CONVENTION ON WETLANDS
CONVENTION SUR LES ZONES HUMIDES
CONVENCIÓN SOBRE LOS HUMEDALES
(Ramsar, Iran, 1971)

Rapid assessment of wetland ecosystem services
(Resolution XIII.17)

Introduction

1. To achieve wise use, and for wetlands to contribute fully to sustainable development, policy-makers and practitioners (such as site managers) need to recognize the important functions and the multiple values[1] of wetlands, and reflect them in their decisions, policies and actions[2]. Without wetlands, the water cycle, carbon cycle and nutrient cycle would be significantly altered, mostly detrimentally. Yet, often due to a failure to recognize these multiple, interconnected values, policies and decisions do not sufficiently take into account these interconnections and interdependencies[3].

2. The Ramsar Convention has recognized the need to integrate the important functions and multiple values of wetlands into decision-making and has produced policy briefs[1], technical reports[4] and wider guidance to address the importance of this issue. However, a review published in 2016 concluded that there is an urgent need to ensure that the requirement to assess a broad range of ecosystem services is achieved in accordance with the reporting obligations under the Ramsar Convention[5]. This improved awareness of and reporting on a comprehensive range of ecosystem functions and ecosystem services is required both for Ramsar Sites and for other wetlands.

3. However, there are inherent limitations, including resourcing, access, cooperation and capacity, which have acted as barriers to more extensive attempts to recognize the functions and

[1] The integral values and benefits, both material or non-material for people and nature, in a non-consumptive approach include spiritual, existential and future-oriented values. Ramsar 4th Strategic Plan 2016-2024.
[2] Kumar, R., McInnes, R.J., Everard, M., Gardner, R.C., Kulindwa, K.A.A., Wittmer, H. and Infante Mata, D. (2017). *Integrating multiple wetland values into decision-making.* Ramsar Policy Brief No. 2. Gland, Switzerland: Ramsar Convention Secretariat.
[3] Russi D., ten Brink P., Farmer A., Badura T., Coates D., Förster J., Kumar R. and Davidson N. (2013). *The Economics of Ecosystems and Biodiversity for Water and Wetlands*. IEEP, London and Brussels; Ramsar Secretariat, Gland.
[4] De Groot, R.S., Stuip, M.A.M., Finlayson, C.M. and Davidson, N. (2006). *Valuing wetlands: guidance for valuing the benefits derived from wetland ecosystem services*, Ramsar Technical Report No. 3/CBD Technical Series No. 27. Ramsar Convention Secretariat, Gland, Switzerland & Secretariat of the Convention on Biological Diversity, Montreal, Canada. ISBN 2-940073-31-7.
[5] McInnes, R.J., Simpson, M., Lopez, B., Hawkins, R. and Shore, R. (2016). Wetland ecosystem services and the Ramsar Convention: An assessment of needs. *Wetlands*. 37(1), 1-12.

multiple benefits that wetlands provide. Therefore, the development of procedures for assessing wetland ecosystem functions and ecosystem services should be targeted and pragmatic in their approach and involve participation of local communities and indigenous knowledge, as appropriate.

4. Many wetland managers have limited time and resources. Therefore, the development of approaches to assessing wetland ecosystem services needs to satisfy the definition of "rapid" insofar that no more than two people should spend more than half a day in the field and another half day on preparation and analysis[6].

Rapid assessment of wetland ecosystem services

5. The development of the *Rapid assessment of wetland ecosystem services* (RAWES) approach, as an example of approaches that can be developed, has considered the requirements of the Ramsar Convention, and particularly the need for qualitative assessments that are not resource intensive and that can be applied within the context of Ramsar Convention-related reporting. However, consideration has also been given to developing an approach that would have wider utility as part of a broader suite of assessment approaches. Consequently, the objective of the RAWES approach is to facilitate an assessment of the plurality of benefits provided by a wetland, which can be considered genuinely rapid, involving limited resources.

6. Based on an understanding of what is required by a specific, but global, wetland audience, the approach has, at its core, the realization that in many situations the availability of time, money and detailed information will be limited and such barriers need to be overcome if the full range of functions and values is to be recognized. Furthermore, the development of the RAWES approach recognizes that less time-intensive methods can be applied at a range of scales, from the site to the landscape or catchment. Too often, assessments of ecosystem services are limited in their scope and fail to identify the multiplicity of benefits provided by wetlands, focusing on a few easy-to-recognize benefits, and consequently inherently assigning a default value of zero to other services, thereby excluding them from decision-making fora[7].

