



FORESTS FOR WATER AND WETLANDS

2 February **WORLD WETLANDS DAY**
RAMSAR CONVENTION ON WETLANDS



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**INTERNATIONAL YEAR
OF FORESTS • 2011**



WORLD WETLANDS DAY 2011

WETLANDS AND FORESTS

“ **NOTHING IS MORE BEAUTIFUL
THAN THE LOVELINESS OF THE
WOODS BEFORE SUNRISE.** ”

George Washington Carver

WHO IS THIS FOR?

Primarily we target WWD leaflets at our key WWD actors across the globe. This year's is intended to raise awareness about the 'big picture' on forests and wetlands to help develop national and local messages on our theme. But it's also for anyone with a serious interest in wetlands who might be able to make a difference in how we understand and manage our wetlands.

Our theme for WWD 2011 is Wetlands and Forests. It's a particularly appropriate theme this year since the United Nations has declared 2011 the International Year of Forests and so an ideal opportunity for the

Ramsar Convention to focus on a particular type of forest – those that are often or always wet, such as mangroves, flooded forests, peat swamp forests, etc. What better occasion for us to look at the importance of these wetlands to people, whether we live near them or not, because of the many benefits they bring? It's also a good opportunity to focus on the many threats they face.





FORESTED WETLANDS

Just what do we mean by forested wetlands? Some 'forests' are dry, terrestrial forests but some are always or often very wet. Ramsar has a detailed classification system for defining wetlands to support the designation of Ramsar Sites (Wetlands

While it would be hard to assess just how much forested wetland there is worldwide, we can say something about such wetlands that are Ramsar Sites: 825 of our 1,891 Ramsar Sites (as at July 2010), covering a total area of over 79 million

hectares, have at least some forested wetlands within their boundaries – this equals **53%** of the global Ramsar Site area.

All three types can be collectively called swamp forest, defined as any wetland with woody vegetation. Swamp forest trees can range in size from 1-2 metres to as much as 50m tall. Inland swamp forests protect catchments while coastal swamp forests protect coasts against storms and rising sea levels in some cases. **All** swamp forests provide fish and many other aquatic foods, both animal and plant, consumed by humans the world over; they provide diverse habitats for an impressive range of animal and plant species, thus contributing significantly to global biodiversity; and importantly, they provide livelihoods for local communities. Overall, the economic value of the services provided by swamp forests

WHAT'S A RAMSAR SITE?

All Ramsar member countries must designate at least one Wetland of International Importance – often called 'Ramsar Sites'.

of International Importance), and in this scheme, three broad types of forested wetland are recognized:

Intertidal forested wetlands:

including mangrove swamps, nipah swamps and tidal freshwater swamp forests;

Freshwater, tree-dominated wetlands:

including freshwater swamp forests, seasonally flooded forests, and wooded swamps; and

Forested peatlands:

including peat swamp forests.

WHAT ARE WETLANDS?

Permanent and temporary wet places such as lakes, rivers, ponds, marshes, swamps, peatlands, mangrove forests, salt pans, sandy beaches, coral reefs... and more.

far outweigh the often short-term value of drainage and conversion for other uses.

It is clear that forested wetlands are particularly important stores of carbon: their destruction would release vast amounts of carbon into the atmosphere **and** eliminate the opportunity for capture of carbon ('carbon sequestration') for the future, thus adding to our present climate change woes. **Figure 1** indicates just how much carbon storage capacity is lost when these wetland forest types (and other wetlands) are mismanaged and become degraded rather than functioning naturally.

What threatens these wetlands? The need for land for urban development, conversion for agriculture and aquaculture, oil extraction, excessive abstraction of water upstream, and so on; in essence, many of the same threats which face other types of wetlands too.



Forested peatlands:

Peatlands (whether forested or not) are particularly good carbon stores and cover vast areas of the world. Globally it is estimated that there are 400 million hectares of peatlands which occur in 173 countries¹. Although the most extensive forested peatlands occur in northern Europe, Russia, and Canada, significant areas of forested peatland also exist in southeast Asia, where the pressure for drainage and conversion to plantations is high. One recent estimate indicates that 13 million hectares of a total of 27 million have already been deforested in southeast Asia, mostly for oil palm and pulpwood plantations, for rice-growing, and for transmigration projects, and this has largely taken place in the last 30 years².

