In response to the Secretary-General's invitation to provide information to the Secretariat for the purposes of informing the compilation of the report on "Protection of coral reefs for sustainable livelihoods and development" **Conservation International (CI)** is pleased to provide the following information:

Importance of protecting coral reefs and related ecosystems for sustainable livelihoods and development

Protecting coral reefs is a key investment in securing sustainable ecosystem services for coastal peoples that rely on them for their health and livelihoods (Kaufman & Tschirky 2010). More than 75% of coral reefs are currently threatened by human activities. However, only 6% of reefs are within marine protected areas (MPAs) that are considered to be effectively managed (Burke et al. 2011). Protection within MPAs has numerous demonstrated ecological benefits including preventing coral decline (Kaufman & Tschirky 2010; Selig & Bruno 2010) and maintaining healthy fish populations (Kaufman & Tschirky 2010). CI's Marine Management Area Science Program (MMAS) has also demonstrated the socioeconomic benefits associated with MPAs, which can assist in the maintenance of critical ecosystem services including fisheries, coastal protection, and tourism and recreation. More specifically, MMAS found that incomes are twice as high within MPAs than outside and MPAs significantly improve livelihood opportunities, particularly tourism (Samonte *et al.* 2010). Other socioeconomic benefits include perceived improvements in food security, conflict resolution and environmental awareness (Samonte *et al.* 2010). Without the use of ecosystem-based management that considers the human-natural coupled system and zones for multiple uses (Kaufman & Tschirky 2010; Samonte et al. 2010), coral reefs may not be able to continue to deliver benefits to the more than 275 million people that reside in the direct vicinity of coral reefs (Burke et al. 2011).

The recent CBD COP's Decision X-29 on marine and coastal biological diversity (paragraph 13(d)) highlights the importance of addressing climate change-related impacts on marine and coastal biodiversity. Increased concentration of carbon dioxide in the atmosphere is predicted to result in greater ocean acidification, increased thermal stress, and increased frequency and intensity of storm events. If greenhouse gas emissions continue on current trajectories, more than 50% of coral reefs could experience major losses from coral bleaching by the 2030s (Burke et al. 2011). Scientists at Conservation International have been using data on current human impacts and more than 13,000 species range maps to identify places of high biodiversity and high threat as well as high biodiversity and low threat, both of which are priorities for conservation. Conservation International notes the considerable importance of improving resilience to 'global change' through representative networks of marine protected areas that explicitly incorporate coral reef ecosystems as part of marine biological diversity and the associated ecosystem services that they provide. In addition, urgent progress towards multilateral agreements and action to reduce carbon dioxide and other greenhouse gases responsible for climate change is essential for both short and longer-term efforts to reduce impacts of climate change on coral reef biodiversity and ecosystem services.

Moreover, with climate change impacts not limited to tropical and shallow water, the CBD COP also noted the importance of carrying out assessments on the status and trends of cold-water coral reef ecosystems (along with seamounts, and hydrothermal vent ecosystems – about which comparatively little is known). Conservation International is carrying out geomorphological seabed mapping of the oceans, and integrating this with existing information including the UNESCO Global Open Ocean and Deep Seas (GOODS) biogeographic classification, and identification of seamounts suitable for deep-water coral habitat as assessed by Clark et al. (2011), which is expected to be completed in 2012. Due to the limited global coverage of biological and ecological data in areas beyond the limits of continental shelves, this will assist in priority setting across the approximately 130 million km2 of marine ecosystems managed by coastal States in their Exclusive Economic Zones (EEZ) – and 230 million km2 of the oceans that require cooperation for effective management of marine areas beyond national jurisdiction (Harris & Whiteway 2009).

Coral reefs and sustainable development

Conservation International has developed the Seascapes and Oceanscape models as mechanisms to drive international coordination and cooperation in the management of coral reef resources. Both the Seascapes and Oceanscape approaches use 'ecosystem-based' management, an approach that has proven to be successful not only for ecological restoration, but also for sustainable development for human well-being and livelihoods (Orbach & Karrer 2010; Samonte et al. 2010). Conservation International has implemented successful multi-national engagements in the Eastern Tropical Pacific Seascape with Ecuador, Columbia, Panama, and Costa Rica that includes a network of World Heritage sites, and in the Sulu-Sulawesi Seascape with Indonesia, Malaysia and the Philippines.

