**POTENTIAL IMPLEMENTATION PLAN FOR ADDRESSING IUCN RESOLUTION WCC-2016-RES-86 ON SYNTHETIC BIOLOGY AND BIODIVERSITY CONSERVATION**

In September 2016, Resolution 086 “[Development of IUCN policy on biodiversity conservation and synthetic biology](https://portals.iucn.org/library/node/46503)” was adopted by the IUCN World Conservation Congress. This calls upon the Director General and Commissions to undertake an assessment, to be completed by 2020. The assessment is to draw on relevant resources and expertise within and outside IUCN, to:

*examine the organisms, components and products resulting from synthetic biology techniques and the impacts of their production and use, which may be beneficial or detrimental to the conservation and sustainable use of biological diversity and associated social, economic, cultural and ethical considerations, and to recommend how IUCN, including its Commissions and Members, could approach the topic of synthetic biology and engage in ongoing discussions and deliberations with the synthetic biology community.*

In addition, it calls upon the Director General and Commissions with urgency to:

*assess the implications of Gene Drives and related techniques and their potential impacts on the conservation and sustainable use of biological diversity as well as equitable sharing of benefits arising from genetic resources, in order to develop IUCN guidance on this topic, while refraining from supporting or endorsing research, including field trials, into the use of gene drives for conservation or other purposes until this assessment has been undertaken.*

This Resolution comes at an important time for the global conservation community. In December 2016, the Convention on Biological Diversity (CBD) reviewed the report of the Ad Hoc Technical Expert Group (AHTEG) on Synthetic Biology and decided to continue to support a global discussion on the many issues raised by the continuing development of this technology, both by continuing the work of the AHTEG and by inviting governments and relevant organizations:

*to conduct research on the benefits and adverse effects of organisms, components and products of synthetic biology on biodiversity, with a view to filling knowledge gaps and identifying how those effects relate to the objectives of the Convention and its Protocols.* (CBD/COP/DEC/XIII/17 at 9(a))

The CBD Parties emphasized that synthetic biology relates to the three objectives of the Convention -- conservation, sustainable use, and fair and equitable sharing of benefits – and considered aspects relevant to both the Cartagena Protocol and the Nagoya Protocol. Parties noted that in relation to the Cartagena Protocol, questions still need to be answered, such as whether the results of synthetic biology can be considered “living” and therefore fall under the definition of “living modified organisms”. They invited the Parties of the Cartagena Protocol to take information developed through the research described above into account in their future deliberations (CBD/COP/DEC/XIII/17 at 15).

A separate decision was taken by the CBD Parties on digital sequence information – matched by a complementary decision by the Parties to the Nagoya Protocol – which establishes a similar process for submission of information on “potential implications of the use of digital sequence information on genetic resources for the three objectives of the Convention” and establishes an AHTEG to consider the information shared (XIII/16 para. 1-2). These decisions similarly invited stakeholders to submit views and relevant information on implications of digital sequence information, including views relevant to the Nagoya Protocol.

IUCN is in a unique position to support and complement the CBD in its efforts, by filling knowledge gaps, and understanding the potential implications of synthetic biology for global policies around biodiversity conservation. IUCN is globally recognized by governments and policymakers as an independent source of scientific and technical knowledge and guidance. IUCN’s research complements that of the CBD, giving it a strong role in filling knowledge gaps and seeking consensus on policy outcomes. In particular, the potential impact of gene drives is a priority focus of IUCN which has only been touched on by the CBD AHTEG.

The field of synthetic biology is developing extremely rapidly, with multiple potential implications in numerous ways, both potentially negative and potentially positive, for global biodiversity conservation. The conservation community needs trusted science to feed into a broader global dialogue that goes beyond the CBD. The growing field of synthetic biology poses prospective benefits and risks in a large number of sectors, including food security, agriculture, trade, health and geo-engineering. Synthetic biology has appeared in national and supranational policy discussions including: regulation of new plant breeding techniques; developing systems for tracing intellectual property rights and benefits from traditional knowledge relating to genetic resources; considering a new instrument on marine biodiversity in areas beyond national jurisdiction; and exploring the issues surrounding synthetic biology products as surrogates in the international wildlife trade.

To address the requests in the Resolution, and building upon the work started by IUCN in December 2015 through a meeting at the Bellagio Center in Italy, we propose a series of activities, divided into three parts, which would result in: 1) reliable scientific and policy information to support governments and the international community, including the CBD, in understanding and developing guidance for the application and use of synthetic biology in the arena of biodiversity conservation; 2) impetus for a cross-sectoral dialogue through engagement with a wide array of stakeholders and constituencies at the national and global levels; 3) an IUCN policy on biodiversity conservation and synthetic biology, to be presented to the next IUCN World Conservation Congress in 2020. We also propose a budget for the activities.

An IUCN Synthetic Biology Policy Committee will be formed which will oversee the whole process. This committee will be supported by staff in the IUCN Secretariat, and a project leader will be recruited. The committee will comprise approximately 20 people, and will include relevant technical expertise, a balance of regional representation, and of different perspectives on the issues. Given the complexity of the topic, the core team will need to hold four meetings during the process described below.

