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Peatlands International

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17th International Peatland Congress: Get ready for Taizhou 2024!


17th International
Peatland Congress
Abstract submission and registration are open!
Taizhou, China
4 - 9 August 2024
www.ipc2024.com
Photo: William Zhang

Editorial

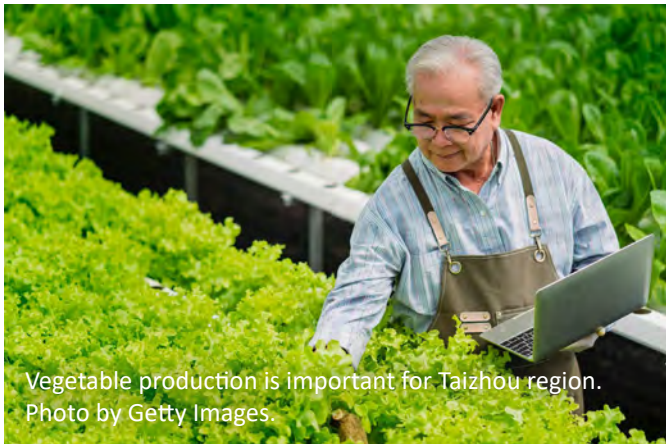
Welcome to China!

The 17th International Peatland Congress is fast approaching and the local organizing committee is diligently preparing for the event. Tasks such as securing the venue, inviting keynote speakers and planning engaging activities are currently underway. It is noteworthy that this will be the second congress held in Asia, with China - an emerging star in peatland research and industry - as the chosen destination.

The Congress will take place in the city of Taizhou, situated along China's vibrant coastline. Positioned within the Yangtze River Delta urban cluster, it serves as a key node city on the 21st Century Maritime Silk Road.

The exciting theme for the upcoming congress, 'Peatlands in a Changing World', reflects the need for peatland stakeholders to adapt to a rapidly changing world.

This special event will gather representatives from various sectors, including science, nature conversation, trade and industry, to collaborate and exchange ideas on a wide array of topics such as the ecological characteristics and management



Vegetable production is important for Taizhou region. Photo by Getty Images.

challenges of peatlands, human life and peatlands, and advancement in peat industry technology. There will also be special sessions dedicated to tropical peatlands.

To honour our industry colleagues, we will organize an Industry Summit to provide a platform for networking, discussion and collaborative efforts towards responsible peat and peatland resource utilization. In particular, we highly recommend attending the 'Meet the Expert' seminar, where you can glean insights from renowned professionals in the field of growing media.

Following engaging sessions and poster presentations, we understand the importance of taking a break to rejuvenate amidst nature. We have curated an assortment of mid-congress excursions, including visits to mid-subtropical mountain peatlands, where you can bask in the region's natural splendour along the way. Alternatively, you can partake in guided tours to

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Are you interested? Do not hesitate to contact the IPS Secretariat!

Cover: Beijing Art by Jimmy Woo.

sites showcasing various application scenarios of peat agriculture. We also strongly encourage attendees to sign up for the post-congress field trips, which offer a chance to explore the breathtaking landscapes of China.

Options range from visiting the virgin forests of the Shennongjia Nature Reserve, the Dajiuhu peatland and the Three Gorges, to ascending to the Qinghai-Tibetan plateau (3,600 metres) to witness the awe-inspiring beauty of the Zoige Wetland Reserve. This reserve boasts vast alpine peatlands, abundant wildlife and cultural heritage.

Additionally, you will have the opportunity to witness the remarkable natural beauty and ecological significance of the Changbai Mountains in north-eastern China. The volcanic activity in the Changbai Mountains has played a pivotal role in shaping the landscape and creating favourable conditions for the development of peatlands. This excursion promises a unique experience to observe the influence of ash and tephra deposits on peatland formation.

We extend a warm welcome to the 17th International Peatland Congress in 2024 and eagerly anticipate your participation! Submit your abstract and register now: www.ipc2024.com!

Meng Wang

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RE3 Québec City Declaration - UN Decade on Ecosystem Restoration

Ecosystem restoration is a key component in achieving a sustainable future for the benefit of nature including people. The United Nations (UN) Decade on Ecosystem Restoration 2021-2030 (the Decade) aims at increasing efforts to restore degraded ecosystems and halt further biodiversity loss, with the ultimate goal of global ecosystem revival and reversing loss of nature.

As a UN Member State, Canada has committed to halt and reverse biodiversity loss by 2030 through the 2030 Nature Compact, the Bonn Challenge and Kunming-Montreal Global Biodiversity Framework (K-M GBF). In the latter, Target 2 calls on signatories, of which Canada is one, to ensure that by 2030 at least 30 per cent of areas of degraded terrestrial, inland water, and coastal and marine ecosystems are under effective restoration, to enhance biodiversity and ecosystem functions and services, ecological integrity and connectivity. To achieve all those promises to the UN, Canada must mobilize and convene scientific, policy and civil society knowledge holders to develop plans to prevent the loss, fragmentation, and degradation of ecosystems and to restore significant areas of degraded ecosystems.