7. The RAWES approach builds on similar techniques applied elsewhere[8]. A checklist of services grouped into functional categories, which were originally defined in the Millennium Ecosystem Assessment, namely provisioning, regulating, cultural and supporting services, acts as an initial structured framework. Although in more recent analytical frameworks the category of supporting services is no longer included, it is retained in RAWES as it recognizes the functioning and resilience of productive ecosystems rather than valuation. Supporting services therefore constitute important considerations in terms of the resilience and capacity of ecosystems to provide wider benefits, and are therefore important considerations in management decision-making.

8. The list of ecosystem services in RAWES can be modified and adapted, as appropriate, by each Contracting Party and to the local context through dialogue and consultation with local

[6] Fennessy, M.S., Jacobs, A.D. and Kentula, M.E. (2007). An evaluation of rapid methods for assessing the ecological condition of wetlands. *Wetlands* 27 (3), 543–560.

[7] McInnes, R.J. and Everard, M. (2017). Rapid Assessment of Wetland Ecosystem Services (RAWES): An example from Colombo, Sri Lanka. *Ecosystem Services*. 25, 89-105. http://dx.doi.org/10.1016/j.ecoser.2017.03.024.

[8] Defra. (2007). *An introductory guide to valuing ecosystem services* [online]. Department for Environment Food and Rural Affairs (Defra), pp. 68. Available from: www.defra.gov.uk.

stakeholders who are familiar with the wetland. Furthermore, when an assessment is being made to inform or update the Ramsar Information Sheet (RIS) it is important to ensure that the description of the ecosystem services provides information on the services described under Resolution XI.8 as well as on any other services that the site is providing. Delimitation of the exact area to be assessed is defined objectively by the assessor depending on the purpose or scope of the assessment. The RAWES approach is flexible, allowing assessments to be made on different habitat units within a larger wetland complex or on an entire wetland site. The onus is on the assessor to define the "wetland" and record the rationale behind the boundaries set and limits used. Since wetland ecosystems can be dynamic or can be subject to change or degradation, an important issue to be addressed is the definition of the condition at the time of the assessment. In some cases, the "natural" condition will vary over time, and it will be necessary to ensure this temporal pattern is considered in the assessment of ecosystem services. For instance, the assessment could return different outcomes if it is conducted during a drought or when the area is subjected to flooding, both of which may represent natural phenomena within the broader tolerances of the system. In other circumstances, a wetland may be subject to ongoing degradation, such as through pollution of surface water or infilling. Therefore, it cannot be safely assumed that the current situation reflects a "natural" condition, and that service delivery is not already influenced by the prevailing conditions. The key issues are to ensure that a comprehensive range of ecosystem services is assessed, that the evidence used to achieve the assessment outcome is transparent and clear, and that the prevailing temporal context is recorded.

Applying the RAWES approach

9. RAWES is designed as a simple and rapid site assessment system that may obtain input from existing studies but does not rely on detailed, quantitative assessments. As such, it is a genuinely rapid approach that may typically take less than two hours per site with trained assessors working in pairs for cross-referencing. Significantly, the RAWES approach is also systemic, addressing all ecosystem services as a connected set rather than selecting only the most readily evaluated or exploited services, and thereby overlooking other services. The RAWES field assessment sheet is included as Appendix 1, with an accompanying explanatory table to guide assessor thinking included as Appendix 2. The field assessment sheet presents a list of ecosystem services which may be interpreted according to the application. For instance, to inform or update the RIS it is important to ensure that the description of the ecosystem services provides information on the services described under Resolution XI.8 as well as on any other services that the site is providing. The method has been used widely in Asia, Australia, Europe and Africa, with a database of sites and informing a number of scientific publications and site reports about the range and likely importance of ecosystem services provided by wetland sites.

10. RAWES can be used across a range of scales from whole wetlands to localized zones of large and complex wetlands; it is in principle also relevant to other habitat types. The RAWES field assessment sheet is a simple table with cells into which assessors record the importance of each ecosystem service produced at the wetland site, with space for free text descriptions of key features supporting that assessment. Assessors are encouraged to interact with stakeholders so that assessments are informed by local perspectives and indigenous knowledge, ensuring that all services are recognized. Early interaction is recommended in order to refine the list of services to be assessed and subsequently to assess the significance of each service.

