Elements of the Guidebook have been incorporated into MPA training through IUCN, WWF, and the U.S. MPA Center. Elements of the Guidebook approach have been incorporated into approaches in other countries, e.g., "Saving Philippine Reefs", and in one non-coral area, the Government of Italy has used the Guidebook as a foundation to its national MPA program evaluation initiative.

At the regional scale, regional approaches to promote marine reserves in the Caribbean and Southeast Asia built action plans for coordinated future action. Some of the outcomes of the activities in the Caribbean include:

- The Toledo Association for Sustainable Tourism and Empowerment (TASTE) increased enforcement personnel and patrolling and surveillance activities in the Sapodilla Cayes Marine Reserve, Belize.
- CREA Panama Foundation worked closely with the indigenous non-profit organization BALU UALA Foundation and the natural resource authority, the General Kuna Congress, to designate five marine protected areas in this Central Caribbean marine eco-region.







### *f. Challenges*

There are many challenges to designing a collaborative partnership to encourage management effectiveness of individual MPAs and MPA networks. The initial NOAA approach focused on developing a formal approach to the evaluation process as a part of the larger adaptive management process. Among the challenges are:

- Institutionalizing evaluation processes as a part of adaptive management at the site and sub-national level.
- Marshalling resources (financial and technical) to implement recommendations through an adaptive management process.
- Sustaining funding to support the evaluation program over several years.
- Catalyzing processes to revise and adapt MPA goals and objectives through a results-based management framework.
- Identifying appropriate evaluation processes for the scale of local resources.
- Training national and regional experts to build local and regional management effectiveness capabilities.
- Maintaining a programmatic commitment to integrate governance and socio-economic indicators with biophysical indicators for a comprehensive evaluation, thus incorporating stakeholders in the process.

A competitive grants program that generally does not provide multi-year funding is not well-suited to long-term institutionalization of management effectiveness processes at individual sites. In 2005-2006, NOAA introduced the opportunity to fund multiple site projects in order to enhance training and capacity building both within and between states. While this has been fairly successful, it is not well-suited to training trainers on management effectiveness approaches.

### *g. Future Directions*

The Management Effectiveness Program will continue to provide support to help individual sites implement a formal evaluation process. Regional projects which include a strong training component will continue to encourage practitioner exchanges. New efforts will be made to consider how to enhance existing training programs to include effectiveness evaluation, and to build a cadre of trainers in performance evaluation addressing the complete suite of indicators. As national MPA networks mature, attention will be given to developing more nationally oriented system evaluation opportunities. Consideration will be given to providing incentives to institutionalization of effectiveness evaluations, such as whether second-year funding opportunities should be opened for projects to implement adaptive management measures.





## ***Subcategory: Reduce Land-Based Sources of Pollution***

### ***a. Introduction to Subcategory***

Pollution from land-based sources is a primary source of coral reef degradation around the globe. In the Caribbean region, approximately 80% of ocean pollution originates from activities on land. Two objectives of the U.S. National Coral Reef Action Strategy are (1) to promote efforts to prevent, reduce, and control land-based sources of pollution and their effects on coral reef ecosystems, and (2) build human and institutional capacity to manage and conserve reef ecosystems and coastal watersheds through integrated coastal management.

Primarily through its small grants programs, NOAA supports international initiatives that promote integrated watershed and coastal management practices that reduce or control runoff to nearshore coral reef ecosystems, assess effectiveness of these management practices, engage stakeholders and government agencies in collaborative partnerships to implement these practices, and recommend best management practices that can be applied elsewhere.

Between 2002 and 2006, the CRCP provided \$0.6 M to support 15 projects in this subcategory. This subcategory accounted for 9% of funding within the category and less than 1% of overall CRCP funding; and 8% of projects in the category and 1% of overall CRCP projects (Exhibit III-6-2). The distribution of funds and effort by tool for this subcategory is shown in Exhibits III-6-9a and -9b.

