

**INTERNATIONAL BARCODE OF LIFE PROJECT (IBOL)
INTERNATIONAL CONSORTIUM INITIATIVE (ICI)
INTERIM REVIEW WRITTEN REPORT FORM**

ASSESSMENT

1. RESEARCH PROGRESS

Progress against the original research plan is assessed as:

Excellent Good Satisfactory Not Satisfactory

Please provide comments to justify your assessment. If there are significant variances in the progress of specific components of the ICI, provide specific comments by sub-project or activity while taking into account factors such as the:

- level of funding received to date;
- duration of the funding period;
- problems encountered;
- progress relative to other research groups working on similar projects; and,
- research team's responsiveness to advances in the field and/or availability of new technologies since the project's inception.

Overall, I think the project has made substantial progress, although clearly not in all areas. Perhaps my biggest concerns are for Theme 1. The group is on their way to their target to provide barcodes for 500,000 species by 2015 and during the period have (if I understand correctly) added barcodes for 57,000 new species meaning that 153,000 species are barcoded to date. This is pretty good going, given the level of funding received and the capacity available for processing samples during the period. While it is clear that the process of adding new species needs to accelerate substantially if the team is able to meet its goals, with increased available lab infrastructure and manpower, this should be achievable. However, I think the team needs to be clearer and more goal-oriented in their approach if this target is to be met and the dynamics of progress need to be closely monitored.

The number of barcode records added to the database has been proceeding faster than originally anticipated, and this is to be applauded. However, progress is far from even across the range of groups and this needs to be addressed in the coming months. I think is important that the team provide a more specific idea of how they are going to make up the lost time for barcoding of reptiles and amphibian, fungi, pathogens and marine biosurveillance. However, it does seem as though much of the difficulties with progress stems from the rate at which new specimens are being acquired for molecular analysis – and this poses real challenges for the team, as to a large extent progress in this area is out of their hands.

A substantial number of samples (90,000) have failed to yield useable barcodes to date, about 8% of the total and 20% of those run during the period. Many of these seem to be museum specimens and I assume many targeted specimens are either impossible or very difficult to recollect (some may even be extinct?). The team need to think about what is the overall strategy for prioritization for species barcode acquisition as we go into this critical 'gearing up' phase.

For WG2.2, I find it interesting how PCR success for the barcode region declines so linearly with time for Lepidoptera, and by just 35 years full-length amplification success falls below 50%. This is a major issue for me because it is going to have a major impact on the application of this method to many museum samples, yet the implication from 2.2 is that only sequences of full-length will be accepted into BOLD, potentially meaning that a lot of sequences may go unregistered or that lengthy (and costly) multi-amplicon sequencing must be embarked upon. I wonder whether full-length sequences are really necessary for the accuracy of the barcode? Maybe this would also save money?

For WG2.4 I think the compatibility of sequences generated by the Barfrost and ECOCHANGE project with related taxon barcodes being produced via iBOL is extremely important and it would be good to know how these projects plan to interact.

2. CHANGES TO THE RESEARCH PLAN

If significant changes to the research plan have been made or are proposed for the future, what is your assessment of these changes?

Recommended as proposed Recommended with modifications Not recommended

Please provide comments to justify your recommendation. Provide details of any modifications or additional changes that you would recommend.

I am now happy with the changes to the research plan suggested in terms of the numbers of sequences and taxa that are planned.

3. GE³LS

The project leaders were asked to identify the ethical, environmental, economic, legal and social aspects (GE³LS) arising from their proposed research and to develop and implement a plan to address them.

The progress towards achieving the goals of the GE³LS subproject is assessed as:

Excellent Good Satisfactory Not Satisfactory N/A

Please provide comments to justify your assessment including comments on the progress towards achieving the GE³LS milestones and the research team in place. Please take into account factors such as the level of funding received to date, duration of the funding period and problems encountered.

I don't have a strong opinion on the whole GE3LS component of the project but I am glad the research component was scaled back because I never really understood its relevance in the first place. Consequently I am pleased to see that GE3LS is taking a role on the governance of the iBOL project – this makes sense and is a good use of resources. Given the emphasis on equitable use of genetic resources at the last CBD CoP in Nagoya, it is particularly timely that the researcher has taken up their position on this issue.

4. ABILITY TO ACHIEVE THE OVERALL OBJECTIVES

Is the research team likely to achieve the overall objectives of the project?

Very likely Possibly Unlikely

Please provide comments to justify your response. In cases where you identify issues that would prevent the team from meeting their objectives, please state the issues and where possible, propose solutions.

Although I have concerns about the progress of some elements of the work, at its core I am fairly sure that the team will be able to accelerate enough to achieve its aims. I am concerned that sample acquisition may prove to be the sticking point because it is not within the control of the project, but the sequencing I think can clearly be done and I am impressed with the rate of development of the bioinformatics and collaboration with Genbank. Provided the materials arrive, that the fungal barcoders can agree on a sequence and implement the sampling, I think the targets can be achieved (although I have concerns about some of the revisions, see above).

5. BENEFITS FOR CANADA

Based on progress to date and the future plans, please assess whether the anticipated results of the research are likely to, a) contribute to job creation and economic growth in Canada, b) social benefits c) improvements in the quality of life, health, and/or the environment, and d) contribute to the creation of new policies in these areas. If commercialization is proposed, please comment on the strategy for IP management and ownership, technology transfer and benefit sharing.

The progress towards realizing the Benefits for Canada is assessed as:

Excellent Good Satisfactory Not Satisfactory

Please provide comments to justify your assessment. Have any opportunities been missed?