11. The RAWES field assessment sheet (Appendix 1) comprises the following sections:
    - Wetland name with GPS coordinates

- Assessment date
- Assessor name(s)
- Table cells to record: (1) the importance of the service assessed using the following relative scale (adapted from Defra 2007, see Table 1 below) where, in order to improve objectivity, the level of significance is decided prior to conducting the assessment but is based on a predetermined number or range of beneficiaries (or of those negatively affected); (2) the benefit; and (3) the scale at which the benefit is realized (local, regional or global), the definition of which needs to be decided prior to conducting an assessment.

Table 1. Defra (2007) scale of likely significance of ecosystem services

Score	*Assessment of ecosystem service*
++	Significant positive contribution
+	Positive contribution
0	Negligible contribution
-	Negative contribution
--	Significant negative contribution
?	Gaps in evidence

12. The assessment sheet provides an initial list of ecosystem services under the four main categories of provisioning, regulating, cultural and supporting services. This initial list should act as a starting point for considering the multiple benefits provided by a wetland. Assessors are encouraged to consider whether this list needs to be expanded or made more site- or context-specific in order to address specific services. For instance, "food" is provided as a catch-all term but could be subdivided into more detail such as "harvested crops", "fish and shellfish" or "collection of fruit and berries" if significant differences are experienced in the wetland being assessed.

Table 2. Linking services to beneficiaries at different scales

- Local benefits: Those experienced by individuals, households or communities living and working in the immediate vicinity of the wetland.
- Regional benefits: Those delivered to individuals, households or communities living and working in the wider catchment of the wetland.
- Global benefits: Those that extend beyond national boundaries.

13. Scores are thus allocated semi-quantitatively, using assessor knowledge and other local and technical input. A more quantitative approach would be more resource-intensive, far from rapid, and would risk overlooking services not initially considered but potentially locally important, as well as skewing assessment towards the more readily exploited, marketable and therefore quantified services to the detriment of other important maintaining processes and wider benefits. The RAWES rapid method thus serves an operational need to incorporate ecosystem service assessment routinely into Ramsar Site assessments and plans.

14. Training in rapid assessment methods has been highlighted as being essential if subjectivity is to be reduced and repeatability of results is to be enhanced[9]. Typically, a one-day training course mixing classroom and field sessions on the RAWES method suffices, with trained assessors undertaking independent surveys following the course for verification by the trainers and also to start building a local site database.

15. The outputs from applying the RAWES approach can be used to inform subsequent quantitative assessments of targeted ecosystem services, by effectively providing an initial screening, or in more general local or national policy frameworks and decision-making process such as environmental impact assessments. It is recognized that rapid assessment does not replace a comprehensive field assessment.

16. The process for applying the RAWES approach comprises three principle activities: preparation, field assessment and information management (Table 3).

Table 3. Process for applying the RAWES approach

Stage	**Information**
Preparation – key considerations	
Who will undertake the assessment?	• The assessment should be conducted by a minimum of two individuals working together. • The pair should be knowledgeable about the site and the type of wetland being assessed.
Where will the assessment be undertaken?	• The assessment should cover a defined area. • The level of significance of services with regard to number and range of beneficiaries and negatively affected groups must be determined prior to conducting the assessment. • The scales at which benefits are described (from local to global) must be determined prior to conducting an assessment. • Ideally the area should be of a relatively homogeneous habitat type but if it covers several different habitats this needs to be noted. • Health and safety considerations must be taken into account.
What is needed to undertake the assessment?	• Ensure that plenty of assessment sheets are available. • Use a clipboard and take several pens/pencils. • Take a camera and global positioning (GPS) equipment to record images and their location. • Take appropriate personal protective equipment.
Field assessment – key considerations	

[9] Herlihy, A.T., Sifneos, J., Bason, C., Jacobs, A., Kentula, M.E., Fennessy, M.S. (2009). An approach for evaluating the repeatability of rapid wetland assessment methods: the effects of training and experience. *Environ. Manage*. 44 (2), 369–377.