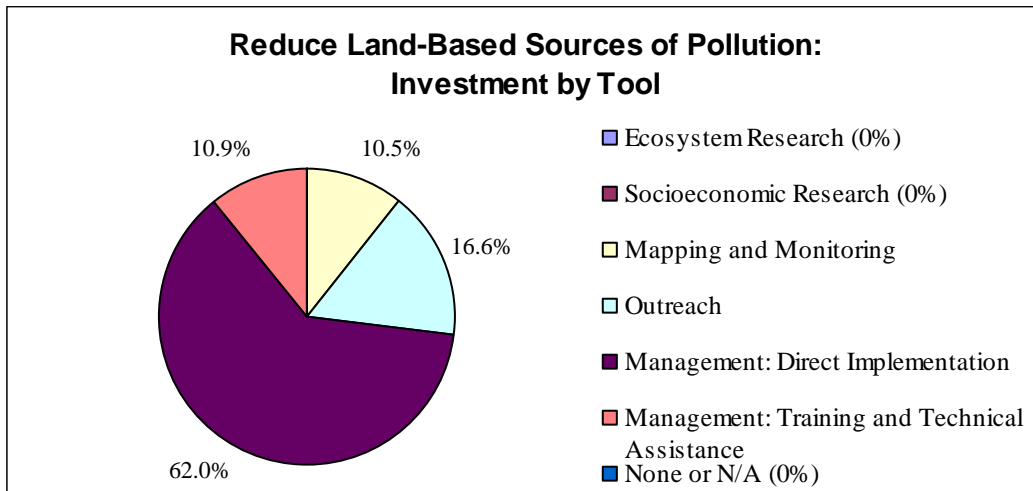




**Exhibit III-6-9a  
Reduce Land-Based Sources of Pollution  
Investments by Tool**

Tool	Number of Projects	Funding	Number of Projects	Funding	Number of Projects	Funding	Number of Projects	Funding	Number of Projects	Funding	Number of Projects	% of Total Subcategory Projects	Funding	% of Total Subcategory Funding
	2002		2003		2004		2005		2006		TOTALS 2002-2006			
	Ecosystem Research	0	\$0	0	\$0	0	\$0	0	\$0	0	\$0	0	0	\$0
Socioeconomic Research	0	\$0	0	\$0	0	\$0	0	\$0	0	\$0	0	0	\$0	0
Mapping and Monitoring	0	\$0	1	\$20,000	0	\$0	0	\$0	1	\$38,500	2	13.3	\$58,500	10.5
Outreach	1	\$20,000	0	\$0	0	\$0	0	\$0	2	\$72,602	3	20.0	\$92,602	16.6
Management: Direct Implementation	0	\$0	5	\$226,600	1	\$15,950	2	\$64,343	1	\$39,000	9	60.0	\$345,893	62.0
Management: Training/Technical Assistance	0	\$0	0	\$0	1	\$60,950	0	\$0	0	\$0	1	6.7	\$60,950	10.9
None or N/A	0	\$0	0	\$0	0	\$0	0	\$0	0	\$0	0	0	\$0	0
<b>TOTAL</b>	<b>1</b>	<b>\$20,000</b>	<b>6</b>	<b>\$246,600</b>	<b>2</b>	<b>\$76,900</b>	<b>2</b>	<b>\$64,343</b>	<b>4</b>	<b>\$150,102</b>	<b>15</b>	<b>100</b>	<b>\$557,945</b>	<b>100</b>



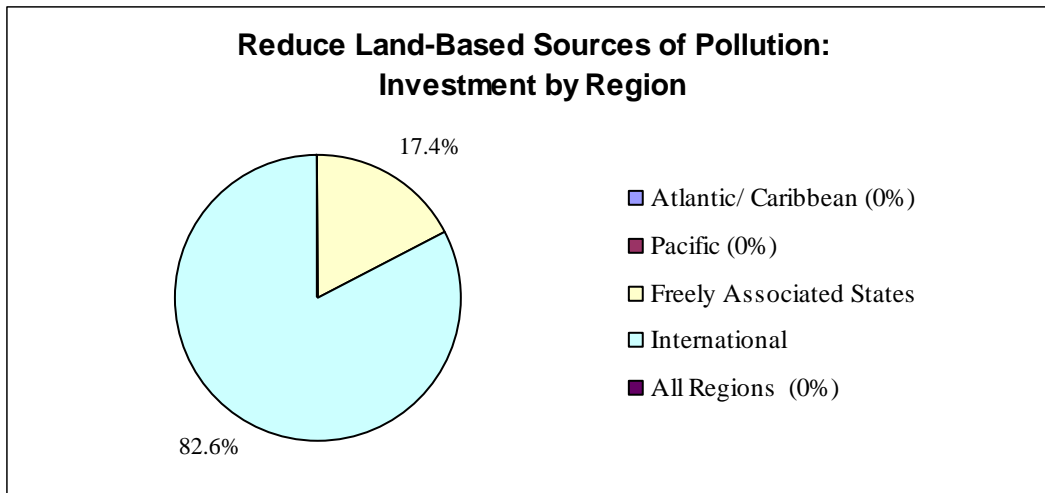


**Exhibit III-6-9b.** Distribution of Investments by Tool, 2002-2006

The distribution of funds and effort by region for this subcategory is shown in Exhibits III-6-10a and -10b.

<b>Exhibit III-6-10a Reduce Land-Based Sources of Pollution Investments by Region</b>														
Region	Number of Projects	Funding	Number of Projects	Funding	Number of Projects	Funding	Number of Projects	Funding	Number of Projects	Funding	Number of Projects	% of Total Subcategory Projects	Funding	% of Total Subcategory Funding
	2002		2003		2004		2005		2006		TOTALS 2002-2006			
Atlantic/ Caribbean	0	\$0	0	\$0	0	\$0	0	\$0	0	\$0	0	0	\$0	0
Pacific	0	\$0	0	\$0	0	\$0	0	\$0	0	\$0	0	0	\$0	0
Freely Associated States	1	\$20,000	1	\$40,000	0	\$0	0	\$0	1	\$37,102	3	20.0	\$97,102	17.4
International	0	\$0	5	\$206,600	2	\$76,900	2	\$64,343	3	\$113,000	12	80.0	\$460,843	82.6
All Regions	0	\$0	0	\$0	0	\$0	0	\$0	0	\$0	0	0	\$0	0
<b>TOTAL</b>	<b>1</b>	<b>\$20,000</b>	<b>6</b>	<b>\$246,600</b>	<b>2</b>	<b>\$76,900</b>	<b>2</b>	<b>\$64,343</b>	<b>4</b>	<b>\$150,102</b>	<b>15</b>	<b>100</b>	<b>\$557,945</b>	<b>100</b>





**Exhibit III-6-10b.** Distribution of Investments by Region, 2002-2006

***b. Activities***

NOAA has engaged in a number of watershed and land-based pollution initiatives in Mesoamerica and the insular Caribbean. However, the primary CRCP conduit for supporting the Land-Based Sources subcategory is through the two NOAA coral grants programs.

The NOAA International Coral Reef Conservation Grant Program supports activities that promote integrated watershed and coastal management practices that reduce or control runoff to nearshore coral reef ecosystems. These activities prioritize MPAs and the conservation of biodiversity within watershed planning and management, assess effectiveness of these management practices, engage stakeholders and government agencies in collaborative partnerships to implement these practices, and recommend a set of best management practices that can be applied to the Wider Caribbean region.

The NFWF Coral Reef Conservation Fund emphasizes solutions to localized threats to coral reefs and associated habitats and seeks to strengthen local capacity for natural resource management and habitat conservation, introduce effective and sustainable models of watershed management, establish networks of practitioners to advance community-based watershed and protected areas conservation, and raise awareness of regional policy makers about participatory strategies to address management needs.

Since 2002, these two programs have awarded over \$600,000 to 15 watershed management projects, primarily in the Mesoamerica and the wider Caribbean regions.