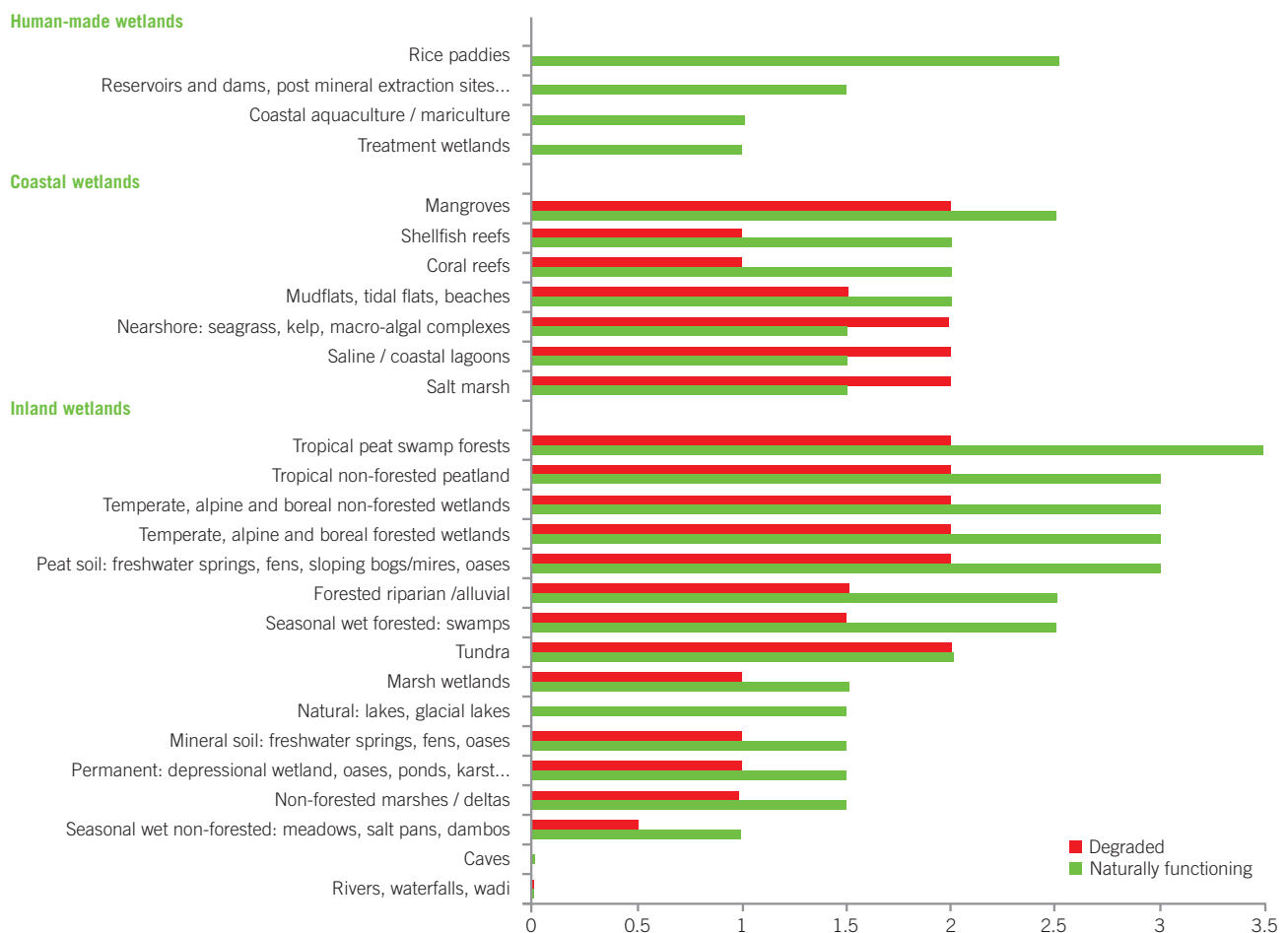
The 175,000-hectare Berbak Ramsar Site is the largest peatswamp forest in Sumatra

and a leading example of its kind in the region. Important for biodiversity – with flagship species like Sumatran tiger and Malay tapir – Berbak also plays a significant role in carbon storage and regulation of water flows. Even within this protected area, fires and illegal logging have taken their toll over time, but this is coming under better control. Work is ongoing through one of our partners, Wetlands International, to achieve a sustainable balance between the activities of the people living around the site and this fragile peatland ecosystem upon which they depend.