Stage	Information
Observations	• Use field indicators to help recognize ecosystem services (see Appendix 2). • Understand the wider context of the site and the surrounding social and natural environment. • Think about the scale at which the service may be providing benefits. • Record actual, not potential, services. If there is no evidence do not record the service but make a note for future reference.
Indigenous and local knowledge	• Use local knowledge of how the site functions and how local communities interact with it.
Discussions	• Ensure that the assessors discuss issues between themselves and make reasoned conclusions.
Stakeholder engagement	• Wherever possible engage with local stakeholders to understand better the relationship between people and the wetland. • Think about a hierarchy of stakeholders, from local (living/working immediately around the wetland), regional (those downstream and upstream of the wetland or in the wider region) and global (stakeholders and beneficiaries beyond national boundaries).
Recording information	• Ensure that as much information as possible is recorded so that others can understand the rationale for any assessments made.
Information management – key considerations	
Data checking	• Before leaving the field, check that all the required information has been recorded.
Data entry	• Ensure all data are entered onto Excel spreadsheets. • Use one spreadsheet for each assessment location. • Work in pairs to enter data. • If necessary check latitude/longitude on Google Earth.
Summarizing for future use	• Make a summary of any key issues recorded such as constraints, uncertainties, impacts and threats.

Appendix 1. Rapid assessment of wetland ecosystem services: Field assessment sheet

Note: The list of ecosystem services provided under the rapid assessment of wetland ecosystem services (RAWES) approach differs partly from that used in the RIS and therefore should be considered as an example which should be adapted as appropriate to satisfy the relevant situation. For instance, where the RAWES approach is being used to inform the RIS then it is appropriate to make the modification required to ensure that all relevant ecosystem services are assessed.

RAPID ASSESSMENT OF WETLAND ECOSYSTEM SERVICES
FIELD ASSESSMENT SHEET

Key	**How important?**
++	Significant positive benefit
+	Positive benefit
0	Negligible benefit
-	N benefit
- -	Significant negative benefit
?	Gaps in evidence

Wetland name:

GPS coordinates:

Date :

Assessors :

				Scale of benefit		
		How important?	**Describe benefit**	**Local**	**Regional**	**Global**
Provisioning services	Fresh water					
	Food					
	Fuel					
	Fibre					
	Genetic resources					
	Natural medicines or pharmaceuticals					
	Ornamental resources					
	Clay, mineral, aggregate harvesting					
	Energy harvesting from natural air and water flows					
Regulatory services	Air quality regulation					
	Local climate regulation					
	Global climate regulation					
	Water regulation					
	Flood hazard regulation					
	Storm hazard regulation					
	Pest regulation					
	Disease regulation – human					
	Disease regulation – livestock					
	Erosion regulation					
	Water purification					
	Pollination					

	Salinity regulation					
	Fire regulation					
	Noise and visual buffering					
Cultural services	Cultural heritage					
	Recreation and tourism					
	Aesthetic value					
	Spiritual and religious value					
	Inspiration value					
	Social relation					
	Educational and research					
Supporting services	Soil formation					
	Primary production					
	Nutrient cycling					
	Water recycling					
	Provision of habitat					
Notes :						

Appendix 2. The example list of wetland ecosystem services considered by the RAWES approach and examples of the indicator questions considered

	Ecosystem service	Example	Examples of questions assessors can ask about this service
Provisioning services	Provision of fresh water	Water used for domestic drinking supply, for irrigation, for livestock etc.	• Does the wetland provide a source of fresh water? • Does the wetland store fresh water for human use? • Is the wetland a net source of pollution, degrading fresh water provision?
	Provision of food	Crops, fruit, fish etc.	• What is grown in the wetland, either formally or from informal harvesting? • Are animals harvested from the wetland? • Are livestock using the wetland?
	Provision of fibre	Timber for building, wool for clothing etc.	• Are any natural materials such as wood, fibre, straw, animal fibre (wool/hide/sinew/antler/other) taken from the wetland?
	Provision of fuel	Fuelwood, peat etc.	• Is any material taken from the wetland and used as fuel for domestic or other uses?
	Provision of genetic resources	Rare breeds used for crop/stock breeding etc.	• Are there any native or rare strains of plants and animals, wild and domesticated, which could contribute genetic diversity for human uses (for instance for drug manufacture, improving resilience of domestic animals and plants, horticultural trade etc.)?
	Provision of natural medicines and pharmaceuticals	Plants used as traditional medicines etc.	• Are there any plants, animals or their parts derived from the wetland which are harvested and used for their medicinal properties?
	Provision of ornamental resources	Collection of shells, flowers etc.	• Are there any plants, animals or their parts derived from the wetland that are collected and used/sold for their ornamental properties?
	Clay, mineral, aggregate harvesting	Sand and gravel extracted for building use, clay extracted for brick-making etc.	• What substances are extracted or dug up from the wetland for construction or other human uses?
	Energy harvesting from natural air and water flows	Water wheels driven by flowing water, windmills driven by the wind etc.	• Are any technologies (water wheels, wind turbines etc.) used to capture natural flows of energy through or across the wetland?
Regulating services	Air quality regulation	Removal of airborne particles from car exhausts, industrial chimneys, dust from agricultural land etc.	• Is there a source of airborne pollutants? • Does the wetland habitat structure help to settle out airborne pollutants? • Does the state of the wetland make it a source of air pollutants (microbial, particulate or chemical)?
	Local climate regulation	Regulation of the local microclimate, through shading, reducing air temperature etc.	• Does the wetland habitat structure provide shade for humans? • Does the wetland have areas of standing water with or without vegetation that will be generating evapotranspiration and consequently reducing air temperatures?
	Global climate regulation	Regulation of the global climate through control of greenhouse gas emissions, the sequestration of carbon, etc.	• Does the wetland store and/or sequester carbon? • Does this balance with generation of methane and other greenhouse gases?
	Water regulation	Regulation of flows of surface water during high and low flows, regulation of recharge of groundwater, etc.	• Do the topography, permeability and roughness of the wetland enable it to store water during high rainfall/discharge and to slowly release it back to surface waters or to groundwater? • Does the wetland regulate discharges during dry periods to buffer low flows during dry weather?
	Flood hazard regulation	Regulation and storage of flood water, regulation of intense rainfall events etc.	• Does the wetland regulate, store and retain floodwaters? • Does the wetland store rainfall and surface water that might contribute to flooding and damage to property or ecosystems downstream?

