

**Synthetic Biology & biodiversity conservation
Joint task force & technical working group meeting**

Dates: 12 - 15 April, 2018

Location: Jesus College, Cambridge UK

Chair	Kent Redford (Appointed by IUCN)
Attendees	Kent Redford, Jason Delborne, Hilde Eggermont, Drew Endy, Bart Kolodziejczyk, Todd Kuiken, Aroha Mead, Sonia Peña-Moreno, Edward Perello, Cyrie Sendashonga, Simon Stuart, Wei Wei, Luke Alphey, Elizabeth Bennett, Kevin Esvelt, Nicholas Macfarlane, Daniel Masiga, Maria Julia Oliva, Ryan Phelan, Lydia Slobodian, Delphine Thizy, Dan Tompkins, Gerd Winter, Jonathan Adams, Victoria Romero, Melanie Ryan.
Apologies	Tom Brooks, Ann Kingiri, Madeleine van Oppen

Meeting objectives

1. Clarify roles and responsibilities and build teams in and across our two groups
2. Agree on work plan and timeline
3. Develop outline for the “Assessment” - clarifying process, roles, and dates
4. Clarify relationship with Convention on Biological Diversity and Convention on International Trade in Endangered Species, and;
5. Next steps; including needed products

Literature and other files shared during the course of the week are available via DropBox.

Thursday, 12th April

Session 1 1300 - 1500	<p>Opening workshop & overview of process</p> <ul style="list-style-type: none"> ● General welcome and introduction was extended to the group from the Chair (Kent Redford), Simon Stuart (on behalf of IUCN) and Melanie Ryan (on behalf of the Luc Hoffmann Institute) ● An overview of the general IUCN process for similar assessments was provided and general Q&A held with group <ul style="list-style-type: none"> ○ The task force and technical working group are a mix of conservation and non-conservation focused actors, with varying degrees of familiarity with the IUCN mandate ○ the timeline for meeting the mandate and completion of the assessment might need to be brought forward by 3 months due to potential change in the timing of the World Congress in 2020 ○ General overview of the process for voting on policy at the world congress and the engagement between NGOs and government members in relation to the mandate ○ one objection to the synthetic biology mandate had been raised by at least one government at the congress in 2016 - but that this is not unusual in these kinds of processes
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	<ul style="list-style-type: none"> ● Discussion around processes related to the development of the assessment and IUCN process for engaging constituents <ul style="list-style-type: none"> ○ Comments on the motion period - online discussion period may be extended from 9 weeks to 13 (post draft assessment production) ○ Participation of this group may extend all the way through to the 2020 congress but is not mandatory for everyone ○ Discussion around what peer review means or looks like for this mandate - the assessment will be completed and circulated globally ○ the current IUCN Oil Palm process has made the technical assessment available online for comment ● Question raised to clarify how the IUCN policy actually impacts on country level policy or decision contexts <ul style="list-style-type: none"> ○ Discussion around the IUCN document as a resource or supporting documents for other processes in country ○ Each government or decision context can use or disregard it as they chose ● Scope of mandate as presented in the resolution presented <ul style="list-style-type: none"> ○ Discussion around the inclusion of Gene Drives assessment to the motion via online forum - as a result, particular attention will need to be paid to the gene drive but it will be dealt with as part of the overall Assessment <ul style="list-style-type: none"> ■ Importance of regulations around gene drives highlighted and whether or how this will be in the scope of the assessment ● One of the ongoing issues is the defining of 'synthetic biology' and then how this will have implications for other sectors, including governance, legislation, Intellectual Property etc - this will also implications for how this group defines this term and treats it in the assessment <ul style="list-style-type: none"> ○ How will the group treat definitions associated with synthetic biology and genome editing and the implications for how the task for treats the substantives topics – to be decided
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Afternoon tea break

