



*Cranes of the Holodomor monument along the Dnepr in Kiev, Ukraine. Photo: Hans Joosten. Poem: Leo Vroman.*

Kom vanavond met verhalen  
hoe de oorlog is verdwenen  
en herhaal ze honderd malen  
alle malen zal ik wenen

Come tonight with stories  
how the war has disappeared  
and repeat them a hundred times  
all the times I will weep

Приходьте з історіями сьогодні ввечері  
як зникла війна  
і повторіть їх сто разів  
Я буду плакати кожен раз

## IMCG Bulletin 2022-1: Jan. – Febr. 2022

The international peatland news that matters



[www.imcg.net](http://www.imcg.net)

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## IMCG issues

### Word from the Secretary-General

Dear mire friends,

This Bulletin appears at the moment that a cruel and unjust war is being fought in Ukraine and our Field Symposium is taking place in South Africa and the Kingdom of Eswatini. How the political entanglements interfere with scientific and - much more importantly - personal fates, some of you experience intensively: imprisoned, besieged, on the run, or “simply” trying to help. This Bulletin can only touch upon this, e.g. under ‘Borderland’ (p. 19) and ‘Belarus’ (p. 23). Crucial is to remind that IMCG is a network of persons - not of nations or institutions - that try to support each other in mire conservation, with the aim – as our Main Board member Tapio Lindholm said on his deathbed – “to make the world better”. I wish you all the strength to do whatever is in your power to pursue that aim. I personally have always associated the word “mire” with the Russian and Ukrainian word “myr”, meaning “peace” and “world”.

Keep sending news, photographs, papers and other contributions for the next Bulletin to Hans Joosten at [joosten@uni-greifswald.de](mailto:joosten@uni-greifswald.de).

### Mires and Peat

In January - February 2022 the following papers were published in Mires and Peat:

- Net primary production of oil palm plantations on tropical peat. [N. Wakhid, T. Hirano, A. Dariah & F. Agus] Volume 28: Article 02 <http://mires-and-peat.net/pages/volumes/map28/map2802.php>
- Regeneration potential of a degraded alpine mountain bog: complex regeneration patterns after grazing cessation and partial rewetting. [U.H. Graf, A. Bergamini, A. Bedolla, S. Boch, H. Küchler, M. Küchler & K. Ecker] Volume 28: Article 01 <http://mires-and-peat.net/pages/volumes/map28/map2801.php>

Find the journal online at <http://mires-and-peat.net/> Electronic submission is required using our dedicated electronic submission system. If you experience any problems please contact the Editor-in-Chief Olivia Bragg ([o.m.bragg@dundee.ac.uk](mailto:o.m.bragg@dundee.ac.uk)) who can offer alternative routes for electronic submission.



*The - drained - peatlands of Polesie, Ukraine. Photo: Hans Joosten.*



*Peat passionate Geoff Hope during his last field trip to Papua New Guinea with over 70 years discovering 10 meters of peat in the Kumusi region. Photo: Felix Beer/GMC.*

Our friend and colleague Professor Geoff Hope passed away over the Christmas break after a long battle with cancer. Geoff contributed enormously to botany, palaeoecology, biogeography and peatland science. His research into landscape change and the role of people in the environmental history of New Guinea, Australia, the Pacific and Asia stands as a remarkable testament to the importance and effectiveness of doing field based research with a minimum of technology and an abundance of enthusiasm.

Geoff was born in 1944 in Sydney. In 1973 he was awarded a Ph.D. in Biogeography with the dissertation 'The vegetation history of Mt Wilhelm, Papua New Guinea'. From 1974 to 1977 he worked as a researcher, from 1978 on as Professor of Geography at the Australian National University. He became emeritus professor in 2009.

Geoff studied human impacts on landscapes and human adaptivity in relation to climate change and fire impacts. He conducted studies on fire ecology in East Kalimantan, Myanmar, New Guinea, New Caledonia, Vanuatu and Fiji in the context of their very different human settlement histories. He was also dedicated to climate change research in high altitude areas in New Guinea. A major interest was in the peatlands of Southeast Asia and Australia in terms of development, extent, carbon sequestration value and restoration after burning or deforestation (see this Bulletin under Australia), including the conservation of peatlands of the Australian mountain regions. Geoff was from 2006 to his death Associate Editor of our journal *Mires and Peat*.

## Papers

### Peatland prose from the past: Ancient Egyptian camouflaged mires in the works of Diodorus of Sicily (1st century BCE) and Frontinus (c. 40-103 CE)

Pim de Klerk (Greifswald Mire Centre/State Museum of Natural History Karlsruhe; [pimdeklerk@email.de](mailto:pimdeklerk@email.de), [www.pimdeklerk-palynology.eu](http://www.pimdeklerk-palynology.eu))

War is one of the most common topics in the works of ancient historians, and there are numerous texts that describe various campaigns and battles in Antiquity. As almost all landscape types, mires and wetlands also played a role in warfare. Mires were particularly used for hiding, for natural defences, or to trap the enemies (De Klerk & Joosten 2019).

The function as trap is mentioned in a particular quote from the ‘Stratagems’ by Sextus Iulius Frontinus (c.40-103 CE). After a successful career in the military, he was praetor, three times consul, governor of Britain, augur, and inspector of waterworks (Campbell & Purcell 1996). This latter function resulted in his work ‘De aquae ductu’ on the water infrastructure of the City of Rome. As military man he wrote a major work on warfare named ‘de re militari’, of which only the ‘stratagems’-section has been preserved. This text was intended as a teaching in tactics for military officers. Frontinus wrote:

*“When Egyptians go into battle in a plain with marshes, they cover these with seaweed. In battle they fake flight to lure the enemies into this trap, who - because of their unfamiliarity with the area – rapidly get stuck in the mud and are surrounded.”* (“*Aegyptii conflicturi acie in eis campis, quibus iunctae paludes erant, alga eas contexerunt commissoque proelio fugam simulantes in insidias hostes evocaverunt, qui rapidius per ignota invecti loca limo inhaeserunt circumventique sunt.*”) (‘Stratagems’ II:5,6).

It is a strange quote, and it seems justified to doubt its accuracy.

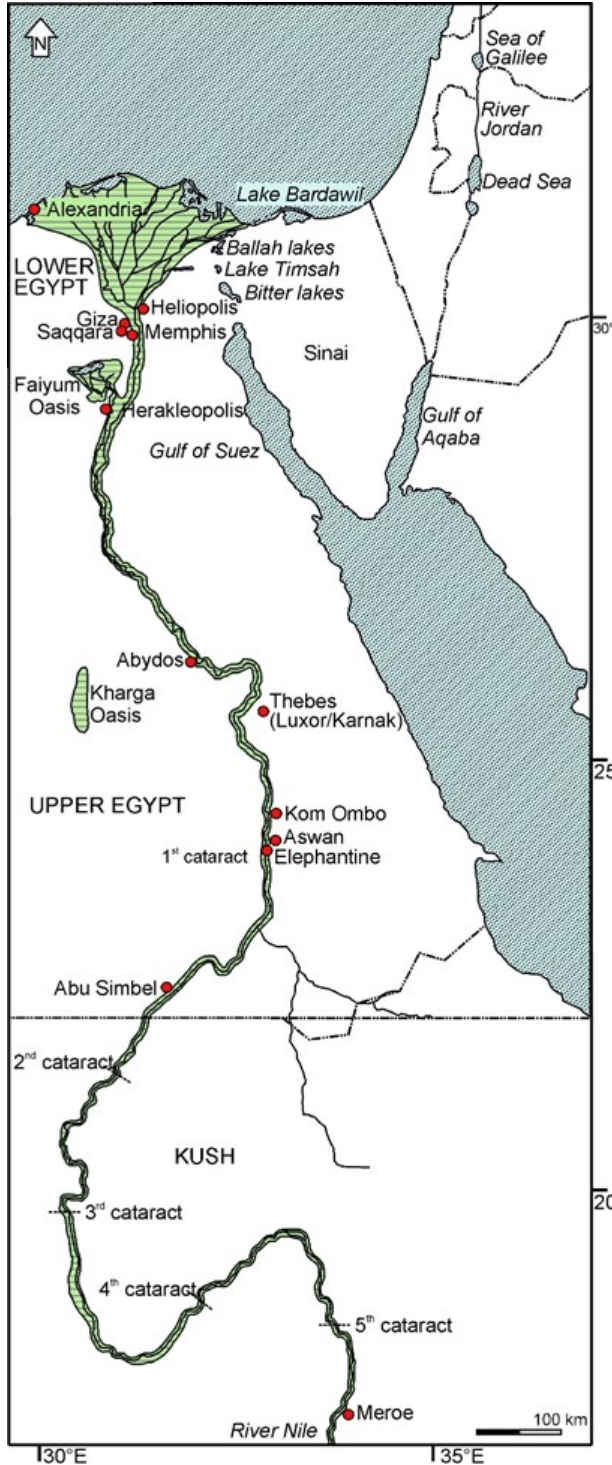
The first questions that arise are where and when this had happened. Ancient Egypt was surrounded by dry desert bordering the fertile Nile River valley: there were no marshes apart from the luxurious papyrus reeds in the Nile Valley and Delta. Furthermore, the low-lying Suez rift between the Gulf of Suez and the eastern Mediterranean contained a series of shallow lakes and wetlands that also will have contained prominent reeds. In general, ancient Egypt was well-defended by its natural landscape. Diodorus of Sicily – a historian from the 1<sup>st</sup> century BCE who probably had visited Egypt himself (Sacks 1996) - wrote:

*“In the west it is protected by the Libyan desert - which is full of wild beasts - and forms the border over a large distance, and because of the lack of water and any kind of food the journey through this desert is not only toilsome but even highly dangerous. In the south is the region of the Nile cataracts and the mountains flanking them. [...] The eastern regions are protected partly by the river, partly by a desert, and by marshy plains...”* (“*ἀπὸ μὲν γὰρ τῆς δύσεως ὠχύρωκεν αὐτὴν ἡ ἔρημος καὶ θηριώδης τῆς Λιβύης, ἐπὶ πολὺ μὲν παρεκτείνουσα, διὰ δὲ τῆν ἀνυδρίαν καὶ τὴν σπάνιν τῆς ἀπάσης τροφῆς ἔχουσα τὴν διεξοδὸν οὐ μόνον ἐπίπονον, ἀλλὰ καὶ παντελῶς ἐπικίνδυνον: ἐκ δὲ τῶν πρὸς νότον μερῶν οἱ τε καταράκται τοῦ Νείλου καὶ τῶν ὄρων τὰ συνορίζοντα τούτοις. [...] τῶν δὲ πρὸς τὴν ἀνατολήν νευόντων μερῶν τὰ μὲν ὁ ποταμὸς ὠχύρωκε, τὰ δ’ ἔρημος περιέχει καὶ πεδία τελματώδη...*”) (‘Library of History’ I:30,2/4).

The notion that the southern border of Egypt was easily protected is not completely true: there were various wars with the Nubian peoples of Kush, who coarsely between 750 and 650 BCE even had ruled Egypt as the 25<sup>th</sup> dynasty (Taylor 2003; Wilkinson 2011). But the major warfare of the ancient Egyptians was directed to the northeast. Egyptians had invaded these lands several times, but marshes were (and are) virtually non-existent in the regions of present-day Israel, Lebanon, and Syria because of the dry and warm climate (Rogerson 1989; De Klerk 2021): Frontinus will not have referred to a battle in these regions. When Egypt was invaded from the northeast, however, it seems logical that the Egyptians constructed defence lines near the lakes of the Suez Isthmus or the Delta. Between the 7th and the 4th century BCE Egypt was invaded various times by Assyrians,

Persians, and finally Alexander the Great (Manley 1996; Wilkinson 2011) and it is probable – if it has a historical background - that the text passage by Frontinus relates to one of these invasions.

It is doubtful that prior to a battle the Egyptian soldiers had sufficient time and seaweed to camouflage the wetlands so convincingly that the enemy would perceive it as dry treatable land: the story, thus, seems unlikely. Other accounts of such strategy have not been transmitted, but there is a distant parallel in the 'Library of history' by Diodorus of Sicily:



“There is between Coele-Syria and Egypt a lake - quite narrow but very deep and 200 stades long - named Serbonis [Lake Bardawil] that has some unexpected perils for those who visit it and don't know the area. The body of water is narrow, like a ribbon, and is surrounded by large dunes. With persistent south winds great quantities of sand are blown into the lake which makes the lake indistinguishable and is perceived as solid land. For that reason, many people - who were unacquainted with the character of the lake - have disappeared with their complete armies when they wandered off the correct road. When the sand is walked-on it gives way and deceives the wanderers for a time deviously, until they perceive the peril, and start helping each-other. But at that moment there is no way back nor an escape. Anybody who has been sucked into the marsh cannot swim since the sludge hampers all movements of the body, nor can they walk-out because they have no solid soil under their feet. Because of the mixing of sand with water - that consequently both had changed their substance - the area can neither be crossed by foot nor by boat. Thus, those who enter these terrains are drawn into the depths and have nothing to grasp for help since the sand slips with them from the surrounding grounds.”

(“ἔστι γὰρ ἀνά μέσον τῆς Κοίλης Συρίας καὶ τῆς Αἰγύπτου λίμνη τῷ μὲν πλάτει στενὴ παντελῶς, τῷ δὲ βάθει θαυμασίος, τὸ δὲ μῆκος ἐπὶ διακοσίους παρήκουσα σταδίους, ἢ προσαγορεύεται μὲν Σερβωνίς, τοῖς δ' ἀπίροις τῶν προσπελαζόντων ἀνεπίστους ἐπιφέρει κινδύνους. στενοῦ γὰρ τοῦ ρεύματος ὄντος καὶ ταινία παραπλησίου, θινῶν τε μεγάλων πάντη περικεχυμένων, ἐπειδὴν νότοι συνεχεῖς πνεύσωσιν, ἐπισείεται πλήθος ἄμμου. αὕτη δὲ τὸ μὲν ὕδωρ κατὰ τὴν ἐπιφάνειαν ἄσημον ποιεῖ, τὸν δὲ τῆς λίμνης τύπον συμφυῆ τῇ χέρσῳ καὶ κατὰ πᾶν ἀδιάγνωστον.”

διὸ καὶ πολλοὶ τῶν ἀγνοούντων τὴν ιδιότητα τοῦ τόπου μετὰ στρατευμάτων ὄλων ἠφανίσθησαν τῆς ὑποκειμένης ὁδοῦ διαμαρτόντες. ἡ μὲν γὰρ ἄμμος ἐκ τοῦ κατ' ὀλίγον πατουμένη τὴν ἔνδοσιν λαμβάνει, καὶ τοὺς ἐπιβάλλοντας ὥσπερ προνοῖα τινὶ πονηρᾷ παρακρούεται, μέχρι ἂν ὅτου λαβόντες ὑπόνοιαν τοῦ συμβησομένου βοηθήσωσιν ἑαυτοῖς, οὐκ οὔσης ἔτι φυγῆς οὐδὲ σωτηρίας. ὁ γὰρ ὑπὸ τοῦ τέλματος καταπινόμενος οὔτε νήχεσθαι δύναται,

*παραιρουμένης τῆς ἰλύος τὴν τοῦ σώματος κίνησιν, οὔτ' ἐκβῆναι κατισχύει, μηδὲν ἔχων στερέμνιον εἰς ἐπίθασιν: μεμιγμένης γὰρ τῆς ἄμμου τοῖς ὕγροϊς, καὶ διὰ τοῦτο τῆς ἐκατέρων φύσεως ἠλλοιωμένης, συμβαίνει τὸν τόπον μήτε πορευτὸν εἶναι μήτε πλωτόν. διόπερ οἱ τοῖς μέρεσι τούτοις ἐπιβάλλοντες φερόμενοι πρὸς τὸν βυθὸν οὐδεμίαν ἀντίληψιν βοηθείας ἔχουσι, συγκατολισθανούσης τῆς ἄμμου τῆς παρὰ τὰ χεῖλη.”* (‘Library of History’ I:30,4-9).

Initially Diodorus did not give any information on which event(s) his account was based, but at a considerable later place he specified that it happened to the Persian army during the invasion under king Antaxerxes III Ochus in the mid-4<sup>th</sup> century BCE (‘Library of history’ XVI:46). Contrary to a human deceit as described by Frontinus, the text by Diodorus only deals with natural characteristics of the landscape that became fatal for the hostile army. Lake Bardawil – in antiquity known as Lake Serbonis or Sirbonis - is a very saline coastal lagune with a mean depth of 1 m (Elshinnawy & Almaliki 2021), which implies that the characterisation “very deep” by Diodorus is highly exaggerated. Using the word “λίμνη” (“limne”) Diodorus principally called Bardawil a lake, but the word “τέλματος” (“telmatos”) that he used later predominantly denotes a shallow and marshy setting. The depiction of sand floating on water instead of sinking appears strange. However, Diodorus may have attempted to describe a quicksand setting rather than an actual lake or marsh. Although in reality quicksand does not allow a person to sink-in completely or drown (Khaldoun et al. 2005), the description by Diodorus greatly resembles the common perception that still exists today.

The text passage on camouflaged marshes/lakes by Frontinus is most likely false, whereas the wrong depiction of quicksand by Diodorus shows that his text can also not be an accurate description of actual events. It would be interesting to trace how the passages entered their works since it would provide valuable information on the research and writing methods of ancient Roman writers.

I am grateful to Immanuel Musäus for his help with the translations.

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## Global



Vivianite ( $\text{Fe}^{2+}\text{Fe}^{2+}_2(\text{PO}_4)_2 \cdot 8\text{H}_2\text{O}$ ) in oxidized (top, blue) and reduced form (bottom, white) in a peatland near Chernihiv, Ukraine. Photo: Hans Joosten

### New York Times: Meet peat – the unsung hero of carbon capture:

- <https://www.nytimes.com/interactive/2022/02/21/headway/peat-carbon-climate-change.html>

### New York Times: What do you know about peatlands? Tell us:

- <https://www.nytimes.com/2022/02/10/climate/climate-change-carbon-peatlands.html>

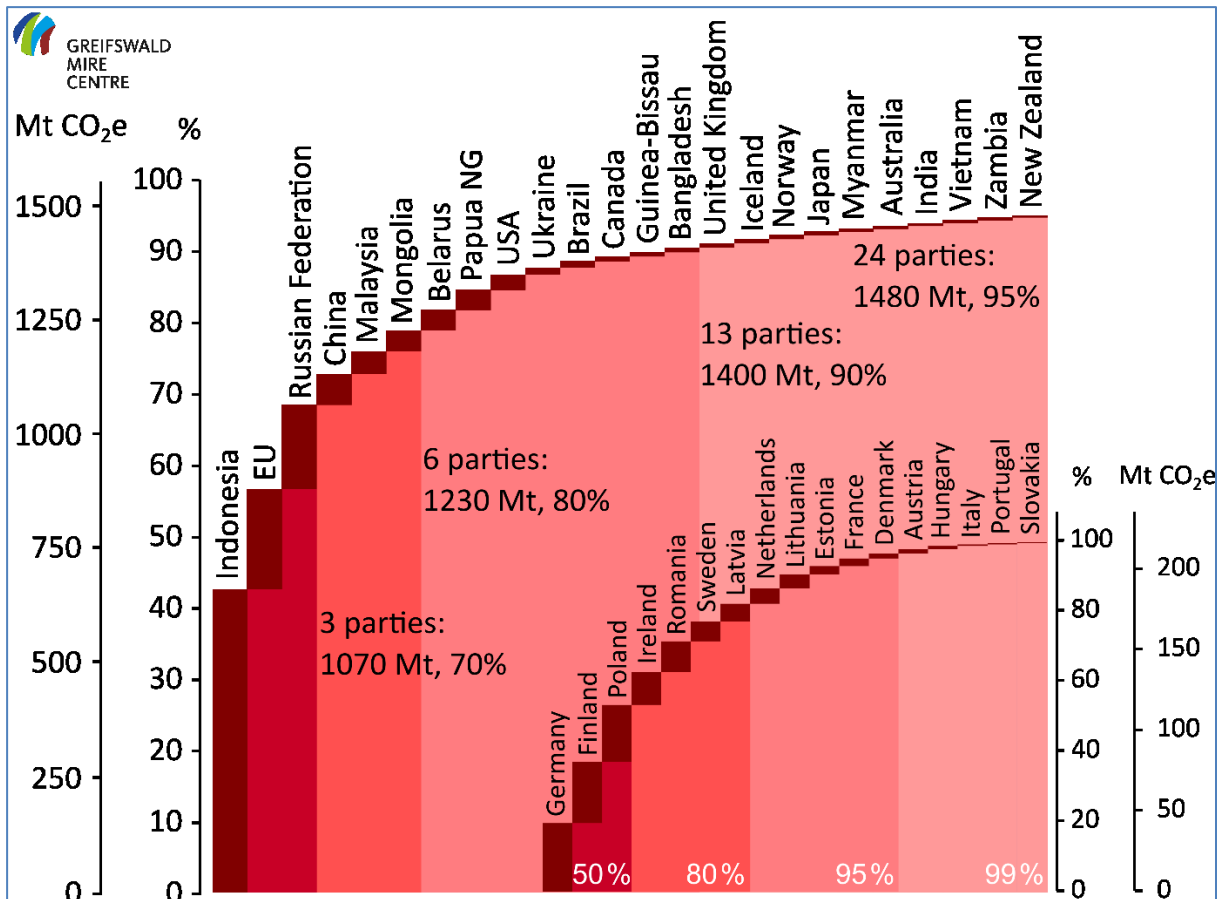
### Safeguarding and restoring wetlands is our last, best defence against global warming and biodiversity loss

Jane Madgwick, CEO, Wetlands International ([Jane.Madgwick@wetlands.org](mailto:Jane.Madgwick@wetlands.org))

Targets matter. They focus attention. They allow us to hold accountable the people who make them. Calls to fight climate change were vague until the world agreed a goal to limit warming to 1.5 degrees Celsius, as confirmed at the recent COP26 Glasgow climate conference. Likewise, a wish to halt deforestation has come into focus with the Glasgow deadline of 2030. But where does that leave wetlands? The world's waterlogged peatlands, mangroves, rivers, salt marshes and tidal flats hold – or lose, if damaged – [more carbon than all our trees](#). They nurture – or make extinct, if lost – [more biodiversity than forests](#).