Canada has already engaged with many public and private sector to initiate activities under different programs. Canada is committed to working collaboratively with partners and stakeholders to drive global system change, prioritizing the inclusion of Indigenous peoples as well as local communities in co-design, decision-making and implementation.

Québec view. Photo: Örjan Berglund

The Workshop "Advancing Ecological Restoration in Canada: Setting an Agenda", held in Ottawa May 30-31, 2022 to discuss strategies to advance the Canadian Agenda for the UN Decade on Ecosystem Restoration, showed that current actions are fragmented and may not be effective to achieve the Target 2 of the K-M GBF. One action was to develop a vision and the possible development of a

coordinating body to enhance the capacity of Canada to respond to the restoration targets and commitments.


Peatland in Canada. Photo: Örjan Berglund

Call for action

At the recent UN Decade Roundtable hosted at the RE3 Reclaim, Restore, Rewild conference in Québec City June 11-15, 2023, 214 experts, specialists, and future leaders from different cultures and disciplines developed a broad understanding of the issues and the challenges and proposed various actions and elements that are required to advance the Canadian Agenda for the UN Decade on Ecosystem Restoration and achieve Target 2 of the Kunming-Montreal Global Biodiversity framework.

Participants concluded that:

- The establishment of a Secretariat that is independent and becomes a legacy for all Canadians is a priority to coordinate all restorative efforts in Canada.
- This coordinating body would be multi-sectoral, multi-cultural, and tie in with global network of restoration initiatives associated with the UN Decade and the Global Biodiversity Framework.
- It would need to be financially supported through governmental, private, and non-governmental partnerships to ensure long-term sustainable and effective delivery of support and programs to meet key climate and biodiversity targets of 2030, 2050 and beyond.

And declared that such a Secretariat should include:

- Learning capacity, including financial support field-based training, internships, and educational opportunities at all levels (long-life and professional).
- Outreach, relationships building, and networking (breaking silos) to heighten awareness of the cultural, economic, social, and environmental importance of restoration for future generations.
- Policy and legislative analysis capacity to provide consultative and co-produced relevant recommendations to enhance ecosystem restoration, appropriate to all cultures.
- Building capacity for research, innovation, and monitoring, including an open-access central, curated repository of maps (geolocation), monitoring data, up to date metrics from various sources (e.g., peer and grey literature, and practitioners, oral presentations), and progress reporting on ecological restoration projects/interventions, to facilitate improved guidance tailored to challenges, ecosystems and cultural needs based on evidence and engagement.
- Capacity building to support to native species seed supply and propagation, which includes the use of innovative technologies to facilitate restorative activities.

Concluding remarks

The RE3 conference was the first national scale gathering on ecosystem restoration since 2004, when the international conference of the Society for Ecological Restoration was hosted in Victoria. National gatherings are essential to convene future leaders, scientists, policy makers, industry, and practitioners to further advance the agenda of ecosystem restoration in Canada and must become a regular event to support the UN Decade and beyond.

This Declaration is based on the key points noted during the UN Decade Roundtable and the Recommendations from the Future Leaders as important elements that were captured in the Declaration. For the full text, visit https://bit.ly/re3decla.

Challenges & opportunities by ecosystem type

Québec City welcomed RE3, an international conference on ecosystem restoration from June 11 to 15, 2023, the theme Re-claim, Re-store, and Re-wild (hence the name RE3). This conference was the first time since 2004 (Victoria, British Columbia) where global ecosystem restoration practitioners, regulators, and scientists came together in Canada.

RE3 provided a full 5-day event with workshops, including one with the United Nations Environment Program, an academy for young professionals, exhibits, poster sessions, and a discussion forum on the United Nations Decade of Ecosystem Restoration.

During one of the RE3 field trips. Photo: Örjan Berglund

The UN Decade forum event (June 15) was to assist in the development of potential actions that will be required in Canada to achieve the UN Decade on Ecosystem Restoration including Target 2 of the Kunming-Montreal Global Biodiversity Framework (KM-GBF).

Participants were asked guiding questions during breakout sessions to help facilitate discussion and promote collaboration with the goal of developing ideas that can advance restoration for seven general ecosystem types found in Canada which are: Wetlands & Freshwater Bodies; Forests; Mines, Borrows, Pits, Roads; Urban Areas; Agriculture, Farmlands, Grasslands, & Shrublands; Coastal Zones & Oceans; and Peatlands.