Seascapes and Regional Ocean Stewardship agreements have improved ocean ecosystem health and human well-being and these approaches have been endorsed and replicated at state/provincial levels, by national governments, as well as by specialised multilateral and bilateral intergovernmental agencies. Conservation International's work including strategic regional initiatives recognized in last year's Resolutions on Oceans and Law of the Sea (A/Res/65/37), and on Protection of coral reefs for sustainable livelihoods and development (A/Res/65/150), namely: the Coral Triangle Initiative on Coral Reefs, Fisheries and Food Security; Micronesia Challenge; Eastern Tropical Pacific Seascape Project; and 'Pacific Oceanscape Framework' adopted by the Pacific Island Leaders Forum in August 2010.

Conservation International's scientists contributed to Reefs at Risk Revisited (available at http://www.wri.org/publication/reefs-at-risk-revisited). This study examined variety of key issues that relate to CI's work including how the threats to coral reefs have changed over the last 10 years, the role of climate change, status and weaknesses in the current protected area system and several analyses that identify the countries that are the most vulnerable to changes in ecosystem health. The report identifies the 27 nations most vulnerable to coral reef degradation and loss in the world, of which 19 are small island nations. The nine countries that ranked were identified as

having low adaptive capacity and high threat include several places where CI works including the Philippines, Vanuatu, Kiribati, Fiji, and Indonesia.

Economic, social, environmental and developmental benefits of protecting coral reefs, in the context of the themes and objectives of the United Nations Conference on Sustainable Development in 2012

The importance of protecting coral reefs and related ecosystems for sustainable livelihoods and development, including understanding the economic, social and development benefits of protecting coral reefs in the context of the themes and objectives of Rio+20 cannot be overstated. Coral reefs can provide long-term sustainable economic benefits to coastal populations worldwide. These benefits translate to millions of dollars per year in fisheries, tourism and recreation, and carbon sequestration. For example, sustainable fisheries deliver renewable resource rents that underpin social and economic development and community, national and regional security.

A recent study in the Eastern Tropical Pacific Seascape showed that marine protected areas with high levels of protection in the Pacific waters of Costa Rica, Panama, Colombia and Ecuador possessed a much greater biomass of higher carnivorous fishes, lower densities of asteroids and Eucidaris spp. urchins, and higher coral cover than limited-protection marine protected areas and fished zones (Edgar *et al.* 2011). These results were generally consistent with the hypothesis that overfishing of predatory fishes within the Eastern Tropical Pacific has led to increased densities of habitat-modifying macroinvertebrates, which has contributed to regional declines in coral cover. Fishing down the food web, with associated trophic cascades, has occurred to a greater extent along the continental coast than off oceanic islands. Poorly enforced marine protected areas generate food webs more similar to those present in fished areas than in well-protected marine protected areas (Edgar *et al.* 2011) . Recovery of fish biomass and habitat can positively influence the value of marine tourism and fisheries in the region. This suggests that the strategy of the Eastern Tropical Pacific Seascape initiative, to strengthen and expand the network of marine protected areas and to encourage comprehensive marine policies that reduce negative impacts on the marine environment, has the potential to both generate environmental outcomes and contribute to sustainable development and human well-being benefits.

In spite of these benefits, incentives are needed to achieve a green (or blue) economy, and to ensure that the supporting institutional framework is effective at different scales to promote integrated management of marine ecosystem services. These incentives can be more powerfully focused through regional economic integration mechanisms, as well as the investment and sustainable development institutions that comprise the World Bank Group, and wider UN System, and engaging the private sector to achieve global objectives of sustainable development.

Making conservation economically attractive is essential for the creation and effective management of networks of representative marine protected areas that can contribute to sustainably managed coral reef resources. Conservation International's research through the Marine Management Area Science Program (MMAS,

www.science2action.org) has shown that incentive-based tools can be a critical complement to more traditional approaches like fines and penalties. Conservation can sometimes result in short-term losses of income or access to resources until resources recover so that they can continue to provide valuable ecosystem services. Conservation incentives provide a means of compensating resource users for these losses so that overall sustainable development goals can be achieved in the long-term (Nietsen & Gjertsen 2010).