Peatlands damaged by drainage are responsible for [more than 5%](#) of global carbon emissions, and intact mangrove swamps [hold four times more carbon](#) per hectare than rainforests. Yet these irreplaceable treasures were sidelined in the commitments made in Glasgow. And they will fare little better at this spring's UN biodiversity conference in Kunming, China, which aims to set an admirable target to conserve 30% of the planet for nature but says little about what should be conserved and where.

It is astonishing that we have no global wetlands targets. Nobody is held to account for the extinction of creatures in these watery domains or the carbon leaching from their ecosystems. Without their protection and restoration, the world has little chance of reaching either its climate or biodiversity goals. And human suffering through floods, fires and droughts will continue to escalate. On World Wetlands Day, we must heed the call for global targets to protect and restore these Cinderella ecosystems.



Greenhouse gas emissions (in CO<sub>2</sub> equivalents, as of 2020) from degraded peatlands of the parties of the United Nations Framework Convention on Climate Change (UNFCCC), excluding peatland fires (using default values from IPCC, 2014: Source: Greifswald Mire Centre 2022).

Existing protection of wetlands is feeble. Their only would-be defender in international environmental agreements - the 51-year-old [Ramsar Convention](#) - has been signed up to by 172 governments but has no teeth. And the degradation and loss of both inland and coastal wetlands has continued regardless.

Only 2.5 million square kilometres are recognized as wetlands of international importance whereas the world's wet places cover an area five times greater - [a twelfth of the planet's land surface](#) - from the frozen bogs of Siberia to the caiman-populated Pantanal in the heart of South America. The world may have lost half its forests, but it has [seen an estimated 87%](#) of its wetlands disappear. Drains and dams, coastal barriers and canals have done far more damage to nature and its capacity to store carbon than chainsaws.

With other international organizations, Wetlands International has drawn up proposed targets that should be included in a new global agreement on biodiversity protection, promoted as part of "nature-based solutions" to climate change, and backed by the UN's [current decade for ecosystem restoration](#). Our targets include:

- Keeping intact remaining undrained peatlands, and by 2030 at least 100,000 square km rewetted by blocking drains to lock in their carbon, with five times more restored by 2050.
- With half the world's coastal mangroves lost, mostly to aquaculture and coastal infrastructure, restoration of 20% of this "blue carbon" by 2030.
- All remaining free-flowing rivers to be protected from dams, levees, sand mining and other impediments.
- Tidal flats to be increased by at least 10% by 2030, by removing sea walls and restoring supplies of silt from dammed rivers.
- Prioritizing stopover sites along the great international flyways of migrating water birds, to secure at least half of the 7,000 critically important sites identified by ornithologists by 2030.

Protecting and restoring wetlands can be challenging. A dam or polluting factory upstream on a river can destroy lakes, floodplains, marshes, fisheries and deltas all the way to the ocean. Many of those rivers cross national

boundaries. That is why international targets and accountability are vital - and also why the benefits of action, for climate, for biodiversity, for human livelihoods and ecosystem protection, will flood across boundaries too. Some countries are leading the way. The Scottish, Irish and German governments have [peatland restoration strategies](#). [Costa Rica is committed to protecting 100%](#) of its coastal wetlands. Nearly [70 dams were removed](#) from US rivers in 2020. Indonesia is bringing back [mangroves for coastal protection](#) and rewetting its forested peat swamps. We are working with African governments to safeguard and [restore around a million hectares of mangroves](#). And the Asian Development Bank has launched a Regional Flyway Initiative to [protect stopovers for migrating water birds](#) in East Asia.

Safeguarding and restoring wetlands is our last, best defence against climate change and biodiversity loss. It will save species, preserve and clean up water supplies, improve fisheries, revive ecosystems, keep carbon out of the air, prevent fires and safeguard billions of people from the impacts of climate change. In Glasgow, more than 100 nations signed up to ending deforestation. We call for a similar effort at the UN biodiversity conference in Kunming this year to turn the tide for the world's wet places.

- <https://news.trust.org/item/20220201100831-79o38/>

**Artistic rendition of peatland landscapes:** Patrick Campbell has drawn a peat core and 6 landscapes that represent different stages in a peatland's development, as they would be inferred from different proxies (which he also drew). This part of the exhibit conveys that peatlands are beautiful ecosystems and valuable archives of past environmental change that can be used to help inform land management and restoration/conservation efforts.

- <http://www.julieloisel.com/cpeat>

**THE LAYER BELOW. Expeditions to the planet's remotest carbon sequestering landscapes showcase the importance of peatland protection for our future:**

- <https://storymaps.arcgis.com/stories/879b209a32d84e9d919b34da21aafe65>

## Africa

### New books on Congo basin hydrology

In February, AGU and Wiley published a pair of volumes: [Congo Basin Hydrology, Climate, and Biogeochemistry: A Foundation for the Future](#) in English, and [Hydrologie, climat et biogéochimie du bassin du Congo : une base pour l'avenir](#) in French. The ebook versions in both languages are now available for free until 14 April.

These books grew out of a collaboration that began six years ago when a group of researchers worked together to address the deficiency of research on the Congo Basin. The Congo is the largest tropical rainforest globally, and is an essential water source, with the second-largest river basin in the world after the Amazon. Its water, climate, and river passages are crucial for millions of people living in the region. But, despite its size and importance, the Congo Basin has received less attention and research than the Amazon.

The researchers aimed to create a roadmap to boost hydrologic research in the Congo basin. In 2016, they published "[Opportunities for hydrologic research in the Congo Basin](#)" in *Reviews of Geophysics*. AGU and the hydrological community developed an [AGU Chapman Conference](#), held in 2018 in Washington, D.C.

The meeting attendees discussed six scientific hypotheses concerning the Congo basin based on changes in precipitation, relationships between rainfall and runoff, wetland water balances, carbon fluxes, forest and land cover changes, and water resources. To overcome the economic and language barriers that are inherent in sub-Saharan Africa, funding groups provided partial to full support for more than 70% of the 85 Chapman Conference attendees, including 25 researchers from the Congo Basin and nearby countries. (Some of this important work continues in the next collaboration, when researchers will convene for the [AGU Chapman Conference on Climate and Health for Africa](#) 22-25 May 2023 in Washington, D.C.)

- <https://fromtheprow.agu.org/new-books-on-congo-basin-hydrology-research-embodys-agus-strategic-goals/>



*Logging rafts in the Congo River near Mbandaka (Democratic Republic of Congo). Photo: Hans Joosten.*

## Democratic Republic of Congo

### **Revealed: Timber giant quietly converts Congo logging sites to carbon schemes**

A major European logging firm may have illegally converted more than a dozen of its timber concessions in the Democratic Republic of the Congo into so-called conservation concessions, a new investigation can reveal. After harvesting the most valuable timber from the 15 concessions — covering an area the size of Belgium — Portuguese-owned Norsudtimber is now eyeing European investment in carbon credit schemes it will operate from the former logging sites.

Since late 2020, the DRC has assigned 24 new conservation concessions, as investors seek to benefit from rising interest in [carbon-trading initiatives](#) in the world's second-largest rainforest. A seven-month investigation by El País/Planeta Futuro has obtained unpublished documents showing that, in December 2020, the outgoing environment minister, Claude Nyamugabo, signed contracts transferring millions of hectares of Norsudtimber concessions from its logging subsidiaries, Sodefor and Forabola, to Kongo Forest Based Solutions (KFBS), another Norsudtimber subsidiary set up to manage its carbon-trading operations. The concessions were reassigned without public oversight or consultation with people who will be affected. Several of the concessions overlap with a protected area and the ancestral lands of the Bambuti, Bacwa and Batwa peoples, and nearly a third of the area covers [climate-critical peatlands](#). “The Minister arranged the deal,” says a senior officer from the environment ministry in Kinshasa, speaking on condition of anonymity for fear of reprisals. “Nyamugabo knew he would lose his position in a cabinet reshuffle, and wanted to ‘eat’ as much as possible before having to leave.” The former minister is accused of having allocated an additional 4.4 million hectares in the north and west of the country in violation of DRC law in 2020, including nine conservation concessions.

At the other end of the deal are the Portuguese Maia Trindade brothers, who lead both the timber and the carbon offset arms of Norsudtimber. In 2018, Global Witness [alleged the group was operating illegally](#) on 90% of its concessions. Norsudtimber denied any wrongdoing.

The Norsudtimber deal is the latest in a series of contentious contracts signed by Nyamugabo, a protégé of former DRC president Joseph Kabila. The latter is currently facing [allegations](#) of embezzling \$138 million.

In 2021, Congolese civil society took legal action against the former environment minister, a first in the history of the country. The NGOs accused Nyamugabo of illegally allocating an area of forest the size of Denmark. It is in this context that the government admitted “the illegality of many contracts,” just two weeks before the COP26 climate summit in October and November 2021. That included six conservation concessions awarded to [Tradelink](#), a company founded by Belgian and Italian investors with a background in logging and mining. At the climate summit, the European Union and the United Kingdom pledged [\\$1.5 billion](#) to protect the forests in the Congo Basin, while the [Central African Forest Initiative](#) (CAFI) announced a 10-year agreement, with [\\$500 million](#) earmarked for the first five years. CAFI is funded by Belgium, France, Germany, the Netherlands, Norway, the U.K., South Korea and the EU. The CAFI initiative is now helping the DRC lift the moratorium on allocating new industrial logging concessions. The measure was put in place 20 years ago to prevent the plundering of equatorial forests following the [Second Congo War](#), which officially ended in 2003. International environmental NGOs argue the country is not ready to end the ban. Ten days before the COP26 climate summit, where the DRC presented itself as a “solutions country,” President Félix Tshisekedi called for an audit of the DRC’s forest concessions and the suspension of all “questionable contracts.”

The first requirement of the \$500 million deal with CAFI was the publication, before the end of 2021, of an audit conducted the previous year by the country’s General Inspectorate of Finance (IGF). The analysis targeted all concessions awarded or transferred since July 2014. The results are yet to be published.

- <https://news.mongabay.com/2022/03/revealed-timber-giant-quietly-converts-congo-logging-sites-to-carbon-schemes/>

## Republic of Congo

**What do the protectors of Congo’s peatlands get in return?:**

- <https://www.nytimes.com/interactive/2022/02/21/headway/peatlands-congo-climate-change.html>
- <https://worldwarzero.com/magazine/2022/02/who-will-save-lokolama-s-peatlands/>



*Spoonbill (Balaeniceps rex) in Ugandan peat swamp. Photo: Samer Elshehawi (GMC).*

## Uganda

### Government embarks on the identification of peatlands:

- <https://www.youtube.com/watch?v=f1lhleJXylk>

## Asia

### China

#### Action Plan: China's first wetland law to conserve 'Earth's kidneys'

China passed its first wetland protection law last year, which will come into effect on June 1 this year. It marks a major step in conserving and restoring the country's vast wetlands, as China increases efforts to prioritize environmental protection. Wetlands play a vital role in purifying water, controlling floods and preserving biodiversity, but are heavily impacted by global human activity. China is home to about 10 percent of the world's total wetland area. Its first wetland protection law will take effect from June 1 this year to strengthen China's legal protection of the environment. The law specifies accountability of government departments, and spells out provisions on protecting, utilizing and restoring wetlands.

Zhang Yimo, Yangtze Priority Project Coordinator WWF-Beijing Office: "Wetlands protection is a global challenge, as the wetlands are very close to human's activities. Lawmakers must find a balance between strict protection and sustainable utilization. The new law has clear guidelines of allowable and forbidden activities, so the administrators can rely on the law to guide its protection and utilization." Conservationist says another highlight of the law is the protection of mangrove wetlands and peatland swamps, both of which help fight climate change.

- <https://news.cgtn.com/news/2022-02-28/VHJhbnNjcmlwdDYzMjg0/index.html>



*Peatland in the Altai Mountains, Xinjiang, China. Photo: Hans Joosten.*

## Indonesia

### Of parachutes and helicopters: reconstructing the decolonisation agenda in environmental research



Senior Indonesian diplomat Arif Havas Oegroseno recently contrasted Indonesia's peatland restoration with Europe's poorer efforts. In a tweet, he suggested, somewhat tongue-in-cheek, that Europe should seek Indonesian advice and technical assistance. The statement echoed comments at COP26, which hailed progress in Indonesia's peatland restoration and research.

It is worth thinking about what this situation tells us about international environmental research and policymaking. European voices in peatland research tend to focus on the negative environmental impact of Southeast Asian peatland policy. Yet, the region has seen decades of peatland research. Indonesia and Malaysia also possess vast experience concerning peatland development and conservation. In this context, the idea that Indonesian expertise might benefit European restoration efforts is entirely valid and should be unremarkable. The fact that both conservation advocates and palm oil industry supporters from Europe highlight evidence of Indonesian leadership in peatland restoration suggest that this is not the case.

This calls attention to a broader issue concerning the relationship between researchers and academics from different parts of the world. Environmental research in Southeast Asia is often initiated, led, funded and conducted by researchers and institutions from countries in the Global North. At worst, this type of situation may contribute to a phenomenon known as '[parachute science](#)' or '[helicopter research](#)'. However, even in circumstances where such projects are conducted with the active participation of local partners, this research is often shaped by Northern concerns.

This has implications for environmental research and policy. For example, tropical peatlands and rainforests have been identified as globally important carbon sinks. This has led to intense international scrutiny of Southeast Asia's peatland management, with little reflection on how historical human activity in European peatlands has reduced their capacity to store carbon, making the current focus on the relatively intact peatlands in the South inevitable. Similarly, research concerning forest fires in the Global South often focuses on direct causes such as unsustainable business practices. By contrast, discussions of forest fire events in affluent countries often focus on the 'bigger picture'. A recent report by the [European Environmental Agency](#), for example, features the increasing role of climate change in causing forest fires on that continent. The implications of such agendas' dominance concerning the allocation of blame and responsibility for resolving global environmental issues is clear and profound.

Read the full opinion paper under:

- <https://www.eco-business.com/opinion/of-parachutes-and-helicopters-reconstructing-the-decolonisation-agenda-in-environmental-research/>

### Peatlands in South Sumatra will be used for agriculture and plantations

The Provincial Government of South Sumatra will use peatland as agricultural and plantation land, because peatland in South Sumatra is the second largest on the island of Sumatra with an area of 25 to 35 percent of the total area of South Sumatra which reaches 9 million hectares. Deputy Governor of South Sumatra, Mawardi Yahya, said that this peat management effort really needs to be done so that this peatland can be economically beneficial for the community. "We need a study about plants that are suitable for this land. Don't wait until later when the water is high, the plants will sink and be damaged which will certainly harm the farmers," Mawardi said when meeting the International Center for Research in Agroforestry (ICRAF) team.

Therefore, Mawardi asked ICRAF to conduct research to determine plants that have great potential to be planted on these peatlands. So that it has an impact and has long-term benefits as a pilot in some of the land areas. "If it works, of course, the community will take advantage of it, because most people, in general, want to see examples

of its success first," he said. Deputy Governor Mawardi Yahya and the ICRAF team discussed the implementation of the sustainable Landscape for Climate-Resilient Livelihoods (Land4Live) project. This project has the main focus on reducing deforestation, improving land conditions, and also increasing carbon sequestration in three provinces in Indonesia, namely South Sumatra, South Sulawesi, and also NTT. The project also aims to increase economic and climate resilience, livelihoods, and food security for poor and vulnerable women and men farmers as well as in the small business sector, in particular paying attention to women entrepreneurs. The project directly targets hazardous land-use change in collaboration with smallholders in efforts to reduce deforestation and peatland reclaim while reducing climate vulnerability and improving livelihoods. In South Sumatra, the focus will be on Banyuasin Regency and Musi Banyuasin Regency. Meanwhile, the Indonesian Country Coordinator, Sonya Dewi, explained that the project is to find solutions to improve the lives of farmers and the environment. This means that even if the management is carried out, the environment will still be well maintained. "We are trying to find ways for people to survive by managing agricultural land but with a natural quality that is maintained. This includes managing it," said Sonya. He said his party would cooperate with farmers to increase the agricultural capacity. "Including the matter of the potential of peatlands for agriculture, what kind of market is it. So that food security is maintained and the community's economy increases," he said.

- <https://kumparan.com/urbanid/lahan-gambut-di-sumsel-akan-digarap-untuk-pertanian-dan-perkebunan-1xSchBvstiv/full>
- <https://www.indonesiawaterportal.com/news/peatlands-in-south-sumatra-will-be-used-for-agriculture-and-plantations.html>

### **Digging Deep: What Indonesia's experiment in reducing emissions reveals about fighting deforestation**

A recent study from a team of environmental economists at the London School of Economics and University of Exeter examines whether Norway's pledge to contribute \$300 million per annum towards 'reducing emissions from deforestation and forest degradation' (REDD+) have borne fruit. In the agreements inked at the 2007 Conference of Parties (COP-13) in Bali, Norway had pledged this amount in bilateral agreements with tropical countries like Brazil, Guyana, Tanzania and Indonesia; in exchange for their efforts in mitigating global warming. As part of the agreements between Norway and other partner countries, Norway had pledged \$1 billion 'to fund results based REDD+ payments'. But, the study questions, is the method working? Having paid Indonesia \$56.2 million (at the rate of USD 5/ton CO<sub>2</sub> equivalent), is Norway getting its money's worth? In order to answer these questions, researchers examined the Global Forest Change Data from 2004 to 2018, which also includes the period before the moratorium. They considered factors like topography and proximity to markets in order to assess how likely each area was to be subject to forest loss due to timber culture. Of special focus was a phenomenon called 'leakage,' whereby licenses for producing timber and palm oil are granted for areas outside the moratorium, even as these activities cease in the moratorium areas. Leakage, as the study recognises, is a major impediment in forest conservation efforts, and brings an artificial contrast to the observed forest cover in the moratorium versus non-moratorium areas.

The results are not surprising: 'overall, the proportion of forest cover has declined, both inside and outside the moratorium's boundaries, by ~10 to 15 percentage points between 2000 and 2018.' However, the decline is much steeper outside moratorium boundaries and outside concession areas (i.e. the areas where agriculture was allowed). Contrasting dryland forests and peatland forests, Groom et al (2022) find that dryland forest cover is comparable between concession areas inside and outside moratorium regions. However, the same cannot be said for peatland forests, where cover is higher in concessions outside moratorium regions than those inside. They conclude that the moratoriums, while being cost effective, were effective in protecting 0.01 sqkm of dryland forest in each 1.2 km x 1.2 km grid cell; while the estimates for peatland forests were not statistically significant. As for leakage, the analysis failed to 'identify significant leakage from the moratorium to the surrounding areas.' Calling to question Norway's payment of \$56.2 mn, which includes the reductions from avoided peat decomposition and forest fires, lead author Ben Groom told Climate Home News: "If Indonesia was going to be paid for the carbon emissions that it prevented, then Norway would have had to come up with a lot more money than it did." Based on their calculation and when applying Norway's price of \$5 per tonne of avoided carbon emissions, they concluded that the forest nation deserved a payment between \$340-435m. Instead, Indonesia received the equivalent of \$1 per tonne of carbon emissions it prevented, the study found. Groom said this was "incredibly cost effective" for Norway but could be seen as unfair towards Indonesia. While "there should be more efforts like Norway's in the world," Groom said the price of a tonne of avoided carbon emissions should be

much higher and reflect the opportunity cost of not being able to grow palm oil on the land. “If you are going to use this mechanism to increase forest cover then you are going to need to scale them up hugely. If you don’t fund them properly, they give very poor results,” he said. “Maybe perceptions of fairness were driving the failure in this otherwise positive bilateral arrangement.”

The moratorium was unilaterally revoked by the Indonesian government in 2021 and is likely to be replaced by other REDD+ initiatives. It is argued, in order to be able to meet Nationally Determined Contribution (NDC) targets, future schemes need to engage local smallholders whose activities contribute to nearly one fifth of total nationwide forest loss. Lastly, fund allocation mechanisms need to be formalised and consolidated further. However, a lot of it depends on the individual countries participating in REDD+ initiatives.

