NatureServe
A Network Connecting Science With Conservation

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June 27, 2008

Richard M. Huber
Department of Sustainable Development
Organization of American States
1889 F. St., N.W., Suite 794-C
Washington, D.C. 20006

Dear Mr. Huber,

NatureServe respectfully submits a proposal to the Organization of American States, which supports your topic area "*Area Social and Economic Issues*" specifically the "*Capacity Building for the Cooperation in Conservation: Western Hemisphere Migratory Species Initiative.*" Our proposal entitled *Analysis of Implementation of Environmental Policy for Conservation of Migratory Species,* a capacity building training initiative, will enhance the effectiveness of the decision making process for biodiversity conservation and migratory birds species in particular in the Western Hemisphere. NatureServe requests $45,000 for this capacity building initiative.

NatureServe's proposed capacity building initiative, in partnership with the Conservation Data Center/ University of San Carlos in Guatemala and the International Institute in Wildlife and Management /National University of Costa Rica, will provide data, tools and practical interactive sessions for decision-makers from Central America countries. The participants will analyze information on biodiversity of migratory species, social, economic and legislation information through a combination of methods from the social and natural sciences. Upon completion of the one-week training course, participants will apply this knowledge for making decisions about environmental needs and issues in their respective countries and regions. This training course is expected to be held at the National University of Costa Rica in Heredia on late fall 2008.

If you need additional information, please feel free to contact Juan Pablo Arce, Director of Latin America and the Caribbean, at (703) 908-1853 or by email juanpablo_arce@natureserve.org. Your consideration is greatly appreciated.

Sincerely,

Mary L. Klein
President & CEO

Enclosure

Title of Proposed Project

"Analysis of implementation of environmental policy for conservation of migratory species"

Contact Information of the Firm

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Project Summary

Title of the Project:
Analysis of implementation of environmental policy for conservation of migratory species

Geographic Location:
Central America

Rationale:
This training activity provides innovative concepts and tools on environmental policy as a key factor for biodiversity conservation, particularly migratory bird species. This training activity for decision-makers supports WHMSI's priority topic area of *Area Social and Economic Issues*.

Goal and Objectives:
The goal of this training course is to share new methodological procedures to analyze and evaluate the implementation of an environmental policy related to social, economic and biodiversity conservation. The objectives include:

1. Provide decision makers the tools and methods to better implement environmental policy for biodiversity conversation
2. Provide a practical environmental policy implementation analysis tool that links biodiversity conservation with social and economic data and information
3. Provide practical statistical and GIS spatial analysis tools to evaluate environmental policy focusing on the mountainous region of Guatemala.

Specific Project Activities:
The training activity will employ a bivariate analysis selecting independent (legislative, migratory species distribution, population, and income) and dependent (habitat change, social, and economic) variables. A Gamma coefficient will be used for measuring the relationship between the ordinal variables. Finally, an example of a GIS application will be used to graph the final outcomes or products. This training course uses existing social, economic and biodiversity data from the montane ecosystems of Guatemala.

Target Decision-Makers:
Mid-level decision makers at the national, regional or local level.

Beneficiaries:
Mid-level decision makers who need to consider scientific, political, social and economic variables in their conservation actions. Participants will come from the Ministry of Environment, local municipalities or legislative agencies of each country.

Expected Products:
Participants will learn how to use state-of-the-art software packages containing models about how to evaluate and test the results, and specifically how to apply this knowledge to their own environmental concerns on migratory species conservation in the future.