In contrast to this threatened site, the North-Livonian Transboundary Wetland Complex in northern Europe covers a total area of 17,575 hectares with both forested and non-forested peatlands. It includes

three contiguous Ramsar Sites, two in Estonia and one in Latvia, recognized by both countries as a transboundary site so that it can be managed and protected as an ecological and hydrological entity. With very sparse human populations around the sites, the low-intensity collection of berries, hunting and fishing have little impact on this wetland ecosystem. People much farther away from the site (and indeed the local people as well) benefit in that these healthy wetlands play a significant role in maintaining water quality in the area and in water storage. Another added bonus is the diversity of animal and plant species sustained by the peatlands, including some large mammals such as wolf, brown bear, and elk, and many bird species, including a number that are endangered.

Fig. 1 Comparative assessment of carbon storage capacity across wetland types



From Achieving Carbon Offsets through Mangroves and Other Wetlands available here: www.ramsar.org/pdf/DFN_report_Final.pdf

Freshwater, tree-dominated wetlands:

These are flooded forests that are either permanently or seasonally inundated with freshwater and they occur all over the world, from tropical to temperate to boreal regions. The Orinoco River runs for 2,600 kilometres through Brazil, Colombia and Venezuela – impressive enough in itself, but the river waters flow over the banks at certain times of the year and create one of the largest and most remarkable tracts of seasonally flooded forest in the world. This swamp forest (called várzea) sustains over 1,000 species of fish and a significant diversity of other animal and plant groups, including endangered species such as the Orinoco crocodile and Giant otter. The fertile soil makes it attractive to cattle ranchers and farmers, unfortunately, and the system endures the ever-present threats from dam and water diversion projects and siltation from deforestation and mining activities.

Another typical flooded forest is the Mamirauá Reserve for Sustainable Development, a 1,124,000-hectare Ramsar Site in Brazil fed by branches of the mighty Amazon. It is well-managed with a particular aim: to sustain local communities and their traditional management techniques as well as the incredible diversity of species.

A contrasting example in terms of multiple human use is the Okefenokee National Wildlife Refuge, a 162,635-hectare Ramsar Site in the USA. It's the second largest wetland complex in the USA and includes significant areas of permanently flooded cypress forests. The refuge welcomes around 400,000 visitors per year for hiking, canoeing, camping, and a variety of other sustainable activities.

The 400,000-hectare Ciénaga Grande de Santa Marta Ramsar Site in Colombia is the most important and largest mangrove area on the Caribbean coast of Colombia, vital for local fisheries and for biodiversity.

© Maria Rivera
http://www.coastalwiki.org/coastalwiki/Cienaga_Grande_de_Santa_Marta

Mangroves:

Mangroves are found in 123 countries in tropical and sub-tropical regions³. It's estimated by some experts that the world's area of mangrove forests has been reduced by 20% between 1980 and 2005⁴, with aquaculture (for fish, shrimps, crabs, etc), agriculture, and urban land uses implicated as the key culprits. The threat is felt even in many of the nearly 200 mangrove areas that have been designated as Ramsar Sites. To put these losses in perspective, it's estimated that mangroves generate from US\$ 2,000 -9,000 per hectare annually⁵ – significantly more than alternative uses like aquaculture or agriculture. With climate change the likely cause, at least in part, of the increased storms striking coastlines, mangroves are now more widely recognized by governments as an asset to be protected, not just for their many products and the millions of livelihoods they sustain, but also for the coastline protection they afford us. For example, Vietnam has invested US\$ 1 million in planting 12,000 hectares of mangroves – and saved annual expenditures of over US\$7 million⁴ on dyke maintenance to protect the coastline and secure livelihoods.

While the battle against mangrove conversion for coastal infrastructure and aquaculture continues, there is a little good news – while mangroves have been used and abused all over the tropics where they occur, the loss of mangroves has slowed significantly in the past few years, except in Asia. In addition, restoration efforts in recent years now cover some 400,000 hectares³ – a win for people and wildlife.