	Ecosystem service	Example	Examples of questions assessors can ask about this service
	Storm hazard regulation	Regulation of tidal or storm surges, regulation of extreme winds, etc.	• Does the complexity of habitat, particularly trees, tall reeds and other vegetation and surface topography, absorb energy from extreme events such as storms and waves that might otherwise damage property or adjacent ecosystems?
	Pest regulation	Control of pest species such as mosquitoes, rats, flies, etc.	• Do natural predation and other ecological processes in the wetland regulate and control pest organisms? • Is the wetland a source of pests (for example rats thriving in dirty water systems)?
	Regulation of human diseases	Presence of species that control the species (vectors) that transmit human diseases such as malaria, West Nile fever, dengue fever, Zika virus, leptospirosis, schistosomiasis, etc.	• Do natural predation and other ecological processes in the wetland regulate organisms that may cause human diseases? • Are faecal deposits, bacteria or other potentially pathogenic microbes immobilized by processes in the wetland? • Is the condition of the wetland contributing to the negative spread of populations of disease vectors (such as mosquitoes)?
	Regulation of diseases affecting livestock	Presence of species that control the species (vectors) that transmit diseases to livestock such as leptospirosis, schistosomiasis, duck virus enteritis, highly pathogenic avian influenza, tick-borne diseases, etc.	• Do natural predation and other ecological processes in the wetland regulate organisms that may cause diseases in livestock? • Are faecal deposits, bacteria or other potentially pathogenic microbes immobilized by processes in the wetland? • Is the condition of the wetland countering the spread of populations of disease vectors (such as mosquitoes or snails)?
	Erosion regulation	Regulation of energy environment to reduce risk of erosion, presence of dense vegetation protecting soils, etc.	• Does the wetland vegetation provide protection from erosion for the soils? • Are there any signs of erosion, such as bare earth, in the wetland?
	Water purification	Cleaning of water, improvement of water quality, deposition of silts, trapping of contaminants and pollutants, etc.	• Do physico-chemical (sunlight exposure in shallow waters, detention of water in aerobic and anaerobic microhabitats) and biological processes in the wetland result in the breakdown of organic, microbial and other pollutants in the water passing though? • Are suspended solids deposited? • Is there a noticeable change in the quality, such as the turbidity, of water entering and leaving the wetland?
	Pollination	Pollination of plants and crops by pollinators such as bees, butterflies, wasps, etc.	• Do populations of pollinating organisms (butterflies, wasps, bees, bats etc.) in the wetland contribute to pollination within the wetland? • Do pollinators using the wetland also help to pollinate nearby crops, gardens, allotments, etc.?
	Salinity regulation	Freshwater in the wetland provides a barrier to saline waters.	• Does the hydrology of the wetland help prevent saline water contaminating freshwaters? • Does the presence of freshwater in the wetland prevent the salinization of soils? • In tidal wetlands are there man-made or man-altered barriers (levies, roads, railroads) that interrupt connectivity with tidal water?
	Fire regulation	Providing physical barriers to the spread of fire, maintaining wet conditions to prevent fires spreading, etc.	• Does the configuration of waterbodies (ditches, streams, etc.) help to prevent the spread of fires? • Is there water at or near the soil surface that restricts the spread of fire? • Are organic rich or peat soils drained and susceptible to fire and burning?