Resumen ejecutivo

Titulo del proyecto
Análisis de implementación de políticas ambientales para la conservación de especies migratorias

Localización geográfica
América Central

Justificación
Esta capacitación provee conceptos y herramientas innovadoras sobre políticas ambientales como un factor clave para la conservación de la biodiversidad, particularmente especies de aves migratorias. Esta actividad está diseñada para tomadores de decisión y coadyuva al tema prioritario del Área Social y Económica del Programa para la Iniciativa de Especies Migratorias del Hemisferio Oeste (WHMSI por sus siglas en ingles)

Metas y Objetivos
La meta de este curso de capacitación es compartir nuevas metodologías y procedimientos para analizar y evaluar la implementación de políticas ambientales integrando los aspectos sociales, económicos y conservación de la biodiversidad (aves migratorias en particular). Los objetivos incluyen:

1. Proveer a los tomadores de decisión las herramientas y métodos para una mejor implementación de políticas ambientales para la conservación de la biodiversidad.
2. Proveer una herramienta práctica de análisis de implementación de políticas ambientales que integre conservación de la biodiversidad con la información social y económica

3. Proveer una herramienta práctica estadística y de análisis espacial mediante SIG para evaluar políticas ambientales enfocándose en la región montañosa de Guatemala

Actividades específicas del proyecto
El programa de capacitación empleará un análisis bivariante seleccionando variables independientes (legislación, distribución de especies migratorias, población e ingreso) y dependientes (cambio de hábitat, temas sociales y económicos). Se utilizará un coeficiente de correlación Gamma para medir las relaciones entre las variables ordinales. Y finalmente se aplicará un Sistema de Información Geográfico (SIG) para graficar espacialmente los resultados finales. Los datos sociales, económicos y de biodiversidad empleados en esta capacitación serán en base a un caso de estudio de la región de ecosistemas montañosos de Guatemala

Tomadores de decisión clave
Las personas a capacitor serán tomadoras de decisión medio a nivel nacional, regional o local.

Beneficiarios:
Principalmente los tomadores de decisión que requieren tomar en cuenta variables científicas, políticas, sociales y económicas en las acciones de Conservation emprendidas. De esta manera, los participantes provienen de diferentes agencias de gobierno de cada país tales como el Ministerio del Medio Ambiente, municipios locales o agencias encargadas de la legislación.

Productos esperados
Participantes aprenderán como utilizar programas sencillos de computación que les muestre como evaluar y validar resultados y especialmente como aplicar este conocimiento en su propia realidad para la conservación de especies migratorias en el futuro.

Project Description

As the world community seeks to replace unsustainable development patterns with environmentally sound management, a key challenge is the need to create a sense of common purpose, especially among government agencies. This project is based on the premise that sound methods for analyzing the distribution of migratory species and the implementation of environmental policy are a fundamental prerequisite for this undertaking, as well as a catalyst for collaboration between the scientific community and concerned decision-makers. The project will be accomplished through a training course for decision-makers.

A five-day training course for mid-level decision-makers will be held for the purpose of integrating biodiversity data (migratory bird species) in to the context of the social, economic and legal situation of a particular jurisdiction. Coming from several countries in South America, participants will use existing data of migratory bird distribution modeling. The training course will use a case study developed by the CDC Guatemala and NatureServe related the dry forest ecosystems of Guatemala. Jointly with the CDC Guatemala, NatureServe will prepare a migratory species distribution modeling data for the training course. The CDC Guatemala will provide the data for its preparation and incorporation into the master table of data for all participants. The training activity will be held at ICOMVIS/Universidad Nacional in Costa Rica where similar training activities has been developed successfully in the past.

The training will provide practical tools for assessing species distributions, social and economic conditions, and legislative policy information, which can be used to monitor the status and effectiveness of conservation migratory species. Even though the distribution of biodiversity is a key factor in

establishing effective environmental policy, making a meaningful connection between the two is still a big challenge, for example:

1. How to determine species conservation priorities in and around a protected area to get the greatest benefit from scarce financial resources?
2. How to improve the implementation of environmental policies using knowledge of the actual and potential distribution of species within a protected area?
3. Which municipalities or districts within areas of high biodiversity or species endemism are most suitable for sustainable development?
4. What role do protected areas play in the implementation of environmental policy in existing development plans?

Resource managers need to know where biodiversity occurs before designing and implementing management strategies for protecting these resources. Species distribution models have recently emerged as key tools for providing this information, especially in remote regions. The development of high-speed computers and geographic mapping software now allows for modeling the distribution of a particular species by analyzing the environmental characteristics of its known localities. These mathematically defined models can then be combined with known constraints based on the species' life history to predict other locations on the landscape the species might occur.