- <https://indianexpress.com/article/technology/science/digging-deep-indonesia-redd-7767775/>
- <https://www.pnas.org/doi/10.1073/pnas.2102613119>
- <https://www.climatechangenews.com/2022/01/24/norway-underpaid-indonesia-forest-protection-results-study-argues/>



*Fishing in restored mangrove on Bali, Indonesia. Photo: Hans Joosten.*

### **Indonesia on track with peatland restoration, but bogged down with mangroves**

Indonesia has recorded mixed progress in its dual programs of restoring tropical peatlands and mangroves, acknowledging that achieving the latter goal will be far more challenging than for the higher-profile peatlands. The government has targeted restoring 1.2 million hectares of degraded peatlands and 600,000 hectares of degraded mangroves by 2024, with both programs overseen by the Peatland and Mangrove Restoration Agency (BRGM).

In 2021, the first year for both programs, the BRGM recorded significant progress on peatlands, restoring 300,000 hectares, or a quarter of the total. On the second goal, however, billed as the [most ambitious](#) mangrove rehabilitation program in the world, it managed to restore just 34,911 hectares, or less than 6% of the total.

“There’s still a lot of work that we have to do until 2024, considering that our target is 600,000 hectares,” Satyawan Pudyatmoko, the BRGM deputy for planning and evaluation, said at a recent [online event](#).

Indonesia has the world’s largest area of tropical peatland, holding about 46 billion tons of carbon, and the largest extent of mangrove forest, which holds 3.1 billion tons. But the country has been losing both landscapes at

alarming rates; a [2018 report](#) by the Center on International Forestry Research (CIFOR) estimated Indonesia had lost 40% of its mangroves in the past three decades.

While progress on restoring peatlands was far more successful in 2021, the program still faced the challenge that “restoration efforts are often at odds with local people’s wishes,” said Tris Radityan, the BRGM deputy for construction and maintenance operations. In some cases, he said, the areas of peatland targeted for restoration are located in areas already being cultivated by local communities.

Peatland degradation across Indonesia begins with draining the waterlogged, and carbon-rich, earth by digging canals. That leaves the land sufficiently dry for planting crops that would otherwise not be suitable in peat, such as oil palm. It also renders the dried-out peat layer a tinderbox that emits huge volumes of greenhouse gases and generates massive clouds of toxic haze when it’s burned, as is typically done prior to planting. Restoring degraded peatland calls for blocking the canals to allow for the rewetting of the peat layer, which fundamentally undermines local communities’ interests, Tris said. “Furthermore, these canals are also used for transportation, both for people and for harvest,” he added.

This year, the government plans to restore another 300,000 hectares of peatlands and 228,200 hectares (563,800 acres) of mangroves. The mangrove figure is nearly seven times the area restored in 2021. To achieve this boost, the BRGM says it will adopt a similar approach to peatland restoration, where it considers the entire landscape instead of focusing just on the areas with peat, and where it has to account for the land being used for different purposes.

- <https://news.mongabay.com/2022/02/indonesia-on-track-with-peatland-restoration-but-bogged-down-with-mangroves>

#### **Recent study on 2019 fires stirs debate on gov't forest data transparency**

The government has disputed the recently published scientific research that claimed the area lost to forest and peatland fires in 2019 was larger than official estimates (see IMCG Bulletin 2021-6), a move which activists said highlighted the government’s lack of openness toward data gathered from independent studies. The research, which was published in the Earth System Science Data (ESSD) journal in November, found that 3.1 million hectares were burned in 2019, almost double the 1.6 million ha reported by the Environment and Forestry Ministry. David Gaveau, one of the study authors, said the recent publication of the research in a peer-reviewed journal had reaffirmed his initial analysis conducted in 2019, which estimated that the 2019 fires were far worse than official estimates.

- <https://www.thejakartapost.com/indonesia/2022/01/21/recent-study-on-2019-fires-stirs-debate-on-govts-forest-data-transparency.html>

## **Philippines**

#### **Seven ‘probable’ peatlands documented under landmark conservation program**

The Department of Environment and Natural Resources – Biodiversity Management Bureau (DENR BMB) through its CARAGA Regional Office has documented seven probable peatlands across the Agusan Marsh Wildlife Sanctuary (AMWS). These probable peatlands are located in Barangay San Marcos, Kiawan Peatland in Barangay Loreto and Nueva Era Peatland in Barangay Nueva Era in the municipality of Bunawan; Impierno Peatland in Barangay Villapaz and Kiongong Peatland in Poblacion in La Paz town. They have been identified based on the description of the local communities as to the area characteristics: spongy soil, tea-colored water that comes out of the soil when stepped on and current vegetation. A detailed scientific assessment will confirm if they are indeed peatlands based on soil profile (presence of semi-decomposed organic matter), water color and the condition on which it was formed. Once confirmed, the number of peatlands inside the AMWS floodplains will increase to 15.

Located in Agusan del Sur, the 5,000-hectare peatland is the largest and the only remaining intact peat swamp forest in the country. Known to be the largest peatland reserve in the country, the Caimpugan Peat Swamp Forest in AMWS stores an estimated 22.8 million tons of carbon.

- <https://smart.com.ph/About/newsroom/full-news/2022/02/08/7-probable-peatlands-documented-under-pldt-group-s-landmark-conservation-program-with-denr>

## Australasia

### Australia



*Dr Ben Kearney led a walk through burnt and unburnt sections of the Square Rock bog.*

A project has begun to restore precious bogs in Namadgi National Park after important ecosystems were desecrated by the Black Summer bushfires. Researchers and volunteers have joined forces to help the bogs recover more quickly, installing shade cloth, undertaking weed control and beginning long-term monitoring.

ANU researcher Dr Ben Kearney said bogs contain sphagnum moss which can hold onto water before slowly releasing it into catchment areas, like the Cotter River. "They also keep moisture in the landscape, by keeping the moisture in the landscape - the landscape isn't quite as flammable," he said. After the 2019-20 bushfires, Dr Kearney and his colleague Professor Geoffrey Hope assessed the damage, focusing on the area near the Cotter River which contains large bogs. "It was absolutely shocking - the vast majority of the bogs in the ACT actually got burnt," he said. "It was really, really, really heartbreaking."

The fire was so severe that in some rare cases it burned the hummocks out and created peat fires, which meant actual sediments had begun burning underground, Dr Kearney said. The project received federal funding in mid-2021 as part of a Landcare bushfire recovery grant.

ACT government's environment and planning directorate have also been working on bog management and research since immediately after the Orroral Valley bushfire. A team has set up shade cloth over patches of sphagnum moss within bogs where its regeneration is likely to be enhanced, providing an opportunity for it to spread out and re-colonise burnt areas. They've also used coir logs to slow down and spread out water, reducing risks of erosion and loss of hydrological function in the peat soils that are a critical part of bog ecosystems.

The recovery works were established in 2020 and annual monitoring has been completed for 2020 and 2021, with the intention to continue annually, a spokesman said. Two wet years since have provided a solid growth opportunity for the bogs, and research will now focus on the effectiveness of shade cloth as a way to encourage further recovery.

Dr Kearney's work has extended beyond the north-east section of Namadgi and Tidbinbilla, and into Kosciuszko National Park. "The fires that we saw in 2020 were unparalleled historically. From Kosciuszko around Canberra, in Victoria and all the way up to Queensland, there was a lot of damage to wetlands," he said. "Hopefully we can see a greater public awareness about their importance and an appreciating of their role in the ecosystem."

- <https://www.canberratimes.com.au/story/7621569/volunteers-join-fight-to-save-namadgis-burnt-bogs/?src=rss>

## New Zealand

### Wellington carbon reduction projects could be accelerated

An extra \$5 million for projects that reduce carbon emissions could soon be available to Greater Wellington if the council approves changes to its Low Carbon Acceleration Fund (LCAF). The fund was established in 2020 by borrowing against a free allocation of carbon credits. With the price of these credits continuing to rise, the council's Climate Committee recommended the loan be extended to 70 percent of their value. Committee chair Thomas Nash said the additional borrowing would be consistent with the fund's purpose. "For Greater Wellington to become carbon positive by 2030, bold leadership is needed to leverage opportunities without relying only on rates. That's why this committee is recommending council increase the fund." The total value of the fund to date, about \$8 million, has been allocated to Parks Restoration/Recloaking Papatūānuku. Projects underway include:

- \$1.4 million to restore 128.5 hectares of peatland and dune forest at Queen Elizabeth Park.
- \$370,000 to restore 21.8 hectares of pasture at Kaitoke Regional Park.

Greater Wellington's parks manager, Jimmy Young, said Recloaking Papatūānuku was a long-term project to restore ecosystem health to Wellington's Regional Parks. "Our parks cover 40,000 hectares some of which is commercially farmed. Over the next 10 years we're going to restore over 1,100 hectares to help Papatūānuku reclaim her cloak. "Farmland will revert to wetlands, peatlands and forest. Habitats will be created for native plants and animals to flourish. Climate change and the risk of flooding will be mitigated, and we will have cleaner air and water."

- <https://www.scoop.co.nz/stories/AK2202/S00306/wellington-carbon-reduction-projects-could-be-accelerated.htm>

## Europe



*Hay making in the peatlands of Polesie (Ukraine). Photo: Hans Joosten.*

## Borderland...

*Ewa Jabłońska, Jan Kucharzyk & Wiktor Kotowski - University of Warsaw, Poland ([ejablonska@uw.edu.pl](mailto:ejablonska@uw.edu.pl))*

In December 2019, the world was still pretty normal. Or, at least, as far as we had known it throughout our adulthood. We had the enthusiasm to take on new challenges, mires were full of mysteries worth scientific exploration, the border between Poland, Belarus and Ukraine was open, and we had friends on all sides of that border willing to jointly study the nature of the peatlands and protect them. We wrote and submitted a project grant "Conditions of stability and vegetation dynamics of Polesie peatlands", which was to be implemented in peatlands of the Belarusian-Ukrainian borderland.

Polesie is the region with the largest peatland cover in temperate Europe. Although many Polesian mires have been drained, a considerable part have hardly been transformed by humans and subject to natural development over centuries. These sites offer today a unique opportunity to analyse the mechanisms and processes that determine the stability and long-term dynamics of mire ecosystems. In the years 1928-1933 Stanisław Kulczyński and his collaborators extensively inventoried the Polesian peatlands. The resulting detailed study of vegetation and peat deposits is now recognised as one of the cornerstones of peatland ecology. Polesie peatlands offered a unique opportunity to analyse ecosystem development over the 20th century and the perspective to strengthen a long-term collaboration with Belarussian and Ukrainian mire scientists.

We had been awaiting the outcome of the project call with eagerness and optimism.

Then, in spring 2020, a coronavirus pandemic broke out locking us indoors. Our attitude towards the expected outcome of the call changed - we started to get scared - what if we get the project? How will we carry out the field trips? We received the decision granting the project in May 2020. Trembling for the health of our relatives and ourselves, we undertook its implementation.

In a few days' time, it turned out that coronavirus was not the only thing that would be disrupting our research plans. At the end of May 2020, anti-government protests began in Belarus. We looked at them with acclaim because of the bravery of the Belarusians and at the same time with fear for their safety. Over time, the protests escalated, and participants in peaceful demonstrations were arrested, tortured, and imprisoned. At the end of 2020, one of our Belarussian colleagues and foreseen collaborators, Viktor Fenchuk (one of the top ornithologists and ecologists in the country) was imprisoned and spent 15 days in jail. The Putin-dependent Lukashenko regime did not stop its persecution and repression of representatives of Belarussian civil society also in 2021. Viktor was arrested again in August 2021, shortly after the office of the environmental organisation he worked for got raided. He is being charged with "organisation and preparation of actions that grossly violate public order, or active participation in them". Over six months after his arrest, Viktor still remains in prison. An official court hearing hasn't been scheduled yet, which makes it difficult to definitively say how much longer he will be detained.

In the project, we had planned a long field trip to Belarus in 2021. After the covid-19 situation had normalized somewhat and we had received vaccinations, the trip abroad was already possible. However, in view of the unstable situation in Belarus, and out of concern for the safety of the doctoral student carrying out the project, we decided to start our investigations in the Ukrainian Polesie. In summer 2021, Jan Kucharzyk, a Ph.D. student of University of Warsaw, started fieldwork in Ukraine.

In the winter of 2021/2022 we started preparing for another long trip to the peatlands of Ukraine. No one of us would imagine what would interfere with our plans that time. Putin's invasion of Ukraine and the cruel war on its territory would be, and still is, beyond the limits of the imaginable reality. Russian troops are stationed on the Belarussian-Ukrainian border, right next to our planned research areas, and from there they are storming the Ukrainian area.



*Viktar Fenchuk (right rear) guiding IMCG delegates from New Zealand, Cuba, Netherlands, United Kingdom, Germany, Finland, France, Poland, Belarus and Estonia into Dikoe mire during the IMCG Field Symposium in Belarus (2014). Photo: Hans Joosten.*



*International mire research in the peatlands of Polesie (Ukraine). Photo: Ewa Jabłońska.*

That we won't be able to complete the project is the least of the problems in this whole situation. However, it exemplifies how totally different is the world of peace from the world of war. Our fellows in Belarus and Ukraine, instead of the prison and frontlines, should now be out in the peatlands. The mires of Polesie should gain the status of complete international protection across the countries' borders. Instead, their main function, which we now perceive is their role as strategic military infrastructure. We are sending binoculars to Ukraine to let them be used for tracking Russian tanks, not wetland birds. But we will never accept the present as a new normal. Therefore, as scientists unwittingly caught up in the global upheaval that Putin is trying to complete, we join the call of millions for an immediate end of the war in Ukraine. We also appeal for the release of the unjustly accused and imprisoned naturalists and all other citizens of Belarus. And we hope that our research project in Polesie mires will be finished - jointly by Polish, Belarussian and Ukrainian scientists.

Жыве Беларусь! Слава Украіні!

## European Union

**To: Ursula von der Leyen, President of the European Commission**

Cc Frans Timmermans, Executive Vice-President of the European Commission, European Green Deal

Virginijus Sinkevičius, Commissioner for Environment, Oceans and Fisheries

Janusz Wojciechowski, Commissioner for Agriculture

18 March 2022

Dear President von der Leyen,

We are extremely alarmed by the European Commission's intention to once again postpone its proposal for legally binding nature restoration targets, which was foreseen for 23 March.

We understand the extremely difficult context in which this proposal is being finalised. With the devastating humanitarian crisis caused by the war in Ukraine ongoing, the priority right now is to end the conflict and ensure the safety and wellbeing of all those affected. But unfortunately, the biodiversity and climate crises won't stop for anyone.

Delaying the restoration law by months would jeopardise the EU's response to the climate and biodiversity crises and will put the European Green Deal agenda into further question.

Nature restoration is crucial to increase our resilience against the impacts of the climate crisis and to protect us from devastating events like floods, forest fires or droughts, all of which are increasing in frequency across our continent and our planet. Enshrining nature restoration principles and targets in law is the best pathway towards a resilient and sustainable Union, capable of withstanding external shocks - including to its food systems. By acting responsibly now, we will ensure that Europe is well-placed to face potential future crises.

We strongly reject the misleading use of "food security" arguments by those opposed to addressing the biodiversity and climate crisis. Millions are at risk of malnutrition in the coming months, especially in North Africa and the Middle East. To address this, we need to find solutions in partnership with those countries impacted and stop utilising food crops for producing energy, cut waste, reduce livestock numbers and reduce dependence on (gas-based) nitrogen fertilizer. **Putting the restoration law on ice would do absolutely nothing to alleviate this crisis – on the contrary, it will make a future food crisis more likely.**

We therefore urge you not to delay the publication of an ambitious and enforceable nature restoration law, nor other important initiatives like the EU legislation on pesticides or the planned legislative framework for sustainable food systems, and to uphold the commitment expressed in the Biodiversity Strategy to show leadership in efforts to agree on a Global Biodiversity Framework.

Last year, over 104,000 EU citizens asked to adopt the restoration law without delay as part of the European Commission's own public consultation process. The nature and climate commitments of the Green Deal are central to making our society more resilient and sustainable and are now more necessary than ever."

Undersigned by many international nature conservation organisations, incl. **IMCG**.



#### **LEAK: 70% of EU's drained peatlands must be restored by 2050, says Commission**

Member states will have to restore at least 70% of drained peatlands under agricultural use by 2050, of which at least half is rewetted, according to a leak of the nature restoration regulation proposal seen by EURACTIV. The proposal, which is due to be presented on 23 March, aims at halting biodiversity loss in Europe by enshrining ecosystem restoration targets into regulation while also strengthening the contribution of the land sector to the overall climate ambition for 2030. A key part of this ambition is the restoration and rewetting of peatlands.

Containing up to one-third of the world's terrestrial carbon, these peatlands are key strategic areas for climate change mitigation. They also offer a unique habitat for diverse species of flora and fauna which are specifically adapted to a specific acidic, low-oxygen environment, therefore increasing regional biodiversity. However, many of these peatlands have been drained to increase the soil productivity for agriculture or forestry, releasing this carbon into the atmosphere as carbon dioxide. To address this, the proposal outlines a plan which progressively increases in ambition from now until 2050. In the shorter term, the communication sets out that 30% of such areas, of which at least a quarter is rewetted, must be restored by 2030, rising to 50% with at least half rewetted by 2040. The ultimate goal for 2050 is to see 70% of drained peatland agricultural areas restored, of which at least half is rewetted, by 2050.

Extolling the benefits of restoring peatlands, the draft regulation states that their restoration, together with other habitats such as marshlands, forests and heathlands, could be worth €1,860 billion, compared to estimated costs of only €154 billion. However the real amount could be even higher with the prospect of monetised benefits for carbon storage, it adds. In order to reap its full benefits, restoring and rewetting of drained peatland under agricultural use should "extend beyond the areas required for the re-establishment of wetlands habitat type" that are already protected under the EU habitats directive.

Allaying potential fears of a loss of production, the proposal contends that restored and rewetted peatlands can continue to be used productively in alternative ways. For example, it proposes that 'paludiculture', the practice of farming on wet peatlands, can include the cultivation of various types of reeds, certain forms of timber, grazing with water buffaloes, blueberry and cranberry cultivation, and sphagnum farming. "Such practices should be based on the principles of sustainable management and aimed at enhancing biodiversity so that they can have a high value both financially and ecologically," the draft states. It adds that 'paludiculture' can also be beneficial to several species which are endangered in the EU and facilitate the connectivity of wetland areas and of populations of associated species populations in the EU.

- <https://www.euractiv.com/section/all/news/leak-70-of-eus-drained-peatlands-must-be-restored-by-2050-says-commission/>

## Belarus

### There was a free election in Belarus...

The election in Belarus was exemplary. Every citizen could make a proposal - their candidate only needed to be a permanent resident of the country. Two other candidates were nominated by independent bodies, the voting was secret. The press, radio and television reported the result in detail and truthfully, the state printed special postage stamps and coins with the likeness of the election winner.

In short, there had just been a free election in Belarus - the country where the obviously rigged and internationally unrecognised re-election of long-term strongman Alexander Lukashenko had driven hundreds of thousands onto the streets and put tens of thousands behind bars. The vote, however, was not for a politician, but for the Bird of the Year. This year, the Lasur's tit won the title.

The white and blue bird could be the last to receive the honour. Because the bird protection association APB, which organises the election so meticulously, so seriously and so democratically, has just been banned. The state has identified the conservationists, of all people, whose logo it itself distributes on stamps, as enemies of the state and bans them on the basis of a law that prohibits associations from distributing war propaganda or other extremist activities. The "liquidation" of the country's largest environmental NGO has been decided in the Supreme Court in Minsk on Friday March 18...

- <https://www.riffreporter.de/de/umwelt/belarus-vogelschutz-verband-wird-verboden-lukaschenko>



The Belarusian state has very recently produced special stamps with the APB logo, the organization that now (March 18) has been forbidden. The Lasur's Tit is the Bird of the Year in Belarus. The election is organised by the bird protection association APB, which is now banned.

**From IMCG's letter of support for APB offered to the Supreme Court of Belarus:**

"...Our main partner in the successful conservation and restoration of peatlands in Belarus has for more than 20 years been the NGO "Akhova ptushak Batskaushchyny" (APB).

In July 2014, the International Mire Conservation Group held its 18th International Field Symposium, Congress and General Assembly in the Republic of Belarus. The organisation and execution of these events were decisively supported by APB. The IMCG delegation from 14 countries, accompanied and supported by Belarusian specialists, travelled across Belarus, studying the diversity and functionality of peatlands and the issues facing them. As a result, the IMCG expressed its appreciation for the efforts of Belarus in ensuring protection and promoting national and international recognition of mires. IMCG applauded the leading role that Belarus had taken in bringing the importance of peatlands for climate regulation under the attention of the UN Framework Convention on Climate Change (UNFCCC) and congratulated Belarus with its achievement of getting peatland rewetting recognized as a new activity under the Kyoto Protocol.

...APB has made an important contribution to these achievements, by its exemplary large-scaled peatland rewetting projects, by its early recognition of the perspectives of peatland carbon trading for the benefit of Belarus, and by its support in developing the necessary international standards and methodologies.

