



## ABOUT ROBIN

ROBIN has assessed the role of biodiversity in terrestrial ecosystems in South and Mesoamerica in mitigating climate change. It has evaluated socio-ecological consequences of changes in biodiversity and ecosystem services under climate change.



# MEASURES OF ECOSYSTEM INTEGRITY PROVIDE A HEALTH CHECK ON HUMAN LAND USE

## Context and trends

National and international agencies need to develop adequate instruments to monitor the state of the environment and assess the effects of public policies. This is because the high costs arising from deteriorating natural resources and increasing environmental pollution are impacting on gross domestic product and peoples' quality of life.

Ecosystems such as forests provide goods and services that are the basis for economic development and social welfare, and are involved in processes of global interest such as climate change. Human activities modify the operating conditions of ecosystems.

The capacity for self-organization of a forest depends upon the level of integrity that it possesses. Thus, a key requirement in the path toward sustainability is to measure the integrity of ecosystems and understand the limits of disturbance they can tolerate that safeguard their ability to provide our desired ecosystem services.

## Policy relevance

In the framework of international agreements to mitigate climate change, countries need to develop better instruments to monitor the state of the environment and better estimate the impacts of human actions.

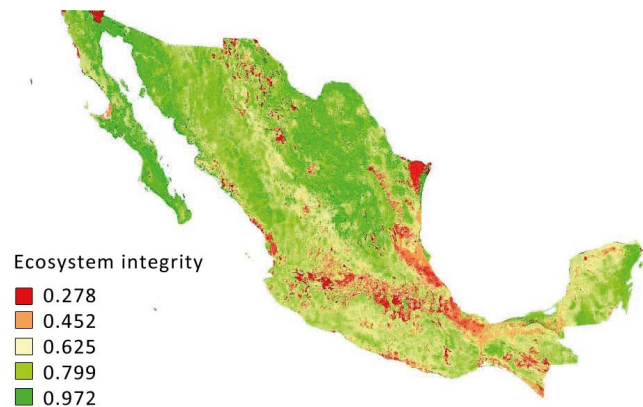
The measurement of ecosystem integrity is a desirable option because it enables an integrated assessment of the impact of public policies on biodiversity and the capacity of ecosystems to provide ecosystem services.

From a biological point of view, a significant loss of biodiversity can be interpreted as an impairment to nature and a loss of natural capital. In our framework, it is equivalent to degradation of ecosystem integrity, which implies a direct alteration to the provisioning of ecosystem goods and services.



## Opportunities

- Ecosystem integrity evaluation meets the policy requirement for biodiversity assessment and the implementation of international policies on biodiversity and mitigation of climate change.
- Ecosystem integrity helps to guide public policy, providing a platform for evaluating anthropogenic impacts on natural capital, and is sensitive to unwanted effects that are likely to be overlooked at first sight.
- It represents a reference point for different environments and geographical scenarios, with different levels of resolution.
- Ecosystem integrity can address the systemic complexity of multifunctional landscapes.
- The index of ecosystem integrity assesses both negative and positive effects on natural capital.
- It allows for driving particular actions under different environmental scenarios to achieve specific targets.
- The index of ecosystem integrity can integrate conventional biodiversity indicators.
- Ecosystem integrity is an integrated measure, unlike conventional approaches that address one variable at a time. It provides a more holistic way of assessing the state of nature while dealing with environmental problems.
- Ecosystem integrity provides a simple yet powerful tool for cross-sectoral policy assessment and innovation.

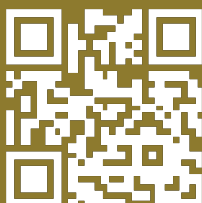


**Levels of ecosystem integrity in Mexico between 2004 and 2007**

## ROBIN outputs

- Equihua, M., García Alaniz, N., Pérez-Maqueo, O., Benítez, G., Kolb, M., Schmidt, M., Equihua, J., Maeda, P. 2014. Integridad ecológica como indicador de la calidad ambiental. In: C. Gonzalez, A. Vallarino, A. Low-Pfeng and J. C. Pérez (Eds) Bioindicadores: guardianes de nuestro futuro ecológico. Ecosur, INECC, México
- Garcia Alaniz, N., Schmidt, M., Equihua, M., Maeda, P., Equihua, J., Pérez-Maqueo, O., Flores, J., Villela, S., Serrano, E., Rodriguez, R., Leyva, J. Maximizing synergies between science and policy to cope with ecosystem degradation and biodiversity change: A national system for ecosystem monitoring. Environmental Science & Policy (submitted)

For more on Ecosystem Integrity, see Factsheets 7 and 10.



**More information**  
[www.robinproject.info](http://www.robinproject.info)

Contact: Miguel Equihua  
INECOL, Mexico  
[equihuam@gmail.com](mailto:equihuam@gmail.com)

This project has received funding from the European Union's Seventh Framework Programme for research, technological development and demonstration under grant agreement no. 283093  
ROBINinfo is protected by Creative Commons



WU Netherlands / Alterra Netherlands / NERC UK /  
PIK Germany / UNI-KLU Austria / UPM Spain /  
CONABIO Mexico / EMBRAPA Brazil / GFC Guyana /  
IBIF Bolivia / INECOL Mexico / UNAM Mexico