The MMAS program has identified three potential conservation incentive tools that can be used to drive sustainable development and conservation. Buyouts are a direct approach and involve the purchase of resource rights or equipment with the intention of retiring them to reduce harvesting capacity and/or effort. Conservation agreements between investors and resource-users include cash, service or goods benefits offered to reduce unsustainable practices the provision of which is conditional on conservation performance over time. With an alternative livelihoods incentive, conservation investors establish livelihood activities that can replace unsustainable activities by resource users. All three approaches have demonstrated benefits and trade-offs. Conservation International has undertaken a comprehensive assessment of the conditions that may affect the success of these tools (Nietsen & Gjertsen 2010; www.science2action.org).

Rio+20: Coral reefs within the so called "blue economy" approach

Conservation International has led efforts to recognize the benefits that coral reefs can provide and create frameworks that ensure sustained good management of these resources. For example, in partnership with UNESCO, IUCN and leading scientists around the world, CI is developing conservation and management tools to protect coastal ecosystems for their carbon sequestration, identifying key policy needs and developing international financing mechanism. Carbon stored in coastal and marine ecosystems is known as Blue Carbon and can be buried in the sediment at rates up to 50 times higher than those observed on land. Although coral reefs themselves are not a major carbon sink, healthy coral reefs are an integral part of seagrass, mangrove and other nearshore ecosystems because of their proven ecological connectivity with one another.

The role of national legislation in protecting coral reefs (including importance of inclusion of indigenous/local communities)

Conservation International's experience with the Marine Management Area Science program suggests that governance plays a key role in the successful implementation of marine protected areas (MPAs). Although MPAs may vary in their structure and governance principles, close monitoring of the uses of MPAs, strict enforcement, and fostering improved compliance by resource users are necessary for MPAs to produce the conservation and social benefits for which they were established. The success of monitoring, enforcement, and compliance depends on the transparency of the management process and integrating stakeholders in decision-making. Adaptive

management strategies to respond to the mentoring data are also necessary for maintaining effectiveness over time (Orbach & Karrer 2010).

The way forward: Potential actions (consistent with international law) needed to protect coral reefs and related ecosystems, including proposals for coordinated and coherent action across the United Nations system

The approaches outlined demonstrate Conservation International's commitment and leadership in relation to conservation and sustainable development of the marine environment, especially coral reef ecosystems, particularly by implementing more effectively in the run-up to Rio+20 and beyond, chapter 17 of Agenda 21, the World Summit on Sustainable Development Johannesburg (WSSD) Plan of Implementation, and Barbados and Mauritius Plans of Action for Small Island Developing States, and achievement of Millennium Development Goals by 2015.

Conservation International's work supports implementation of recommendations of the meetings of relevant UNGA processes; and promotes cooperation to achieve the CBD's 2011-2020 Strategic Plan, Aichi Targets and decisions concerning: 'sustainable fisheries' (Target 6); minimising by 2015, the multiple anthropogenic pressures on coral reefs, and other vulnerable ecosystems impacted by climate change or ocean acidification, so as to maintain their integrity and functioning (Target 10); protection of 10% of marine ecosystems and the ecosystem services they provide (Target 11); identification of ecologically and biologically significant areas (EBSAs); and vulnerable marine ecosystems (VMEs).

With an increasing global population, sustainable development will inevitably involve more intensive use of marine resources and ecosystem services. Analyses of cumulative human impact indicate that no areas of the ocean are unaffected and a large fraction (41%) are strongly affected by multiple drivers (Halpern *et al.* 2008). In this context of the scale of these issues, Conservation International assisted Kiribati with its objectives of establishing the Phoenix Islands Protected Area (PIPA), covering an area of 408,250 km2 (157,626 sq. miles) in 2006. The PIPA is the largest marine protected area in the Pacific Ocean and the largest marine conservation effort of its kind by a Least Developed Country (LDC). In 2010, PIPA was added to the list of UNESCO World Heritage sites. It is the largest and deepest World Heritage site on Earth.

Conservation International will continue to support a wide range of international objectives, including implementing forthcoming FAO Technical Guidelines for Responsible Fisheries addressing in an integrated way, marine protected areas and sustainable fisheries; in initiatives that support international objectives and that are tailored to regional, national and local community needs. Seascapes and Oceanscapes extend beyond country boundaries, creating opportunities for governments, multinational corporations, and others to work together to conserve the seas and the diverse marine life that is the lifeline for people living near their shores.

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