Cameroon's fifth Ramsar Site, Rio Del Rey, is an impressive 165,000 hectares, covering half of the country's mangrove area and contiguous with a large mangrove area just over the border in Nigeria. Rio Del Rey is not just home to a number of endemic and threatened species such as the Goliath frog, a giant indeed weighing in at 3 kilograms, the estuary has much more to offer – its role in providing a spawning ground for fishes, in protecting shorelines, in supplying fish and timber and other forest products to support the local economy, and its hydrological value in groundwater recharge and discharge, make it an ecosystem of enormous value for the whole country.





FORESTS - LOOKING AT THE BIG PICTURE

We have begun by looking at forested wetlands for this year's theme, a natural focus for Ramsar. But it's important to look at forests in a broader context as well and the following pages explain why.

First, a startling fact from the United Nations Forum on Forests Secretariat: "Every day, some 350 square kilometres of forest cover are lost worldwide. Conversion to agricultural land, unsustainable harvesting of timber, unsound land management practices, and creation of human settlements are the most common reasons."

Does this really matter? If our food comes from agricultural fields and we still have some forests to supply us with timber for building and paper, and enough space for recreation, then we don't really need vast areas of forests. Right? Well, not really...



Forests and people

We have just over 4 billion hectares of forests in our world. That's 31% of our total land area and about 0.6 hectares per person⁶. Sounds like a lot, but more than half of this forest area occurs in just five countries: Brazil, Canada, China, Russian Federation, and the USA. Globally the rate of loss of forests is daunting – 130,000 square kilometres of forest have been lost each year between 2000 and 2010⁴ (that's

an area the size of Greece or twice the size of Sri Lanka **each year**). While this might be an improvement on the 160,000 square kilometres lost per year in the 1990s, it's still a significant continuing loss. At the same time, large-scale tree planting efforts are helping to stem this tide. Afforestation and natural expansion of forests in some countries have

helped to reduce the overall net loss of global forest area; indeed, planted forests and trees account for an estimated 7% of total forest area, or 264 million hectares.

Why do we cut our forests?

Many reasons, but often to produce more agricultural land to support our ever-increasing global population, to meet our ever-increasing demand for timber, and of course, in many countries, to accommodate the ever-expanding urban areas. In addition, poor forest management affects how forests function, so we cannot just avoid deforestation – we need also to avoid forest degradation.

DRY FOREST – WET FOREST

Most of our forests are terrestrial but some are wetland forests as discussed above. Wet or dry, forests have an important role for people.

Why does it matter?

Here's what forests do for you.

Thirty percent of the world's forests are used to produce wood and non-wood products. This includes **timber** for construction and **fuelwood**, but also many non-wood products like food, medicine, and clean water. Forests can provide **honey**

Currently, 12% of the world's forests have been designated for protected status for the conservation of biological diversity. National parks, game reserves, wilderness areas and other legally established protected areas cover more than 10% of the total forest area in most countries and regions⁶.

and **fruits** as well as many **edible animals and non-woody plants**, and of course **fish** and other 'fishy' foods in flooded forests.

Then there's a whole range of other benefits for people. Like watershed and local flood control, protection from wind and soil erosion, air pollution filtering, avalanche protection in the mountains, storm protection in coastal areas, recreation opportunities. They are home

to an amazing diversity of species - close to 80% of the world's terrestrial biodiversity live in forest habitats. And of course forests have a vitally important role to play in mitigating and adapting to **climate change**. Top of the list of carbon stores are tropical and sub-tropical forests; next comes boreal