It is therefore with great concern, that we have heard that APB has received an invite to an interrogation in the Supreme Court of Belarus as a case was initiated on the suit of the Ministry of Justice on the liquidation of the organization.

The liquidation of APB would be a great loss for the Republic of Belarus as well as for European and worldwide nature and especially peatland conservation. The work of APB has always been to the benefit of the Republic of Belarus, its nature and its people. With its initiatives and involvement in peatland conservation and restoration, APB has substantially increased the standing of Belarus in the international arena.

We therefore urge you and all government bodies in your country to consider very carefully any decision on the future of APB and to allow this globally recognised organisation to continue its work for the benefit of peatlands, the people of Belarus and our common planet.

## **Finland**

### **Stora Enso Oyj: Cooperation on peatland restoration to enhance biodiversity**

Stora Enso and Tornator will restore 1,000 hectares of low forest cover peatland in eastern and southern Finland between 2022 and 2027. The land is owned by Tornator. "Restoring peatland to as natural state as possible starts with harvesting when the ground is frozen and able to support forestry machinery. After the restoration measures, the drained peatland will, in the long term, recover to its natural state. We will use the harvested wood for renewable and recyclable products that replace fossil-based raw materials," says Niina Partanen, Environmental Manager at Stora Enso. "In its biodiversity program, Tornator mainly restores drained peatlands where it is not reasonable to continue active forestry. Our cooperation with Stora Enso promotes harvesting in these areas, thus enabling the projects to be implemented as planned," says Heikki Myöhänen, Environmental Manager at Tornator.

In the long term, the restoration of low forest cover peatland will increase the amount of carbon sequestered in peat. Improving peatland habitat will contribute to the recovery of vegetation and other species, the condition of the waterways beneath peatlands and thus, for example, the recreational use of lakes. At the same time, berry picking and hunting opportunities in these areas will be improved. The cooperation between Stora Enso and Tornator on peatland restoration is part of a broader partnership between the companies, which also includes forest management services, research and development work and a long-term timber trade agreement that was renewed in 2021.

- <https://www.marketscreener.com/quote/stock/STORA-ENSO-OYJ-1412452/news/Stora-Enso-Oyj-Cooperation-on-peatland-restoration-to-enhance-biodiversity-37606893/>

[Tornator](#) owns 637,000 hectares of forest in Finland, making it the largest private forest owner in Finland. Stora Enso owns 41% of Tornator.

## Germany

### Germany to boost renewables in agriculture, link peatlands with solar panels

The agriculture, climate and environment ministries of Germany led by three Green ministers want peatland areas – which are key for the climate – to be connected to agricultural photovoltaics. “Our three houses have set out to ensure an optimal exchange between the requirements of agriculture and energy production as well as the protection of nature,” said Agriculture Minister Cem Özdemir at the presentation of the paper on 10 February. According to the paper, so-called Agri-PVs, which are a smart combination of agricultural infrastructure with a solar PV installation, are to be promoted via the Renewable Energy Sources Act EEG. This would allow using the land both for agriculture and energy production. In addition to subsidies from the EEG, it should also be possible to receive them from the EU’s Common Agricultural Policy (CAP).

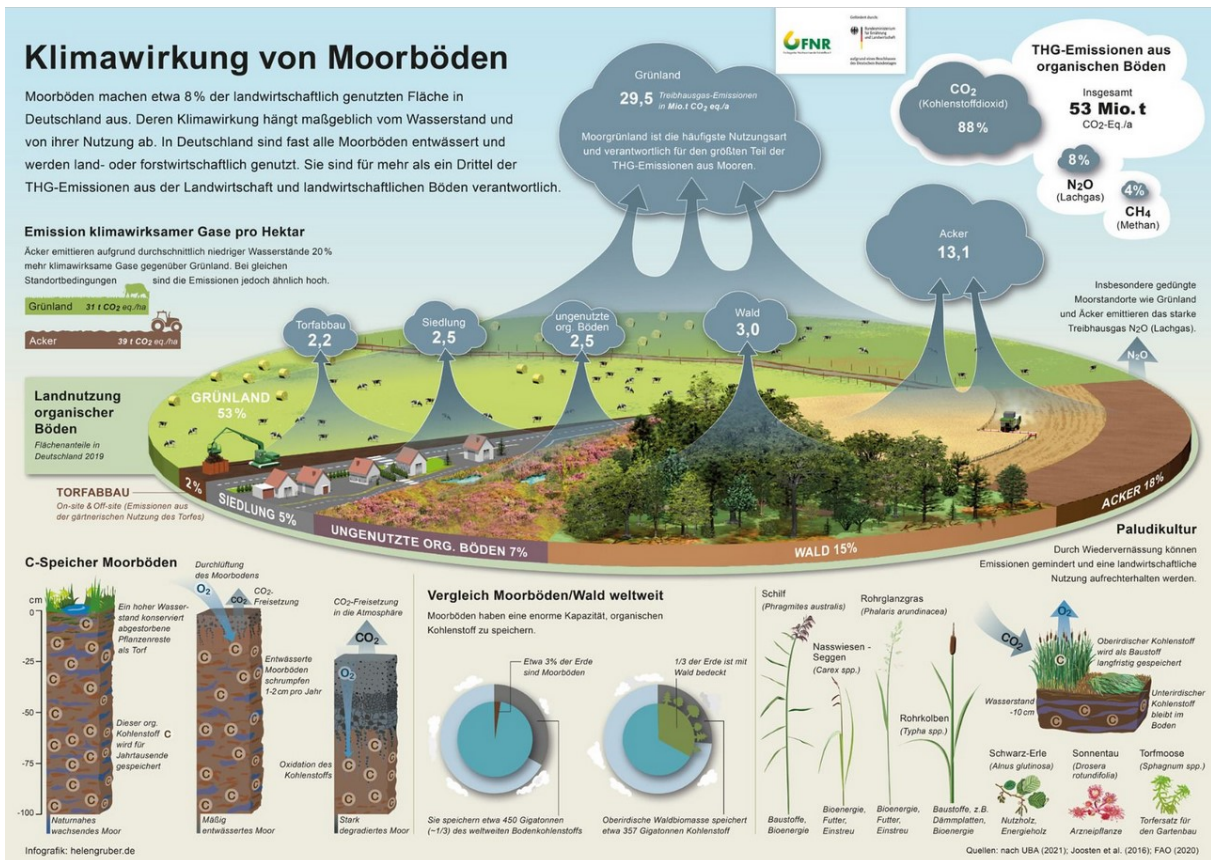
The three ministers also agreed to have peatlands used for agricultural purposes as a new land category of the EEG subsidy in the future. This means that farmers who re-wet peatlands could receive additional funding for the construction of solar cells. The rewetting of peatlands is considered an important climate protection measure. But because the agricultural use of the land is severely restricted or made impossible, financial compensation for farmers is a central and sensitive issue. The German Farmers’ Association DBV has repeatedly stressed that rewetting measures must be voluntary and adequately compensated. The expansion of photovoltaics should continue to take place primarily on buildings or on land converted for this purpose, it wrote in a position paper. The loss of agricultural land, which is needed for sustainable food security, must be avoided “as far as possible”, it added.



*German Environment Minister Steffi Lemke (l.) receiving the brand new and huge book “Deutschlands Moore - Ihr Schicksal in unserer Kulturlandschaft” (“German peatlands - Their fate in our cultural landscape”) written by IMCG honorary members Michael Succow (r.) and Lebrecht Jeschke, IMCG Main Board member Franziska Tanneberger and IMCG ordinary member Greta Gaudig, on February 15, 2022. Photo: Jan Peters, Succow Foundation/GMC.*

“We have set ourselves the goal of generating 80% of our electricity from renewable energies in less than nine years,” explained Robert Habeck, the Vice-Chancellor and Economy and Climate Action Minister. Given the meagre 40% share of renewables in the country’s energy mix and the expected increase in electricity consumption, the share would have to be more than doubled. Within a few years, the new federal government wants to almost quadruple solar power capacity in Germany. Of the 750 terawatt-hours that Germany will probably consume in 2030, 200 are to come from solar cells. “In the former cabinet: renewables OR nature conservation OR agriculture. In the end, everyone lost,” commented [Özdemir on Twitter](#). In the previous Grand Coalition under former Chancellor Angela Merkel, former Environment Minister Svenja Schulze of the Social Democrats and former Agriculture Minister Julia Klöckner of the conservative CDU, rarely saw eye to eye. However, the environment ministry and agriculture ministry have not yet been demoted to extended state secretaries of the ministry of economy and climate, as was initially feared. Even Environment Minister Steffi Lemke has been able to set her own accents, by allowing municipalities to link up with nature conservation. “We want to make the necessary expansion of open space and agricultural PV compatible with nature: by linking it to nature conservation criteria, the simultaneous rewetting of peatlands and an expansion of the area coverage in disadvantaged areas,” said Lemke.

- <https://www.euractiv.com/section/agriculture-food/news/germany-to-boost-renewables-in-agriculture-link-moorlands-with-solar-panels/>



- [https://fnr.de/fileadmin/Projekte/2022/Mediathek/Abb\\_319\\_Moor\\_Grafik.jpg](https://fnr.de/fileadmin/Projekte/2022/Mediathek/Abb_319_Moor_Grafik.jpg)

**Ireland**

Anja Murray is an ecologist and broadcaster, she is a regular presenter on ‘Eco Eye’ on RTÉ 1 and writes the weekly ‘Nature File’ on RTÉ Lyric FM.

**Anja Murray: We have done a great deal of damage to bogs in a very short space of time**

We have always had a deep relationship with peat bogs in Ireland. Thousands of years ago, in Neolithic times, people believed peat bogs were the meeting point of sky and earth, portals or entrances to the ‘otherworld’.

Votive offerings were often left in bogs, precious objects offered up to appease the goddess of the land and assuage the threat of storms, droughts and plagues. Since we began harvesting deep peat for fuel in the 1960s, countless artefacts have been unearthed from bogs, including the bodies of sacrificed kings from the Bronze Age. We have come a long way since in our understanding, especially in the past 20 years. We now understand, for example, that the conditions that preserve bog bodies, bog butter and even ancient manuscripts, are the same conditions that make peat bogs enormous stores of fossil carbon.

All the plant material that accumulates as wet peat is actively sequestering carbon from the atmosphere. When we drain peat bogs and harvest the peat, this stored carbon is released into the atmosphere. Because we have already drained and damaged most of our peat bogs, huge quantities of carbon dioxide are escaping from peatlands and contributing to climate heating. In Ireland, drained peatlands account for emissions of 11 million tonnes of CO<sub>2</sub> each year, the same quantity of CO<sub>2</sub> emitted by the entire energy sector in 2018.

To address this gaping problem, people all over the world have been embarking on projects to 'rewet' peatlands. Rewetting involves raising the water table to re-establish water-saturated conditions. If we have any hope of meeting emissions reduction targets that might keep global heating to below 2°, then rewetting peat bogs must be carried out in addition to stopping emissions from burning fossil fuels, from ruminating cattle, and from other land use changes. Peatland restoration cannot be accounted as a way to offset continued emissions from other sectors, as some suggest. Every available action has to be taken, there is no wiggle room in addressing the climate emergency. The good news is that rewetting peatlands also provides much-needed space for nature.

Peat bogs, because of the distinctive nature of the conditions, are home to some very strange plants. Because nothing really breaks down in a natural wet bog, there are very few nutrients available to growing plants. So some have evolved highly specialised ways of overcoming such a challenge. Sundews and Butterworts are plants that have evolved to feed themselves on midges and small flies. These carnivorous plants have glistening sticky tentacles which a passing insect mistakes for a tempting droplet of nectar, but once they land on one of these tentacles, will find themselves stuck. Over the course of a few days, the plant secretes digestive enzymes to consume its catch, an unusual approach for a plant to get the nutrition it needs. Dragonflies and damselflies are often seen on wet bogs too, shimmering blue and emerald green, darting about over wet pools between the hummocks of colourful sphagnum mosses. Frogs in turn eat the damselflies, a tasty, protein-rich food source for them.

Today, only a tiny proportion of the raised bogs in Ireland are ecologically worthy of conservation, and actively growing raised bog now covers only 0.6% of the original area. We have done a great deal of damage in a very short space of time. Urgent action is now needed to bring back many of the species that rely on bogs from the brink of extinction in Ireland. Our record on implementing environmental law that protects peat bogs is atrocious. The state is only now beginning to fund rewetting and other conservation programmes.

The economics and ethics of harvesting and processing peat no longer stack up: not only does draining peat bogs release millions of tonnes of carbon dioxide, but the fuel itself is more climate polluting than coal. In moving away from harvesting peat, provision must be made to ensure a just transition for the workers of Ireland's peat industry, protecting the rights and dignity of workers and communities whose livelihoods have depended on peat production.

The industrially harvested peat bogs of the midlands are now in need of rehabilitation to stem the continued seepage of greenhouse gases into the atmosphere, long after harvesting has ceased. And then there are the 270,000 hectares of natural peatlands, those where small amounts have occurred, mostly around the periphery of the bog, and these are in need of restoration for the very rare habitats and species they contain. Afforested peatlands, those upland areas blanketed in exotic spruce plantations will also need to be restored - all 300,000 hectares of them. Currently, less than 10% of peatlands in Ireland are under rehabilitation or restoration.

There is one community showing the way forward for our relationship with bogs. Twenty years ago, a local action group fought to protect Abbeyliex bog from industrial peat harvesting, and after a long but eventually successful campaign, the bog was spared. Now the community take much pride in the bog and it serves as a focal point for the whole community to manage and enjoy. Teams of volunteers run local events out on the bog, the men's shed have built almost a kilometre of wooden walkway, and schools groups monitor the wildlife that lives in and around the bog. Recently, nesting boxes for barn owls and kestrel box have been erected by the community too.



There are communities all over Ireland involved in peatland restoration, while also celebrating the heritage of turf cutting in the past.

Bogs are places that change very little over time, if left to their own devices. When we didn't know any better, we mined Ireland's peat bogs to near oblivion. Now that we do know better, we have a small window of opportunity to make amends with the natural world, not only for the benefit of sundews, dragonflies and nesting curlew, but for all our benefit, now and in the future.

- <https://www.irishexaminer.com/lifestyle/outdoors/arid-40809567.html>

*Peatland landscape in County Kerry, Ireland. Photo: Hans Joosten*

### **Teagasc removes peatland from drainage advice**

After decades of encouraging farmers to reclaim boggy land, Teagasc, the Agriculture and Food Development Authority of Ireland, has updated its land drainage advice manual to remove references to environmentally harmful peat drainage. In an update to its Manual on Drainage and Soil Management published in February, Teagasc now says farmers should not consider any fields with high organic content or peat soils for the implementation of land drainage works, as this would be contrary to climate action goals for Ireland. It said with vulnerable habitats or wetlands, any benefits yielded from drainage will come at too high a cost to the wider environment and cannot be justified, adding that such works must be avoided. "The drainage of high organic content or peat soils will result in substantial CO<sub>2</sub> emissions to the atmosphere, which would dwarf any non-CO<sub>2</sub> benefit," it says.

In the manual, Teagasc director Prof Frank O'Mara highlights that science and policy have acknowledged that the role of land drainage across the globe needs to change. "Drainage of high organic content soils is no longer climate-smart. This manual, therefore, focuses on mineral soils," he says. "Further drainage of high organic content or peat cannot be justified and a significant programme of water table management should be considered on those organic soils that were previously drained." Prof O'Mara says it is vital that any future drainage project is climate-smart and profit-driven and carefully evaluated for financial viability as well as technical feasibility. "Farmers have a profound understanding of sustainability and realise that the optimum drainage project may include leaving some hectares as they are," he says.

In its previous land drainage manual published in 2013, while the drainage of peat was not dealt with specifically, Teagasc said it was accepted that some peat lands were "worth draining". "Where peat has been successfully drained, the nature of the peat itself has been changed by the removal of water to a point where it will not 'wet up' to the same extent again," it said. Teagasc's change in policy comes after the Government announced an ambitious target to rewet at least 80,000ha of drained, agricultural, managed, carbon-rich soils in its Climate Action Plan.

- <https://www.independent.ie/business/farming/news/farming-news/teagasc-removes-peat-from-drainage-advice-41369898.html>

### **Peatland: Ireland ‘not taken into account’ on commission rewetting plans**

The European Commission has compiled a draft regulation to go before the European Parliament and European Council that will set out a range of actions for “nature restoration”. These cover a range of areas, including forestry and biodiversity. However, the document’s targets for peatland rewetting will cause the most concern. This proposal, which pertains to “drained peatlands under agricultural use” calls on member states to “put in place, without delay, restoration measures including rewetting”. The targets are as follows:

- By 2030 – restoration measures on 30% of these peatlands, of which at least a quarter must be rewetted;
- By 2040 – restoration measures on 50% of these peatlands, of which at least half must be rewetted;
- By 2050 – restoration measures on 70% of these peatlands, of which at least half must be rewetted.

As can be seen, the proposal will not require all peatlands to be rewetted. However, farming on targeted peatlands is still likely to be restricted under other types of restoration measures. For example, the document outlines some ways in which restored or rewetted peatlands can be used productively. However, these methods are far from the norm in Ireland and have no history of being practiced here.

Although this proposed regulation is some ways off from becoming an actual legally-binding policy, it has already received an unwelcome reception in Ireland. When asked for a comment, Fianna Fáil MEP Billy Kelleher said: “The draft proposals coming from the commission seem to place a very high burden on [Irish farmers](#). “While they still need to go through the legislative process, with the European Parliament and the European Council having their say, I am worried that Ireland’s particular circumstances and the impacts on farmers – especially small farmers – has not been taken into account,” Kelleher added. “This proposal is aimed at agricultural land. However, Ireland has some of the largest concentration of peatland in the EU, and Bord na Móna has already committed to rewetting 35,000ha of bog. This needs to be included in Ireland’s totals I believe.” The MEP – who is a member of the European Parliament’s Environment Committee – said: “I will follow this file closely when it comes before the [committee] to ensure it is fair and proportionate.”

- <https://www.agriland.ie/farming-news/peatland-ireland-not-taken-into-account-on-commission-rewetting-plans/>

### **FarmPEAT’s ‘Love Your Wellies’ Art’s competition**

The FarmPEAT ‘Love Your Wellies’ Art’s competition is now live, and it is unlike anything you have seen before! Every corner of every field, village and town in rural Ireland has a story that needs telling. This is the chance for students across the country to give a voice to those gems. Through song and dance, story-telling or visual arts, use your skills to tell us your story. This art’s competition is designed primarily for students living in the peat landscape of the midlands of Ireland but is open to everyone with a passion for nature, farming, community, or history. All we ask is that students tell us their story through their eyes, using whatever means best suits them and that their story has a connection to the peat landscape. Firstly though, I should mention who we are and why we want your story.

FarmPEAT is an EIP (European Innovation Partnership Project) aiming to improve the environmental quality of agricultural lands on peat soils. The aim of the project is to find ways of managing agricultural land on peat for the benefit of climate, biodiversity, and water quality. To encourage this change of management we offer results-based payments. This means a farm in good ecological condition will get a higher payment than a farm in poor ecological condition. We work with a group of farmers whose lands surround 8 raised bogs across the midlands. These farms surround some of Europe’s finest remaining raised bogs. Improving the quality of the transition zone around these bogs will help protect the raised bogs for generations to come.

Farmers are on the frontline in the fight against climate change and as much as they try to do, they cannot do it alone. Every farmer is part of a community, and they also need to help. The real question though, why does it matter? Why do we need to save raised bogs? Did you know that they store 13x more carbon per hectare than the Amazon rainforest? Yes, they are that effective! However, after years of draining water out of our bogs, most of Ireland’s raised bogs are now carbon sources, which means they are releasing more carbon into the atmosphere than they are taking in. We need to turn them back into carbon sinks so they can take in the carbon and store it out of harm’s way, or at least reduce the amount of greenhouse gases they are releasing. We can do this by stopping the flow of water (water is essentially the blood of the bogs) from the peat and make our bogs wet again. In Ireland, the greenhouse gases released from 1ha of farmland on drained peat releases about the

same amount of greenhouse gases as 5 cars. We need this to stop but we need to find a balance so farmers can continue to do the great work they have done for so long, while also helping to store carbon in their peat soils. The 'Love Your Wellies' art's competition is one of the ways we are engaging with the community. We need your stories to show why this land is so special and to raise awareness to those who are unaware. So far, the response has been incredible to the competition with numbers expressing interest beyond what we thought possible, but we do not have a limit. Every entry will be accepted and given our full attention. We have students making 3D models, writing stories and drawing some beautiful art. A wonderful example of our entries so far is of a group of students who are interviewing their grandparents, comparing how different their lives are with when their grandparents were young and then creating a collage to represent it. Another group of students are writing a song and creating a music video about their local bog while performing from that same bog. The opportunities are endless!

Be sure to get your entries in before 8<sup>th</sup> April. Go to our website at [www.farmpeat.ie](http://www.farmpeat.ie) for all the competition details on how to enter the 'Love Your Wellies' art's competition. Follow us on Facebook @FarmPEAT and Twitter @FarmPEATProject to stay up to date on the competition. Subscribe to our YouTube Channel ([www.youtube.com/c/FarmPEATproject](http://www.youtube.com/c/FarmPEATproject)) to learn more about the project. There are prizes for both the students and their schools. We await your creation.