Grants-supported watershed projects generally fall into four categories:

- Public Awareness
- Research and Assessments
- Protection and Restoration (development, management or training)
- Capacity Building (establishing/supporting a program or agency)

**c. Funding Recipients and Partners**

To carry out the projects in this subcategory, the CRCP partnered with the NOAA offices and external partners listed in Exhibit III-6-11.

<b>Exhibit III-6-11 Reduce Land-Based Sources of Pollution Funding Recipients and Partners</b>		
NOAA Offices	Academic Institutions	Non-Governmental Organizations
<ul style="list-style-type: none"> <li>• NOS - International Programs Office</li> </ul>	<ul style="list-style-type: none"> <li>• Texas A&amp;M Research Foundation</li> <li>• Toledo Institute for Development and Environment</li> </ul>	<ul style="list-style-type: none"> <li>• Organization of Eastern Caribbean States</li> <li>• Soufriere Marine Management Area</li> <li>• CORALINA</li> <li>• Caribbean Student Environmental Alliance</li> </ul>

**d. Outputs**

The Organization of Eastern Caribbean States completed a project in 2003 which yielded the following reports: Soufriere Marine Management Area Manual of Methods for Environmental Monitoring and Assessment of the Infrastructure for Improved Wastewater Management in Soufriere”. A public awareness DVD was also produced on best practices for disposing of solid waste and the relationship of these practices to the marine environment.

In 2003, the Yucatan Environmental Foundation examined upgrades to constructed wetlands and evaluated increases in efficiency in the reduction of sewage and stormwater runoff. The project concluded that poor plant selection, substrate dissolution, design inefficiencies, and a lack of maintenance contribute to constructed wetlands failing in efficient removal of contaminants. Research from the project continues to influence how constructed wetlands are used elsewhere in the region in houses, condos, and hotels. In addition, waste water management agencies, architects, engineers, and government officials have partnered with the grantee organization to study ways of implementing wetland construction on a larger scale.





In 2004, the Toledo Association for Sustainable Tourism and Empowerment, Belize, initiated a project to reduce impacts of pollution and tourism on coral reefs at Hunting Caye through improvements of public infrastructure (toilets, grey water boxes, and waste management).

In 2004, 500 Red Mangrove *Rhizophora mangle* seedlings were planted by volunteers at Grand Ilet in the Simpson Lagoon of St. Maarten, Netherlands Antilles.

In August, 2005, the EcoLogic Development Fund conducted a seven-day workshop in San Antonio, Solola, Guatemala, to share best management practices in community-led watershed stewardship in the Mesoamerican Biological Corridor. It brought 24 participants to the workshop, including two academics, two government decision-makers, and 20 NGO representatives from Guatemala, Mexico, Belize and Honduras. Products included: a “Water for Life” Declaration; a workshop report on “Cross-national experiences with Management of Water Resources and Micro-watersheds and Payment for Ecosystem Services” (Spanish); a press release “Cambridge’s Ecologic Fund helps launch water conservation initiative”; and case studies, overviews and working session presentations in Spanish.

### *Performance Metrics*

Performance is evaluated at the project level.

#### *e. Outcomes*

As a result of a 2004 NFWF Coral Reef Conservation Fund effort to plant red mangrove seedlings in the Simpson Lagoon, St. Maarten, Netherlands Antilles, recruitment of new trees, potentially from the trees which were planted, offers great hope for the long-term establishment and growth of a mangrove forest at this site. The new mangroves are already home to a variety of wildlife. Community awareness of mangroves and their ecological importance increased as a result of this project, especially for the school children who participated in the planting. Press releases and media interviews raised awareness among the general public.

Based on CRCP supported efforts by the Yucatan Environmental Foundation to evaluate constructed wetlands for increased in efficiency in the reduction of sewage and stormwater runoff, waste water management agencies, architects, engineers and government officials have partnered with the grantee organization to study ways of implementing wetland construction on a larger scale.

#### *f. Challenges*

The NFWF Coral Reef Conservation Fund has generally been more successful than the NOAA International Coral Reef Conservation Grants Program at attracting quality projects to promote integrated watershed management issues addressed by WW2BW. From 2002 to 2004, the CRCP





funded only one watershed grant, while NFWF funded approximately two watershed-themed grants per year for a total of nine grants. Most proposals submitted to the CRCP failed to meet the program's selection criteria relating to Best Management Practices to control runoff. On the other hand, two thirds of the NFWF watershed projects are linked in some way to management and most have an education component. Although they are not restricted to the Wider Caribbean, most NFWF projects are located in the Mesoamerican region.

### *g. Future Directions*

The CRCP is currently assessing possible future directions in this area.

## ***Subcategory: Reduce Impacts of International Trade***

### *a. Introduction to Subcategory*

Trade in coral reef species targets an unusually high diversity and volume of organisms, including species that are vulnerable to overexploitation and are rare, ecologically important, and poorly characterized. Since 1990, international trade in coral reef species has increased by 10–30% per year. The United States is the number one importer of coral reef species for aquaria, curios, and jewelry, with approximately 2/3 of these originating in the Indo-Pacific. Other major importers are the European Union, Japan, and China (including Hong Kong and Taiwan).

While impacts from trade are affecting reef resources in over 50 countries, including the United States, the highest level of threat is occurring in developing countries in the Indo-Pacific where other human impacts are greatest. Unsustainable harvest and destructive fishing practices are altering ecosystems function from serial depletions of target species and habitat destruction, and are greatly diminishing their long-term benefits as sources of food, livelihoods, and cultural activities. It is in the national interest of the U.S., because of its prominent role as a consumer of coral reef species, to ensure the environmental sustainability of the collection and trade of these resources as well as long-term environmental and economic benefits to local communities dependent on them.

The CRCP's efforts to reduce the impacts of international trade have focused on (1) certain groups, including stony corals, precious corals, ornamental fish, live reef food fish, traditional medicines (seahorse trade), and luxury food items (sea cucumbers), and (2) specific locations of concern, including Southeast Asia and the South Pacific and U.S. Atlantic and Pacific. The different components in trade are discussed separately because the users and importers differ, level of existing protection varies (e.g., CITES vs. non-CITES species), and conservation and management needs differ by location and component of the trade (e.g., biology of the species and specific threats they face).