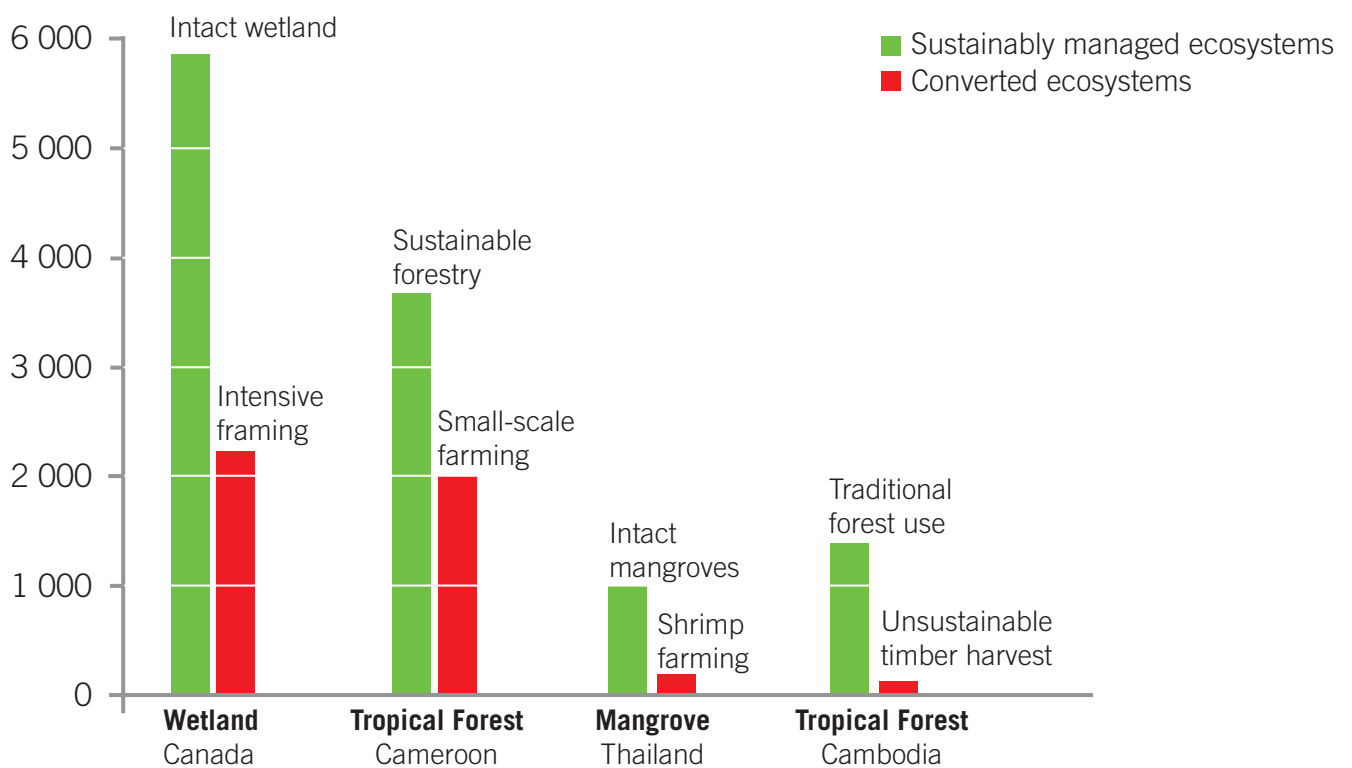
forests and then temperate forests. Overall, they store as much as 60% of the world's terrestrial carbon⁷.

It's estimated that forests contribute to the livelihoods of 1.6 billion people.

Over 2 billion people use biomass fuels, mainly firewood, to cook and to heat their homes.

Not all forests deliver all of these benefits to people – but all natural forests deliver a solid range of these benefits, which we call “ecosystem services”. So losing them by conversion to other uses (such as agricultural or urban land), or even degrading them by poor harvesting practices, means losing their services. By putting a dollar value on these services, **Figure 2** shows some examples of just what we are forfeiting in three forest types when we lose or abuse the natural forest.

Fig.2 - Net Present Value in dollars per hectare



Source : Millennium Ecosystem Assessment

The 12,800 hectare Losiny Ostrov National Park is located very close to the city of Moscow and includes coniferous and birch forests on peatland; this area is the source of the Yauza and Pekhora rivers.

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SPECIAL FOCUS: RIPARIAN FORESTS

Riparian forests are found along or around rivers, streams, and lakes. They have significant water-protection functions:

- stabilizing banks, thus minimizing erosion;
- trapping sediment before it enters the water body;
- reducing water velocity after storms;
- removing harmful nutrients (e.g., fertilizers and pesticides);
- increasing aquatic insect populations in the water bodies, resulting in higher water quality;
- providing shade, thus reducing water temperature;
- providing leaf and fruit debris which enters the aquatic food chain.