# 'Love Your Wellies'

Choose YOUR Theme  
Choose YOUR Format  
Tell YOUR Story!



## Art's Competition



**Did you know?**  
*with Farmer Pete*

*Raised Bogs store approximately 13 times more carbon than the Amazon Rainforest at 3,250 tonnes p/ha!*

*1 hectare agricultural grassland on peat emits the equivalent amount of Carbon that 20 cars do in 1 year.*

- <https://www.farmpeat.ie/>

### **Climate Action Plan 2021 - Securing Our Future**

On Thursday 4 November 2021, the government has launched the Climate Action Plan 2021, an ambitious plan to put Ireland on a more sustainable path, cutting emissions, creating a cleaner, greener economy and society and protecting us from the devastating consequences of climate change. The Climate Action Plan follows the Climate Act 2021, which commits Ireland to a legally binding target of net-zero greenhouse gas emissions no later than 2050, and a reduction of 51% by 2030. The plan sets out indicative ranges of emissions reductions for each sector of the economy by 2030: Electricity 62-81%, Transport 42-50%, Buildings 44-56%, Industry/Enterprise 29-41%, Agriculture 22-30%, Land Use, Land Use Change and Forestry (LULUCF) 37-58%. Reducing emissions from land use, and a move to being an overall store of carbon, will involve reducing management intensity of 80,000 ha of drained organic soils and rehabilitation of 65,000 of peatlands.

- <https://www.gov.ie/en/press-release/16421-climate-action-plan-2021-securing-our-future/>

### **5,200 hectares of boglands restored in 2021**

Bord na Móna announced on World Wetlands Day, February 2, that 5,200 hectares of peatlands has been restored across the country in 2021. The achievement is due to a large-scale rehabilitation scheme begun last year that is aimed at securing carbon over a vast area of Irish peatlands by reviving their natural ability to capture carbon dioxide – to help tackle carbon emissions. The scheme is supported by €108 million of Government and European funding and €18 million from Bord na Móna itself. The total amount of peatlands that have now been rehabilitated and restored by Bord na Móna is more than 25,000 hectares. This growing area “is creating a rich mosaic of biodiverse peatlands, incorporating important carbon sinks and stores”, Bord na Móna said. These restored and rehabilitated bogs are increasing biodiversity and providing new habitats for thousands of native plant and animal species, it added. “The return of nesting cranes to a Bord na Móna peatland after 300 years shows the enormous future potential for nature to renew and restore itself.”

There are almost 300 people employed in peatland rehabilitation and associated operations in Bord na Móna, with many new roles in this regard taken up by people previously employed in extraction and transport of mostly peat-based fossil fuels, Bord na Móna chief executive [Tom Donnellan](#) said. The company has also recruited engineers, ecologists, and surveyors to deliver in the design and implementation of the Peatlands Climate Action Scheme.

Rehabilitation operations for 2021 were focused on 18 bogs, with the lion’s share in Co Offaly and east Co Galway. The county-by-county breakdown for peatlands rehabilitated in 2021 shows: Offaly, 2,519 hectares; Galway, 1,563ha; Longford, 634ha; Roscommon, 354ha; and [Kildare](#), 126ha. This work is administered by the National Parks & Wildlife Service with oversight and monitoring by the EPA. The new scheme is one of the largest in Europe and is of international importance because of its scale – although overall land use in Ireland continues to be a significant net source of nearly 5 million tonnes of carbon emissions. Grassland on drained organic soils and degraded bogs together emit about 10 million tonnes of carbon, about the same amount as the power sector, each year.

The peatlands scheme uses a range of engineering and ecological interventions to carefully rewet peat and encourage processes that will secure and capture carbon. Ultimately, it is projected to rehabilitate more than 30,000 hectares, with the aim of benefiting communities across Ireland by helping to reduce emissions, improve water quality and enhance the local environment.

- <https://www.irishtimes.com/news/environment/at-least-7-5m-tonnes-of-carbon-protected-by-peatlands-rehabilitated-in-2021-1.4791340>
- <https://www.irishexaminer.com/news/arid-40798161.html>

### **“Peat extraction should not continue for horticulture”**

The Irish Peatland Conservation Council (IPCC) has said it does not support the final report on peat use in horticulture claiming that recommendations go against Ireland’s commitment to the climate and biodiversity crisis. The final report of the working group on the use of peat moss in the horticultural industry was published on Monday, January 17. The IPCC said that it recognises that viable peat alternatives have been identified by the working group, however, it is against the working group’s statement to continue peat extraction for horticulture

until 2035. The final report stated that the use of peat in horticulture should be phased out by 2035 at the latest, provided that alternative materials are available.

In a series of action, the government [announced](#) that it will commission experts to provide free advice to those wanting to extract peat, which must happen in compliance with the relevant regulations on bogs below 30ha.

In its announcement, the Department of Agriculture, Food and the Marine (DAFM) said that the “fastest route for the domestic industry appears to be small-scale extraction on previously drained sub-30ha bogs”. The IPCC said it is “shocked” by the government which “gives with one hand and takes with the other”, considering previous investment in peatland restoration and its climate change obligations under EU law. Instead of [rehabilitating](#) smaller bogs for wildlife purposes and climate mitigation, the DAFM will “provide free advice on how to finalise their destruction”, the organisation stated. “The department has failed to put an end to the environmentally damaging practice of peat extraction for horticulture.” The IPCC added that peat exportation remains unaddressed and that “peat sales from the amateur retail market” continue.

Another “disappointing announcement” sees Bord na Móna, a “climate solutions company”, adding 2,000t of horticultural peat to the market, according to the IPCC.

The peatland charity said that it welcomed previously announced government [investment](#) and actions for the protection of the peatland ecosystem. However, the IPCC concluded: “As one governmental department creates positive climate action and biodiversity policy, another department is eroding any progress made away.”

- <https://www.agriland.ie/farming-news/peat-extraction-should-not-continue-for-horticulture-conservation-council/>
- <https://www.ipcc.ie/6804-2/>

## Netherlands

### Kate Foster invites peatland conversations at World Soil Museum



*Kate Foster invites peatland conversations at World Soil Museum*

This year, the ISRIC World Soil Museum, Wageningen, welcomes an artist-in-residence to bring new perspectives to education about the importance and diversity of soils. The artist, Kate Foster, will work with the World Soil Museum during 2022 to generate dialogue and engagement around peatland and wetland soils. Kate Foster is

an environmental artist in the Netherlands and Scotland. Her ecological concern led to collaborative art-science projects and involvement with grassroots restoration projects and advocacy. Since 2016, she has focussed on wetlands. "Peatlands are among the most severely affected by human-induced degradation. The work of Kate is thought-provoking, stimulates dialogue and invites to reflect on the values of wetlands and their soils in relation to society and sustainability," said Head of the World Soil Museum Stephan Mantel.

Kate's commitment to making peaty connections between Scotland and the Netherlands led to an Erasmus+ scholarship in Wageningen University (2020) with the [Home Turf Project](#) -- a project which analyses the long-term development of raised bogs in the Netherlands, Germany and Belgium. This year, Kate's residency with the [World Soil Museum](#) will bring together her interests in the heritage and future of wetlands and their soils, environmental advocacy and fostering community conversations.

The first collaborative initiative of Kate's work at the World Soil Museum will be a four-part online series of researchers talks for the wider community on peatland-related topics. How have people interacted with peatland landscapes over time? How can we know more about peatlands and appreciate their value better? The four webinars will give a variety of perspectives from interdisciplinary research by Wageningen University and Research's (WUR) Home Turf and [Wetfutures](#) projects. Each webinar presents new research work on a particular theme with a response by Kate:

- Past environments of peatlands: Thursday, February 10, 2022 at 14.00-16.00 CET
- Archeological tales from the bog: Thursday, February 24, 2022 at 14.00-16.00 CET
- Reviewing cultural histories: Thursday, March 10, 2022 at 14.00-16.00 CET
- Living with peatlands today: Thursday, March 24, 2022 at 14.00-16.00 CET

Register here: [https://us02web.zoom.us/meeting/register/tZYtfuCprDMpHtNKPIK2Xy\\_Ng3m2vcno5qj2](https://us02web.zoom.us/meeting/register/tZYtfuCprDMpHtNKPIK2Xy_Ng3m2vcno5qj2)

What is the current sense of peatlands in The Netherlands? How can the other research we have heard about relate to this? How do people perceive peatlands in Ireland, where 20% of the country is covered by peat soil of which 85% is environmentally degraded? How might an artist characterise non-human figures for new narratives? Explore these questions with Head of World Soil Museum Stephan Mantel, WUR Research and Education officer in Cultural Geography Maria de Wit, National Geographic Explorer Emily Toner and artist Kate Foster.

Kate Foster's formal education includes Environmental Art in 2001 at the Glasgow School of Art, a PhD in social science, and an MSc in Research in Interdisciplinary Creative Practice from University of Edinburgh in Scotland in 2019. Learn more about Kate Foster's work here: <https://linktr.ee/katefoster>

- <https://isric.org/>
- <https://ifthenisnow.eu/nl/agenda/kate-foster-invites-peatland-conversations-at-world-soil-museum>

## United Kingdom

### Are sequestration sales the Highland Clearances Part II?

The emergence of markets for carbon and other forms of natural capital has led to increased interest from private investors in ecosystem restoration. Coupled with grants for woodland creation and peatland restoration, this is acting as a major driver for land use change across the UK. The increasing interest in forestry and plantable hill ground from corporate investors due to high timber prices, competitive planting grants and the strong investment performance of forestry has also been widely noted. But with farmers warning that the lack of regulation on such sales threatened to see Scotland become the 'bargain basement' for foreign investors wanting to offset their environmental footprint or to speculate in carbon credits, fears have been raised in some quarters of a repeat of the Highland Clearances. So, with agriculture increasingly being displaced by large private acquisitions, a major roundtable event has been announced to bring together key stakeholders from across the UK to investigate the opportunities and risks arising from such landscape-scale alterations in how the countryside is managed – and as tree planting displaces agriculture, food sovereignty and the viability of rural communities will also be on the table..

However, the roundtable will also look at the benefits of private investment which could help meet net zero and other nature-related targets over the next ten years – as well as increase land values for owner-occupier farmers. Researchers from the Scottish Environment, Food and Agriculture Research Institutes (SEFARI) and the University of the Highlands and Islands have invited people from all sides of the debate – including representatives from the UK and returned governments, investors, landowners and community groups – to join the proposed Special Advisory Group. The project, which will also look at changes in land use within existing holdings as well as large-scale acquisitions is funded by the Scottish Government –with the first meeting taking place on Feb 22, chaired by the SRUC’s Professor Mark Reed.

A preliminary evidence review, which collated and assessed evidence from the UK and international studies, was drawn up before the meeting by SRUC rural society researcher, Dr Rob McMorran. “These market shifts bring real opportunities for increasing private investment in the environment and for land managers to diversify their income at a time of uncertainty in relation to future agricultural support,” said McMorran. “However, we found that large scale private acquisitions of land for natural capital may also bring real risks, including potentially concentrating the distribution of benefits associated with natural capital and conflicting with a wider policy emphasis on diversifying landownership and increasing opportunities for communities to influence decisions around land use.” McMorran said this meant that how large scale acquisitions and the development of natural capital markets sat alongside public support mechanisms, needed careful consideration to ensure related opportunities were fairly distributed across the land management sector and rural communities.

- <https://plainsmenpost.com/are-sequestration-sales-the-highland-clearances-part-ii/>

### **Scotland tipped to benefit from carbon market boom as firms seek ‘home-grown’ nature solutions**

Property experts are forecasting a 40-fold increase in the carbon credit market – where investment in environmentally beneficial projects is used to offset greenhouse gas emissions – over the next eight years. In a new report, property consultancy Bidwells suggests businesses struggling to fully decarbonise at source will increasingly be forced to rely on such schemes to neutralise ‘residual’ emissions and achieve Scottish and UK net-zero targets by 2045 and 2050. Bidwells says the UK currently cannot produce enough carbon credits to fulfil demand, but greater provision must be created urgently.

As part of this they are expecting a massive surge in demand for land in the UK which can provide “home-grown” nature-based solutions for removing and locking up carbon.

And [Scotland](#) is prime territory for such initiatives, with peat covering around 23 per cent of the total land area. We are already seeing a glimpse into the future of how ‘carbon capture’ potential is driving up land prices north of the border as buyers rush to snap up sites that can be used to plant trees or where peatlands need restored. The value of areas planted with commercial forestry has been rising steadily over the past five years, but recently there has been a significant increase in demand for rougher hill ground, traditionally considered to have limited uses.

- <https://www.scotsman.com/news/environment/how-carbon-offsetting-could-benefit-scotland-3570504>

### **Peatland Code update**

The [Peatland Code](#) continues to grow rapidly. 79 projects have now registered 10,300 ha of expected peatland restoration. Of these 79 projects, 11 are validated with a total of 1,600 ha and 304,239 tonnes of carbon dioxide equivalent (CO<sub>2</sub>e) emission reductions over their project lifetimes. Another 20 projects are currently undergoing validation and 3,334 Pending Issuance Units have been sold to date representing an expected reduction of 3,334 tonnes of CO<sub>2</sub>e emissions. [Read more...](#)

### **Yorkshire Peat Partnership celebrates another successful year**

As Yorkshire Peat Partnership (YPP) heads into the new restoration season, they take a moment to celebrate their achievements from the 2020-2021 season with their [annual report](#). In their 2020-2021 season they:

- brought over 5,000 hectares of peatland into restoration management
- blocked 156 km of eroding grips and gullies
- planted over 76,000 sphagnum moss plugs, 132,000 crowberry plugs and 173,000 cottongrass plugs
- surveyed over 6,500 hectares of peatland on foot [Read more...](#)

### Moors for the Future Partnership presents: Blanket bogs are worth protecting video series

Moors for the Future Partnership has developed five videos to help people understand the multiple benefits of healthy blanket bogs in the Peak District, South Pennines and beyond. They will be releasing and promoting the videos fortnightly on social media over the next few months. The following videos have already been released:

- [Tackling climate change](#)
- [Reducing the risk of flooding](#)
- [Cleaner water](#)

[Read more...](#)



*Peat landscape in the Flow Country, Scotland. Photo: Hans Joosten.*

### Natural heritage organisation withdraws Yell wind farm objection

Scotland's natural heritage agency has now formally withdrawn its objection to a proposed 18-turbine wind farm of the Norwegian company Statkraft in Yell. NatureScot said following discussion with the applicant, and the submission of an amended habitat management plan, it was satisfied provided there are conditions imposed in the event of consent for the Energy Isles wind farm. The agency previously objected to the plans over the "adverse impacts" on peatland and on the special qualities of the Shetland National Scenic Area. The proposed wind farm, which would be located south of Gloup, originally began life as a 63-turbine development. Through the years the project has been [refined down to 18 turbines](#).

Campaign group Sustainable Shetland has issued fresh concern over the plans, saying the turbines would be "grossly out of scale to the local landscape" despite the reduction in numbers. The turbines would be 180m from bottom to blade tip, which is 25m larger than those that will be installed at the Viking Energy wind farm. Group chairman Frank Hay questioned the carbon payback figure of 1.7 years – as well as the value for money to energy consumers due to grid upgrades required to connect the wind farm. "The main aim of this proposed wind farm continues to be financial gain, as governments seem all too willing to throw money towards renewables, rather than any genuine ambition to achieve net zero and save the planet," he wrote to the Scottish Government's energy consents unit.

"The foolhardiness of supporting an energy source which cannot be relied on to deliver as and when required has been all too apparent in recent months, as energy bills rocket upwards. "Supporting and giving planning

consent to projects like Energy Isles can only contribute more to energy poverty as well as permanently damaging a pristine peatland environment.”

Speaking last year in response to concern from Shetland Amenity Trust on the peatland impact, Energy Isles Limited director Derek Jamieson said: “Renewable energy must be part of the strategic fight against climate change and reduction of carbon emissions. “That is why our proposals have evolved to ensure that the Energy Isles Wind Farm is the correct size to contribute to renewable energy and why we have submitted a robust peat management plan that will not only minimise the impact on the site itself but regenerate vital carpet bog areas elsewhere as well for a net gain in the amount of quality peatland here in Shetland.”

- <https://www.shetnews.co.uk/2022/02/21/natural-heritage-organisation-withdraws-yell-wind-farm-objection/>

#### **UK: Research reveals impact of horticulture peat use on climate**

The campaign to stop peat extraction took off in the 1990s but only now are the UK and Welsh governments conducting a public consultation on ending the use of peat in the retail sector in England and Wales by 2024. The Wildlife Trusts believe we cannot wait this long.

Despite 30 years of campaigning against extraction and increased public outcry, peat continues to be sold in vast quantities for amateur and professional horticultural use, with huge consequences for nature and climate. Industry progress towards peat-free alternatives has been slow and inconsistent, and between 2018-19 peat consumption in the UK declined by just 2.3 per cent before rapidly increasing by nine per cent as lockdown drove more people to buy compost for gardening. Ailis Watt, peat officer at the Wildlife Trusts, said: “These losses are gigantic, irrecoverable and unjustifiable. Peat and the carbon stored within it simply cannot be replenished within human lifetimes. Each time governments dither over whether to ban peat use in horticulture we risk losing more of this habitat that has taken millennia to develop, as well as losing its huge capacity for carbon storage.

“Extracting peat is bad for our climate and for wildlife. Peatlands provide habitat for a rich diversity of plants and animals. Migrating birds feed on peatland insects, while snakes and lizards also thrive in these special places. The UK is already one of the most nature-depleted countries in the world and extracting peat destroys complex ecosystems that are vital for nature’s recovery. It has to stop. Investing in peatland restoration whilst allowing extraction to continue is illogical and an inefficient use of public funds.”

- <https://www.hortidaily.com/article/9405771/uk-research-reveals-impact-of-horticulture-peat-use-on-climate/>

#### **UK: Government urged to take faster measures against peat use**

35 key environmental organizations, including the National Trust and The Wildlife Trusts and over 150 high-profile names from horticulture and politics have released a joint statement urging the UK government to take faster, more effective action to ban peat in horticulture:

Protecting our peatlands and ending the use of peat in horticulture is a vital issue – it’s unusual for so many key organizations covering all areas of conservation to be united on the same issue. These organizations have teamed up with high-profile individuals to send the same clear and urgent message to the government - take faster, more effective action to protect peatlands and ban the sale of horticultural peat.

Continuing to extract, import, export, and sell peat as a product is indefensible. UK Governments must act decisively and bring about a speedy end to the retail sale of peat for horticulture – there is no time to waste.

In going peat-free, the UK would benefit from securing a thriving, sustainable horticultural industry, that leads the way in the development of sustainable, peat-free growing media.

- <https://www.hortidaily.com/article/9406333/uk-government-urged-to-take-faster-measures-against-peat-use/>

#### **RSPB asks public to report burning on peatlands**

The RSPB is asking members of the public to log incidents of burning on peatland using their new app, which allows people to report information on moorland fires while out and about. The evidence collected through the app will help make the case for better protection of Britain's globally important blanket bog, they say.

Between October and April, vegetation is systematically burnt in many upland areas in the UK, in order to encourage the growth of young heather shoots and grass to provide grazing for red grouse, deer and livestock. A practice carried out by shooting estates, deer managers and sometimes crofters and farmers, such rotational burning often results in damage to peatland. Evidence shows that regular burning has numerous harmful

environmental impacts, and has actually caused peatlands to become a source of emissions when they ought to be a carbon store. "Burns are designed to cause significant long-term changes to peatland plant life, and these changes have led to the degradation and loss of our precious upland peatlands and severely damaged the wildlife and communities that depend on it" said Pat Thompson, Senior Policy Officer for RSPB UK. "This damage also has other consequences including reducing water quality through the release of soil carbon, increased risks of flooding for communities downstream of the moors and reducing the landscape's ability to deal with drought." "Whilst some action has been taken by the Scottish and Westminster Government to limit when and where burning takes place, we are concerned that current and often voluntary restrictions are not being followed". "We also believe that they do not go far enough to meet our climate and nature ambitions."

Scotland's Muirburn Code says that burning on peatlands should not take place, but the RSPB is concerned that such burning does, in fact, continue. "As we move towards new legislation it is important that the debate is supported by evidence" Andrew Midgley, Senior Land Use Policy Officer for RSPB Scotland said, "and we think that 'citizen science' could have a useful role to play in collecting data." "That is why we are asking members of the public to help us record evidence of recent burns. This will help us provide information to the Scottish and Westminster Governments so that decision making is informed by real life practice."

Here's where the app comes in. To anonymously report a burn, members of the public can visit the [RSPB Burning website](#) or download the My Survey123 app, available on [iOS](#) and [Android](#). Once the app is downloaded you can head to the RSPB website and follow the steps to sign up to the [Upland Burning Survey Form](#).

To report a burn you need to provide the location, the date, and information on whether it's active or recent. The data collected through the app will be passed to the relevant authorities in England and Scotland in order to help them identify and tackle unsustainable - and in places illegal - moorland burning, and to help bolster the case for tougher legislation.