NatureServe and its two local partners, the International Institute in Wildlife Conservation and Management (ICOMVIS) from the Universidad Nacional (UNA) in Costa Rica, and the Conservation Data Center (CDC Guatemala) from the Universidad San Carlos in Guatemala, believe that he proposed integrated training initiative supports WHMSI's mission to build human resource capacity for the future conservation of key migratory species in the Western Hemisphere. The training will allow decision makers to acquire increased knowledge and understanding on order to address better conservation investments, create protected areas or prioritize conservation units, and practice sustainable development practices in a sound environmental policy framework.

The primary audience includes public agency staff that makes decisions related to the environment, especially in the areas of planning, protected areas, biodiversity conservation, land use development, and natural resources management. The staff in these agencies has national-level responsibility for the conservation and sustainable use of biological resources.

Starting with the nearest MERCOSUR countries, two decision makers from each country (Venezuela, Brazil, Colombia, Ecuador, Peru, Bolivia, Paraguay, Argentina, Uruguay and Chile) will attend the training. Contingent upon future funding, additional countries and regions can be trained.

Project Goals and Objectives

The goal of this initiative is to train conservation decision makers to analyze the distribution of high priority migratory species and apply the results learned from a Central American case study to develop sound environmental policies for biodiversity conservation in a sustainable development framework.

Objective 1:
Train 20 decision makers and protected area staff to use practical, statistical tools to evaluate options for successful implementation of environmental policy.
Objective 2:
Increase human resource capacity for effective wildlife conservation and management in Latin America by increasing conceptual understanding of the linkages between environmental policy, biodiversity conservation, and information management.

Objective 3:
Contribute to the WHMSI initiative given an innovative method of analysis from the social sciences as well as the natural sciences and low cost tools of analysis that can be replicate in other countries of Latin America by our trainees in the future..

Project Activities and Methodologies

The course will integrate Species Distribution Modeling data of selected migratory birds in the montane ecosystems region in Guatemala with social, economic and environmental legislation data, using statistical and GIS tools. Previously, similar methodology was applied in two training courses for decision makers, graduate level students and protected areas managers from Central America countries at the Universidad Nacional (UNA) in Costa Rica. The application of these tools and methodologies for non-technical people demonstrated its versatility for any policy analysis by decision makers.

The methodology assumes that the effectiveness of the implementation of environmental policies varies with the social framework, economy, environmental factors, legislation, and biodiversity factors of a country, state or municipality. Two types of ordinal variables will be used: independent (legislation, ecosystems, biodiversity, social and economic) and dependent (poverty index, illiteracy, education, municipality expense, deforestation). A gamma-coefficient will be used to measure the relationship between the ordinal variables. Using a practical guideline, a GIS will be used to graph the final outcomes or products from a sample case study. Using existing statistical data from Guatemala, each participant will receive an Excel-base information tool on a CD-ROM.

Training Agenda Activity:

Timetable	Course Content
Day 1	Basic concept on policy and environment Revision of statistical methods and correlation coefficients Hypothesis and selection of independent and dependent variables Presentation of Paraguay case study Brief description of the guidelines Establish eight working groups (two per computer) Questions & answers
Day 2	Definition of ordinal variable: Independent and dependent Selection of one environmental variable Selection of categories of variables Distribution of species data analysis Inclusion of data into the Excel spreadsheet provided Questions & answers
Day 3	Statistical analysis Calculation of Gamma Correlation coefficient Interpretation of statistical results Statistical significance Explanation of GIS process in Arc View 3.3 Questions & Answers sessions
Day 4	Mapping analysis of environmental policy using GIS Integration of distribution of species data Interpretation of results using selected variables Preparation of power point presentation by group
	Presentation of each group describing:

Day 5	• Background • Methodology • Description of variables • Prioritization of opportunities in the implementation of environmental policy • Recommendations on conservation, and socio-economic investments on biodiversity • Synthesis of the training course • Evaluation survey by participants

Time Frame/Work Plan

Project Tasks:

