Proposed remote sensing methodology for assessing projects against the BGCI Global Biodiversity Standard

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Executive Summary

The Earth's ecosystems are changing rapidly, driven increasingly by human processes like land clearing for agriculture. The recognition that humans are having such a large negative impact on the environment has increasingly been translated into mitigation action. Climate change and biodiversity loss are the twin environmental challenges faced by society, to which governments and organisations are responding by incorporating environmental considerations into decision-making processes and by dedicating increasing amounts of money towards mitigating environmental impact.

Many of these mitigation efforts revolve around either protecting existing forests or restoring previously forested areas via massive tree planting campaigns, many of which are linked to carbon credit producing projects. While still sequestering carbon, some tree planting projects can be harmful to local biodiversity; for example, clearing native, high biodiversity ecosystems to develop monoculture non-native tree plantations, or planting trees in areas that are naturally grassland. These types of projects ultimately harm biodiversity in the very areas they are trying to enhance, restore and protect.

In order to ensure these projects have a positive impact on biodiversity, the right trees need to be planted in the right places. Botanic Gardens Conservation International (BGCI) is taking the lead in this area, by creating the Global Biodiversity Standard to ensure forest carbon projects not only sequester carbon dioxide, but also promote biodiversity recovery and provide socio-economic benefits to local communities.

A robust methodology is under development for the Standard, incorporating both field surveys and remote sensing analysis. This report details the remote sensing method proposed for assessing forest project sites against the Global Biodiversity Standard. Remote sensing technology for biodiversity monitoring is reviewed, as well as available spatial data considered for use in the assessment. The final proposed methodology includes the following five steps: (1) locate the project area and assess its extent; (2) identify land and/or forest cover changes; (3) assess potential biodiversity impact; (4) compare remote sensing and field observations; and (5) undertake ongoing monitoring.

A separate report will detail results from testing the proposed methodology on several project sites.

Summary

This report provides an overview of remote sensing technology suitable for monitoring land/forest cover changes and biodiversity within tree planting project sites, concluding with a proposed methodology for assessing project compliance with BGCI's new Global Biodiversity Standard. Under the Standard, projects must prove that there has been "no active removal, displacement or modification of intact or partially degraded existing native ecosystems with high biodiversity value" during the development of the project and throughout the project's lifetime.

In order for the proposed remote sensing methodology to be accessible for all project partners and developers, the use of publicly available datasets has been suggested where possible. For assessing land or forest cover change (and thus whether native ecosystems have been removed or displaced), the use of either Hansen Global Forest Loss or JRC Tropical Moist Forest deforestation and degradation datasets is suggested. Both datasets have a 30m spatial resolution and show forest loss by year, allowing for the assessment of deforestation within a project area on an annual basis, including prior to project establishment.

Alongside datasets for assessing forest loss within project areas, a handful of global spatial datasets have been recommended for monitoring biodiversity, including: IUCN Red List data; NDVI for vegetation productivity; protected areas location data; and the forest structural integrity index. There are many other datasets available that could be suitable for assessing biodiversity on a national, regional or local scale, and should be investigated for use on a project-by-project basis.

A comparison between field survey data and remote sensing observations has also been recommended, where possible. This includes a comparison of the following variables: project extent; habitat type; habitat intactness; presence of threatened or rare species; and area of land protected or restored.

Finally, it is recommended that ongoing project monitoring is undertaken using remote sensing data on at least an annual basis to check for any changes in land or forest cover (e.g., through illegal deforestation, pest or storm damage) and biodiversity. Ongoing annual monitoring is also essential for assessing project performance (e.g., tree or crop growth; project expansion).