Assessing Ecosystem Services in Canadian Biosphere Reserves

Liette Vasseur
UNESCO Chair in Community Sustainability
Brock University

Assessing Ecosystem Services in UNESCO Biosphere Reserves

Vasseur, L. and R. Siron. 2019

Assessing ecosystem services

- Provisioning, Supporting and Regulating, and Cultural

Explain first
what they are

The framework

United Nations
Educational, Scientific and
Cultural Organization

Man and
the Biosphere
Programme

A New Roadmap for the
Man and the Biosphere (MAB) Programme
and its World Network of Biosphere Reserves

MAB Strategy (2015-2025)
Lima Action Plan (2016-2025)
Lima Declaration

UNESCO
Education
Natural Sciences
Social and Human Sciences
Culture
Communication and Information

United Nations
Educational, Scientific and
Cultural Organization

Canadian
Commission
for UNESCO

Brock
University

The framework

The Man and the Biosphere (MAB) programme is part of UNESCO's Natural Sciences sector

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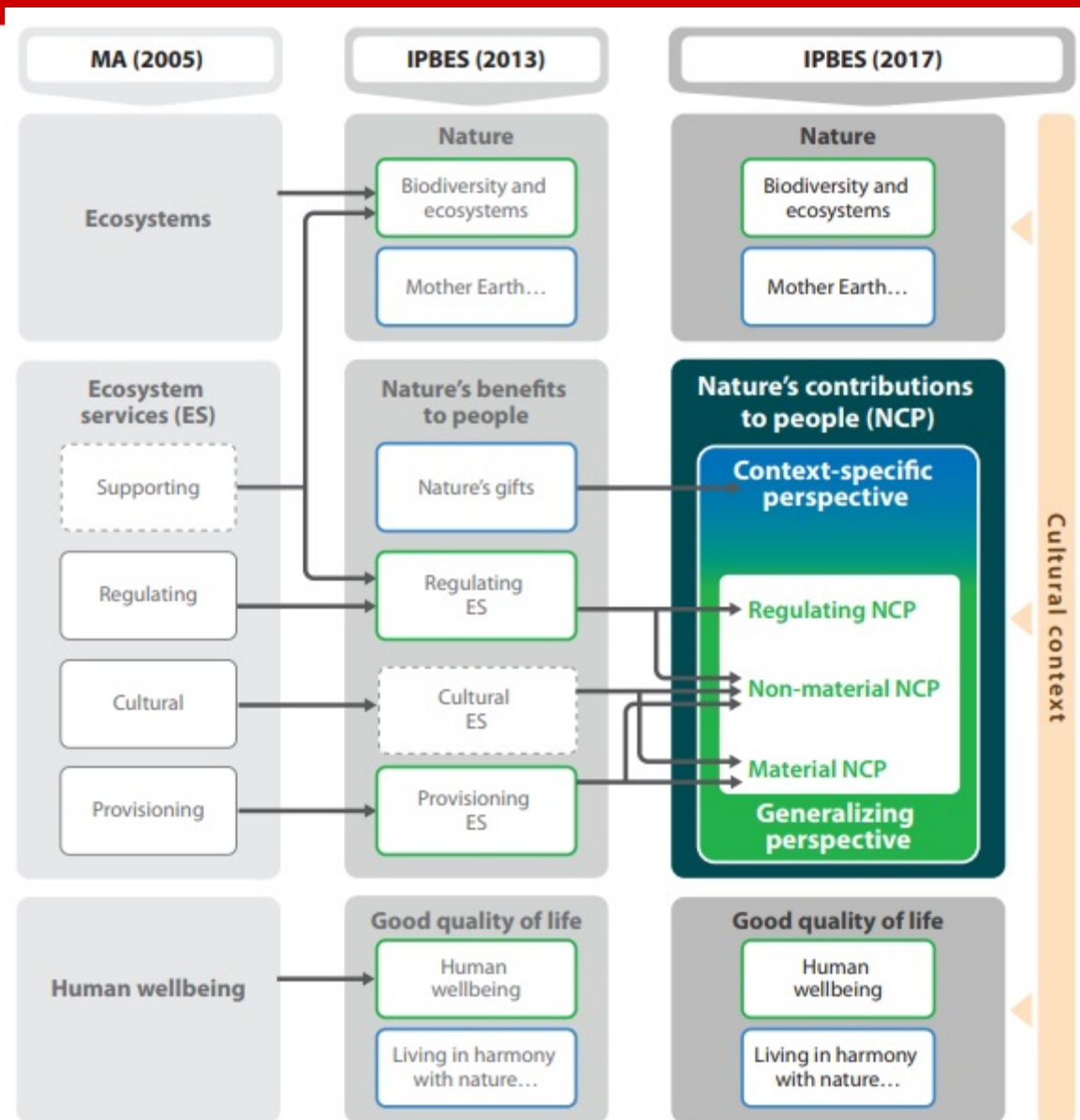It is implemented by the World Network of Biosphere Reserves