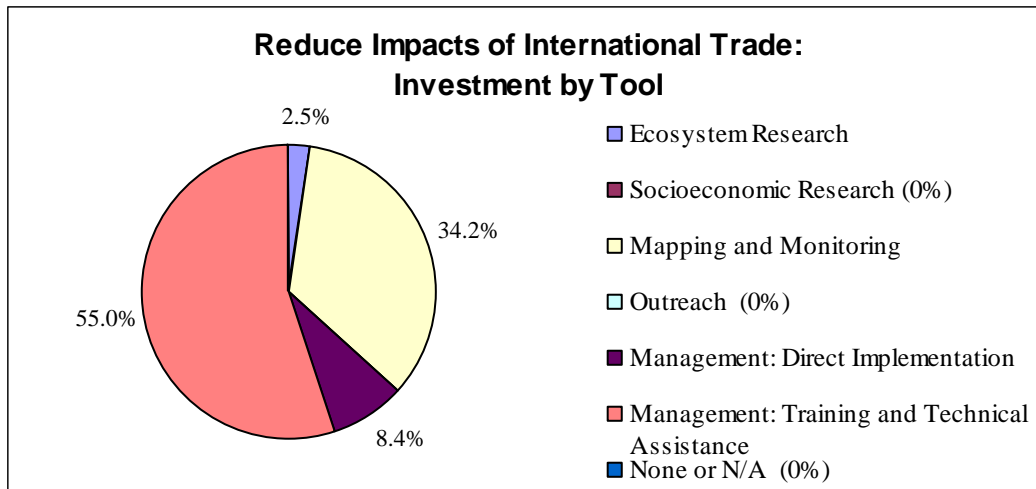




Between 2002 and 2006, the CRCP provided \$0.3M to support 11 projects in this subcategory. This subcategory accounted for 9% of funding within the category and less than 1% of overall CRCP funding; and 6% of projects in the category and 1% of overall CRCP projects (Exhibit III-6-2). The distribution of funds and effort by tool for this subcategory is shown in Exhibits III-6-12a and 12b.

Exhibit III-6-12a Reduce Impacts of International Trade Investments by Tool														
Tool	Number of Projects	Funding	Number of Projects	Funding	Number of Projects	Funding	Number of Projects	Funding	Number of Projects	Funding	Number of Projects	% of Total Subcategory Projects	Funding	% of Total Subcategory Funding
	2002		2003		2004		2005		2006		TOTALS 2002-2006			
Ecosystem Research	1	\$7,319	0	\$0	0	\$0	0	\$0	0	\$0	1	9.1	\$7,319	2.5
Socioeconomic Research	0	\$0	0	\$0	0	\$0	0	\$0	0	\$0	0	0	\$0	0
Mapping and Monitoring	0	\$0	0	\$0	1	\$50,000	2	\$52,000	0	\$0	3	27.3	\$102,000	34.2
Outreach	0	\$0	0	\$0	0	\$0	0	\$0	0	\$0	0	0	\$0	0
Management: Direct Implementation	1	\$25,000	0	\$0	0	\$0	0	\$0	0	\$0	1	9.1	\$25,000	8.4
Management: Training/Technical Assistance	1	\$14,949	2	\$45,000	1	\$18,000	1	\$37,000	1	\$49,310	6	54.5	\$164,259	55.0
None or N/A	0	\$0	0	\$0	0	\$0	0	\$0	0	\$0	0	0	\$0	0
<b>TOTAL</b>	<b>3</b>	<b>\$47,268</b>	<b>2</b>	<b>\$45,000</b>	<b>2</b>	<b>\$68,000</b>	<b>3</b>	<b>\$89,000</b>	<b>1</b>	<b>\$49,310</b>	<b>11</b>	<b>100</b>	<b>\$298,578</b>	<b>100</b>



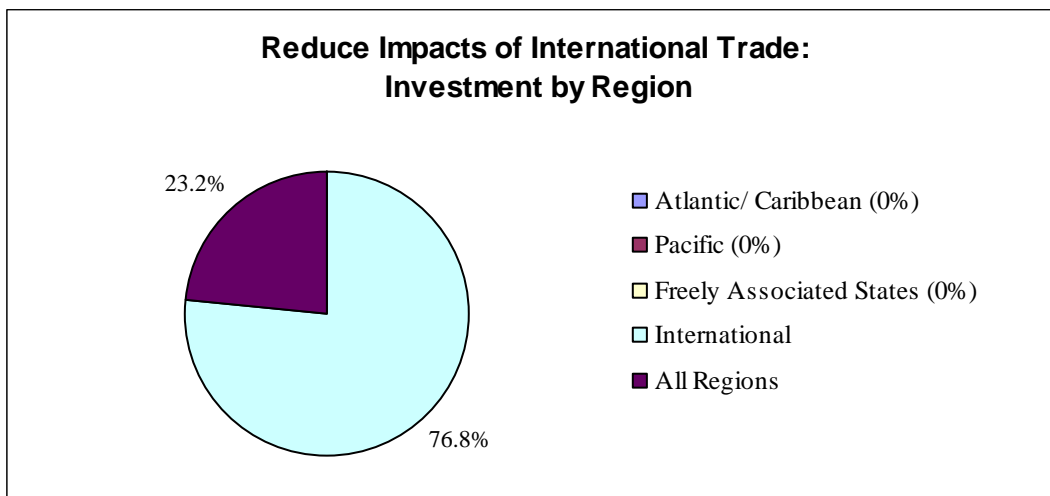


**Exhibit III-6-12b.** Distribution of Investments by Tool, 2002-2006

The distribution of funds and effort by region for this subcategory is shown in Exhibits III-6-13a and -13b.