- [https://www.ukclimbing.com/news/2022/02/rspb\\_asks\\_public\\_to\\_report\\_burning\\_on\\_peatlands-72991](https://www.ukclimbing.com/news/2022/02/rspb_asks_public_to_report_burning_on_peatlands-72991)
- <https://community.rspb.org.uk/ourwork/b/science/posts/can-you-help-us-report-burning-on-peatland>
- <https://www.countryside-alliance.org/news/2022/2/open-letter-the-rspb-s-obsession-with-controlled>
- <https://raptorpersecutionscotland.wordpress.com/2022/02/06/grouse-moor-lobby-group-furious-about-public-reporting-peatland-fires-to-rspb/>
- <https://community.rspb.org.uk/ourwork/b/science/posts/vegetation-burning-in-the-uk-uplands-the-danger-of-importing-science-from-other-biomes>

### **Restoration of Peatland (Net Zero Targets) in the Scottish Parliament on [10th February 2022](#).**

5. To ask the First [Minister](#) what action the [Scottish Government](#) is taking to restore peatland as part of its net zero targets. (S6F-00797)

[Nicola Sturgeon Scottish National Party](#): Since 2012, we have funded the restoration of 30,000 hectares of degraded peat. We are committed to significantly increasing that activity to help meet net zero targets. In 2020, we announced a record funding package of £250 million to support the restoration of 250,000 hectares of degraded peatland by 2030. That commitment is helping to grow a new industry. It is supporting a pipeline of multiyear landscape-scale restoration projects, it is boosting the confidence of contractors to invest in the people, skills and machinery that are needed to get the job done, it is attracting private finance into the sector and, by supporting green jobs in communities across rural Scotland, it is helping our just transition to net zero.

[Rachael Hamilton Conservative](#): I thank the First [Minister](#) for that answer, but we know that her Government's desktop approach to rural areas is failing. For the past four years, peatland targets have been missed. Emissions targets for five key sectors have been missed. Since 1994, 50 per cent of Scotland's iconic species have vanished.

[Lord Deben](#) has said: "the credibility of the Scottish climate framework is in jeopardy." When will the [First Minister](#)'s Scottish National Party-Green coalition take climate change seriously—[Interruption.]—and produce a robust moorland strategy to save Scotland's iconic species and protect biodiversity—[Interruption]

The [Presiding Officer](#): Ms Hamilton, I could not hear your question and I am not convinced that the First [Minister](#) would have been able to hear it. Would you be good enough to repeat the end of your question?

[Rachael Hamilton Conservative](#): When will the [SNP](#)-Green coalition take climate change seriously and produce a robust moorland strategy to save Scotland's iconic species and protect biodiversity and rural jobs and livelihoods?

[The First Minister](#): It actually beggars belief that a [Tory MSP](#) is getting up to talk about taking climate change seriously. [Interruption.] Clearly, they were not listening to the questioning by their leader at an earlier stage. The [Conservatives'](#) approach is, of course, to say that we should take climate change seriously but then opportunistically oppose every measure that we take to tackle climate change when it suits them to do so. We saw that very clearly earlier.

This Government's record on peatland restoration is a good one. I have already spoken about the restoration of 30,000 hectares and the record funding package and all that it is enabling. We will continue to get on with taking the actions to tackle climate change. Perhaps it is the Conservatives who need to learn to take it a bit more seriously.

[Collette Stevenson Scottish National Party](#): Will the First [Minister](#) outline what funding has been made available for the 45 hectares of peatlands at Langlands Moss? Does she agree that the work undertaken by the Friends of Langlands Moss has been a huge factor in promoting the local environment and improving people's health?

[The First Minister](#): In 2019-20, the peatland restoration programme funded by the [Scottish Government](#) funded work at Langlands Moss to the value of £63,800. I certainly agree that the Friends of Langlands Moss is an excellent example of the type of partnership that is needed to allow communities to make decisions about the management of their local environment and to help address the twin climate and biodiversity crises.

- <https://www.theyworkforyou.com/sp/?id=2022-02-10.17.0&s=speaker%3A25510>



*Peatland erosion in the Pennines, UK. Photo: Hans Joosten.*

### **How climate change is washing away precious evidence of our distant past**

As well as threatening [biodiversity](#), [food systems](#) and [human health](#), climate change has another victim: ancient artefacts. At some UK sites of archaeological interest, unusually heavy rainfall is eroding layers of protective peat to damage the [preserved relics](#) that lie beneath.

Some of the UK's finest archaeological remains have been found buried in [peat](#), a type of soil that's naturally high in acidity and low in oxygen. That means it [preserves](#) wood, leather and textiles extremely well, as the microorganisms that would usually cause these materials to break down can't thrive. Peat has helped to keep Britain's ancient environments alive for modern analysis: from [neolithic trackways](#) marking where our ancestors travelled between settlements in Somerset, to preserved bodies like the [Lindow Man](#) found in a bog in Cheshire.

The peat environment in which Lindow Man was buried dramatically reduced [decay](#), meaning that his hair and beard have remained visible even after almost 2,000 years. But climate change is bringing increasingly hotter summers and wetter winters to the UK, including unprecedentedly [heavy](#) local rainfall. This changes the landscape by washing away layers of soil and peat to reveal archaeological buildings, items and human remains. To better understand how fast these changes are taking place – and what their consequences might be for future archaeologists – our colleagues are studying what’s happening at [Magna](#), the site of an ancient Roman fort in Northumberland.

Magna is one of the most fascinating, well-preserved sites in the UK. As a strategic army base, it would have held a commanding position at the [junction](#) between three key Roman roads: the Stanegate, Military Way and Maiden Way. Surveys suggest that it was occupied from AD80-85 to the end of Roman Britain, in around AD410.

To study it, archaeologists dug boreholes and inserted devices called [piezometers](#) to collect data on groundwater levels and temperature. They’re also sending peat samples to a laboratory for chemical and microbiological analysis. This information will help us to understand how the local environment is changing and what effect this might have on archaeological degradation.

Another Roman fort just a few miles east of Magna, Vindolanda, has provided some of the most significant finds from Roman Britain. Here, archaeologists have discovered the first evidence of handwriting by a woman (Claudia Severa writing to invite her friend Sulpicia Lepidina to her upcoming birthday party), the world’s oldest boxing gloves from around AD120, and the largest Roman leather shoe collection ever found – consisting of an astonishing 7,000 items.

These remarkable finds are due to the fort’s unique, peat-rich environment, which means that they’re also threatened by climate-driven deterioration. We fear that finds which haven’t yet been discovered may soon be irreversibly damaged due to the effects of climate change. The drainage, cutting and agriculture that have damaged these ecosystems have caused equal damage to the archaeological finds buried within them. Peat growth is slowed or stopped when peatlands are drained, leading to oxidised soil that encourages destructive microorganisms to proliferate.

Archaeologists and policymakers are now working side by side to keep peatlands protected environments, to help capture and preserve both carbon and the evidence of the UK’s history. And this [commitment](#) to protecting peatlands and the heritage they shelter has gone global. Last year, a [session](#) at the UN climate conference [COP26](#) was dedicated to highlighting the importance of protecting peatland. But this is only the beginning of a long journey to ensure that peatlands, and the treasures they hold, will remain safe for generations to come.

- <https://theconversation.com/how-climate-change-is-washing-away-precious-evidence-of-our-distant-past-175758>

### **UK’s common crane has best year since 17th century with record 72 pairs**

Last year was the most successful year for common cranes in the UK since the 17th century, with a record-breaking 72 pairs. The UK’s tallest bird became extinct around 400 years ago due to hunting and loss of wetland habitat but is making a strong comeback since wild birds first returned to the Norfolk Broads in 1979. They have also had a helping hand from conservation efforts to restore peatland habitats, protect wetlands, and since 2010, hand-rearing and releasing young birds on the Somerset Levels and Moors. The latest breeding survey for the common cranes shows a new high of 72 pairs of the birds. Of the pairs, up to 65 bred, fledging 40 chicks between them, a new record, as the highest number of young fledged previously was 26 in 2019, conservationists said. A new population estimate now stands at more than 200 birds.

Andrew Stanbury, RSPB conservation scientist, said: “The recovery of the UK crane population, now at its highest level since the 17th century, showcases that conservation action can make a real difference.”

- <https://www.belfasttelegraph.co.uk/news/uk/uks-common-crane-has-best-year-since-17th-century-with-record-72-pairs-41303092.html>

### **Man jailed after causing mile-long inferno with firework on moorland trying to impress girlfriend**

An artist has been jailed after starting a devastating moorlands [blaze](#) and causing £500,000 worth of damage - by setting off a [firework](#) to impress his girlfriend. More than 100 [firefighters tackled](#) the mile-long inferno after Viktor Riedly, 28, torched 285 hectares of land in Marsden Moor. The stunt, which took place on April 25 of last year, has been described as an "act of gross and crass recklessness". Leeds Crown Court heard the 3D artist

sparked the [fire](#) by "experimenting" with a device he'd created for letting fireworks off remotely. Charlotte Rimmer, prosecuting, said that embers from the firecracker rapidly spread across Marsden Moor, near the town of Holmfirth, West Yorks. The flaming inferno then went on to consume precious peatland habitat and harmed wildlife, including ground-nesting birds, in a site of special scientific interest (SSSI).

Ms Rimmer said that the incident cost the fire service £410,000 and would set back the National Trust £167,000 to repair the damage. The National Trust, which manages the land, said recovery work had already begun, with 65,000 sphagnum moss plugs planted over the autumn and winter, which "helps to re-wet the moorland, reducing the risk of future fires". Most of the planting was done by volunteers, including local schoolchildren and firefighters, the National Trust said.

Riedly, of Huddersfield, West Yorks pleaded guilty to arson and was jailed for a year.

Anastasis Tasou, mitigating, said: "He accepted full responsibility, and he is a man who has exhibited genuine remorse over his actions. "He is not a young hooligan. He is otherwise a respectable person. "He just didn't consider that there was a risk in an area that was devoid of buildings. The barrister also said his client had applied to become a volunteer for the National Trust to help repair the damage he had caused.

Judge Neil Clark said the offence was too serious to impose anything other than an immediate prison sentence. He told Riedly: "It was an act of gross and crass recklessness" "This was done for no other reason than to satisfy your curiosity for what you had created. People have to understand that taking risks with such a vital public amenity cannot be tolerated."

- <https://www.mirror.co.uk/news/uk-news/man-jailed-after-causing-mile-25978035>
- <https://www.yorkshirepost.co.uk/news/crime/artist-jailed-for-causing-moorland-fire-as-he-experimented-with-firecracker-3531121>
- <https://www.bbc.com/news/uk-england-leeds-60027468>

## North-America

### Canada

#### **Protecting the peat: Conservationists have bought a bit of the threatened Alfred Bog**

The thick dome of peat is up to eight metres deep at the centre of the Alfred Bog, a unique landscape plunked amid the farms and towns that crisscross much of the eastern arm of Ontario, about an hour's drive east of Ottawa. Eight metres of decaying vegetation takes a long time to accumulate – in this case, about 10,000 years – and over that span, the Alfred Bog has attracted a parade of plant and animal species ranging from plain to bizarre. In warmer months, carnivorous sun dew and pitcher plants sit in carpets of spongy sphagnum moss. The rare Eastern Whip-poor-will flits between the bog's sparse trees. Moose and sandhill cranes stalk the marshy ground on long, knobby legs. "We think of this bog as being big, beautiful and bountiful," said Rob McRae, eastern Ontario program director for the Nature Conservancy of Canada. So big, beautiful and bountiful, in fact, the nature conservancy [partnered with other conservation groups](#) to purchase the largest privately owned plot of land remaining in Alfred Bog, an 82-hectare parcel somewhere near the bog's deep, domed middle.

The groups bought the land for an undisclosed price from an unnamed seller in May 2021, but only announced the deal earlier this month to mark an international day recognizing wetlands. The Nature Conservancy of Canada drew on a range of funding, including the federal [Natural Heritage and Conservation Program](#) and the Ontario [Greenlands Conservation Partnership](#). The bog is [a provincial nature reserve](#), and the province announced plans in April 2018 to turn it into a provincial park, although it has not yet done so.

McRae characterized the 82-hectare purchase as protecting "a fairly small piece" of the bog. The piece *is* small, at least compared to the bog's 4,000 hectares, 3,300 of which are protected by the Nature Conservancy of Canada or Ontario Parks. Under private ownership, however, McRae said the land's "future was uncertain." For some, the protections are long overdue.

"Alfred Bog has been pretty much eaten alive from the outside in," said Murray Richardson, a professor of geography and environmental studies at Carleton University. "It's been ditched and drained and burned and converted to agriculture." These factors have reduced the bog's footprint to about a third of what it measured

during the industrial revolution. Even shrunken, its borders are slightly roomier than those of the nearby Mer Bleue, another bog that sits much closer to Ottawa's outskirts.

Mer Bleue receives significantly more academic attention, even though the two share similar origins. Both were formed many centuries ago by the retreating Champlain Sea, a massive inlet of the Atlantic Ocean that was left behind when continental ice sheets melted after the last ice age. But Alfred Bog doesn't draw the [same research, foot traffic](#) or investment that Mer Bleue does. It's distinguished instead by a different type of human intervention. "There are massive ditches that cut across the bog," Richardson said. "When you approach the bog by car, or drive around its perimeter, you can see active mining happening. Active peat mining, massive vacuum harvesters driving around, huge stockpiles of peat that's getting ready to be packaged up and shipped off."

The recently purchased plot, located near the bog's mostly intact centre, makes it an especially important candidate for protection, said Jakob Mueller, president of the Ottawa Field Naturalists' Club, a non-profit natural history group that contributed \$10,000 to the purchase. As long as the parcel remained in private hands, Mueller said, it was at risk of being drained for agriculture or stripped of its peat. Its central location in the bog meant any tampering would have fragmented the habitat and harmed surrounding parcels as well. "An equally sized parcel of land right on the edge of the bog is also good to preserve – or maybe rehabilitate, to whatever extent that's possible. It really helps secure a big chunk of the bog from potential future impacts." But, Richardson says, it's "hard to prioritize" protection of any one part of the bog over another. The centre is important, he said, because it holds a much greater volume of peat. At the same time, easy access to the bog's outer edges could make those sections more appealing to peat strippers. Ultimately, though, Richardson said conservationists likely bought the parcel simply because it was the one up for sale at the time.

- <https://capitalcurrent.ca/protecting-the-peat-conservationists-have-bought-a-bit-of-the-threatened-alfred-bog/>

### **For Peat's Sake wants to protect the muskeg in northern Saskatchewan from peat mining**

A grassroots environmental group that wants to protect the muskeg in northern Saskatchewan from mining virtually took their concerns to Parliament Hill in February. Members of For Peat's Sake joined other environmental groups and spoke with federal politicians at Nature on the Hill 2022, an annual event organized by national nature conservation charity Nature Canada. Nature Canada organized the week-long event to demand change. They want permanent government funding for the protection of nature, support for Indigenous-led conservation, stronger plans to save critical ecosystems like grasslands, forests, wetlands and ocean and access to nature for all.

"It was a bit of a surprise to be invited, and a big honour to be part of a group of 70 other nature organizations that are lobbying the government to halt the loss the critical ecosystems like grasslands and wetlands," said Mirimam Körner, who co-founded For Peat's Sake about two years ago. She lives near one of the areas in Saskatchewan being assessed for peat extraction by Lambert Peat Moss, a company based in Rivière-Ouelle, about 170 km northeast of Quebec City. Lambert Peat Moss has put forth a proposal to exploit 2,547 hectares of peat from four areas south of La Ronge, about 380 km northeast of Saskatoon, working in sections over the next 80 years, with 540 hectares of Crown land being exploited at a time.

There's been strong local opposition to the Lambert Peat Moss project proposal [from community members, local leaders and scientists](#) who say the project will harm Indigenous land users and the environment. Peat develops over centuries and the wetlands, when left undisturbed, act as a giant natural carbon capture system.

Lambert Peat Moss has said it will focus on [restoration and use reclamation techniques](#), but the company anticipates it would take about 1,500 years to accumulate pre-harvest thickness.

For the Lambert Peat Moss project to move forward, the company needs to submit its own environmental impact assessment to the Ministry of Environment for approval. Körner said For Peat's Sake has asked the federal government to designate the project under the federal Impact Assessment Act. "What that means for the project, would be that it requires an Indigenous-led impact assessment," Körner said. "We have the knowledge up here in the community and we don't want a consulting firm coming in and saying there is no significant impact." They expect to learn whether they are successful in their bid for federal intervention in April. The women said it is critical the land be left alone for the sake of the environment, the local land users and the animals. "The whole peat muskeg area is surrounded by boreal forest, but that is vanishing really quickly [with] forest fires, but also clear cutting and logging," Körner said.

Stopping the Lambert Peat Moss mining project is a core goal for the group, but they're also advocating for better policies to protect wetlands and developing alternatives to peat like locally sourced compost. She's optimistic that their continued efforts will lead to change, and noted politicians of all stripes took time to listen. "We're not denying climate change anymore. We know it's happening and now we have to find a solution together."

- <https://www.cbc.ca/news/canada/saskatoon/for-peats-sake-nature-on-the-hill-1.6355385>



*Mining in patterned peatlands, south of Attawapiskat River.*

### **Mushkegowuk Council's Vern Cheechoo on peatlands, climate change and the 'Ring of Fire'**

To help inform their stewardship decisions, the [Mushkegowuk Council](#), which represents seven First Nations communities in northern Ontario, is working with WWF-Canada and McMaster University's Remote Sensing Lab to "ground-truth" the carbon mapping research they [launched at COP26](#).

So we sat down with Vern Cheechoo, the Council's Lands & Resources director, to find out more about their territorial peatlands and community-led carbon [field sampling](#) as well as rising regional threats from climate change and the planned Ring of Fire mining development.

- "The Hudson and James Bay Lowlands are a globally significant centre of carbon storage. What else can you tell us about this part of Mushkegowuk territory?"

We live in a very unique region of the world. Its size is immense — the largest wetlands in North America, which house the second largest carbon sink in the world. They say it's worth approximately \$700 billion a year in [\[ecosystem\] services](#), and that means recharging aquifers, providing habitats for animals of many species, etc. It's a very important bird staging area. Nearly 400 species of birds come to have their young and, in the fall, 3 to 5 billion birds migrate back down to the southern regions, all the way to South America!

- "What does this mean for Omeshego people and how are things changing?"

We have lived in this region since time immemorial, as we say, living off this region for what it provides us — the animals, the fish and so forth. We say that the Creator gave us everything that we needed to live a healthy, vibrant lifestyle. Climate change is impacting the region. We're experiencing more winter rains. The winter road system is a shorter season, making it difficult for communities to get supplies. It's impacting our food security and making it more difficult for people to get to their hunting areas. The people in the region know how to read ice and snow within the wetlands when we travel and it's becoming more treacherous because the snow has changed, the ice conditions have changed. Then we have a large influx of water in the springtime and, in the summer months, the water levels are right down and people can't access their territories up the river and gather their food because it's so shallow.



Map of Mushkegowuk territory  
© Mushkegowuk Council

- “How is the Council working to protect and steward this culturally important place?”

The Elders have referred to this area as the Breathing Lands of Mother Earth because of what it does for the world in sequestering large amounts of carbon and cooling the Earth. The best thing you can do with the wetlands is to leave it alone and allow it to do what it does. It’s still doing its job, and what we’re trying to do at Mushkegowuk is bring attention because, in large part, it has been ignored. Climate change is a big issue globally, but no one was talking about the significant carbon sink that we have in our region. So, we have different projects that we’re following up on, like the WWF-Canada carbon mapping project.

- “Tell us about your work on monitoring and measuring carbon?”

Mushkegowuk Council is quite happy to be part of this sampling project, collecting the peatland cores to measure carbon. We’ve had great success in this first year, building capacity within the Council and a monitoring team which involves different individuals from each community. We’d like to continue monitoring year after year to highlight changes and find out how to protect and conserve this region.

- “Why have the Mushkegowuk Chiefs called for a moratorium on development on your territory?”

Because our region’s wetlands could be impacted from potential development that’s to happen just west of here called [the Ring of Fire](#). They’re talking 150 to 200 years of mining and the size is, roughly, 10 times bigger than the De Beers mine along the Attawapiskat River. [The open-pit Victor [diamond mine](#), which shuttered in 2019, had an impact area of 5,000 hectares.] We’re calling for a proper protection plan in place for the wetlands from cumulative impacts that could happen — not only downstream but down muskeg because there are streams that run underneath that feed the rivers and also into James Bay, where we’re working to create a [National Marine Conservation Area](#). We look at it as one ecosystem.

- “And can you explain your concerns about regional assessment under way for the Ring of Fire?”

The federal government did announce one and we’ve been meeting with them regularly. Our push is to have co-governance and to be directly involved in this process. As we’re the ones that could be impacted as the

communities within the vicinity of the Ring of Fire, our community should sit at the table in assessing what potential cumulative impacts could happen.

