SECRETARÍA NACIONAL DE EDUCACIÓN SUPERIOR, CIENCIA TECNOLOGÍA E INNOVACIÓN

PROYECTO PROMETEO

RESEARCH PROPOSAL FORM

Researcher's name	Cogălniceanu	Researcher's last name	Dan
Area of research	Ecology and Biodiversity Conservation		
Title of PhD.	PhD in Ecology	University that awarded the Ph.D.	University of Bucharest, Romania
Host institution (MAIN)	Universidad Tecnica de Machala	Name of the counterpart in the host institution	Favián Maza
Higher Education Institution		Name of the counterpart in the host institution	
Name of research with which the research contributes	Inventory and monitoring of amphibians in the site " Bosque Buenaventura"		
Objective of the research	To conduct a full amphibian species richness inventory, design a monitoring program using amphibians as bioindicators and provide a package of measure for the conservation and proper management.		
Starting date of activities	1 period 07/07/2014 2 period 06/07/2015 3 period 05/07/2016	End of activities	1 period 06/10/2014 2 period 05/10/2015 3 period 05/10/2016
Total months of linkage	**9 months**		

Researcher Profile
I am professor at the University Ovidius Constanta, Romania, and a visiting professor at Central European University, Budapest. I lectured for one year in Germany as a DAAD scholar and was a Senior Fulbrighter. I worked on a variety of projects involving wetlands, inventory and monitoring, and tested ecological and evolutionary hypotheses focusing on amphibians as target group. I have done fieldwork in Europe, Qatar, and USA. I published several books and chapters on environmental issues and 90+ scientific papers in peer-reviewed journals. I am also involved in environmental policy implementation and conservation and management of endangered species.

- In a concise way and no more than two thousand (2,000) words, please specify the following elements of your research proposal:

1.Research Question and their delimiting spatial, temporal

Studies of biodiversity have increased after the Convention on Biological Diversity was signed at the 1992 World Summit in Rio de Janeiro. Despite repeated attempts to halt biodiversity loss, the 2010 targets were not met. The new Aichi Biodiversity Targets provide more detailed and focused targets for 2020, but achieving them requires detailed data and information on biodiversity. Basic knowledge of the species distributions within a region is required for a proper management of biodiversity, e.g. to predict species extinction under habitat loss, to understand the potential impacts of climate change on biodiversity, to prioritize conservation efforts and design conservation areas

Amphibians are considered the most threatened group of vertebrates worldwide, despite a still high rate of new species description. The causes of amphibian declines are multiple: habitat degradation, fragmentation and destruction, pollution, accidental mortality, utilization by humans, alien invasive species, and diseases. Ecuador is a megadiversity country and a major amphibian biodiversity hotspot. Of the 7140 known species of amphibians (amphibiaweb.org, consulted 13.06.2013) at least 526 species (with an estimate of 700) occur in Ecuador (about 9% of the total number of species worldwide) of which 221 endemic species. On the downside 163 species are considered threatened and 153 species were Data Deficient (i.e. their status could not be assessed because of lack of information). The task of describing, inventorying and preserving amphibians in Ecuador is difficult and requires extensive efforts.

Protected areas continue to be one of the main instruments in the biodiversity conservation toolbox, and the total area benefiting of legal protection has been increasing worldwide. Despite concerted efforts towards designing resilient protected areas, and implementing ecologically-relevant conservation strategies, reserve networks still fail to conserve important biodiversity elements. The designation process is not always based on quantifiable conservation targets or comprehensive spatial planning. The Ramsar Convention was the first worldwide environmental approach to provide a safety net for wetlands around the globe. Achieving this goal requires detailed data and continuous monitoring required for an adaptive and flexible management.

In 2012 the wetland La Tembladera was declared a Ramsar site, mostly based on the diverse bird fauna. In the 2009 report (Plan de manejo participativo del humedal La Tembladera, El Oro-Santa Rosa) not a single amphibian species was listed from the area. Overall there is a scarcity of data on amphibian species diversity in the region, most studies on amphibians being done in the Andean and Amazonian regions. The threats to the wetland are well documented: habitat degradation and destruction, pollution, alien invasive species, all factors that affect amphibian well-being. The lack of data on amphibians means that management plan and conservation measures will elude them, posing threats to their survival.

In the present project I intend to (i) inventory amphibian species richness in the La Tembladera Ramsar site and its vicinity, (ii) develop and help implement a monitoring program focused on amphibians as bioindicators of environmental health and human impact, (iii) design and promote conservation measures of habitats and amphibian species. All these activities will be carried in ciose cooperation with staff and students from the Technical University of Machala and will also contribute to human resource development.

In this part mention clearly what will be the contribution of research knowledge in the respective area

1. AMPHIBIAN INVENTORY

Species inventories provide the basic information for any biodiversity related study, but full inventories are difficult to complete. Despite the relative small size of the study area, a comprehensive inventory of amphibian species richness is hard to achieve on short term, especially in a megadiverse country as Ecuador. To increase the success of the study my visits will be spread over a period of three years (3 months/year), and will involve students for a continuous sampling throughout the year. The use of estimators of species richness will provide a measure of the completeness of the inventory and of the progresses made.

2. MONITORING PROGRAM

A monitoring program should detect trends in the targeted groups, and thus provide feedback regarding the efficiency of the conservation and management activities in the area. Designing a feasible and informative monitoring program requires the identification of target species (i.e. bioindicator species easily observed whose changes in population size, body size, reproductive success or other measure of population parameter is an indicator of change), habitats to be monitored (where the species occur, or habitats whose change will affect the target species), and human activities that might have negative or positive effects. After the first year a pilot monitoring program will be started in parallel with the continuation of the inventory.