<p>Session 2 1530 - 1730</p>	<p>The taskforce and technical working group members introduced themselves to the group</p> <ul style="list-style-type: none"> ● Question related to the selection/composition of the task force <ul style="list-style-type: none"> ○ Description from the Chair related to pursuing diversity of participants from geographical perspectives, gender, substantive expertise, different perspectives, disciplinary diversity ● Discussion of the agenda for the next few days, ● Issues raised by the group specific to their experiences and the topic of synthetic biology: <ul style="list-style-type: none"> ○ 1. Different country processes and legislation related to freedom of information for people employed in particular organisations was raised. This issue related back to how the group would
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	<p>seek to communicate, what level of transparency it would embrace and how this would impact communications, information and risk management processes for the duration of the assessment</p> <ul style="list-style-type: none"> ■ As an example, US based people employed in public universities and government agencies ■ This includes email traffic ■ Similar in the UK ■ IUCN Council member/s to seek guidance or investigate these issues and position on them <ul style="list-style-type: none"> ○ 2. Public commentary on individuals/process/organisations related to the process - people have had experiences with this and concerns about how this might be arise through this process <ul style="list-style-type: none"> ● A question was posed around the process for resolving points on which the group might not agree ● Overview of current expected timeline for the next couple of years (subject to change) - see slides in Dropbox
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Friday, 13th April

<p>Session 3 0830 - 1030</p>	<p>Kent opened meeting & welcomed new members not present yesterday</p> <ul style="list-style-type: none"> ● Summary & recap of yesterday's session ● Group discussion related to foundational concepts, namely: <ul style="list-style-type: none"> ○ 1. Ideas, frameworks and examples related to evidence, science-policy interface, complex problems was presented by Melanie Ryan ○ 2. How will we think about evidence and what does the evidence base look like? <ul style="list-style-type: none"> ■ Reference to the multiple evidence base slide (Tengo et al. 2014) - who in the panel can speak to what discipline and contribute to what piece of the assessment ■ How does the assessment frame the 'evidence' around what future scenarios and technological developments? ■ What is 'evidence' versus a prediction when discusses future possibilities? Can models generate evidence? ■ Evidence base: providing a status of the knowledge base now versus what would be? Where are the boundaries for the evidence base? ■ How does the evidence base suit a flexible, robust, long-term policy framework and empower it to be adaptive to future scenarios ■ Time scales inform the 'uncertainty' related to the evidence ■ Different components of synthetic biology have different levels of certainty ■ The current technology predictions around 10 years are more comfortable than 20 years ■ Different approaches <ul style="list-style-type: none"> ● Future scenarios that are possible? What are
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	<ul style="list-style-type: none"> possible technical advances? <ul style="list-style-type: none"> ● Back-casting - where do you want get and then how do you get there? ● This group is not tasked with making judgements about future possible states and whether these are good or bad ■ The general consensus in the group is that they will not just include 'peer reviewed, academic literature' - but how will this be defined? <ul style="list-style-type: none"> ● How do we 'investigate' what different pieces of evidence tell us? Letters, informal communications, grey literature ● What is the context that this evidence speaks to? ● How to think about the evidence related to the use of non-regulated synbio that will operate outside of formal policy and governance ● How does the assessment treat the discussion of 'bias' ● Question about 'can we update the assessment'? - the answer is 'this could be a possible option' <ul style="list-style-type: none"> ○ Developing different criteria for the assessment and policy phases and keeping the processes ○ WHO analysis includes the principles of the assessment on how the future/technology is treated ○ Timeline for assessment - will need to 'finalised' by end of 2018 calendar year, including incorporating comments/responding to comments <p>CITES (the Convention on International Trade in Endangered Species of Wild Fauna and Flora) & Convention on Biological Diversity (CBD) conversation</p> <ul style="list-style-type: none"> ● Overview of relationships between these different international protocols/conventions ● There will be information provided for background on these two particular bodies and their processes related to synthetic biology ● Worth understanding the connections between this process and the CBD
<p>Morning tea break</p>	
<p>1100 - 1230 Session 4</p>	<ul style="list-style-type: none"> ● Discussion on defining synthetic biology <ul style="list-style-type: none"> ○ The definition will be interpreted through various political lenses of people from different parts of society, different sectors, different cultures, ○ Drawing on existing definitions but making it suitable for the purposes for the assessment but also understandable by others, ○ Possible that the definition will be informed by process of undertaking the assessment,