Riverine forests have significant water protection functions.
© Tobias Salathé



FORESTS, WETLANDS, WATER - A POWERFUL RELATIONSHIP

Today the world's leaders are focused on WATER. As global populations increase, as lifestyles become more water demanding, and as climate change impacts are increasingly apparent, the availability and scarcity of freshwater has become an urgent global

issue. Water supplies are dependent on healthy wetlands; healthy forests help to support and protect wetlands. The statistics speak for themselves – freshwater scarcity and limited access to water already affect 1-2 billion people and the situation

can only get worse unless we manage our environment better. A recent survey of Fortune 1000 companies showed that 40% felt that the impact of water shortage would have 'severe' or 'catastrophic' impacts on their business⁸.

Forests and water: what we should know

Forests USE water and they use more of it than shorter vegetation (like grasslands) because they have a higher evaporation rate. But forest soils ABSORB and RETAIN water easily. This may take surface runoff away from the water system but forests use this water to produce many useful products as noted above. Forests also reduce soil erosion so the QUALITY of the water that is stored is better: maintaining good forest cover in forested catchments is considered the most effective mechanism for reducing excessive sediment in downstream wetlands. It's also important to note that many other land uses (such as agriculture, urban, and industrial development) produce pollutants which are picked up in rainwater and end up in wetlands –

and thus in our drinking water unless costly purification treatment takes place. Forests, on the other hand, even those that are heavily managed, have low inputs of pollutants.

But it's not just about improving water quality. Terrestrial forests and forested wetlands have a crucial role in the global water cycle – the cycle of freshwater that keeps our world alive (**Fig. 3**). Forests have a significant impact on the levels of evaporation and transpiration of water into the atmosphere, which in turn affects rainfall. What matters is not just that forests play this critical role, but that other kinds of ground cover cannot produce the same effect. Thus well-drained agricultural fields neither

absorb nor retain the same amount of water as forests, and they provide nothing like the same rate of evaporation and transpiration of water to the atmosphere so their contribution to the water cycle is significantly less.

In summary, in a catchment forests play a dual role both as a vital part of the water cycle AND as a strong influence on how water is routed through the catchment and stored.

These roles explain why many countries are placing a high value on protecting their forests in catchments. The classic example of this 'value' is New York City, which found that it could avoid spending US\$ 4-6 billion on water treatment plants (plus annual maintenance costs) by investing just US\$ 1.0 billion in land purchase and management measures to conserve the catchment, including large forest areas⁹. On a smaller but no less important scale, the city of Basel in Switzerland 'treats' water from the Rhine by allowing it to run into small channels through a forest where it seeps into the soil and is purified: no other water treatment is necessary for the city's water supply. At the national level, use of untreated groundwater, mostly

GOOD TREES – BAD TREES

Black wattle, a native of Australia, has been introduced into many countries as a fast-growing source of timber. The downside is that it can become invasive, threatening native vegetation and – of considerable importance – increasing water loss. In South Africa this invasive frequently grows in dense stands replacing the natural vegetation and, depending on the circumstances, their removal can lead to significant, measurable increases in water availability – very important in water-short countries and now a recognized water management 'tool' in South Africa¹¹.

