Developing ecosystem-based indicators for Managing Impacts to Biodiversity and Ecosystem Services at a Peruvian Amazon Gas Field

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Fauna & Flora International

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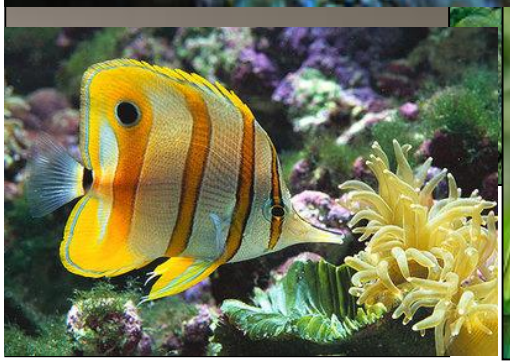
Ecosystems and ecosystem services



Structure

Composition

Function

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- The case study landscape is dynamic and rich in biodiversity.
- Communities depend on the products and services of the ecosystem for their livelihoods. Both biodiversity and these ‘ecosystem services’ are maintained by complex environmental and ecological interactions.
- Taking an ecosystem based approach to define and manage biodiversity and ecosystem services (BES) is considered best practice for minimising negative environmental impacts caused by the development of extractive projects

Company impacts and dependencies on ES

Dependencies
Timber and aggregates
Soil stability from vegetation
Waste services
Fresh water

Standard Risk-based Approach

Impacts
Fragmentation
Loss of soil stability
Noise and light pollution
Vibrations
Loss of access for local people
Potential pollution
Introduction of alien species
Increased hunting pressures
Opening up of forest to indirect/ induced impacts

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Science and sustainability

- The Project development is supported by
  - detailed biodiversity and environmental baselines,
  - a participatory community relations programme and
  - a comprehensive Environmental Impact Assessment and Environmental Management Plan.
- These represent a scientific and integrated approach to understanding and reducing impacts to biodiversity and the environment in general.
- Indicators for monitoring BES and ecological function have been identified for the company to better manage risks and mitigate impacts to BES in this dynamic landscape.
- This enables a clear and integrated approach to managing biodiversity at an ecosystem scale with better understanding of the consequences and implications for communities and operational risk management

BES and EF Indicators

		Access to cultural practices	Changes to effort required for access		Priority for inclusion in the EMP and Community Relations Programs.
			Continuity of cultural values		
Ecosystem function	Natural habitat quality	Habitat strata	Changes to habitat strata composition and diversity	Habitat strata, such as levels of forest species assemblages and habitat resources can be assessed through a combination of land cover mapping and field assessments to determine the forest habitat strata and quality for different habitat types and areas.	Captured in Biodiversity Monitoring Plan of the EMP. Additional mapping assessment is not a priority for inclusion.
		Habitat connectivity (at habitat strata and habitat patch scale)	Reduction in habitat connectivity in the forest canopy	Habitat connectivity can be spatially analysed from land cover and vegetation layers. This can be simple metrics of habitat functions, or can be more complex including corridor pathways and fragmentation metrics at the different spatial scales of habitat patches and habitat strata.	Captured in Biodiversity Monitoring Plan Requires additional information and analysis as a priority.
			Reduction in habitat connectivity across the forest landscape		
			Increase in fragmentation of habitat patches		
		Core/edge area	Decrease in ratio between core and edge habitat at habitat patch level and across ecosystem	The functional role of habitat within a connected patch or patches can be determined through the spatial assessment of habitat layers to determine the function classes such as core and edge habitat.	
		Native species composition	Change in native species assemblages	Native species diversity and native species composition are complementary metrics that provide a holistic view on biodiversity. These values are being captured in the EMP, however the assessment of alpha, beta and gamma diversity need to be assessed to understand the impacts of operational and mitigation activities.	Captured in the Biodiversity Monitoring Plan of the EMP.
			Change in native species richness		
	Native species diversity	Food webs	Changes in species and roles within and across trophic levels	The assessment of food webs and the linkages between producer and consumer species may have a correlation and impact on their abundance. This should be monitored to prevent the indirect and cumulative impacts to related species, such as grassland species and herbivore species or primary consumers (such as peccary) and secondary consumers (such as jaguar). All this information is captured in the species baselines, yet it will just require the ecological links to be explicitly made.	Not currently captured in the Biodiversity Monitoring Plan of the EM and should be included as a priority.
	Productivity	Net primary productivity	Reduction in net primary productivity	Variable represents the productivity of vegetation and habitats and can be derived from a combination of field sampling and land cover, or obtained from remotely sensed and analysed sources.	Not captured in Biodiversity Monitoring Plan of the EMP. Additional vegetation biomass assessment is not a priority for inclusion.
		Biomass	Change in above ground (vegetation) and below ground (root and soil biota) biomass		
	Decomposition	Presence of decomposer species	Change in species assemblages and presence	These presence and values are captured in the field sampling strategy, which will then be assessed for species assemblages	Captured in the Biodiversity Monitoring Plan of the EMP.