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The current action plan for the MAB programme is the Lima Action Plan

Periodic reviews

- And the challenge of assessing... or
- Valuing nature's contributions to people (Diaz et al. 2018)
- ...a tool to connect people and nature
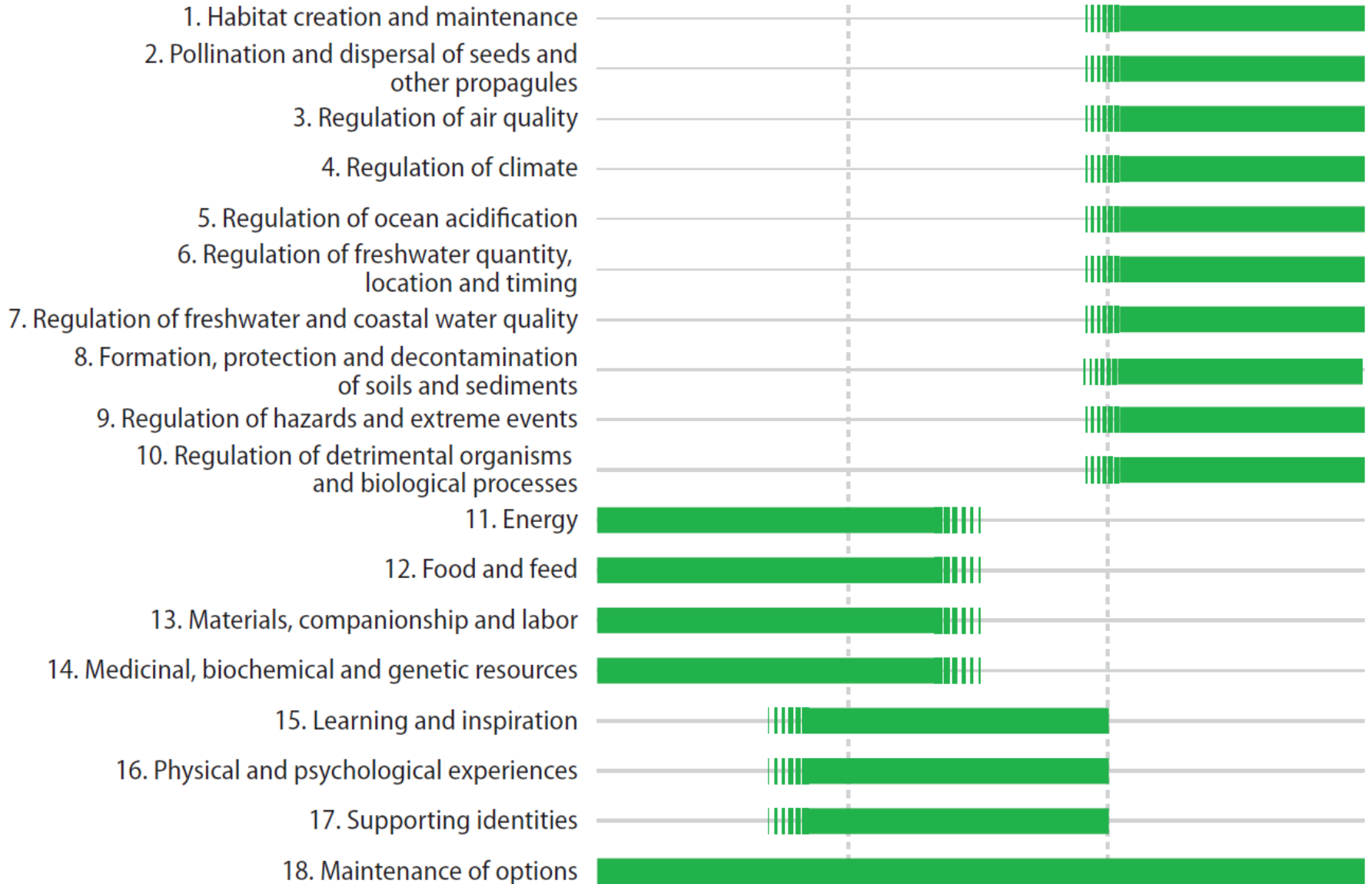
Nature's contributions to people

(Diaz et al. 2018)