	<ul style="list-style-type: none"> <ul style="list-style-type: none"> ■ Start with parameters of a 'range' for the pieces of the definition - or a range of definitions ■ Use this workshop as a baseline for a definition and then deliberately see how you evolve this over time ■ Example definition/framing in the AI100 report ○ It was noted how the IUCN mandate refers to the needs/use of a definition of synthetic biology ○ The process is not to generate some kind of 'standard' or 'internationally agreed definition', but more for an internal definition that can bound the work of the group and the scope of the work/data/what is in and what is out ○ Does the definition need to include what is excluded from the definition of synthetic biology? ● Discussion on values & mode of operating for the group <ul style="list-style-type: none"> ○ How does the ethics, values and behaviours suggestions fit with both the technical working group (assessment) and the task force (policy formulation) ● Discussion around idea to include a process that looks like an open/more open 'call for evidence', - in the end it was decided not to do this. <ul style="list-style-type: none"> ○ Discussion around what would be in scope in terms of 'evidence', what scenarios will relate to biodiversity conservation - for example teleconnection of 'economic displacement' (eg. production of a certain crop in a factor through synthetic biology rather than using land for agriculture) ○ National academy of science US' call for evidence process ○ Call for evidence for gene editing has been done before ○ Look at what other calls for evidence have been done and draw on them as well as filling gaps in other places where they have not been done ○ The consultation process may also reveal 'gaps' in the assessment scope and evidence base that would need to be updated and addressed ○ How does bias of interest groups become represented in the call for groups? ○ Who would that call go to? (target IUCN constituents?) ○ Setting up the call as a interaction and process and managing expectations? ● Beginning the exercise of drafting the table of contents for the assessment <ul style="list-style-type: none"> ○ Discussion and framing of the Nagoya Protocol ○ What will the scope of the governance questions and assessment of law ○ When topics come up, first undertake a scan on how others are treating them or what other work is ongoing assessing issues ○ How does the scope include or represent what is 'actually happening' in the field ○ How will gene drives be treated in the TOC (independent or collapsed within the overall assessment) ○ The most critical thing is that the assessment demonstrates
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	that it has fulfilled all the criteria/needs of the mandate
Lunch break	
Session 5 1330 - 1600	<p>(Joined by several people on the tele conference in the afternoon)</p> <ul style="list-style-type: none"> ● Focused discussion (and presentation) around gene drives - presentation online from Kevin Esvelt (slides in Dropbox) <ul style="list-style-type: none"> ○ There are many kinds of gene drives ○ Public perception focuses on self-propagating typology ○ Discussion around whether models can be or how they can be treated in policy ○ Treatment of what is currently possible now versus what is thought to be theoretically possible (how does the assessment think about this as in or out of scope?) ○ What would case studies look like <ul style="list-style-type: none"> ■ Example of work in New Zealand with Maori people ○ What are useful time horizons for policy given rapid evolution of technology? <ul style="list-style-type: none"> ■ 10 year revision timeline BUT with the preference that all research is done transparently and in the open ○ Further discussion on what is modification of species, how are other reviews treating this ○ How will the assessment treat the analysis in relation to the definition of biological diversity in the CBD <ul style="list-style-type: none"> ■ Genes ■ Species ■ Ecosystems
Afternoon session in the David Attenborough Building for open discussion with attendees	



Afternoon session at the DAB



End of Day 2:

Suggestions of models to look at to inform structure of assessment, treatment of evidence, context framing

- [AI100 report](#)
- IPBES evidence framework
- Multiple evidence base [framework](#)

Recommendations to the group/actions to be undertaken

1. Literature or sources to include not just peer reviewed, academic literature.
2. Report can include a section on the treatment of evidence and how the assessment is dealing with this and defining it.
3. Definition of evidence to be formulated that includes what data (and what is relevant data for each disciplinary perspective), what sources, temporal bounds or validity of data or relationship of time-knowledge base-uncertainty.
4. That the group does not need to seek consensus about each point of evidence - that there is a 'multiple' evidence base this is being made visible.
5. Small group to draft first cut of definition of 'synthetic biology'.