1. Implement specific agreements with the Conservation Data Center, and International Institute in Wildlife Conservation and Management or their institutional roles in the development of this training activity and preparation of data.
2. Build capacity by training 20 decision makers from 8 countries of Central America in an integrated training course in to be held in Heredia, Costa Rica in late fall, 2008.
3. Evaluate the methodological approach by participants. Use the results to develop a network of decision makers in biodiversity and environmental policy.
4. Set recommendations to the WHSI and OEA about the training course for decision makers and future steps among other government agencies or sectors

Expected Results

- Improved knowledge about the importance of migratory biodiversity in the context of a socio/economic development and conservation framework.
- Well-trained decision makers in social and natural sciences methodologies management tools to analyze and implement environmental policy in a integrative way of biodiversity conservation, legal, social and economic data
- Contained on a CD-ROM and in Spanish, a printed synopsis of the training activity including all statistical data and spatial information from the selected case study in Guatemala.
- Increased collaboration and networking among decision makers to enhance the importance of the WMHSI and refinement of policy that could affect the migratory species habitats and ecological niches.

Key Outcome	**Responsibility**	**Evaluation Plan**
Improved knowledge about the importance of migratory biodiversity in the context of a socio/economic development and conservation framework.	NatureServe ICOMVIS CDC Guatemala	Evaluation form completed by each participant at the end of the training course.
Well-trained decision makers in the social& natural sciences methodologies management tools for the analysis of the implementation of environmental	NatureServe Decision makers	Evaluation form completed by each participant at the end of the training course. A PowerPoint presentation of

Key Outcome	Responsibility	Evaluation Plan
policy in a integrative way of biodiversity conservation, legal, social and economic data		each group.
Contained on a CD-ROM and in Spanish, a printed synopsis of the training activity including all statistical data and spatial information from the selected case study in Guatemala.	NatureServe	20 color-printed synopses for each participant and 20 CD-ROM's, including statistical tables of analysis, GIS files and literature
Increased collaboration and networking among decision makers to enhance the importance of the WMHSI and refinement of policy that could affect the migratory species habitats and ecological niches.	NatureServe CDC Guatemala ICOMVIS Decision Makers participants	A complete contact list of participants for future exchange of experiences in environmental policy

Team Composition and Task Assignment

Name	Organization	Area of Expertise	Position Assigned	Task Assigned
Juan P. Arce	NatureServe	Environmental Policy	Instructor	Design and development of a 5-day training course
Miguel Flores	Centro de Datos para la Conservación /CECON, Guatemala	Species Distribution Modeling	Training Course Assistant	Preparation of Migratory Species Modeling data
Monica Retamosa	ICOMVIS/UNA, Costa Rica	Biodiversity Conservation	Training Course Assistant	Development of Training Course
Whitney Weber	NatureServe	GIS	Technical Assistant	Preparation of guideline and GIS instruction

CVs of Proposed Staff

Juan Pablo Arce, Director, LAC Section Support. Juan Pablo has extensive experience in policy and conservation through his previous employment as the Bolivia Country Director for Conservation International, former Vice Minister of Natural Resources and Environment in Bolivia, and former project manager for the Paraguay Environmental Policy project. In 2007 and 2008, Juan Pablo was the instructor

of an Environmental Policy training activity at UNA. Sponsored by the FWS, the course trained 32 graduate students representing four Latin America countries. He holds a Master of Science degree in Rural and Land Ecology Survey from ITC, The Netherlands and global studies courses from the Graduate School of International Studies at the University of Denver, USA. Currently, he is the Director of the Latin America and Caribbean program at NatureServe, USA.

Miguel Flores has degree in Biology from the University San Carlos, Guatemala, and graduate studies in Plant Taxonomy, Vegetation and Geographic Information Systems. Currently is responsible for the Ecology Unit of Data Center for the Conservation of CECON at the University of San Carlos. Research scientist in Policies for Land Use and Conservation of Tropical Forests Nuts to departmental and municipality level in Guatemala, Studies of Biodiversity in the biotopes San Miguel-La Palotada The Zotz and Naachtun-Two Lagoons Zotz. His areas of interest include vegetation mapping, species distribution modeling and conservation biology.