The following three questions were the basis for discussion:

- What is the current status and pressing issues for restoring your targeted ecosystem?
- What is needed? What are the constraints or opportunities to scale up and out?
- What are the concrete priorities and next steps (real actions)?

Summary of cross-cutting priorities across ecosystem type

- Establishment of secretariate that is external to promote unbiased knowledge exchange, better collaboration that is linked to state of the environment reporting,
- Cultural shift so restoration becomes a public priority, develop education and engagement strategies so people see the need / relevance for habitat restoration,
- National tracking system - need to know what we have lost, better accounting of what we have, what we are losing, what we are gaining and how it all works together - whole ecosystem approach with area-based objectives and long-term monitoring,
- Financial fund to ensure long-term maintenance, a need to develop bilateral agreements around restoration, funding, and capacity,
- Stronger incentives and penalties, need to

incentivize landowners to conserve habitat,
- Education - tie into curriculum, engage local communities, Indigenous knowledge, place-based knowledge, land-based peoples, and work within ethical space and two-eyed seeing,
- Capacity building in communities to involve in restoration, citizen science, bottom up - co- design projects at all levels with input at the beginning of design / concept,
- Keep the networking going - series of meetings to develop strategic plan and working on relationships around solutions,
- National seed strategy and supply, only have 1.5% to meet biodiversity targets, need more diversity, need to move away from plantation mentality.

UN Decade on Ecosystem Restoration Forum Results by Ecosystem Type - 7: Peatlands

For ecosystem types 1-6, including forests, wetlands, agriculture and others, please read the original statement at https://bit.ly/re3decla.

Current status and pressing issues:

- Unclear boundaries,
- Fire management needs to be improved,
- Not enough support for non-commercial, no system for producers in Canada, majority of money going to commercial,
- Agricultural disturbance - draining, deforestation in forested peatlands,
- On-going and historic injustice - power - who has it, who does not,
- Natural resources versus peatlands, who is deciding, need to popularize peatlands to public,
- Not recognized for place / role in climate change - this needs to be better communicated.

What is needed:

- Governing oversight body needed for better knowledge sharing,


Peatland restoration in Canada. Photo: Örjan Berglund

- Nationwide campaign for restoration, identify lands for restoration, conservation strategy, with better ecosystem indicators, prioritization criteria, and mapping,
- National seed strategy,
- Protect what is left, public awareness better informed by science,
- Scale down consumption,
- Network that can provide resources, information, who is doing what, better action between practitioners, science at all levels,
- Increased monitoring and capacity,
- Established relationships on the land, involve Indigenous communities,
- Need to work with new land dynamics such as fires and climate change,
- Compensation - better incentives, legalize obligation to restore / off-set.

Constraints to scale up and out:

- Funding for research and restoration across boundaries, collaboration is required but challenging,
- Cultural shift to change minds and attitudes.
- Understanding of hydrological systems and effects of ditches / drainage,
- Seed supply bottleneck.

Opportunities to scale up and out:

- Foster education and engagement - start in rural areas where there are still connections to the land, shifting cultural values, cross sectoral partnerships emerging,
- UN Decade to come up with a plan for restoration,
- Massive land acquisition for restoration,
- Reduce the need / reliance through reuse - recycling.

Priorities, actions, and next steps:

- Public awareness campaign - making restoration success and their champions visible,
- Competitive flagship application for Canada re restoration, support transition to reclaiming agricultural peatlands for conservation,
- Canada wide proactive restoration law to obligate the implementation of GBF & UN Decade restoration targets in Canada,
- Bottom up secretariate - facilitate more workshops for knowledge sharing and exchange - liaison with all parties globally, provide expertise to policy makers, connect academia and practitioners. Identify multi-scale projects to develop database of restoration opportunities with mapping,
- Monitoring and mapping peatland disturbances and restoration priorities - areas for best targeted restoration, increase accessibility to funding,
- Removing barriers for re-wetting, framework to prioritize restoration,
- Better communication between practitioners and between agriculture and peatland industry, networks of networks - cross-sectorial partnerships,
- Peatland education program highlighting peatland importance & impact of degradation on human health & social economic wellbeing & biodiversity.

The SER North American Conference 2024 will be held in Vancouver, Canada on 28 October to 1 November 2024. Welcome!

SER2025, the 11th SER World Conference will take place in Denver, Colorado from 25 September to 4 October 2025. More information on both events is available via https://www.ser.org.

New Members of the IPS

New members (or new contact persons for organisations, in brackets) are mainly approved by our National Committees. For all other countries, the approval is made by the Executive Board of the IPS.

Each National Committee is asked to compare their membership list to that of the IPS at least once a year (status below as of 15 December). In some countries, IPS has both a National Committee and an industry association as a member. **Note that the membership update initiated in November continues in January.**

In countries without a National Committee, member applications can be sent directly to the IPS Secretariat or online via **www.peatlands.org/join-us**.