<b>Exhibit III-6-13a Reduce Impacts of International Trade Investments by Tool</b>																
Region	Number of Projects		Funding		Number of Projects		Funding		Number of Projects		Funding		Number of Projects		Funding	
	2002		2003		2004		2005		2006		TOTALS 2002-2006		TOTALS 2002-2006		TOTALS 2002-2006	
	Number of Projects	Funding	Number of Projects	Funding	Number of Projects	Funding	Number of Projects	Funding	Number of Projects	Funding	Number of Projects	% of Total Subcategory Projects	Funding	% of Total Subcategory Funding		
Atlantic/Caribbean	0	\$0	0	\$0	0	\$0	0	\$0	0	\$0	0	0	\$0	0		
Pacific	0	\$0	0	\$0	0	\$0	0	\$0	0	\$0	0	0	\$0	0		
Freely Associated States	0	\$0	0	\$0	0	\$0	0	\$0	0	\$0	0	0	\$0	0		
International	1	\$14,949	2	\$45,000	2	\$68,000	2	\$52,000	1	\$49,310	8	72.7	\$229,259	76.8		
All Regions	2	\$32,319	0	\$0	0	\$0	1	\$37,000	0	\$0	3	27.3	\$69,319	23.2		
<b>TOTAL</b>	<b>3</b>	<b>\$47,268</b>	<b>2</b>	<b>\$45,000</b>	<b>2</b>	<b>\$68,000</b>	<b>3</b>	<b>\$89,000</b>	<b>1</b>	<b>\$49,310</b>	<b>11</b>	<b>100</b>	<b>\$298,578</b>	<b>100</b>		





**Exhibit III-6-13b.** Distribution of Investments by Region, 2002-2006

## ***b. Activities***

### ***Stony corals and live rock***

The United States has consistently been the world’s largest importer of ornamental coral reef species, including 60–80% of the live coral and 95% of the live “rock” or reef, and an estimated 50% of all coral skeletons for curios, but we do not allow commercial harvest of these materials in U.S. waters. To assess and address conservation concerns, the CRCP supported projects involving:

1. An annual assessment of the volume of coral in trade by type of product and exporting and importing country
2. Capacity-building workshops geared towards the development of sustainable management approaches for wild harvest, monitoring approaches, and best collection practices
3. Comparative assessments in Indonesia of the existing harvest and export quotas versus resource abundance and condition
4. Characterization of the coral industry in Fiji with emphasis on live rock
5. Development of tools and measures to enhance reporting and enforcement of stony corals in international trade under the provisions of CITES

### ***Sea cucumber conservation***

Global harvest increased by 500% between 1950 and 2000, most of which occurred since the 1980s. Because most locations lack national management measures, and trade is the largest driver of the fisheries, the CITES Secretariat, in partnership with the U.S. and the United Nations





Food and Agriculture Organization (FAO), led a CRCP-supported international collaborative effort (two international workshops) to review biological, fishery, and trade information for commercially important sea cucumber species; identify possible national, regional, and international management mechanisms; and develop conservation recommendations.

### *Seahorses*

The United States is undertaking a multi-year process to address threats associated with the trade, including overfishing and habitat destruction, lack of management, difficulties in enforcing existing national and international regulations, and large gaps in available information needed for management. The process, integrally linked to CITES' program, included CRCP-supported efforts such as:

- A technical workshop in the Philippines (2002) involving all range states and exporting countries and seahorse experts to evaluate existing information on biology, population status, fisheries, and trade.
- U.S. submission of successful proposal at the Biodiversity Convention Conference of Parties (2003) to list all species of seahorses in Appendix II.
- A capacity-building workshop in Mexico (2004) to consider management approaches, monitoring programs, identification materials, and size limits to ensure a legal and sustainable seahorse trade under CITES and effective implementation and enforcement of the listing.

### *Marine ornamental fish trade*

To better understand levels of harvest and trade including the U.S. role, CRCP began an analysis of annual species-level U.S. imports of ornamental reef fishes. In the first phase, a database was developed for marine ornamental fishes, all hard-copy customs declaration forms of reef fish imports were pulled from the USFWS, and initial verification of common and scientific names and limited data entry was completed.

### *Live reef food fish trade (LRFFT)*

The live reef food fish trade is a high value-to-volume fishery, with up to 20,000 kg/yr consisting of over ten taxa of groupers and wrasses imported by Hong Kong from at least 20 IndoPacific source countries. NOAA CRCP has conducted activities with partners through our CRCP General Grants Program, the Asia-Pacific Economic Cooperation (APEC), and CITES to implement conservation mechanisms for the LRFFT. This includes U.S. submission of a successful CITES Appendix II listing proposal for the humphead wrasse; capacity building in Indonesia to implement a management plan, reporting scheme, and necessary research to make required non-detriment findings for exports of the humphead wrasse; and characterization of the LRFFT in the Marshall Islands and development of management recommendations to reduce overfishing and associated impacts to other reef species and habitats.





### *Destructive fishing*

Building on cyanide testing efforts implemented by the International Marineline Alliance in the Philippines in the early 1990s, our goal has been to develop a reliable test for use either at the point of export or import and assist countries in Southeast Asia in establishing a regional network of Cyanide Detection Test (CDT) laboratories. Formal agreements were established with fisheries agencies in Philippines, Malaysia, and Vietnam. In each country a CDT facility was equipped with necessary supplies; an expert from the Philippines trained local chemists in monitoring, inspection, and sampling for cyanide; and testing of samples was initiated.

### *Queen conch*

Queen conch populations are overfished throughout the Caribbean, and were added to Appendix II of CITES in the 1990s as one step to develop a sustainable trade. NOAA CRCP supported a workshop on the trade in queen conch (*Strombus gigas*) to review the outcomes of the CITES significant trade review with range states and to develop a suite of country-specific recommendations to meet the requirements for trade in a CITES Appendix II listed species, including monitoring of stock status in commercial conch fisheries, regional management planning, standardized trade terminology, and cooperative law enforcement.

### *c. Funding Recipients and Partners*

To carry out the projects in this subcategory, the CRCP partnered with the NOAA offices and external partners listed in Exhibit III-6-14.