Monica Retamosa Izaguirre has a degree in Biological Sciences from the University of the Republic of Uruguay, a master's degree in Management and Wildlife Conservation from the National University of Costa Rica and a PHD in Wildlife Sciences from Purdue University, Indiana, U.S. At present serves as a teacher and researcher at the International Institute for Conservation and Wildlife Management of the National University of Costa Rica. His areas of interest include ecology and wildlife management, landscape ecology, application of geographical information systems for biodiversity conservation and management of landscapes.

Whitney Weber, a GIS & Application Support Specialist at NatureServe, will provide technical assistance in the GIS methodology and logistics portion of the training. In the past she contributed her GIS skills to the Environmental Policy training held at UNA as well as trainings routinely given by NatureServe. Whitney has applied her knowledge of GIS to conservation goals for the last 10 years.

Staffing Schedule

N°	Name of Staff	Staff input (in the form of a bar chart)													Total staff-month input	
		1	2	3	4	5	6	7	8	9	10	11	12	n	Home	Total
1	Juan P. Arce														PT	2
2	Miguel Flores														PT	1
3	Monica Retamosa														PT	2
	W. Weber														PT	1
													Subtotal			6

Work Schedule Indicate all main activities of the assignment, including delivery of reports and other milestones. Duration of activities shall be indicated in the form of a bar chart

N°	Activity[1]	Months[2]											
		1	2	3	4	5	6	7	8	9	10	11	12
1	Partnership Agreements												
2	Preparation of Distribution species data and Modeling												
3	Preparation of statistical data in social and economics												
4	Training activity												
5	Evaluation of training course												
6	Final report to OEA												

Relevant Literature

Arce J.P. 2008. Instructor of the Training Course Analysis of Environmental Policy Implementation. Integrated training courses for graduate-level wildlife management students and protected-areas decision makers. Universidad Nacional (UNA-ICOMVIS), Heredia, Costa Rica. Funded by the US Fish and Wildlife Service & NatureServe

Arce J.P. 2007. Instructor of the Training Course Analysis of Environmental Policy Implementation: An integrated methodology and tool for biodiversity, legislation, social, economic, and policy information. Universidad Nacional (UNA-ICOMVIS), Heredia, Costa Rica. Funded by the US Fish and Wildlife Service & NatureServe.

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Josse, C. 2004. Sistemas Ecológicos de Latino América. NatureServe. USA

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Ministerio de Finanzas Públicas. 2008. Transparencia Municipal. Reporte de Ingresos y Gastos municipales seleccionados para varios años, Gobierno de Guatemala

Ministerio de Agricultura y Ganadería. 2008. Mapa de uso y cobertura de la tierra. Región seleccionada conjuntamente con el CDC Guatemala, Guatemala

Summary of Costs

	Item Description	OEA	NatureServe	ICOMVIS	CDC Guatemala	TOTAL
I.	**Personnel**					
	Project Coordinator & Environmental Policy Trainer	11,760	10,000			21,760
	GIS Assistant	1,480	2,000			3,480
	Financial Specialist II	808.50				808.50
	Total Personnel	**14,048.50**				**26,048.50**
II.	**Direct Costs**					
	Contractual ICOMVIS	1,000		10,000		11,000
	Contractual CDC Guatemala	1,000			5,000	6,000
	Travel- Air (18 people)	8,432				8,432
	Travel- Ground Transportation	115				115
	Lodging	3,708				3,708
	Per Diem	4,320				4,320
	Communication and Postage	3,465	400			3,865
	Office Supplies	50	200			250
	Printing	200	200			400
	Conference room	400		1,100		1,500
	Audiovisual equipment			2,100		2,100
	GIS LAB			6,000	8,000	14,000
	Total Direct Costs	**22,690**				**55,690**
	Total Indirect costs (@36.4%)	**8,259.16**				**8,259.16**
IV.	**Project Total**	**45,000**	**12,800**	**19,200**	**13,000**	**90,000**