Key definitions required

1. Synthetic biology (led by Drew Endy)
2. Evidence (ending up in its own Assessment chapter)

Saturday, 14th April

Session 6 0830 - 1030	<ul style="list-style-type: none"> ● Dropbox has been updated after last two days with a range of literature for members to read and also add to <ul style="list-style-type: none"> ○ Short overview on the two cases in the slides (IAASTD &
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	<p>UKEA) and some of the findings that came out of the review process in terms of conducting the writing and deciding on the content and framing</p> <ul style="list-style-type: none"> ● Check-in on who the main audiences for the assessment are <ul style="list-style-type: none"> ○ 1. IUCN council as the first group of people who need to accept the assessment and make a policy recommendation to the IUCN constituency ○ 2. The IUCN commissions ○ 3. The broad/all IUCN constituency ● Discussion around authorship and attribution for all writers – Decision: make chapters in Technical part of Assessment be authored by all who contributed. Overall document to include Redford and Brooks and potentially others. <ul style="list-style-type: none"> ○ Proposal #1 <ul style="list-style-type: none"> ■ Proposed group as a list of editors (like an edited book) ■ Sub-chapters could be then written by individual editors ■ Doesn't seem to fit with how people thought that the structure intended ■ Preference is for the whole group to have ownership of the whole assessment and not just contributing ○ Proposal #2 <ul style="list-style-type: none"> ■ A high-level summary document that is co-authored by all and a joint statement ■ Below this there are then technical chapters ■ Example of IPBES process (Pollination review) - Overarching document, summary for policy makers, technical chapters ■ Need to address confidence level of evidence and extent of evidence base ■ Makes a distinction between those who are chairing the process and then those are contributing to the unique technical expertise ○ Proposal #3 <ul style="list-style-type: none"> ■ Just listed as IUCN 2019 and then all contributors listed ○ Anyone with concerns around the authorship, please contact the chair offline and share their thoughts and comments ● Group process for thinking through the structure of the assessment <ul style="list-style-type: none"> ○ Strong preference for use of case studies to illustrate implications for particular conservation topics and economic, social and environmental issues ○ Consideration of synbio applications that are both direct and indirect ○ Intersection between synbio and conservation and use these as discussion points ○ Identification of spaces for collaboration via the linkages between sectors (technology-conservation) depending on case studies ○ Idea to structure the assessment around key questions, for example: <ul style="list-style-type: none"> ■ How can it benefit conservation?
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- How can it harm conservation?
- How might these two communities interact?
- What is already going on in synthetic biology related to conservation?
- What is going on in synthetic biology community in general?
- Group brainstorm on the main questions that could be part of the assessment