**Exhibit III-6-14  
International Trade  
Funding Recipients and Partners**

NOAA Offices	Other Federal Agencies	Countries	Fishery Management Councils	Academic Institutions	Non-Governmental Organizations
<ul style="list-style-type: none"> <li>• NMFS - Office of Habitat Conservation</li> </ul>	<ul style="list-style-type: none"> <li>• U.S. Coral Reef Task Force</li> <li>• DOI - U.S. Fish and Wildlife Service</li> <li>• U.S. Agency for International Development</li> <li>• U.S. Department of Justice</li> <li>• U.S. Department of State</li> </ul>	<ul style="list-style-type: none"> <li>• Indonesia</li> <li>• Freely Associated States</li> <li>• Fiji</li> <li>• Japan</li> <li>• China</li> <li>• Australia</li> <li>• Mexico</li> <li>• Ecuador</li> </ul>	<ul style="list-style-type: none"> <li>• Western Pacific</li> </ul>	<ul style="list-style-type: none"> <li>• NOAA National Undersea Research Center at UNC Wilmington</li> <li>• University of Hawaii</li> <li>• University of Miami/RSMAS</li> <li>• University of Puerto Rico - Mayaguez</li> </ul>	<ul style="list-style-type: none"> <li>• FAO</li> <li>• CITES</li> <li>• UNEP</li> <li>• IUCN</li> <li>• Indonesian Coral, Shell, and Ornamental Fish Association</li> <li>• TRAFFIC</li> <li>• World Wildlife Fund</li> <li>• Marine Aquarium Council</li> <li>• ReefCheck</li> <li>• Project Seahorse</li> </ul>





#### *d. Outputs*

The major goal of this initiative is to build sustainable ornamental coral reef fisheries and reduce habitat impacts associated with the harvest and trade in these species by eliminating overfishing, destructive fishing and improper collection and transport practices. These activities have been directly implemented by NOAA staff and through contracts and grants using the following tools: monitoring and assessment, management (training and technical assistance and direct management), and stewardship. Examples of major products are listed below and in Exhibit III-6-15.

#### *Stony Corals and Live Rock*

- A workshop provided recommendations on where and how to harvest corals, and possible management and monitoring approaches as necessary to implement the Appendix II listing.
- An assessment of the major stony coral collection area in Indonesia provided information on the status of the resource and the potential harvest pressure based on the current harvest quota, with a focus on nine genera of corals that were under EU trade suspension.
- We developed a coral identification manual for stony corals in trade (printed in English and Bahasa (Indonesian)) to aid law enforcement in verifying CITES permits for corals, and provided annual training for law enforcement in coral identification.

#### *Sea Cucumber Conservation*

The most urgent needs were the development and implementation of national and regional fishery management plans, harmonized trade reporting, and possible CITES listings for species of concern to prevent illegal trade and harvest and ensure that exports are sustainable. CRCP helped production of the following outputs to address these needs:

- Workshop proceedings summarizing the state of knowledge on the biology, population status, status of fisheries, and trade from each major exporting country and recommendations on management and conservation.
- Regional analysis of the status and management of sea cucumbers.
- Detailed analysis of sea cucumber fisheries in the United States.

#### *Seahorses*

CRCP helped produce a number of products that were used in U.S. justification to list all species of Seahorses on CITES Appendix II. This included proceedings from two workshops included recommendations on adaptive management measures, approaches to address non-selective (trawl) fisheries, standardized data collection, and reporting guidelines. A seahorse identification





manual for dried seahorses and derivatives was developed, printed and distributed to law enforcement at ports of export and import.

### *Program Highlight: Analysis of Coral Trade in Fiji*

An analysis was completed in Fiji on the collection and export of wild coral, live rock, and reef fish, including the volumes and types of products, locations of collections, and impacts of collection. Fiji recently adopted national legislation to implement CITES, and this study helped provide information needed to make non-detriment findings for the extraction of and trade in marine aquarium species. Through a coral working group within CITES, we improved reporting requirements for coral in trade, including establishment of definitions for various coral products in trade, units for reporting volumes, and lists of taxa that must be reported to the species level on permits. We also successfully defended the inclusion of various types of coral products on Appendix II, including maintaining live rock under the provisions of CITES.

### *Marine Ornamental Fish Trade*

A database for marine ornamental fish trade was created, containing preliminary results on total volume of imports during 2004–2005. One significant finding is that U.S. imports are close to twice that of published estimates (over 16 million fish imported in one year). USFWS has improved reporting requirements for import of ornamental fish, requiring (since 2004) submission of invoices by importers that include separate codes for marine and freshwater fish. Several peer-reviewed publications and presentations at international meetings on the levels of trade have also been completed.

### *Live Reef Food Fish Trade*

The humphead wrasse was successfully listed in CITES Appendix II in 2004. An ongoing program in Indonesia has developed a management plan for this species, including provisions for monitoring catch and trade and for assessing the resource.

### *Destructive fishing*

IMA completed the initial scoping efforts for reestablishment of cyanide detection facilities, and initially got the Philippines lab up and running. This project has not been completed.

### *Queen conch*

Countries were ranked based on their conservation concern, and specific actions were identified for each country of concern. Seven countries of highest conservation concern (Antigua and Barbuda, Barbados, Dominica, Trinidad and Tobago, Honduras, the Dominican Republic, and Haiti) had trade restrictions imposed on them. Before trade can resume, each of these seven countries was required to implement a number of long-term conservation measures, including scientifically sound species management programs.







