

## *CASE Studentship with Royal Society for the Protection of Birds*

### **Project title:**

Quantifying the effects of development projects on biodiversity conservation in West Africa

### **Supervisors:**

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### **Project summary (30 words):**

This project aims to understand how development projects and biodiversity conservation interact, focusing on the case of Gola Forest in West Africa.

### **Project background:**

The Sustainable Development Goals, which the world's governments have pledged to meet by 2030, include targets requiring the conservation of biodiversity and others relating to economic development. Reconciling biodiversity conservation and human development activities is challenging and contentious and outcomes that demonstrably benefit both biodiversity and people remain elusive. To address the dual challenges of human development and biodiversity conservation, many aid agencies have made efforts over the last 25 years to incorporate environmental considerations into their development projects. The World Bank, in particular, has introduced a safeguard regime that includes environmental impact assessments, environmental education programs, management plans to strengthen habitat protection, reforestation activities and other efforts to preserve and protect natural habitats and biodiversity. These safeguards apply to most World Bank-funded projects, regardless of whether or not their primary purpose is environmental protection, and require compliance with various national and international biodiversity regulations, site-selection criteria that take into consideration biodiversity conservation aims, offsetting of expected losses in natural habitats, and sustainable harvesting of forest products.

West Africa is an area of biodiversity importance and is undergoing rapid development, spurred on by a large number of development projects. Using a mix of local, field-based surveys, satellite imagery and GIS data, this research would make a major contribution to our understanding of the relationship between human development and conservation based on data collected in this area. The CASE partner, The Royal Society for the Protection of Birds, have been working on multiple conservation and commodities projects around the Gola Rain Forest Park in Sierra Leone, which will act as a focal site for surveys to understand how these different projects interact to affect biodiversity, local livelihoods and wellbeing. The research will also combine existing satellite data for assessing land cover change with spatially referenced information on development projects collected by AidData, to look at larger-scale effects of human development projects on land cover and biodiversity. The results will be used by RSPB to inform their policy work on the Sustainable Development Goals.

### **Key research questions:**

The project will answer the following key research questions based on new data:

- How does sustainable development of commodities affect livelihoods and wellbeing?
- How does sustainable development of commodities interact with biodiversity conservation?

- Are World Bank safeguards effective in protecting biodiversity in areas affected by development projects?
- Which types of development project have the largest impact on biodiversity?

### **Methodology:**

This project will draw upon a combination of survey-based methods, images derived from satellite remote sensing and analysis of existing data sets. Case studies will use semi-structured household interviews and field-based biodiversity surveys, supplemented by field data already held by RSPB, to determine the effects of conservation projects and commodity development on biodiversity, livelihoods and wellbeing. The broad scale studies will use data on development project location and purpose from AidData ([www.aiddata.org](http://www.aiddata.org)) and data on land cover type and condition derived from satellite remote sensing. In particular, changes in land cover (especially forest and woody land cover) derived from existing pantropical products and those directly produced by the student from radar satellite data will be assessed at different distance bands from project locations. The degree of loss will be compared to project characteristics. These analyses will utilise matching methods. The student will benefit from a large body of previous work carried out in and around Gola, which provides in-depth background understanding of the area, and work on the impact of development globally carried out by RSPB.

*Timetable:* Year 1: Literature review; Training and skills development; Gola data collation; field surveys. Year 2: Field surveys; data analysis; manuscript preparation; satellite image data analysis; Year 3: Data analysis and writing-up; Dissemination activities

### **Training:**

A comprehensive training programme will be provided comprising both specialist scientific training and generic transferable and professional skills. We expect that the student would undertake specific training in the design and implementation of field surveys and statistical computing using *R*, as appropriate, to complement their existing skills. Training will also be provided on analysis of satellite remote sensing data, both optical and radar.

### **Requirements:**

We are looking for an enthusiastic and creative student with excellent quantitative skills, an interest in satellite remote sensing and an ability to undertake field surveys. Computer literacy is essential, including ideally experience of direct programming in for example python or *R*. The student will have a proven track record of working independently, and be willing and able to develop innovative approaches to their work. Strong communication skills and direct experience of conservation in practice are also highly desirable as they will be expected to work directly with RSPB policy staff.

### **Further reading:**

Adams, W. M., Aveling, R., Brockington, D., Dickson, B., Elliott, J., Hutton, J., [...] Wolmer, W. (2004). Biodiversity conservation and the eradication of poverty. *Science*, 306(5699), 1146–1149.

Bare, M., Kauffman, C., & Miller, D. C. (2015). Assessing the impact of international conservation aid on deforestation in sub-Saharan Africa. *Environmental Research Letters*, 10(12), 125010.

Kareiva, P., Chang, A., & Marvier, M. (2008). Development and conservation goals in World Bank projects. *Science*, 321(5896), 1638–1639.

McShane, T. O., Hirsch, P. D., Trung, T. C., Songorwa, A. N., Kinzig, A., Monteferri, B., [...] O'Connor, S. (2011). Hard choices: Making trade-offs between biodiversity conservation and human well-being. *Biological Conservation*, 144(3), 966–972.