**Part One – Broad Scientific & Policy Review**

Building on the work that has already taken place within the Convention on Biological Diversity (CBD) and incorporating any significant and relevant outcomes from the CBD CoP 13 in December 2016, IUCN will conduct a broad review of the current state of science and policy around genomic technologies to identify potential applications and products that might impact conservation and the sustainable use of biological diversity, both negatively and positively. While this exercise will incorporate synthetic biology and gene drives (as required by Resolution 086), it will not limit itself to those terms as the technology underlying them changes rapidly. As evidenced by the negotiations around synthetic biology within the CBD, which began in 2010, the pace of change is rapid and limiting any analysis based on a particular term or specific technology or application will miss larger trends in genomics that may impact future conservation efforts and the sustainable use of biological diversity. The review will consider the potential impacts of synthetic biology on biodiversity, both positive and negative, as well as broader impacts on planetary systems and human social and economic structures. Social, economic, cultural and ethical considerations associated with the use of such technology will also be evaluated. The review will be conducted by one or more consultants, and will be subjected to wide peer review prior to completion and publication.

Members of the Policy Committee will use the results from the review to draft an initial policy document, incorporating sufficient background to inform people new to the topic. This will be a focus for subsequent discussions, recognizing that this initial draft policy will change greatly during the process.

The review and the draft policy will be used, in part, to develop engagement exercises in all IUCN regions and carried out at the Regional Conservation Fora to be held in advance of the next World Conservation Congress, as described in Part Two. This process will be informed by, and coordinated with, the CBD processes around synthetic biology, including through their Bio-Bridge Initiative.

**Part Two - Engagement**

In order to assess if and when synthetic biology, gene drives and other emerging biotechnologies may be beneficial or detrimental to the conservation and sustainable use of biological diversity, and the associated social, economic, cultural and ethical considerations, we propose a series of engagement and assessment activities.

The first set of activities will be conducted through the Regional Conservation Fora in advance of the next World Conservation Congress (during 2019), giving a robust global perspective on the issues. In each Regional Conservation Forum, the background review and the draft policy document will be presented for consultation and feedback.

Specifically, one person from each IUCN region will be trained in engagement and consultation processes on this topic; ideally these would be members of the Synthetic Biology Policy Committee, although that might not be possible for all regions. These regional leaders will then run the consultation sessions in each Regional Conservation Forum to maximize the engagement of the IUCN Members in each region in developing the synthetic biology policy. The consolidated feedback from each Regional Conservation Forum will be sent to the Synthetic Biology Policy Committee that will then use it to help prepare the next draft of the policy.

These will be complemented by consultations with international institutions and processes that are currently grappling with synthetic biology issues or that are strongly implicated by the assessment. This will be achieved through direct contact with relevant institutions, *e.g.* the CBD and Cartagena Protocol, CITES, WHO, WTO, DOALOS and UNFCCC, as well as side meetings or workshops in the context of global events.

**Part Three - Finalize an IUCN policy to guide the Director General, Commissions and Members on biodiversity conservation in relation to synthetic biology**

Development of an IUCN Policy will be done in the following stages:

* Synthesize the results of the previous stages to refine further the draft IUCN policy providing guidance for regions, individual countries and IUCN members to evaluate genomic technologies for conservation;
* Prepare a new draft of the policy following the Regional Conservation Fora, and then send this to IUCN Council for submission as a motion for the 2020 IUCN World Conservation Congress;
* The draft policy will then be debated in the online debate on motions in the months prior to the 2020 World Conservation Congress, and a new version prepared for debate and adoption at the World Conservation Congress;
* Finalize and adopt the policy at the 2020 IUCN World Conservation Congress.

**Estimated Budget:**

**Part 1 Broad Scientific & Policy Review (2017-8): $432,000**

- Consultants to carry out review (3 consultants at US$20,000 each) = US$60,000

- Travel for four workshops for 20 participants (US$1,000/per person/workshop) = US$80,000

- Workshop costs (US$15,000 per workshop) = US$60,000

- Consultancy costs for project leader = US$132,000 (for three year process: 40 days per year x US$1100 x 3 years)

- Salary support for IUCN Secretariat staff (1/3 time for P1 Programme Officer and for A3 Administrative Assistant for two years) = US$100,000

**Part 2 Engagement (2019): $135,000**

 - Travel and training session costs for training of Regional Conservation Forum facilitators (10 participants, 2 trainers) = $35,000 (at North Carolina State University)

 - Consultations with International institutions and processes (travel and meetings) = US$50,000

 - Salary support for IUCN Secretariat staff (1/3 time for P1 Programme Officer and for A3 Administrative Assistant) = US$50,000

Note: Core costs of participation by IUCN Members at the Regional Conservation Fora are already covered by IUCN core funds.

**Part 3 Finalize IUCN Policy (2020): $70,000**

- Salary support for IUCN Secretariat staff (1/3 time for P1 Programme Officer and for A3 Administrative Assistant) = US$50,000

- Participation by key resource people for the Policy Committee to help with the finalization of the policy (5 x US$4,000) = USD 20,000.

**Subtotal: $637,000**

**Total with overhead (12%) - $713,440**