**Exhibit III-6-15  
NOAA CRCP Products  
Reduce Impacts of International Trade**

Workshop Proceedings on Sea cucumbers	Bruckner, A.W. 2006. The proceedings of the CITES workshop on the conservation of sea cucumbers in the families Holothuridae and Stichopodidae. NOAA Tech Memo NMFS-OPR-34. 244 pp.
Publications and Session on coral trade at the 10 <sup>th</sup> ICRS	Bruckner, A.W. and E. Borneman 2006. Addressing sustainability of the ornamental coral reef species trade. Session Summary. Proceedings of the 10 <sup>th</sup> Intern. Coral Reef Symp 1689-1691.  Bruckner, A.W. and E. Borneman. (2006) Developing a sustainable harvest regime for Indonesia's stony coral fishery. Proceedings of the 10 <sup>th</sup> Intern. Coral Reef Symp. 1692-1697
Publication on U.S. Sea cucumber fisheries	Bruckner, A.W. 2005. The recent status of sea cucumber fisheries in the continental United States of America. SPC Beche de Mer Bulletin 22:39-46.
Workshop Proceedings on seahorse management	Bruckner, AW, JD Field and N Daves. 2005 The proceedings of the international workshop on CITES implementation for seahorse conservation and trade. NOAA Tech Memo NMFS-OPR-27. 174 pp.
Presentation and paper on Caribbean Marine ornamental trade	Bruckner, A.W. 2005. THE IMPORTANCE OF THE MARINE ORNAMENTAL REEF FISH TRADE IN THE WIDER CARIBBEAN. Proc. 31 <sup>st</sup> Scientific Meeting of the Assoc Marine Labs of Carib., Trinidad and Tobago. Revista Biologica Tropical: 53: 127-138.
Presentation at Marine Ornamentals Conference and book chapter	Bruckner, A.W. 2003. Sustainable Management Guidelines for Stony Coral Fisheries. In J. Cato and C. Brown eds. Marine Ornamental Species Collection, culture and conservation. Blackwell Scientific. Iowa State University Press. pp167-184
CITES listing proposals for coral reef species developed by NMFS	1. Inclusion of Cheilinus undulatus, Rüppell 1835 (humphead wrasses) in Appendix II. CoP 12 Proposal, 2002 and CoP 13 proposal, 2005. 2. Inclusion of all species of the genus Hippocampus (Hippocampus spp.) in Appendix II of CITES. CoP 12 Proposal, 2002 3. Inclusion of the Banggai cardinalfish (Pterapogon kauderni, Koumans 1933) in Appendix II of CITES. CoP Proposal 19, 2007 4. Inclusion of all species in the genus Corallium in Appendix II of CITES. CoP 14 Proposal 21, 2007
Paper on use of CITES to conserve sea cucumbers	Bruckner, A.W., J. Field and K. Johnson. 2003. Conservation strategies for sea cucumbers: Can a CITES Appendix II listing promote sustainable international trade? SPC Beche de Mer Bulletin 18:24-32.
Popular article	Bruckner, A. W. 2002. Countering the global coral reef crisis: The U.S Coral Reef Task Force. Tropical Fish Hobbyist. April: 12-18
Presentation and paper from the first Marine Ornamentals Conference	Bruckner, A.W. 2001. Tracking the trade in ornamental coral reef organisms: the importance of CITES and its limitations. Aquarium Sciences and Conservation. 3:79-94
Popular article	Bruckner, A. W. 2000. Developing a sustainable trade in ornamental coral reef organisms. Issues in Science and Technology. 17:63-68.
Paper from an international meeting	Bruckner, A.W. 2000. The Ornamental and Live Food Trade in Coral Reef Species: The Extent, Impact and Possible Strategies for Sustainable Harvest. In: Coral reefs: Threatened Marine Richness. Univeridad Nacional de Mexico.
Workshop proceedings on coral trade	Bruckner A.W. 2002. Proceedings of the International Workshop on the Trade in Stony Corals: Development of Sustainable Management Guidelines. NOAA Technical Memorandum. NMFS-OPR-22 September 2002, 163 pp.





<b>Exhibit III-6-15</b> <b>NOAA CRCP Products</b> <b>Reduce Impacts of International Trade</b>	
Coral Id Manual	Bruckner, A.W. 1998 (second printing, 1999; 3 <sup>rd</sup> printing in Bahasa in 2002). Guide to Indo-Pacific Corals in International Wildlife Trade. U.S. Fish and Wildlife Service. 40 pp.
Seahorse ID manual	Lourie, Foster, Cooper and Vincent (2004). A Guide to the identification of seahorses. Project Seahorse and Traffic North America (supported through the NOAA CRCP Grants program)

### *Performance Metrics*

The performance metrics to track the subcategory goals and objectives are made at the project level and also at the programmatic level with regards to successful conservation advances for the particular species group. These measures have included:

- Successful compilation and analysis of data sets on imports and exports of coral reef species.
- Development of tools and training programs to assist in monitoring and enforcement of shipments.
- Capacity building workshops to identify and implement management and conservation options.
- Successful addition of species added to the CITES Appendices; improvements to reporting provisions for trade in coral reef species.
- Adoption of sustainable quotas for harvest and export.
- Successful implementation of fishery independent monitoring programs.
- NOAA CRCP chaired sessions, presentations, publications and informational booths in major domestic and international fora, conferences, and popular and peer-reviewed journals.
- Adoption of new legislation and management measures in support of sustainable harvest and trade.

### *e. Outcomes*

#### *Stony Corals and Live Rock*

- Completing the first analysis of the amount of trade in stony corals and live rock (and annual analyses 2002-2006) provided policy makers with the first comprehensive understanding of the levels of trade, key species, and key source countries.
- Recommendations provided to Indonesian authorities on reductions in harvest and export quotas for particular species, as determined by the NOAA-led field surveys of coral collection sites, led to the adoption of reduced harvest and trade quotas for 9 coral taxa of





conservation concern. These efforts also formed the basis of a framework for a more comprehensive monitoring program of the coral trade.

- Production of a coral identification manual for stony corals in trade and training to USFWS law enforcement has allowed them to verify CITES permits for corals, and has resulted in the seizure of numerous illegal coral shipments.
- Efforts to address unsustainable harvest of live rock in Fiji led to reductions in export of wild-harvested reef substrate and expanded production of “artificial live rock” (made from cement and rubble collected from the shoreline), as well as a requirement for annual resource monitoring in sites utilized for collection.