Lunch break

**Session
1330 - 1730**

- Reconvening after lunch and group presentations back on their discussions regarding the question groups:
 - No direct mention of gene drives in the questions?
 - These could be fully covered under the overarching question and do not need a separate section
- Presentation of a suggested structure for the outputs from the task force/technical sub-group
 - Set of technical chapters/contributions (more technical)
 - An interface/narrative section that pulls up the conclusions, main messages, key points (Science-policy interface description/discussion)
 - Overarching section of conclusions and recommendations (more policy focused)
- Question raised around how the discussion on the treatment of evidence would be integrated/presented? (for later discussion)
- Authorship
 - Proposal that other co-authors can be added to the technical chapters if there are people who are willing to write
 - Decisions on co-authors for technical chapters should be approved by and go through Kent based on recommendations from the technical members and taskforce
 - Would want to make sure that this didn't end up with a biased authorship
 - Would need to explain transparently (for example, on the website) we need to say why they were added and how they were chosen
 - The chair will have the final approval and has noted all of the concerns around bias, transparency, balance, diversity and how the process has already been structured
- Request for the group to send through 'model' for the assessment, including
 - Citation format
 - Literature scope/criteria
 - IUCN already has a set of publishing guidelines that could contribute significantly to this process question (can draw on this)
- The methods for review and approval are approval,
 - Does it need group consensus?
 - Does it go out to third party review?
- How does this report relate to other relevant bodies?
- Any thoughts about length of the report in general
 - IPBES one was 400+ (90pp. A chapter)
 - This is extensive
 - Length will be reliant (affect case study length)
 - Recommendation that each chapter be 20 pages double-

	<p>spaced text and additional 20 pages of references, tables, etc.</p> <ul style="list-style-type: none"> ● Values/ethics and values of the group (this was a continuation of the issues raised on day 1 and the drafted text on day 2) <ul style="list-style-type: none"> ○ Updated prior text - now two paragraphs - one for assessment and one for policy component ○ Text will be revised and then people can have until Monday to comment or make other suggestions ○ There was a subset of the group still in favour of a targeted call for evidence but overall, the timelines will not permit this additional process ● Consultation and training process – in the end this is not possible due to limitations of timing and IUCN process <ul style="list-style-type: none"> ○ Getting nominees from the regions ○ Potentially bringing them to North Carolina to undertake training on how to implement the consultation process ○ So that people from the regions implement that consultation process ○ This is a new proposition for the IUCN process and is not tested with IUCN yet ○ IUCN are happy for this group to consider but realising that the regional conservation fora are usually quite busy and full schedules, in the past there has been less useful input then would be desirable ○ The proposed process is desirable and might enhance the inputs from the regions, however, a task force person must attend each regional forum ● Schedule discussion – final schedule will be completed soon <ul style="list-style-type: none"> ○ Sao Paulo, Brazil 16 - 20 July - primarily technical subgroup - to write the first draft ○ July - Sept Review process ○ Mid Sept - Mid Nov - meeting of technical group to deal with review comments ○ Dec 2018 - task force sign off ○ Feb - June 2019 regional conservation fora (communication of draft) ○ Timeline will be inserted into dropbox for the group to look over
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Sunday, 15th April

<p>Session 10</p>	<ul style="list-style-type: none"> ● Group revision of structure that was drafted yesterday for the assessment (see Dropbox folder) <ul style="list-style-type: none"> ○ Headings/chapter names are place holders right now and not the final title ○ Discussion around structuring around indirect and direct benefit as opposed to beneficial and detrimental impacts <ul style="list-style-type: none"> ■ In this way the group feels that the case studies will present a balanced picture or both cases for each example rather than polarising the report ○ Discussion around the chapter that references the ‘unknown unknowables’
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- Flagging that future developments are very uncertain
- This might draw too much attention (comment)
- Will determine the scope for this in Brazil
- Each group should note things that come up as they go along that could be considered for this chapter and summary
- A folder/file will be set up for people to harvest these into
 - Gene drives will be integrated throughout the assessment with a definition up front as well
 - Chapter leads will have responsibility for overall writing, direction and then responding to comments on each chapter
- 30th June is the date for complete rough draft of chapters to be sent to Jonathan and Kent
- IUCN will have a style guide for citations etc.

Members started to depart and the group was given the freedom to start working with their co-chapter leads on how to approach the assessment tasks.

Meeting closed 1100



IUCN Task Force and Technical Subgroup on Synthetic Biology, Jesus College, Cambridge, April 12-15, 2018

Relevant links & folders for information

- Final agenda for the week
- Dropbox (including slides, literature, draft structure of assessment, photos)
- IUCN [website](#)
- Bios of members