	Ecosystem service	Example	Examples of questions assessors can ask about this service
	Noise and visual buffering	Wetland trees or tall reeds absorbing and buffering the impact of noise.	• Is there a source (busy road, industry, construction etc.) and receptor (houses, wildlife, etc.) for noise pollution? • Does the wetland ecosystem structure, particularly tall trees and reeds, provide visual screening as well as suppress noise transmission?
Cultural services	Cultural heritage	Importance of the wetland for historical or archaeological value, as an example of traditional uses or management practices, as a cultural landscape, etc.	• Does the wetland system have cultural importance, either due to its natural character or traditional uses?
	Recreation and tourism	Importance of the wetland in providing a location for recreation such as fishing, watersports or swimming, or as a tourism destination, etc.	• Is the wetland used for organized or informal recreational purposes? • Is there infrastructure provided for access and recreation? • Are their wider tourism/ecotourism benefits flowing from these uses?
	Aesthetic value	The wetland is overlooked by properties, is part of a known area of natural beauty, is used as a subject by painters and artists, etc.	• Does the wetland provide aesthetic benefits through the desirability of siting houses or commercial development adjacent to it? • Does the presence of a wetland have a significant impact on property prices? • Is the wetland depicted in many works of art?
	Spiritual and religious value	The wetland plays a role in local religious festivals, the wetland is considered as a sacred site, the wetland forms part of a traditional belief system, etc.	• What spiritual or religious values do people derive from the wetland? • Does the wetland hold any important spiritual or cultural value to people? • Does the wetland play any part in traditional religious ceremonies? • Are there any traditional wetland management practices (such as the timing of planting and cropping of rice according to Buddhist or other traditions and teachings) associated with the wetland?
	Inspirational value	Presence of local myths or stories relating to the wetland, traditional oral or written histories about the wetland or wetland animals, creation of different art forms associated with the wetland, development of distinct architecture based on the wetland, etc.	• Are there any particular myths or other folklore associated with the wetland? • Do any wetland animals appear or are any featured in local stories and myths? • Does the wetland inspire people to create music or other forms of art? • Have particular ways of designing and building developed which reflect the wetland?
	Social relations	Presence of fishing, grazing or cropping communities, which have developed within and around the wetland.	• Have communities formed around the wetland and its uses, including for example fishing (subsistence, commercial and recreational), cropping or stock management, walking and jogging, birdwatching and photography, etc?
	Educational and research	Use of the wetland by local schoolchildren for education, site of long-term research and monitoring, site visited by organized educational study tours, etc.	• Is the wetland used for any educational purposes, organized or informal, ranging from school visits to university research and teaching? • Are there any public awareness or educational materials present?

	Ecosystem service	Example	Examples of questions assessors can ask about this service
Supporting services	Soil formation	Deposition of sediment, accumulation of organic matter, etc.	• Do accretion processes (both sedimentation of mineral material and the build up of organic material) on the wetland result in the formation of soils?
	Primary production	Presence of primary producers such as plants, algae, etc.	• Do photosynthetic processes on the wetland produce organic matter and store energy in biochemical form?
	Nutrient cycling	Source of nutrients present from inputs from agricultural land, internal cycling of plant material, inputs of nutrients from floodwaters, presence of fauna to recycling nutrients, etc.	• Do wetland processes biochemically transform nutrients (for example nitrification/denitrification)? • Are nutrients settled out in particulate forms, changing the characteristics of water passing through the system? • Are there abundant invertebrates and detritivores that are decomposing and cycling organic material?
	Water recycling	Presence of wetland vegetation and open water result in evapotranspiration and local recycling of water, relatively closed canopies and low exposure to winds retains water in local cycles, sandy or coarse substrates allow exchange with groundwaters, etc.	• Does the structure of the wetland retain water in tight cycles (for example recapture of vapour produced by evapotranspiration)? • Does the wetland enable exchanges with groundwater (either discharge or recharge)?
	Provision of habitat	Presence of locally important habitats and species, presence of species and habitats of conservation concern, etc.	• Does the wetland support a diversity of locally representative biodiversity (plants and animals)? • Does the wetland support species which humans consider of conservation concern or charismatic interest? • Are there invasive plants and animals that pose a threat to ecosystem services and/or functions?