	Material NCP	Non-material NCP	Regulating NCP
1. Habitat creation and maintenance			████████
2. Pollination and dispersal of seeds and other propagules			████████
3. Regulation of air quality			████████
4. Regulation of climate			████████
5. Regulation of ocean acidification			████████
6. Regulation of freshwater quantity, location and timing			████████
7. Regulation of freshwater and coastal water quality			████████
8. Formation, protection and decontamination of soils and sediments			████████
9. Regulation of hazards and extreme events			████████
10. Regulation of detrimental organisms and biological processes			████████
11. Energy	████████		
12. Food and feed	████████		
13. Materials, companionship and labor	████████		
14. Medicinal, biochemical and genetic resources	████████		
15. Learning and inspiration		████████	
16. Physical and psychological experiences		████████	
17. Supporting identities		████████	
18. Maintenance of options	████████	████████	████████

A tool for decision making

- To improve the connection between man and nature, which:

- Aims to raise awareness of the importance of ecosystems; promote the protection of the natural environment for well-being of communities

- Offers a positive alternative to alarmist speeches about environmental degradation

- Proposes a positive vision of the territory and the future.

And reaching SDGs

Goals directly related to ecosystem governance and management
Critical to achieve all SDGs

Goal 6 – Water availability and sustainable management

Goal 13 – Tackling climate change

Goal 14 – Conservation and sustainable use of oceans, seas and marine resources

Goal 15 – Protection and restoration of terrestrial ecosystems

Goal 1 – End poverty

Goal 2 – Food security

Goal 3 – Ensure healthy lives and promote wellbeing

Goal 4 – Inclusive and equitable quality education

Goal 5 – Gender Equity

Goal 7 – Reliable sustainable energy for all

Goal 8 – Inclusive and sustainable economic growth

Goal 9 – Build resilient infrastructure, promote sustainable industrialization

Goal 10 – Reduce inequalities within and among countries

Goal 11 – Inclusive and sustainable cities and human settlements

Goal 12 – Sustainable consumption

Goal 16 – Promote peaceful and inclusive societies, justice and institutions for all

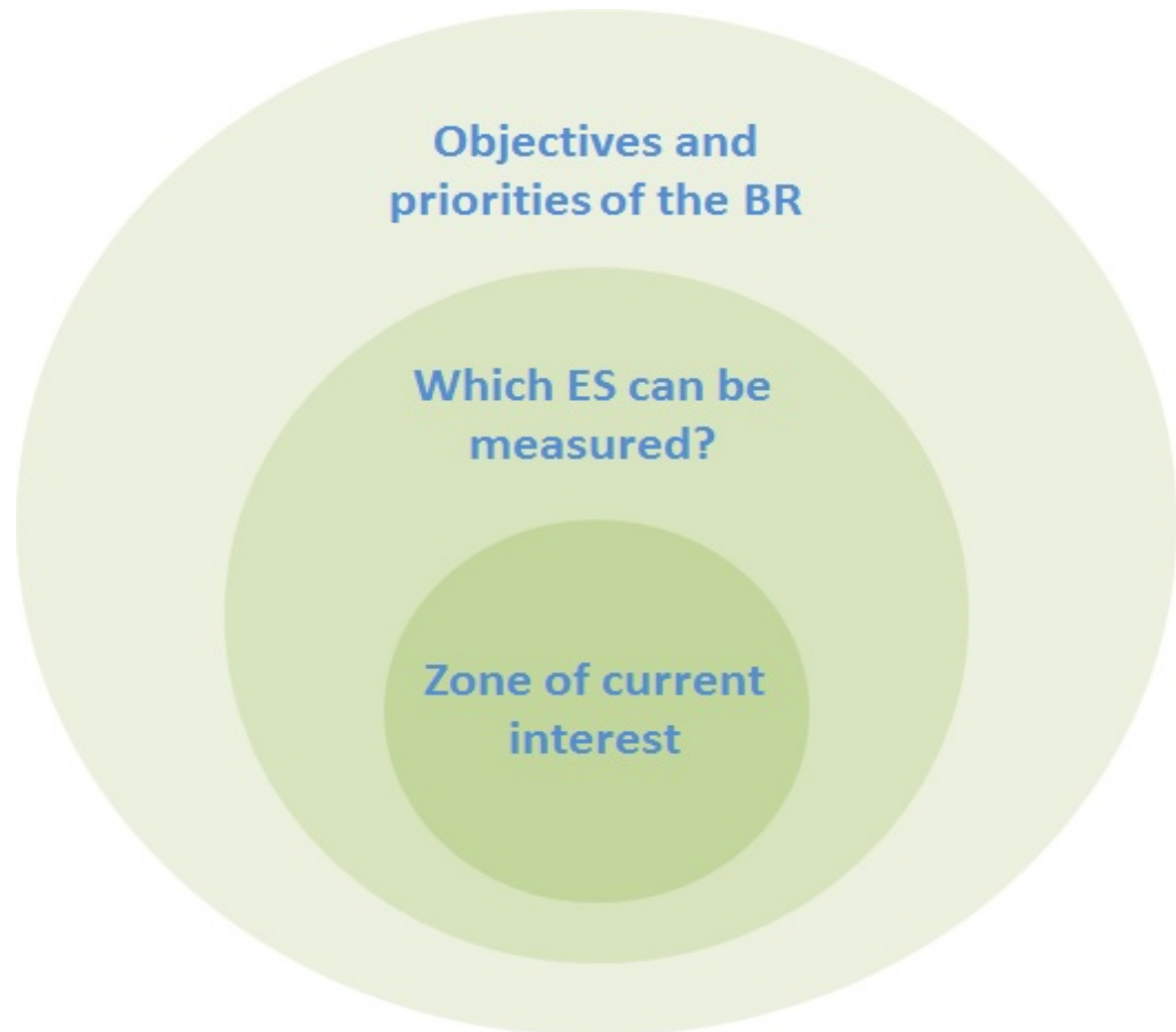Goal 17 – Revitalize global partnership for sustainable development