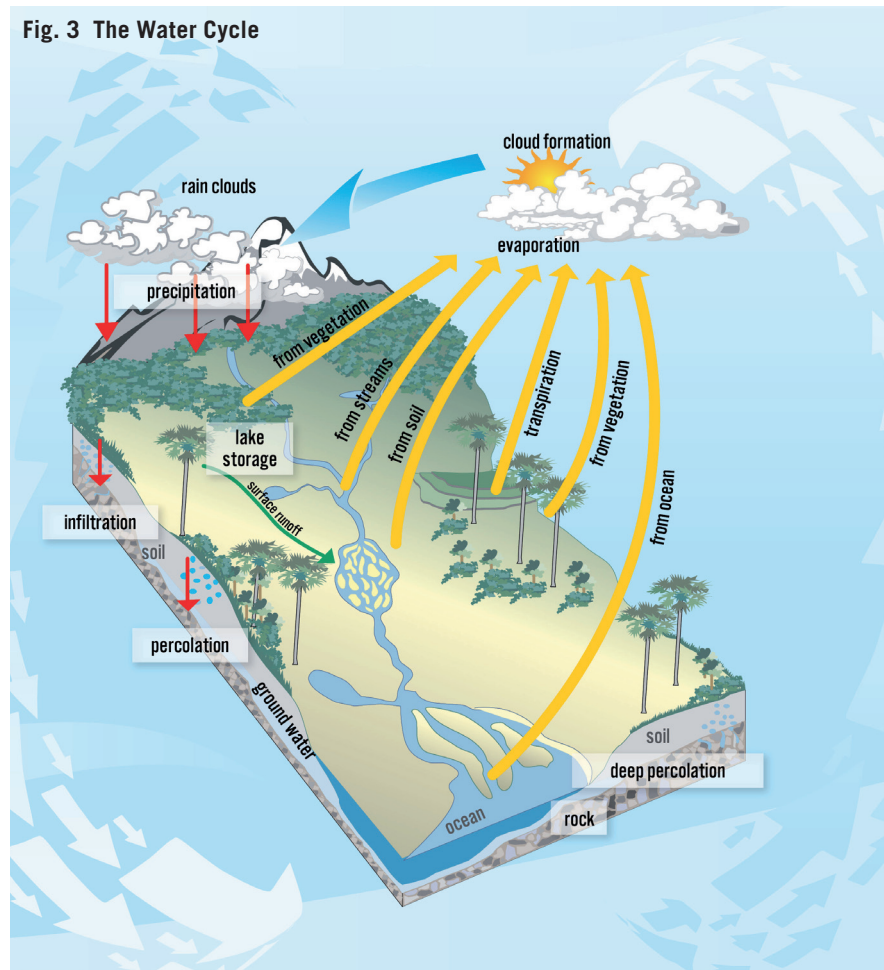
A CATCHMENT OR DRAINAGE BASIN OR WATERSHED:

an area of land where water from rain and melting snow or ice drains downhill into a body of water, such as a river, lake, reservoir, estuary, sea etc. The catchment includes both the streams and rivers that convey the water as well as the land surfaces from which water drains into those channels. Thus catchments act as a funnel channeling water into a waterway.

coming from forested watersheds, saves the Swiss population around US\$ 64 million per year¹⁰.

So, managing our forests helps us manage water for people, for agriculture, for industry – and for wetlands.

Fig. 3 The Water Cycle



Forests and climate change

Forests and their management figure widely in climate change discussions. We've already noted the importance of forested wetlands in capturing and storing carbon but on a broad forest scale it has been estimated that deforestation and forest degradation account for around 17-20% of the annual greenhouse gas emissions that are known to be fuelling climate change^{12,13}. To put this in perspective, this is more than the emissions from the entire global transport sector¹². And of

course losing or degrading forests is a double loss – since forests absorb CO₂ from the atmosphere as well as storing it.

At the same time forests provide great opportunities for adaptation to climate change (e.g. through reforestation of mangroves) and mitigation of climate change (e.g. through afforestation, reforestation) – all of which increase the resilience of ecosystems and people to cope with the challenges posed by climate change.

REDD – Reducing Emissions from Deforestation and Forest Degradation in Developing Countries:

an initiative that recognizes the role of forests as carbon store and carbon dioxide absorber. Its aim? To link directly financial incentives with conservation, sustainable management of forests and enhancement of forest carbon stocks¹².



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OUR CONCLUSION ON WETLANDS AND FORESTS?

This leaflet has looked at:

- Forested wetlands – and the special benefits they bring. Mangroves, peat-swamp forests, freshwater swamp forests: biologically diverse, helping us manage our freshwater, and providing us with many other ‘services’ across the globe including vital roles in carbon storage – our allies in the face of climate change. Despite their utility, they are often under threat from development, from drainage and conversion.
- The role of forests – wet or not – in our lives, and why looking after them matters. Vital to all human

lives, freshwater availability on a global scale depends on our forests. So too, to a large extent, does freshwater quality.

- The role of forests in how our wetlands function. It’s simple: the health of our wetlands, whether forested or not, is linked to the health of forests in our catchments. Losing and degrading forests means losing and degrading wetlands.

We cannot manage without forests, whether terrestrial forests or forested wetlands, given the critical roles that

they play in our lives – for water, for food, for livelihoods, for recreation... and more.