Our request to be involved has been refused by the [Impact Assessment Agency](#), they say that will not happen. They will establish a committee of experts, people that will listen to the concerns of all of the people involved, all the stakeholders and the First Nations in the region. We're having to explain ourselves rather than being part of the decision-making, so we're disappointed. We are the ones that have the connection to the land. And we feel that we are being severed from that and someone else is going to make the decision of how it's going to impact our region.

- <https://wwf.ca/stories/mushkegowuk-council-carbon-peatlands-climate-change-ring-of-fire/>
- <https://www.youtube.com/watch?v=-b7Uzq4npp4>
- <https://scienceline.org/2022/01/protecting-natures-best-carbon-sink-peatlands/>

## United States of America

### **A climate conundrum beneath our feet: Minnesota's farmed peat soil releases greenhouse gases**

Researchers have identified a key source of greenhouse gases in Minnesota, and now they have to figure out where it is — and what to do about it. The culprit? The state's soggy, carbon-packed peat soil, drained and farmed in places for decades. Mapping the disturbed soils, ascertaining their uses and quantifying their greenhouse gas emissions is key to the state's struggle for climate solutions that don't turn Minnesota's farm economy on its head. "The emissions from agriculture overall are sort of surprising," said Anne Claflin, the research scientist at the Minnesota Pollution Control Agency (MPCA) who heads the state's greenhouse gas inventory. "We think about emissions from fossil fuel. The other systems that are part of our daily life and our state economy, that aren't in that fossil fuel carbon cycle, sort of fly under the radar."

Although true peat bogs are concentrated in Minnesota's north, the state has an estimated 6 million acres of rich peat soils scattered around, more than any other state except for Alaska. Only Michigan, Wisconsin and Florida come close. The MPCA estimates about 800,000 acres have been drained for crops or pasture, although new research from the Nature Conservancy puts the total closer to 330,000. Either way, the disturbed peat soil emits a lot of greenhouse gases. The MPCA puts the greenhouse gas emissions from such "cultivated histosols" at a whopping 11 million metric tons a year. That puts disturbed peatlands as the state's fourth-highest source of emissions, just behind natural gas, coal and "light duty trucks," which includes small and mid-sized pickups. Even at half that amount, the gassy soils pose a major climate challenge for agriculture, right up there with emissions from cow burps, manure and fertilizer.

Researchers are stretching for solutions. The one favored by conservation groups and some state officials is the most direct — and farmers have heard it before: remove the land from production and restore the natural wetlands. Protecting and restoring peatlands and other wetlands is a point in Minnesota's draft [climate action framework](#) released Feb. 1. Other ideas to lower the peat soil emissions include reduced tilling, fine-tuning fertilizer application, adding cover crops and switching to lower-impact crops such as wild rice, cranberries or mint. "What we're all thinking about is where is the low-hanging fruit we can go after for mitigation purposes," said University of Minnesota soil scientist Timothy Griffis. "From an efficiency standpoint you could ask, 'How much food is produced relative to how much greenhouse gas is lost?' That's one way to look at it."

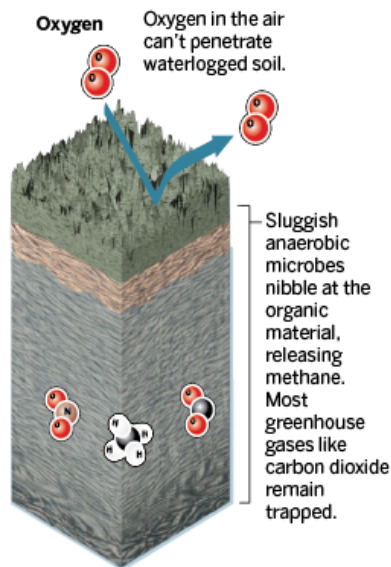
Minnesota's peatlands formed as the glaciers that flattened the state retreated some 10,000 years ago, leaving cold, wet conditions for plants sprouting in the muck left behind. The dead plants and animals just kept stacking up, said U soil scientist Nic Jelinski. Left alone, the water-logged soil lacks oxygen and traps enormous amounts of carbon, although anaerobic microbes emit methane. That all changes with draining and plowing. Oxygen enters and more vigorous oxygen-loving microbes multiply. They feast on the vast stores of carbon, spewing greenhouse gases in a decades-long process. "Some of these peatlands can be 30, 35 feet deep and it's just all carbon and carbon products," said Randy Kolka, research soil scientist with the U.S. Forest Service in Grand Rapids. "When you start disturbing these ecosystems for any reason, they are prime to flip from being sinks of carbon to being sources." A lands team that's part of Gov. Tim Walz's climate change subcabinet is cataloging the drained

## From carbon trap to carbon source

Minnesota's peat soils, known as histosols, have trapped dead plants and other organic matter for thousands of years. When they are farmed, they release greenhouse gases.

### Undisturbed peat soil

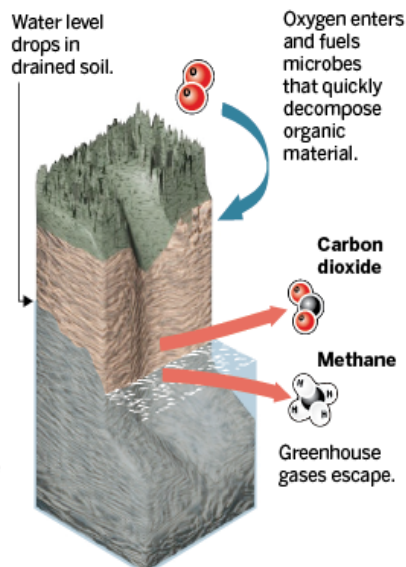
Waterlogged peat soils trap and hold carbon in organic matter. Oxygen doesn't penetrate the soil and so microbes can't quickly decompose the organic material that would release the gases.



Source: University of Minnesota

### Disturbed peat soil

Peat soils that are farmed or developed are usually drained, allowing oxygen to enter. Organic material decomposes quickly, releasing large amounts of greenhouse gases such as carbon dioxide, methane and nitrogen dioxide.



MARK BOSWELL • Star Tribune

peatlands and their gases. Kristen Blann, a freshwater ecologist with the Nature Conservancy in the Upper Midwest and a member of the team working to map the acres, said most of the farmed peat soils appear to be covered with corn, soybeans, hay, alfalfa and other crops. Cultivated wild rice and sod are also grown on these soils. Pasture covers the remaining 88,000 acres, according to her research. Companies in Minnesota also mine peat and sphagnum peat directly for the horticulture industry — even for flavoring a [local whiskey](#). Large combine-looking vacuums are sometimes used to Hoover up the soil and peat. Peat extraction in Minnesota emits an additional 124,000 tons of greenhouse gases a year, according to the state inventory..

But many more acres are planted with row crops. Blann's research shows a pocket of heavy peatland cultivation in central Minnesota, for example. Stearns, McLeod and Meeker counties rank at the top for farmed acres, much of it in corn and soybeans. Blann said the goal is to eventually create an interactive soils map people can use to help with conservation planning. The idea is that established conservation programs — such as easements and wetland banking — could be adapted to target peatlands and create incentives for farmers to set them aside.

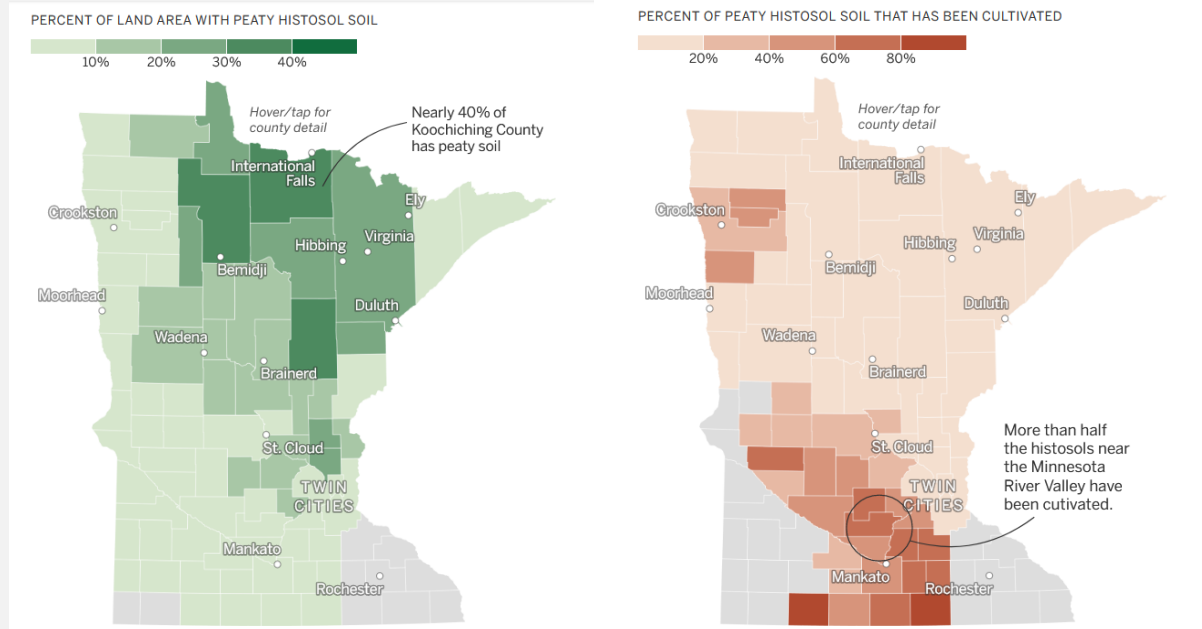
Restoring peat ecosystems is the best way to address the problem, said Kolka, with the U.S. Forest Service: "Plugging the ditches, bringing the water tables back up and planting the native vegetation to the best of our ability. That's our best bet." It's a formidable challenge. Farmers know their fields well and where they have more organic material, but they won't likely know if that's a histosol, said Larry Lahr, who farms in Stearns County near Cold Spring. Lahr and his wife, Jennifer, are part of a pilot project studying how much carbon is released from their farming practices and how practices such as cover cropping might reduce emissions. But the project doesn't target peat soils that he's aware of, he said. Farmers won't rush to permanently idle land, Lahr said, particularly if it's rich soil. "It's the most productive acres that we have," he said.

Restoring any kind of wetland, including soggy peat soil, is expensive. "That's the sad truth. Nobody can afford it," said Dennis Rodacker, wetland mitigation supervisor at the Minnesota Board of Water and Soil Resources. "Everything's a great idea until someone has to pay for it, and then the wheels fall off." Some question whether efforts should focus instead on conserving the peat that remains. A prime candidate, Blann said, is the 500,000 acres of peatlands in northern Minnesota that were ditched long ago but were abandoned when the ground proved too difficult to farm. These acres are not included in the Nature Conservancy's estimate that 330,000 acres of peat soils are farmed. "We are working on a strategy," said Nature Conservancy spokesman Chris Anderson. "It's the best bang-for-your-buck climate strategy that we've got."

- <https://www.startribune.com/a-climate-conundrum-beneath-our-feet-minnesotas-farmed-peat-soil-releases-greenhouse-gases/600146107/>

### Minnesota's peat soils

Minnesota has about 6 million acres of peat soils, called histosols, mostly concentrated in the north. Histosols are peaty, waterlogged soils with a top layer of highly organic material that's at least 16" thick, where the organic matter is at least 30% organic material, mostly decaying plants, by weight. The Nature Conservancy estimates that about 330,000 acres of Minnesota's peat soils, or histosols, have been cultivated for farmland or pastures.



C.J. Sinner, Star Tribune Source: Dr. Kristen Blann, The Nature Conservancy

### Rice farming to restore soil

In California's Sacramento-San Joaquin Delta, farmers are converting corn fields to rice in an effort to stop subsidence and reduce carbon emissions.

Dawit Zeleke, president of the nonprofit Conservation Farms and Ranches, runs Staten Island's 8,500-acre working farm. While corn and potato fields take up most of the island, towards its southern tip, grassy stalks of rice wave knee-high in flooded paddies. Along with the flocks of long-legged shorebirds and wading waterfowl, the 1,000 acres of flat, wet fields seem right at home in the swampy landscape. Rice, however, is an uncommon crop in the Delta — and for this Northern Californian farmer, an entirely new venture.

Corn has long been king of this agricultural region. But in 2019, Zeleke took a chance on cultivating rice, starting with the conversion of a 350-acre experimental plot; in three years, he's nearly tripled his acreage. His goal is to convert over half the island — 4,500 acres in total — to rice fields by 2025 and restore what a century-and-a-half of farming has stripped away: rich peat soil.

The Delta lies at the confluence of the Sacramento, San Joaquin, and Mokelumne rivers, past the eastern reaches of the San Francisco Bay. It was once a 500,000-acre freshwater wetland, created over thousands of years by the accumulation of carbon-rich, organic matter in its estuaries. Modern settlers began reclaiming the flat, fertile land in the 1860s, diking and draining peat marshes to build farms. Within decades, they had dried up 98 percent of the Delta and transformed it into the heart of California's agricultural economy. More than a thousand miles of levee now surround vast fields of corn, grain, asparagus, and tomatoes planted on artificial islands, holding back the rivers and channels that snake around them.

"We've disconnected the water from the land," says Letitia Grenier, program director at the nonprofit [San Francisco Estuary Institute](#). Wetland reclamation has taken a toll on peat soil, which sequesters large amounts of carbon when left submerged. When peat dries, it oxidizes and releases carbon dioxide, she explains. And as the ground deflates, it causes the region to subside at a rate of approximately an inch a year. "Now, the middle of the Delta is wildly below sea level," she adds, "10, 20 feet in some places."

Subsidence puts increasing stress on the levees, Grenier says, most of which have been built from peat and aren't federally engineered. "In an earthquake, they'll turn into jelly and fail, and then the tide would come in [from

San Francisco Bay] and pull saltwater in with it.” The diluvial consequences could have far reaching implications for the California Aqueduct, which carries fresh water from the Delta to 27 million people in Southern California. “We could have a disaster,” she adds, “where we’re sucking saltwater into the pumps.”

Even without a doomsday breach, the realities of a sinking Delta are sobering. “[At some] point, water will just come in under the levee and seep up in the fields,” she says. As saltwater intrusion and soggy soil become increasingly problematic, farming may simply cease to be an option.

Yet there’s an obvious solution to countering the impact of current agricultural practices. “When you grow rice, you’re getting the benefits of keeping peat wet,” says Grenier. With fields flooded for long stretches of the year, rice farming resaturates the soil and helps put the brakes on subsidence. It’s a promising alternative crop for the region, she adds — one that benefits both the Delta’s ecology and its main economy.

The idea of planting rice on Staten sprouted back in the 1990s, Zeleke says, but agronomic hurdles made for a challenging implementation. First, there were the climatic considerations; some 95 percent of California rice is grown in the hot and arid Sacramento Valley, an ideal environment for cultivating *O. sativa japonica*, the golden standard for sushi. Because Bay breezes keep Delta summers cooler, it took a long search for a short season varietal, bred to produce seed heads in lower temperatures.

Soil type between the two regions also vary. The Valley’s hard clay allows fields to be furrowed and flooded, then air-seeded en masse by crop dusters. Peat, on the other hand, is too soft to maintain ridges when wet, he explains, and needs the more focused attention of grain drills that sow seeds directly into the soil. Rice farming also poses different challenges than corn. “Rice is a precision crop,” says Zeleke. “Between pre-planting to when you flood the rice, drain and dry your fields, and harvest it, your timing has to be perfect.” Corn, he notes, is much more forgiving; it grows quickly, is less fussy about watering, and has a much bigger harvest window.

Finally, the high silica content of rice makes it harder on harvesting and processing equipment, necessitating new combines and storage facilities built to accommodate the smaller, more abrasive grains. “There’s a whole change you need to make,” he says, including crop management, staff training, and marketing. “That’s why it’s been so difficult.”

But in the sinking Delta, the wet nature of rice farming holds a key advantage over other crops. As seepage worsens, growers are expending increasingly vast resources to drain and pump their fields. For aquatic plants like rice, maintaining a dry root zone becomes a non-issue. In fact, the wetland region is particularly well-suited to rice. Located at the bottom end of a river system, water is simply more abundant than in other parts of California. And unlike the Sacramento Valley, where historic drought has led to severe allocation cuts, riverside farms in the Delta have riparian rights, which ensure crops with a steady supply directly from the estuary.

As acreage declines elsewhere in the state due to water shortages — the California Rice Commission reports a near 20 percent drop last year — rice is proving to be an economically viable crop for Staten. Zeleke estimates that in total, 8,000 acres of the grain are currently grown in the region; he hopes to see that amount expand fivefold in the near future.

Staten is a bird preserve owned by [The Nature Conservancy](#), the parent organization of the island’s working farm. As a critical wintering stop along the Pacific Flyway, its wildlife friendly agriculture provides a vital foraging habitat for sandhill cranes and numerous migratory bird species. Rice farming on the island creates a flooded refuge for waterfowl while also increasing diversity in their food source — important considerations in a region facing the growing threat of development and the conversion of pasture to orchards and vineyards.

But the environmental benefits of wet paddies have an even greater reach. “Rice could potentially save the Delta,” says Campbell Ingram, executive director of the [Delta Conservancy](#), referencing the related threats posed by subsidence. The region’s 200,000 acres of farmland emit 2 million tons of carbon dioxide annually, he explains. Flooded fields resaturate the soil and prevent carbon volatilization, plugging the area’s inordinately high and concentrated emissions — and subsequently halt further subsidence.

He and Zeleke both stress, however, that rice farming alone won’t reverse the sinking process. Even then, “it’s better than losing half an inch or so of soil [annually by] growing corn,” notes Zeleke. Increasing elevation, he says, requires restoring biomass and carbon levels in the soil. To that end, he’s studying the feasibility of turning swaths of rice fields into surrogate marshes, in 10 to 15-year cycles, to cultivate freshwater crops like reeds and tule rushes, lotus, and wild rice. “The reality is, we may never catch up,” Ingram concedes. Reversing subsidence is painstakingly slow — studies top results at about a couple of inches a year — and rising sea levels complicate



This initiative proposes to protect 300,000 hectares of land, in addition to 200,000 hectares of coastal waters, home to half of Argentina's kelp forest, another key ecosystem for fighting climate change.

Martina Sasso, Marine Program Coordinator for Rewilding Argentina, explains, "With the Covid-19 pandemic, wild and isolated places like Peninsula Mitre are suddenly facing an onslaught of unregulated activities abusive to its fragile ecosystems."

The peninsula's unusual composition of species absorbs 4.5 times more carbon than other peatlands in Tierra del Fuego. The main species, *Astelia pumila*, forms "cushions" that act as an exceptional carbon sink. The bogs' enormous water-holding capacity helps irrigate other ecosystems in times of drought, playing a key role in climate change adaptation and mitigation. The diverse terrain of this beautiful peninsula has unique ecological characteristics: the mountain ranges, valleys, forests, lakes and rivers provide a bridge between different habitats and their species, including Andean condor, steamer duck, guanaco, red fox, southern river otter and upland geese.

For more than 30 years, the community of Tierra del Fuego has sought to transform Peninsula Mitre into a protected area with the aim of advancing towards a nature-based economy. The protection of the peninsula is a local decision with a global impact on biodiversity loss and climate change.

- [https://rewildingargentina.org/un-llamado-urgente-para-proteger-la-mayor-reserva-de-turba-de-sudamerica\\_eng/](https://rewildingargentina.org/un-llamado-urgente-para-proteger-la-mayor-reserva-de-turba-de-sudamerica_eng/)

See the impressive video material and flyer produced by GP3, an initiative of Tompkins Foundation, Fundación Rewilding Argentina and Global Peatlands Initiative in English and Spanish versions:

- GP3\_english-finalcut.mov: <https://dgroups.org/?p7yzpj68.f2tpgzm2> - 94.0MB
- GP3\_cortefinal\_SUBS\_español.mov: <https://dgroups.org/?p7yzpj68.y14s629q> - 94.0MB
- Peninsula Mitre Press Release-GPI campaign\_Spanish version.pdf: <https://dgroups.org/?p7yzpj68.l4dr7tcg>
- Peninsula Mitre Press Release-GPI campaign.pdf: <https://dgroups.org/?p7yzpj68.tn0djwsf>



Peatlands up to the coast in Peninsula Mitre, Tierra del Fuego, Argentina. Photo: Hans Joosten.

## Chile

### **The House Environment Committee passed a bill to protect peatlands and Sphagnum mosses**

Protecting peatlands as strategic reserves for the regulation of atmospheric chemistry and hydrology is the objective of the bill ([boletín 12017](#)) approved in particular by the Committee on the Environment and Natural Resources. The legislative text, in the second constitutional procedure, was approved in general in the Chamber on 11 January, with 132 votes in favour and one abstention. However, it was referred back to the committee for a second report, as it was the subject of amendments.

The law provides for the protection of peat bogs and secondary sphagnum moss formations. The idea is to preserve and conserve them as strategic reserves for climate change mitigation and adaptation, as well as for the conservation of biodiversity and the multiple ecosystem services they provide. Specifically, the initiative prohibits extraction in peatlands and secondary Sphagnum formations, including their materials and products. Likewise, it prevents the filling, draining, drying, extraction of flows, alteration of the terminal bar, deterioration, impairment, transformation or invasion of the flora, vegetation and fauna contained within them.