3. CONSERVATION MEASURES

This objective is focused on developing the human resource that will improve communication with the local communities and will continue the inventory and monitoring of amphibians in and around La Tembladera. An Action Plan for the conservation of amphibians in this Ramsar site will be finalized at the end of the project. An online fieldguide that can be continuously updated will be started after the first year of fieldwork. Whenever possible, male reproductive calls will be recorded and made available on the site for audio identification. A side effect of this study and of the publicity provided by the data made available on the web site could be an increase in ecotourism.

The methodology used in the investigation. This section should demonstrate the feasibility of the research.

There are ampie methodologies developed for monitoring amphibians (see review in Dodd et al. 2012). Depending on water level and local conditions a mixture of visual and auditive transects, both during the day and by night (torch surveys). Repeated transects along the same track will allow to estimate the detectability of the different species.

Estimating the richness of the species-pool or the number of additional species expected in the next sample are important in designing cost-effective species inventories. A variety of methods of estimation of species richness that allow the reduction of the underestimation associated with incomplete sampling have been developed and will be tested: visual encounter surveys, audio strip transects (limited by the lack of data on calis in many species), quadrat sampling in piots with dense litter, survey at breeding sites and netting and trapping in water for larvae. Based on the data provided by a preliminary inventory, fixed transects will be established during the pilot monitoring program. The use of drift fences and pitfall traps will be tested in areas with low human population and if successfull will be used on a larger scale.

A succesful monitoring project requires excellent planning and extensive associated data. The project will require detailed maps and aerophotograms, weather data and information about local communities

(population, agriculture and animal husbandry activities, use of pesticides, water use, waterwater treatment, presence and spread of alien species). The use of a set of dataloggers for temperature and air humidity and water temperature, will allow to downscale the weather data and identify areas with different microclimates. Photomonitoring will be extensively done at fixed points to estimate changes in vegetation cover, habitat quality and human activities in time.

There are two major risks in this type of studies:
1. Sampling bias, usually caused by oversampling easily accessible areas and avoiding difficult and/or dangerous ones. There is also a tendency of spending more time sampling in species rich zones and avoid species poor areas. A proper design of the sampling protocols and areas to be sampled will mitigate this risk.

2. Species identification. Due to the very high species richness, identification in the field will be difficult. If a partnership with a major museum housing amphibian collections will be reached and the needed permits obtained, samples of captured animals will be preserved. Otherwise captured animals will be photographed in the field, measured, weighed, their calls recorded and then released on site. Swab samples of skin for DNA and chytrid fungus will also be collected after obtaining the necessary permits.

Expectations

In this section, please fill out the following table. Please do not modify the components and must meet mandatory components 1, 4 and 7. If any component is not applicable, please put N / A

	COMPONENTS	SPECIFIC OBJECTIVES	OBJECTIVE RESULTS
1	RESEARCH	**1. Inventory amphibian species richness within La Tembladera.** **2. Establish a monitoring program focused on amphibians as bioindicators.**	**1. A list of amphibian species present in La Tembladera.** **2. A monitoring program established for amphibian communities in La Tembladera.** **3. An Action Plan for the conservation and management of amphibians in La Tembladera.** **4. An online fieldguide of amphibians**
2	SCIENTIFIC TRAINING IN THE RELEVANT AREA OF THEIR SPECIALTY (theoretical training)	**Management of species richness data. Design and start scientific collections of the fauna of the Oro Province.**	**1. Contribute to the existing web site amfibioswebEcuador.ec.** **2. Start in cooperation with a national museum a collection of fauna from the Oro province.** 3. **Write an on-line fieldguide for the amphibians in La Tembladera protected area.**
3	ADVICE ON THE DEVELOPMENT OF PUBLIC POLICIES	This component relates to providing advice to various government agencies in regard to the development of policies and guidelines for the	**The results of the inventory and monitoring program will provide important data to the site administration and will help improve**

	COMPONENTS	SPECIFIC OBJECTIVES	OBJECTIVE RESULTS
		management of the Ecuadorian state.	**management plans.**
4	TEACHING	**Offer optional courses in either English or Spanish:** **1. Understanding biodiversity** **2. Nature conservation and management** 3. **Analysis of species richness data.** 4. **Water resources management.** 5. **Amphibian monitoring and conservation.**	**Raise awareness and promote conservation skills in students, coupled with field applications. Coordinate BSc and MSc projects if requested.**
5	CONSULTING AND DESIGN GRADUATE PROGRAMS	**1. Help in designing and implementing specific courses related to biodiversity conservation and management.** **2. Identify specific needs within the host university and identify potential partner universities.**	**Develop links with European university and promote student and staff exchange within projects like Erasmus Mundus.**
6	MANAGEMENT NATIONAL AND INTERNATIONAL RESOURCES (**administ**rative, human, **economic**, etc.).	N/A	N/A
7	STRATEGIC RELATIONSHIP BETWEEN INSTITUTIONS NATIONAL AND INTERNATIONAL	This component refers to the creation of research networks and knowledge transfer with institutions related to the field of research.	**During my stay I will attempt to develop links between my University Ovidius Constanta and similar institutions in Europe with whom I have links and institutions in Ecuador by developing specific project proposals and accessing alternative funding sources.** **I consider my visits during the Prometeo project as an opportunity to identify new and specific directions of research that will be further developed. As a hotspot of biodiversity Ecuador needs and deserves more efforts to map and properly manage its incredible biodiversity.**

SIGNATURE AND SEAL OF THE HOST INSTITUTION

Date of proposal:_____