TERMS OF REFERENCE (TOR)
For the Development of Value-Added Tools for Decision-Making

I. INTRODUCTION AND RATIONALE

The demand for decision support tools for environmental management is increasing as decision-makers in both the public and private sectors are routinely required to make decisions in an atmosphere of uncertainty and, sometimes, without a complete understanding of the different factors that can affect the environment. In many cases, these decisions do not adequately account for risk or they fail to anticipate the second- and third-order effects that will result from a decision. The ability to make informed decisions which consider unforeseen circumstances in such a setting is fundamental to achieving efficient and effective environmental management, conservation of biodiversity, and sustainable development.

The integration of natural and social science data and information is increasingly recognized as vital to scientific research and societal decision making related to a wide range of pressing environmental and biodiversity issues. In addition, the use of Geographic Information System (GIS) for visualization and spatial analysis of data is well documented. Many information products have been developed that allow users to perform a variety of functions on biodiversity and remote sensing data. These functions include predictions of spatial distribution, changing distributions according to key variables, three dimensional visualization, and time-series animation (fly-through).

II. OBJECTIVES

An important ultimate objective of IABIN is to make biodiversity information useful to decision-makers in the public and private sectors. The IABIN initiative seeks to hire consultants for the development, adaptation or modification of a series of value-added applications that will demonstrate to decision makers how data and information can be effectively used in the decision making process to improve the environmental outcomes of their management decisions.

IABIN is seeking to foster the use and further development of current value-added tools created within the context explained above that can be either adapted or modify to serve the needs of the IABIN community. This provided that we understand the differences and capabilities between the diverse decision-support tools available or proposed in order to decide which tool should be used or recommend for a particular need within the network. Of course, innovative ideas for the development of the tools sought after are also welcomed.

In order to accomplish the above, IABIN is requesting proposals from institutions that have experience in developing value-added tools to help guide environmental management, conservation of biodiversity and sustainable development decision-making processes throughout the Western Hemisphere. IABIN is interested in forging partnerships with institutions involved in the development of decision support tools in order to promote an efficient use of the resources available for this task within the network. In this regard, proposals showing a substantial level of cost-sharing, creation of partnerships, tools that can be used throughout the network and that are multilingual will be favorably considered.

In general, proposals should make emphasis on and demonstrate with concrete products how biodiversity information is useful to decision-makers in the public and private sectors and at the local, national, sub-regional and regional level.

III. AREAS TO BE ADDRESSED BY THE PROPOSED VALUE-ADDED TOOLS

The basic principle of the proposals should be to demonstrate with concrete products how biodiversity information is useful to decision-makers in the public and private sectors and at the local, national, sub-regional and regional level. Under that principle, proposals should propose to develop, adapt, or modify a value-added tool that addresses the need for information products tools in one of the following areas:

1. ***Integrate data from biodiversity and socio-economic databases***

   Under this area, socio-economic data relevant to biodiversity issues will be identified and tools will be provided through the IABIN Web Portal / Gateway that will allow users to access socio-economic and biodiversity data in an integrated manner. An example of socio-economic data relevant to biodiversity issues is land-use databases, which combine information from the social sciences on population and economics trends and demography, with biological information about an area's biodiversity and conservation status. Such databases and mapping applications allow for improved coordination and planning between resource managers and broader civil society and provide greater access to information for researchers and the general public.

2. ***Visualize and analyze data and information***

   Under this area IABIN is interested to foster development of tools at the regional level that would allow users to visualize data and information in an interactive, as well as non-interactive manner. A simple example of a visualization product could be a dynamic map showing actual and predicted spread of invasive species across several countries.

   Another example of a visualization product has been developed for the Central America sub-region by the Comision Centroamericana de Ambiente y Desarrollo (CCAD) in coordination with NASA and the World Bank. This product allows the user to fly through Central America, viewing the 3-dimensional landscape. An added-value product relevant to biodiversity could be built on the existing NASA/CCAD product, by overlaying an ecosystems map on the existing landscape.

   Similar products can be developed or adapted for a range of existing data and information throughout the Americas, allowing decision makers, resource managers, the biological community and general public improved access and value from biological research.