We believe World Wetlands Day 2011 brings us a great opportunity to look at our forested wetlands and the benefits we enjoy from them, and also to look at the forests in our catchments which ensure that there is enough water of good quality reaching our wetlands to keep them healthy. We hope our Ramsar countries will designate more of these vital wetland types as Ramsar Sites – a gift to Ramsar and themselves on Ramsar’s 40th birthday!

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Additional useful resource:

- **Forests and water**. FAO Forestry Paper 155. 2008. www.fao.org/docrep/011/i0410e/i0410e00.htm

All weblinks correct as at July 2010

CELEBRATING 40 YEARS OF THE RAMSAR CONVENTION ON WETLANDS



Celebrating WWD2010 at the Parque Nacional Huatulco, an event supported by the Comisión Nacional de Áreas Naturales Protegidas, Mexico

February 2nd 1971 marks the birth of the Ramsar Convention in the city of Ramsar in Iran. February 2nd 2011 will mark our 40 years as an intergovernmental treaty focused solely on one ecosystem – wetlands.

In 1997 the Convention launched World Wetlands Day as the annual campaign day when all those who care about wetlands can celebrate their beauty and utility.

We hope WWD2011, and indeed the whole year, will be a time for wetland supporters to focus on Ramsar and its role in saving wetlands from degradation and destruction.

Are we progressing as a Convention? Of course we are. Since 1971 the Convention has grown in every dimension.

Where are we now?

We have...

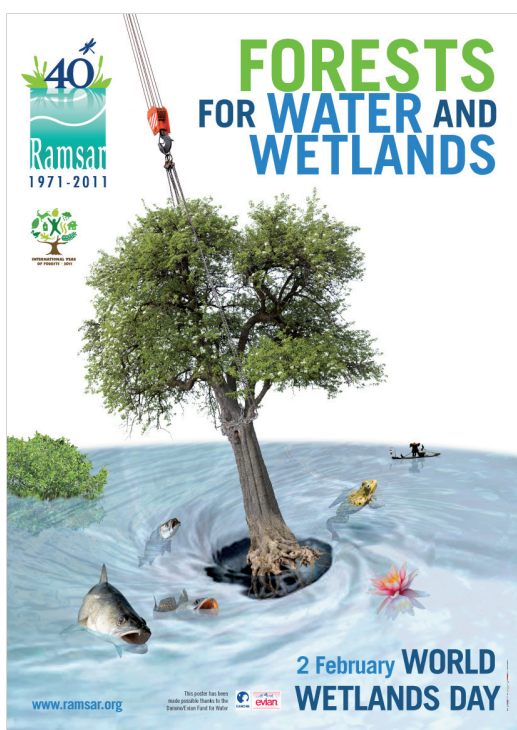
- 160 Contracting Parties
- 1,896 Ramsar Sites covering 185 million hectares – the largest protected area network in the world
- 5 very active International Organization Partners – strong NGOs working for wetlands and supporting the Convention all over the world (BirdLife International, IUCN, IWMI, Wetlands International, and WWF)
- An increasingly effective mechanism for dealing with Ramsar Sites that are in ecological trouble for whatever reason
- Helpful guidance for countries at the policy level and for site managers at ground level on caring for wetlands
- An increasingly popular campaign day on February 2nd every year to celebrate wetlands

...and more

Would you like to join those celebrating 40 years of Ramsar? Look here www.ramsar.org/40-Anniversary to download our animated 40th logo and to see what the Secretariat and some countries are planning to do.

Coming soon... our [commemorative brochure to be launched on World Wetlands Day 2011 celebrating 40 years of Ramsar](#). This will be available in PDF and the design files will be accessible should you wish to translate it in September/October 2010.

Ramsar's WWD 'Package' for 2011



Poster



Sticker



Do-it-yourself facemask for children



Brochure



CD with all the WWD materials in high resolution

Need more information on WWD? Visit www.ramsar.org/WWD/ or write to WWD@ramsar.org



Ramsar Convention Secretariat
Rue Mauverney 28
1196 Gland
Switzerland
Tel: +41 22 9990176
Fax: +41 22 9990169
ramsar@ramsar.org
www.ramsar.org

United Nations Forum on Forests Secretariat
DC1-1245, One UN Plaza
New York, NY 10017
USA
Tel: +1 212 963 3401
Fax: +1 917 367 3186
forest@un.org
www.un.org/esa/forests