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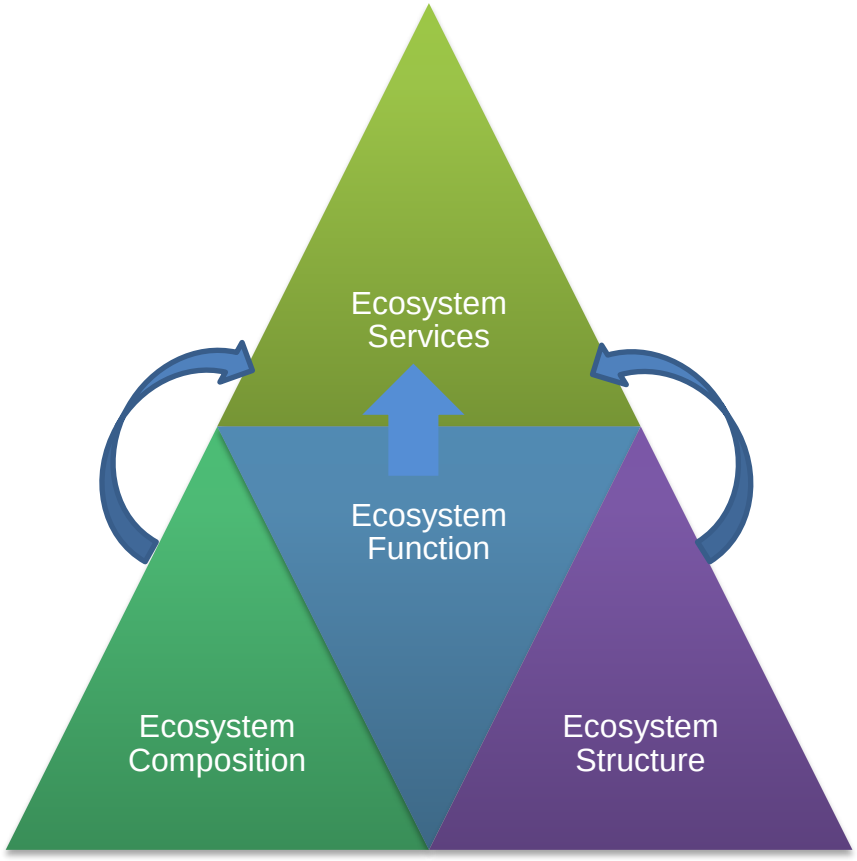

Healthy, functioning ecosystem

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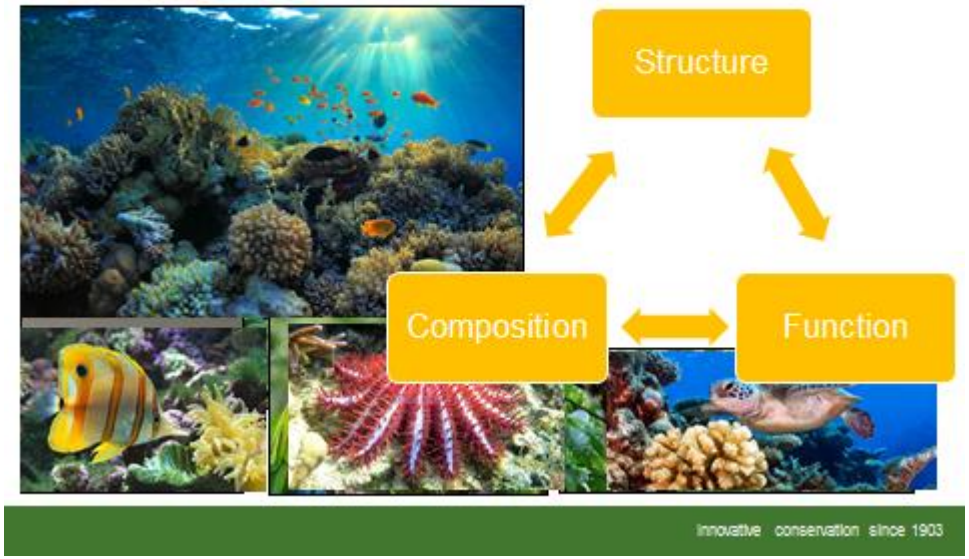
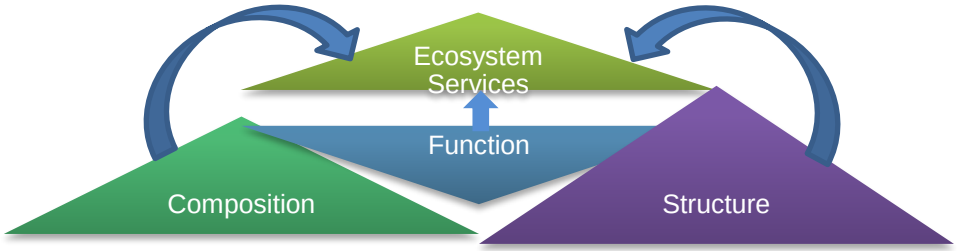
Ecosystems and ecosystem services





Collapsing ecosystem

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FIEL

To view activities specified within the EMI

1 INPUT USER INFORMATION:

First & last name: Gabriel Garcia Marc

Company: Fauna Flora

Date: 25/11/2016

2 SELECT FILTER CRITERIA:

Responsible for enacting activity: All / Team manager / Site manager / Environment team

Responsible for undertaking activity: All / Team manager / Site manager / Environment team

notes | Instructions | TOOL | LOG

Ecological Management Plan for the development

Draft final report produced by Fauna & Flora International
28 October, 2016 (draft 2)

Deliverable 3a

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impact to BES
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Conclusion

- This project is an example of best practice
- This is definitely how the future needs to be addressing BES impacts and dependencies
- …and the monitoring and management of BES

- The strong consideration of ecosystem services and ecosystem function as well as the practical focus on tools for implementation differentiates the approach taken by FFI and our partner