The marketing, export and import of peat and Sphagnum or Pompon moss is also prohibited. Contravention of the above is punishable by a fine of 10 to 1,000 UTM (~ €625 and €62,500). The Servicio Agrícola y Ganadero will be in charge of the control.

The legal text defines peatland as a type of wetland that constitutes an ecosystem and is characterised by the formation of peat. It stresses that it normally contains plant species on its surface with which it is functionally connected, such as the aforementioned Sphagnum moss. The text also states that peat is a mixture of plant remains or dead organic matter in varying degrees of decomposition, present in peat bogs, and clarifies that secondary Sphagnum formations are wetlands of recent origin, which have been formed after fires or clear-cutting of forests on sites with poor drainage.

The text amends the Mining Code to include peat in the exceptions for mining concessions and introduces new requirements in the General Environmental Bases Law regarding the authorisation of projects that may cause damage to them. Finally, it details, among other points, that projects or activities carried out in peatlands will require the preparation of an environmental impact study.

- <https://www.elciudadano.com/chile/comision-de-medioambiente-de-la-camara-despacho-proyecto-que-protecte-a-las-turberas-y-al-musgo-sphagnum/03/07/>

### **From the Letter of Concern of IMCG to the Comisión de Medio Ambiente y Recursos Naturales, Cámara de Diputados of Chile, of 1 March 2022**

...“We want to congratulate you sincerely with the adoption of the “Ley de Protección Ambiental de Turberas” by the Chamber of Deputies on January 11, 2022. Undoubtedly, the law as adopted constitutes a great example for the world, since its aims for a complete protection of peatlands and bans any kind of extractive activity. Our enthusiasm was, however, tempered when we became aware of the modifications to the law as proposed to the Environment Committee, which has to revise the legal text before its final adoption by the Chamber of Deputies. With this letter, we want to share our concerns with respect to the proposed modifications.

Peatlands in Chile are mainly concentrated in the southern part of the country (Chiloé to Cape Horn), where they have remained largely untouched, protected by their isolation. Next to being of global importance for biodiversity conservation, the pristine peatlands of Chile fulfil key functions for climate change mitigation as major carbon stocks and CO<sub>2</sub> sinks. These highly vulnerable ecosystems remain until today almost unstudied. There is great potential for non-extractive sustainable use (e.g. tourism, education, climate regulation, water supply etc.). Without the effective protection of its peatlands, it will be hard for Chile to reach its targets under the UNFCCC. As peatlands in Chile are spread over more than 1500 km latitude, they differ in geomorphic setting, ecological conditions and biomass productivity. Until now, there is no peatland registry in Chile that considers these aspects, nor monitors the status of these ecosystems (disturbed or pristine). Because of this lack of overview, the peatlands are threatened by economic developments, which push infrastructural connections towards the peatlands and make them accessible. In most parts of the world, where research has been carried out into the consequences of extractive activities in peatlands, the evidence shows that ecological and social costs exceed

the short-term monetary benefits. This also applies to Chile, where the few studies on peatmoss (*Sphagnum magellanicum*) show that this species has very low rates of growth and regeneration.

Therefore, the law came right on time, to prevent the spreading of extractive activities in peatlands, especially peatmoss extraction, and the disastrous consequences for their ecological and hydrological functioning (cf. the drought and water scarcity in Chiloé). A law for peatland protection in Chile can only be effective, if there is no backdoor regulation allowing peatmoss extraction from pristine peatlands, and if any use of peatlands may only take place in a sustainable way.

We therefore strongly request you to prevent the weakening of the draft bill approved of January 11 to ensure that no pristine peatlands will be affected by extractive activities or drainage, that the already disturbed peatlands will be restored, and that any use of peatlands only takes place in an environmentally sustainable way. We advice that the ley should include the prompt establishment of a national peatland registry, in order to identify and protect pristine peatlands, as well as already damaged peatlands as possible targets of restoration measures.”

**Dear IMCG main board members,**

“we have the very great pleasure to let you know that the environmental committee rejected all the proposed changes aiming to weakening the peatland protection law. In a fourth step, it will be voted again in the national congress, where it must pass with simple majority. Last time it passed with 132 votes in favour and only one abstention. So it seems, as if this law, which has a very strong protection potential, might become true.

We still don't know when this wil happen, but we will inform you when there are news.

The IMCG Letter of Concern surely has had an influence on the environmental committee's decision today. Thank you all very much for your swift reaction and consent on the letter.”

### **Fires threaten vital peatland in Chile’s Tierra del Fuego**

A forest fire that has been spreading for weeks in Chile’s Tierra del Fuego is threatening the ancestral land of an Indigenous group and destroying some of the world’s highest concentration of peatlands. The fires, which started in mid-January, have burned approximately 1,250 hectares (nearly 3,100 acres) of forest, peatland and grassland in the municipality of Timaukel, approaching Karukinka Natural Park on Isla Grande de Tierra del Fuego.

“This is an environmental, even global, emergency,” Barbara Saavedra, Chile director for the Wildlife Conservation Society (WCS), which manages the area, told Mongabay. “It’s not just a local problem because the forest that’s currently burning in Tierra del Fuego is some of the best conserved on the planet. The peatlands that are burning with the forests are some of the largest carbon reserves in existence.”

Chile’s portion of Tierra del Fuego, an island that it shares with Argentina, has [approximately](#) 2.3 million hectares of peatlands, making it one of the highest concentrations on Earth. Local fauna under threat from the fire include the llama-like guanaco (*Lama guanico*) and Fuegian culpeo fox (*Lycalopex culpaeus lycoides*), which is endemic to the area.

Fires aren’t a part of the natural environment here; the name Tierra del Fuego (Land of Fire) was coined by the first Europeans who arrived, after they spotted the campfires set by the Indigenous inhabitants on the shore.

For thousands of years, the peatlands of Tierra del Fuego were stewarded by the Selk’nam Indigenous people. But colonization throughout the late 1800s and early 1900s [drove](#) the group out of the area. In recent years, descendants of the Selk’nam have [solicited](#) the Chilean government for official recognition as an Indigenous group, with many returning to Tierra del Fuego’s Isla Grande in hopes of rediscovering their roots. Some members have also helped WCS conserve Karukinka Natural Park.

“For us, [the fire] has been devastating in every sense of the word — ancestrally and environmentally,” said Herma’ny Molina, president of the Corporation of the Selk’nam People in Chile. “For thousands of years, our people lived there. We were violently removed 130 years ago and now we’re in the process of returning — and then this happens. Imagine the pain that this causes us.”

Patagonia has experienced several extreme fires in the last decade. In 2011 and 2012, Chile’s Torres del Paine National Park [lost](#) around 17,000 hectares of protected forest. And in 2013, El Torito Bay in Tierra del Fuego

National Park, on the Argentine part of Isla Grande, lost around 1,640 hectares of forest and peatland to a fire that burned for more than two weeks.

In more recent years, the area has experienced unusually prolonged droughts, causing the peatlands and forests to dry up, resulting in faster-spreading fires, according to WCS. Some [studies](#) have [attributed](#) the trend to climate change.



*The fires have burned approximately 1,250 hectares of forest, peatland and grassland. Photo via WCS*

Luis Barria, the mayor of the municipality of Timaukel where Karukinka Natural Park is located, told Mongabay there hasn't been a confirmed cause of the fire but that it's likely connected to human activity.

- <https://news.mongabay.com/2022/02/fires-threaten-vital-peatland-in-chiles-tierra-del-fuego/>
- <https://www.opendemocracy.net/en/democraciaabierta/fighting-wildfires-chile-peatland-vital-carbon/>
- <https://www.elmostrador.cl/cultura/2022/02/03/las-turberas-el-tesoro-chileno-para-el-almacenamiento-de-carbono-que-corre-peligro/>

## Peru

### Chocolate frog? New burrowing frog species unearthed in Amazon's rare peatlands

A photo of an odd-looking amphibian [drew attention on Twitter](#), where it was described as a "smooth lil fella", compared to a melted tootsie roll candy, and likened to the chocolate frogs from Harry Potter. "I'm quite surprised at how fast the popularity of this frog is rising up," Germán Chávez, a researcher at the Peruvian Institute of Herpetology, and one of the scientists to describe the frog, told Mongabay in an email. "I'm not sure whether it is because of the tapir-like profile or its chocolate-texturized skin." Chávez and colleagues found the small, long-snouted frog during a rapid inventory in Peru, in one of the rarest habitats in the Amazon rainforest, the [Amazon peatlands](#), a boggy wetland thick with decaying plants. The tapir frog's slight body is well suited for burrowing into soft, wet peat. The researchers suspect that it, as well as other burrowing animals, may affect soil and water infiltration, playing important roles in the peatland ecosystem.



*The newly described burrowing frog, Synapturanus danta, from the Peruvian Amazon has a tapir-like snout and resembles chocolate. Photo by Germán Chávez.*

“The frogs are tiny, about the size of a quarter,” said Michelle Thompson, a researcher in the Keller Science Action Center at Chicago’s Field Museum who was part of the team that found the frog. “[T]hey’re underground, and they’re quick,” she said, so the team relied on sound. When they heard an unfamiliar “beep, beep” call, they sprang into action.

The herpetologists found the frog while surveying for reptiles and amphibians as part of the Chicago Field Museum’s [Rapid Biological and Social Inventory of the Lower Putumayo Basin](#). During these rapid inventories, biologists and social scientists intensively study and survey an area to learn what species it holds, how locals manage the land, and how to make the case for the area to be better protected.

The tapir frog’s peatland home lies inside a proposed conservation area on unclassified federal land, and neighbors a titled Indigenous territory as well as Yaguas National Park. The region is home to many Indigenous people, including the people of Peru’s Comunidad Nativa Tres Esquinas, who led the researchers to the tapir frog. The species may be new to science, but it was old news to the locals.

Currently, there isn’t much evidence of deforestation or mining around the peatland, Chávez said, most likely because it’s far from the river or any roads. But “habitat loss [from logging, farming, and mining] in the Amazon is a threat wherever we go, so we have to keep an eye on that,” he said. The Putumayo River is one of the last free-flowing rivers in the Amazon Basin, with no planned or existing dams, making it a critical pathway for wildlife and a source of unrestricted lifeblood for the whole basin. There’s a “huge conservation opportunity to conserve the whole corridor, watershed and surrounding area,” Thompson said. “This tapir frog is another piece of evidence of why scientists and local people need to work together to protect this region.”

- [https://news.mongabay.com/2022/02/chocolate-frog-anyone-new-species-uneearthed-in-amazon-peatlands/?mc\\_cid=d366e8af86&mc\\_eid=268d1757f8](https://news.mongabay.com/2022/02/chocolate-frog-anyone-new-species-uneearthed-in-amazon-peatlands/?mc_cid=d366e8af86&mc_eid=268d1757f8)
- <https://www.sciencedaily.com/releases/2022/02/220222135153.htm>
- <https://evolsyst.pensoft.net/article/80281/>



*Amazonian peatlands inhabited by Synapturanus danta sp. nov. Photo: Luis Montenegro*



*Turberas de la Amazonía Peruana - Día Mundial de Humedales 2022* <https://www.youtube.com/watch?v=qRqC-bErUrM>

### **Aguajales in Loreto: study highlights their key role in capturing greenhouse gases**

Scientists from the Peruvian Amazon Research Institute (IIAP) are developing a study in Loreto that seeks to understand the behaviour of greenhouse gas pollutants, such as carbon dioxide and methane, in one of the emblematic ecosystems of the lowland rainforest: the aguajal.

Loreto, Peru's largest department, has more than 5 million hectares of aguajales that capture and store some 3,000 million tonnes of carbon. This means that this ecosystem, known as the Amazonian peatland, plays a fundamental role in the control and reduction of greenhouse gas emissions. The aguajal is a swampy area, permanently flooded, where the aguaje palm (*Mauritia flexuosa*) grows, some 27 metres high, in pure formations and also mixed with other palms and various trees. The aguaje is a dioecious palm; that is to say, it has male and female trees, the latter producing the fruit called aguaje, which is widely consumed by the population and therefore has a very significant commercial use in the local economy. In addition to its nutritional attributes, the aguaje has great potential in the field of cosmetics and forestry.

The project, which began in 2016 and whose first stage was completed in 2019, is being carried out in the Quistococha Tourist Complex, located about 10 kilometres from the city of Iquitos, the capital of Loreto. This site was chosen by the IIAP because of its proximity to the city of Iquitos, the security it provides as it is a fenced area and the facilities it offers for the care and monitoring of the equipment. Thanks to funding from the United States Forest Service, a vertical platform called the Greenhouse Gas Flux Tower was installed in the middle of the swamp located there, 42 metres high, an extension that exceeds the top of the tallest palm trees in the swamp, which reach an average of 27 metres.

"This project aims to obtain information about the behaviour of greenhouse gases in the aguajal ecosystem. To do this, we measure, with sensors installed at the top of the tower, the flow of gases that come from the subsoil and from the surface of these aguajales and are emitted into the atmosphere, as well as the gases that enter the ecosystem," explained forestry engineer Lizardo Fachín Malaverri, principal investigator of the project.

The greenhouse gases studied are mainly carbon dioxide (CO<sub>2</sub>) and methane (CH<sub>4</sub>) and their effects on the environment, as well as other variables such as humidity, temperature and wind speed. "All this helps to understand the behaviour of these gases that go from the ecosystem to the atmosphere and vice versa," he said in an interview with Agencia de Noticias Andina. Fachín Malaverri explained that by means of a methodology called Eddy Covariance, an atmospheric measurement that calculates air flow, the behaviour of greenhouse gases is studied when they interact with the natural Amazonian environment. "Through this methodology we simultaneously measure the variations in gas concentration and the direction of the swirling wind at high

frequency. The data is recorded thousands of times per minute, and through a series of equations we obtain estimates of the movement of the gases leaving and entering the aguajal," he said. These measurements are made not only in Peru but also in other countries by different organisations that contribute together to the large database called Fluxnet, which is used to generate climate models at multiple time scales, as well as models of carbon dioxide and methane distribution at a global level. The IIAP is part of this global information network through the Ameriflux database, which collects information from different parts of the American continent.

The installation of the Greenhouse Gas Flux Tower was executed in 2016 and the following year the collection of information through sensors began. In 2018, the IIAP partnered with the Universities of Minnesota and Michigan (USA) and won a competition for funding sponsored by the US Department of Energy to continue the research. In this way they managed to extend its validity until this year. The project is currently in a second stage called "Biophysical processes and feedback mechanisms that control methane contributions in an Amazonian peatland". "Since 2021 we have been recording information not only about the aguajal ecosystem from the tower, but also through sensors installed in the palm trees and in the ground where they grow, in order to also measure the flows of greenhouse gases in that sub-ecosystem," he said.

Fachín Malaverri said that among the first results of this research are the fact that the aguajales behave as a carbon dioxide sink and a source or emitter of methane, generated by the decomposing matter that accumulates in the soil of the aguajal. "That is why it is important to conserve the aguajales, avoiding the felling and burning of their trees so that the enormous amount of these greenhouse gases that are stored in this tropical peatland are not released into the atmosphere," he said.

Another relevant result has to do with the increase in the "breathing" of the aguajal ecosystem in dry conditions or in the dry season due to the lower flow of the Amazonian rivers, that is, when it is below the annual average, he said. "An increase in methane emissions has also been determined during the rainy season, although there is no significant daily pattern in the emission of this greenhouse gas, as initially proposed by our research hypothesis," said the IIAP scientist.

Fachín Malaverri welcomed the recent extension of the agreement signed by the IIAP with the Regional Government of Loreto to continue researching the behaviour of greenhouse gases in the Quistococha water reservoir, administered by the regional authority. The signing of the agreement took place on 1 March, in the facilities of the Regional Government of Loreto, between the regional governor, Elisbán Ochoa Sosa, and the executive president of the IIAP, Carmen Rosa García Dávila.

Lizardo Fachín recalled that there are many local people whose economy depends on the aguajal, given that they extract and commercialise its fruit called aguaje, rich in nutrients, as well as the trunk for the floors of houses and the leaves of this palm tree for roofing houses. According to a study on the aguaje market, in the city of Iquitos alone, around 20 tonnes of aguaje are consumed every day. It is sold fresh or in preparations such as soft drinks, ice cream or pulp, among other presentations. "The problem with this growing demand for aguaje lies in the fact that in order to take advantage of it, the palm tree is cut down, which has a negative impact on the survival of the aguajal," he warned.

As part of the project, the IIAP is developing education and awareness-raising activities for the community, so that they understand the importance of conserving and sustainably using the aguajal, given its enormous ecological and environmental importance. "We are organising a workshop in the communities surrounding the Quistococha Tourist Complex to inform and educate about the importance of maintaining these ecosystems. We are also teaching the population how to harvest the aguaje bunches using techniques to climb the palm trees without cutting them down or damaging them in any way. We work with parents and children and also with those in charge of harvesting the aguaje," he said.

The IIAP researcher also emphasised that this scientific project will enable the training of Peruvian and foreign researchers interested in the study of the behaviour of greenhouse gases in the aguajal. National researchers are working with the National University of the Peruvian Amazon (UNAP), through its Faculty of Forestry Sciences, which has the Professional Schools of Forestry Engineering and Tropical Forest Ecology; and the Faculty of Agronomy, which has the Professional Schools of Agronomy Engineering and Natural Resources Management Engineering. "The IIAP launches calls for pre-professional internships and thesis projects. Since 2017 we have had nine undergraduate students doing their pre-professional internships, as well as two thesis students. In this way, we are strengthening the scientific capacities of young researchers from Loreto, so that in the future the

region and Peru will have professionals capable of understanding these ecosystems in order to respond to the problems caused by climate change and forest degradation," he emphasised.

In addition to the presence of students and professionals from Loreto, this IIAP project has received visits from students from other universities in the country, such as the National University of Moquegua, who carried out an exchange programme. Foreign students interested in learning about the behaviour of Amazonian peatlands and tropical ecosystems in the face of climate change have also visited. "Since 2017, two delegations of foreign students and members of NGOs have come to Loreto. What we intend with this centre, which we have called the Intensive Carbon Monitoring Site, is that it becomes a showcase for this type of ecosystem at a scientific level and transcends the local and national level to have an international presence," he said.

"The research on the impact of greenhouse gases carried out by the IIAP allows us to generate scientific information for the authorities to make decisions on development policies in the Amazon, given that the ecosystems are being impacted by legal and illegal productive activities," he said. The information generated by the IIAP is very useful for the processes of ecological and economic zoning, which identifies potential and limitations in a given territory, as well as instruments such as concerted development plans, cadastre, among other management documents that allow for adequate land use planning in our country. This type of study and others carried out by the IIAP will help us to know and have elements of judgement to identify where are those spaces that can be used, those that cannot and those that can be used under criteria of sustainable development, said Lizardo Fachín.

- <https://andina.pe/agencia/noticia-aguajales-loreto-estudio-destaca-su-rol-clave-para-captar-gases-efecto-invernadero-883417.aspx>

What lives in the peatlands of Peru?: <https://www.youtube.com/watch?v=6mV7CcQBISw>

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Collected by Hans Joosten: [joosten@uni-greifswald.de](mailto:joosten@uni-greifswald.de)

1. Landscape footprints of peopling and colonisation from the Late Bronze Age to Antiquity in the coastal hinterland of Emporion-Emporiae, NE Iberia: <https://journals.sagepub.com/doi/full/10.1177/09596836211066597>
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3. Tropical peatland hydrology simulated with a global land surface model: <https://agupubs.onlinelibrary.wiley.com/doi/10.1029/2021MS002784>
4. Assessment of the applicability of UAV for the creation of digital surface model of a small peatland: <https://www.frontiersin.org/articles/10.3389/feart.2022.834923/full>
5. Large soil carbon storage in terrestrial ecosystems of Canada: <https://agupubs.onlinelibrary.wiley.com/doi/full/10.1029/2021GB007213>
6. Neue Märkte – neue Produkte: MoorFutures® eine Investition in Klimaschutz: <https://www.springerprofessional.de/neue-maerkte-neue-produkte-moorfutures-eine-investition-in-klima/20123010>
7. Classification of European bog vegetation of the Oxycocco-Sphagnetnea class: <https://onlinelibrary.wiley.com/doi/epdf/10.1111/avsc.12646>
8. Evidence for the Little Ice Age in upland northwestern Europe: Multiproxy climate data from three blanket mires in northern England: <https://journals.sagepub.com/doi/abs/10.1177/09596836221074036>
9. Biological nitrogen fixation and nitrogen accumulation in peatlands: <https://www.frontiersin.org/articles/10.3389/feart.2022.670867/pdf>
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14. Drivers, pressures, and state responses to inform long-term oil sands wetland monitoring program objectives: <https://link.springer.com/article/10.1007/s11273-021-09828-2>
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17. Late Glacial and Holocene palaeoenvironmental changes recorded in landslide fens deposits in the Polish Outer Western Carpathians (Southern Poland): <https://www.sciencedirect.com/science/article/abs/pii/S1040618221005279>
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25. Peatland dissolved organic carbon export to surface waters: Global significance and effects of anthropogenic disturbance: <https://agupubs.onlinelibrary.wiley.com/doi/10.1029/2021GL096616>
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