### *Sea cucumber conservation*

- NOAA CRCP efforts on sea cucumber conservation have led to the development of a working group within FAO with mandates for the development of national and regional management plans for sea cucumbers.
- Through NOAA-led workshops and participation in an international working group on sea cucumbers, we have facilitated the development of guidelines for management, and provided support for future capacity building workshops, and partnerships with source countries to develop approaches to improve reporting and documentation of international trade in sea cucumbers.

### *Seahorses*

- CRCP efforts directly supported the successful U.S. justification for listing all species of seahorses on CITES Appendix II, which went into force in May 2004. CITES parties adopted interim short-term voluntary measures to ensure non-detrimental trade for wild harvest that included a universal minimum standard length for export.
- By successfully listing seahorses on Appendix II of CITES, all exporting countries are required to implement a management plan (including resource monitoring) for seahorse fisheries that includes provisions for the collection and reporting of trade data.
- It also resulted in a ban in the trade of seahorses from the Philippines and provides a tool to ensure trade in seahorses is legal.
- Through printing and distribution of a seahorse identification manual, we improved the ability for law enforcement to track and verify exports and imports.
- The listing has also led to reductions in the trade of wild harvested live seahorses, with expanded efforts in seahorse mariculture as sources of aquarium animals.

### *Marine ornamental fish trade*

- CRCP-supported studies of volumes of U.S. imports produced a number of significant findings including that U.S. imports are close to twice (over 16 million fish imported in one year) that of published estimates by the USFWS, which is responsible for tracking imports.





- Based on these findings, the USFWS has improved reporting requirements for import of ornamental fish, requiring (since 2004) submission of invoices by importers that include separate codes for marine and freshwater fish.
- This analysis will provide the first comprehensive species-specific data on levels of trade in marine aquarium fish species and be used in assessment of future options regarding U.S. imports.

### *Live reef food fish trade*

- Through listing of one of the most valuable and vulnerable fishes in the LRFFT, we created a framework for reporting of trade in all grouper/wrasse species. This species also served as the basis for the establishment of monitoring protocols and national management plans for the LRFFT, with pilot efforts underway in Indonesia.

### *Destructive fishing*

- Our efforts to reestablish cyanide detection facilities have resulted in the acknowledgement by other groups (e.g., Marine Aquarium Council and Reef Check) of the need for a reliable testing method and have initiated a process to review existing methods and adopt a standardized test that is easily applied both in field situations and at export/import facilities.
- It has also stimulated interest and partnerships with other groups (e.g., Telepak and SeaWeb) in the development of cyanide reform and net retraining programs for ornamental coral reef fishers.

### *Queen conch*

- The significant trade review for queen conch is the first review of this type for a marine species that has resulted in an international process to evaluate existing management and address deficiencies, thereby ensuring that the CITES approach can work. It also provides a framework for future assessments of other CITES-listed coral reef species.

## *f. Challenges*

There are numerous challenges to achievement of the program goals. The National Action Plan to Conserve Coral Reefs identified overfishing and habitat destruction as the highest threats associated with international trade. A multifaceted strategy is required to address these threats at intergovernmental (FAO/CITES), national policy and management levels. In addition, this strategy must include stakeholders, including communities and industry, at local to global levels.





### *National and regional level*

- Inadequate legislative frameworks to regulate trade at home and abroad. U.S. agencies lack authority to restrict imports of coral reef species to those harvested under sustainable management programs without the use of destructive methods, or from approved mariculture facilities.
- Exporting countries do not have capacity to monitor coral resources at a species level, or to determine the impacts of these fisheries, and current quotas implemented by source countries may be inadequate to ensure conservation of the resource.
- Developing countries lack capacity to implement national management, and they lack information on population status or trends, basing their export quotas on demand instead of resource capacity.
- Lack of a regional management plans to ensure that regulations are similar between countries can impede sustainable management of trade (e.g., queen conch).
- International standards of best practice for maricultured products do not exist, resulting in poor conservation practices for *in situ* coral farms.
- Rapid assessment of species-level imports is not possible because of the sheer volume of labor intensive paper declarations, and differences in taxonomy and nomenclature used by exporters.
- Lack of coordinated, consistent national and regional management; widespread illegal, unregulated, or unreported (IUU) fisheries; absence of accurate information on the extent of trade; and few reporting codes to identify individual species in trade.
- Monitoring of destructive fishing methods needs to be improved, including developing an internationally accepted cyanide detection method.

### *Global level*

- Engaging industry to support retention of corals on CITES Appendices, and to promote sustainable industry practices, is a challenge.
- Without the adoption of future CITES listings, we have no mechanisms to ensure these countries implement sustainable management measures or other conservation approaches.
- Lack of binding international mechanisms for ensuring sustainable trade in FAO, where recommendations are non-binding; and in CITES, where recommendations could be binding, but major importing and exporting nations feel they do not have capacity to implement recommendations on national management and reporting.

### ***g. Future Directions***

The program, consisting of eight projects, will maintain its existing priorities and activities, in particular, to foster partnerships among parties to CITES (and FAO) to improve both CITES/FAO trade mechanisms and build capacity of exporting/importing country capabilities to ensure sustainable trade consistent with those mechanisms.





The Program approach will be to:

- Understand the volume and diversity of corals and ornamental reef fish in international trade.
- Develop sustainable management guidelines for corals and reef-associated species.
- Improve capacity in exporting countries for monitoring, management and enforcement.
- Improve protection of species through CITES Appendix II listings and assist exporting countries in implementing CITES Appendix II listings.
- Identify actions to improve the conservation status of non-listed species and improve reporting criteria for CITES Appendix II listed species.
- Implement cyanide detection facilities.
- Support habitat characterization, management and monitoring approaches for aquarium fisheries.
- Train enforcement officers and develop identification guides for CITES listed species
- Support industry-led certification efforts.
- Participate in international and regional fora to raise awareness of issues surrounding the trade in coral reef species.
- Develop public education and awareness materials to build support and compliance.