I think the leading role that Canada has played during the last 18 months, including investment in infrastructure (lab and informatics) and therefore capacity has been impressive. Clearly commercial opportunities need to be sought and this is beginning to happen – this is important for the long-term future of the employees at the core facility. The appointment of a Director of Business Development is to be applauded. I have to say that I remain very skeptical about the feasibility of the development of a hand-held DNA barcoder in the foreseeable future, but I do not see this as a core problem for the program.

6. GOVERNANCE & MANAGEMENT

Are the established governance and management plans, processes, and structures appropriate and effective?

Yes Remediable Concerns No

Please provide comments to justify your assessment including comments on the:

- governance and management structures and processes;
- decision-making processes – do these ensure that critical decisions about the research direction can be made and provide the ability to respond to unanticipated difficulties?
- effectiveness of communication mechanisms within the project.

The governance and management structures now in place seem to me to be appropriate and commensurate with the level of activity of the project. It is clear that sound management will be key for this project and communication among the board of directors, who are placed in many different locations. The appointment of a SAB is a very positive development and the inclusion of Steve O'Brien gives it real teeth – I know he will be a positive force for change if change is needed. The Scientific Steering Committee has met twice during the review period – which seems appropriate given the stage of development of the project. The identification of an executive sub-committee provides iBOL with the flexibility it needs to respond to matters arising. I am happy that the GE3LS involvement in governance is becoming more emphasized.

7. HANDLING OF SCIENTIFIC DATA & RESOURCES

Are the plans for handling scientific data and sharing of data and resources created by the project appropriate and effective?

Yes Remediable Concerns No

Please provide comments to justify your assessment and, where appropriate, make suggestions for the improvement of the plans.

I think this is perhaps the most impressive component of the project – although there have been a few teething problems with data flow from BOLD to Genbank, this has gone remarkably smoothly in my opinion. I have no major concerns over other aspects of the handling of data and resources.

8. TRAINING, RECRUITMENT AND PROFESSIONAL DEVELOPMENT

Has the project team been and/or will they continue to be successful in training, recruiting, and professional development of highly qualified personnel?

Yes Remediable Concerns No

Provide comments to justify your assessment and, where appropriate, suggest possible new approaches. Please comment on the responses to any challenges faced to date.

This is difficult judge on the evidence available, but I think the continued training courses and the number of people who have come through the centre in Guelph is pretty impressive and so the project is fulfilling its training role. The workshops seem to have been successful too. I cannot comment on recruitment and professional development.

9. PUBLIC OUTREACH & COMMUNICATION ACTIVITIES

Do the activities that have been undertaken or are planned ensure that the research is communicated to the public and other interested parties?

Yes Remediable Concerns No

Please provide comments to justify your assessment and, where appropriate, make suggestions for improvement.

Clearly the project has been doing pretty well on this front, with lots of activities during 2010 as expected and meetings with stakeholders in the GO, NGO and public sectors. The project has high media visibility and seems to be doing a good job of assuaging the public's antipathy towards genetics in general. I cannot say the project has had much visibility internationally, beyond the scientific community as a whole, but it was heavily referred to at the German Tropical Ecology Congress – so I think it is really making its mark within the community of biodiversity scientists who previously thought genetics was something to be afraid of – a very good thing!

10. FINANCIAL

Is the research progress commensurate with how funds have been spent to date?

Yes Remediable Concerns No

Please provide comments to justify your response. Include comments on the following:

- whether explanations for budget variances are reasonable in the context of research progress to date;
- the level of success in securing co-funding from other sources;
- if there is a co-funding shortfall, suggest alternate sources of co-funding and comment on how the shortfall will impact the research.

Yes, I think progress is commensurate with expenditure, as far as I can tell – but I must confess I found the financial details somewhat difficult to work through. Clearly co-funding has been patchy and not as high as envisaged in the original proposal, but it is playing a very important role for some Themes and working groups. I am concerned about the apparent doubling of cost per BIN between year 1 and 2, and I think it needs to be made clear why this was the case and what is anticipated for the future.

11. Progress towards addressing the issues raised at the time of the initial ICI review

Excellent Good Satisfactory Not Satisfactory

Please comment specifically on the progress towards addressing the issues that were raised by the Expert Committee at the initial review listed below:

- the resolution of outstanding management, budget and co-funding issues;
- the revision of the GE³LS component of the proposal;
- the establishment of a Technology Development Advisory Group (TDAG)

and a Science Advisory Board (SAB);

- the implementation of a quality control/quality assurance monitoring system.
- the resolution of outstanding issues with the public release of data in the ***International Nucleotide Sequence Database Collaboration (INSDC)***;

I am happy with the resolution of most of the issues raised. I think issues to do with co-funding are still problematic and I am not convinced that some of the co-funding cited will provide complementary enough data to be fully regarded as co-funding. However, this will be discussed at the face-to-face meeting.

OVERALL RECOMMENDATION

Further funding for the ICI is recommended

Further funding for the ICI is recommended with modifications

Further funding for the ICI is not recommended

Please provide a brief summary of the status of the project and a justification for your recommendation. Where issues have been identified, state whether these are major or minor, what actions should be taken (e.g., activities that should be reduced, abandoned or strengthened), alternate approaches to be considered and avenues to strengthen the project.

I think the project is going well and I anticipate that it will accelerate during the coming 12 months. I would urge the team to think more about the prioritization strategy for species barcode acquisition during the remainder of the project. There are a few minor issues that I have raised elsewhere but I would emphasise that there is also much to be admired in the progress to date.