3. ***Utilize data with models to develop scenarios (options and consequences) for decision makers.***

   This area seeks to demonstrate how data can be used as input to models. The output of these models will allow the user to build scenarios, with options and consequences that will help them make an objective decision.

   An example will be used to illustrate what we mean by the use of models to support the decision making process. Assume that limited funds are allocated for re-vegetation of an area in order to eliminate soil loss. The decision to be made is where to carry out the re-vegetation in order to optimize the use of the funds and minimize soil loss. Two models will be used to help us decide where to carry out the re-vegetation: a model based on the Universal Soil Loss Equation and an economic model.

   The Universal Soil Loss Equation allows one to calculate the amount of soil loss in units of weight/surface area/year. The inputs to the model are: rainfall erosion index, soil erosion factor, slope length and slope gradient factor, vegetation cover factor, and agricultural

practice factor. In order to obtain a map of the existing soil loss conditions, the area to be considered can be divided into pixels, the size of which are determined by the spatial resolution of the input data; the soil loss can thus be calculated for each of these pixels.

A modified conditions scenario can be calculated by changing the vegetation cover factor in the pixel where the re-vegetation is planned. The modified conditions scenario will provide the change in soil loss due to re-vegetation. Different modified condition scenarios can be calculated assuming the re-vegetation will be carried out in different locations. In this fashion, one can calculate where the re-vegetation will be most effective in reducing soil loss.

The economic model can be very simple, calculating the cost of re-vegetation per pixel considering two factors: slope and the existence of roads. Combining the output of the economic model with the soil loss for each of the modified scenarios calculated above, one could then choose objectively where to carry out the re-vegetation, by choosing the scenario with maximum reduction in soil loss/unit cost.

Additionally, consideration will be given to the proposals that address the following criteria:

a. ***Integrate data that are facilitated for open access under the current IABIN Thematic Networks,***
b. ***Utilize open source tools and can be widely disseminated,***
c. ***Concur with the objectives of the IABIN Network and demonstrate the willingness to provide cost-sharing in developing value-added tools,***
d. ***Promote partnerships among institutions with different capacities and from different countries,***
e. ***Can be easily adopted to local settings,***
f. ***Are multilingual,***
g. ***Can be used throughout the network,***
h. ***Represent the subregion or country which is currently underrepresented in IABIN or has significant impacts on promoting IABIN,***
i. ***Demonstrate reasonable budget for the scope proposed, and***
j. ***Demonstrate technical and financial sustainability.***
k. ***Consistent with national policy requirements using appropriate tools (e.g. National Biodiversity Strategies and Action Plans [NBSAPs]).***
l. ***Synergistic to international commitments (e.g. CBD, CITES)***

Proposals may be either for tools that will be built upon already developed tools by proponent or for new tools to be developed.

IV. DURATION

The duration of the consultancy is expected to be up to six months after signing the Grant Agreement.

V. DELIVERABLES AND TIMETABLE

The grantee will produce the following deliverables with the approximate target dates. These deliverables should be submitted to the supervisors listed in Section VII.

1. Detailed work plan by January 15, 2010
2. First progress report by March 1, 2010

3. Second progress report by April 1, 2010
4. Beta version of the value-added tools by April 15, 2010
5. Draft manual and user guide by May 1, 2010
6. Two demonstration events to the IABIN participants and decision-makers by June 2010
7. Final report by June 30, 2010 2009

VI. PAYMENT SCHEDULE

	Milestone	Payment
1	Signing the Grant Agreement and Detailed work plan	10%
2	First progress report (Deliverable 2)	30%
3	Two demonstration events of beta version (Deliverable 4)	30%
4	Final production version, manual, user guide, and final report (Deliverable 5-7)	30%
		100%

VII. SUPERVISION

The grantee will be supervised by the OAS on administrative and technical aspects.

VIII. REPORTING

In addition to the progress reports specified in Section V, the grantee will keep regular communications with the GS/OAS on technical and administrative aspects. Upon requested for information by the IABIN participants or decision-makers, the grantee will be responsive to such inquiries.