Achievement of all SDGs

United Nations Educational, Scientific and Cultural Organization · Canadian Commission for UNESCO

Vasseur et al. 2017

The approach

- Improve landscape understanding of biodiversity and ecological services

- Highlight the importance of protecting and connecting natural environments

- Develop a shared and more sustainable vision of the BR territory

- Optimize the benefits of scientific research through consultation and participation of BR stakeholders.

Starting point

- ES should be assessed through the lens of the priorities and objectives of the BR, with a realistic view of which ES can be measured, and in which zone

Objectives and priorities of the BR

Which ES can be measured?

Zone of current interest

A proposed step-by-step approach

1. Define your BR's objectives and priorities

2. Selection of key ES within your BR

3. Working together to assess ES

4. Monitor ES over time

1. Define your BR's objectives and priorities

- Specific to each BR with some placing more importance on conservation measures and others on sustainable development.

- E.g.: priority is habitat creation and maintenance (SDG15), and this is done through various activities such as land acquisition for conservation and promoting nature literacy (SDG4) by engaging with citizen scientists.

2. Select key ES within your BR

- Regulating NCP: Habitat creation and maintenance

- Regulating NCP: Regulation of climate

- Material NCP: Medicinal, biochemical and genetic resources

- Non-material NCP: Learning and inspiration

NCP categories and names and contributions to SDGs	Main ecosystems producing NCP	Ecosystem Services examples	Examples of related indicators	Biosphere Reserve case studies	
				Clayoquot Sound	*Mont-St-Hilaire*
Regulating NCP					
1. Habitat creation and maintenance	All types of ecosystems	Essential habitat for species' life cycle (e.g., nursery, spawning ground areas)	Identification of habitat types Habitat quality assessment	Suitable habitat for salmon	Ha of forests and natural habitat Ha of protected areas Habitat quality (monitoring of species by citizen science) example) of forest patches in the agricultural milieu.

2. Pollination and seed dispersal and propagules	Forests, wetlands, agroecosystems	Essential process to plants reproduction and agriculture (crops)	Number and diversity of pollinators Plant populations pollinated		Number and diversity of pollinators in apple orchards Flower visits by pollinators Seed set in plants that require pollination

3. Work together to assess ES

- Keep the process simple
- First step: acquire data and information from the different partners about ES/NCP and make a summary of it to know what the initial situation is
- Invite as many people as possible

Assessing together

- Convening people together to assess ecosystem services can be done in formal and informal settings

- Visualization using maps or drawings

- Measuring the status of ES can be quantitative or as simple as using emoticons or a number scale

OR

1 – 2 – 3 – 4 – 5

4. Monitor ES over time

- Assess ES on a regular basis, providing data to inform local decision making and to describe in the BR's periodic review

- Important to keep the process be transparent, inclusive, iterative and collaborative

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Ideas to retain

- Simple guide
- Greater collaboration with the various partners
- May lead to new actions
- Help manage sustainably some of the activities
- Importance of using local resources and people

Huge thanks

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- Contributions: Eleanor Haine Bennett (Canadian Commission for UNESCO), Elena Bennett (McGill University), Shailyn Drukis (Youth Advisory Group), Andreas Link (Ontario Ministry of Natural Resources & Forestry), Laura Loucks (Clayoquot Biosphere Trust), Lenore Swystun (Prairie Wild Consulting), and Geneviève Poirier-Ghys (Mont Saint-Hilaire Biosphere Reserve)