Members are currently not accepted from Belarus and Russia. Membership fees are invoiced for the first year immediately, after that in June/July. Beware of scam emails.

Individual members
Bulgaria: Ina Agafonova
Ireland: Michael Keegan, Ita Sherlock

Corporate members/NGOs
Canada: Shauna Wright (Canadian Sphagnum Peat Moss Association, CSPMA)
Estonia: Eve Altrov, Kersti Rannamäe (Estonian Peat Association)
The Netherlands: Martine Holtkamp, Barbara Zeelenberg, Marco Zevenhoven (RHP)

More info and membership form:
www.peatlands.org/join-us

Membership benefits:

4 issues of Peatlands International / year | 10-12 issues of Peatland Snippets / year | Significant discounts at IPS events, congresses and symposia & IPS online store. | Excellent networking possibilities with peatland science and peat-related industry. Supporting the only peatland organisation worldwide that involves members from all sectors. Join us!

Get involved - IPS Board Elections in 2024!

Dear National Committees, dear members, We hereby remind you about the elections of the IPS Executive Board (EB) next year and encourage you to nominate your candidates. If the current number of seats (11) is kept, there will be **7 vacancies** on the Board. Re-elections are possible, but the nomination procedure is the same as for new applicants.

Deadline for nominations is **4 March 2024**. Only those National Committees that have paid their membership fees 2022-2023 can nominate candidates.

The terms of the current Board members are as follows:

Ending in 2024:

Marko Pomerants, Estonia, President
Guus van Berckel, Netherlands, 1st Vice President
Jack Rieley, UK, 2nd Vice Pres. & Principal Scientist
Donal Clarke, Ireland
Asha Hingorani, Canada
Giedrius Kavaliauskas, Lithuania
Tuija Vähäkuopus, Finland

To continue until 2026:

Bernd Hofer, Germany
Sabine Jordan, Sweden
Anna-Helena Purre, Estonia
Meng Wang, China

We kindly ask you to consider smart and competent persons from the science, industry and other sectors as soon as possible for these responsible tasks.

Note that as our budget is limited, travel costs and working hours must be covered by the EB candidates (or their organisation) unless otherwise agreed beforehand. Take into consideration that the EB is not a supervisory, but a **working board**, so we also hope for true participation and input in between meetings (2-3 times a year face-to-face, plus two hours every 1-2 months).

With the exception of the Presidents, there can be only one person per country (National Committee, NC) on the EB, so in practice the NCs of Germany, Sweden, Estonia and China can only make nominations for the three President positions.

The position(s) need(s) to be stated clearly in the nomination letters; President(s) plus ordinary member are possible, as they are elected after each other.

Formally, a nomination letter from the NC and a CV are the only requirements. We very much look forward to hearing from you.

The elections will be held at IPC2024 in China during the week of 4-9 August; from a technical point of view, this will most likely be carried out without online voting. Mark the dates.

In addition, the elections for the **three Commission Chairs** forming the Scientific Advisory Board will take place, either by the Commissions themselves or by appointment by the EB. Deadline for applications and nominations is also **4 March**.

Please send your nomination/application letter and CV (max 4 pages) to susann.warnecke@peatlands.org. Thank you very much in advance!

Additional information on the Boards can be found at https://peatlands.org/about-us.

Susann Warnecke

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Peatland restoration practices in vegetable cultivation

RE3 pre-conference tour to Montérégie region

Before the RE3 conference in Québec, Canada, Professors Jean Caron and Jacynthe Dessureault-Rompré and their team guided us through the Montérégie region's multiple research sites.

This tour showcased the intricacies of outdoor vegetable production and highlighted various conservation practices for agricultural peatland, including windbreak, drainage trench installations and biomass production areas. These sites in Montérégie primarily focus on devising conservation methods for vegetable crop cultivation on agricultural peatland.

Figure 1. Wind erosion on cultivated peat soil. All photos: Örjan Berglund

Due to farming and drainage, these soils undergo decomposition and erosion (Figure 1), with an annual soil loss of 2.5 cm. In some fields, the peat layer is so thin that farmers relocate the peat (Figure 2) and use the underlying soil for non-vegetable production.

Professors Caron and Dessureault-Rompré are researching the potential of offsetting this carbon loss by growing biomass crops on the farm for soil amendments. Such crops might be cultivated on degraded or underproductive lands not designated for vegetable growing.

Although sorghum has also been experimented with, miscanthus (Figure 3) and willow (Figure 4) are showing the most promise as potential crops. The crops were dried and crushed into 25 mm fragments. To compensate for the carbon lost through emissions, 15 ton/ha of miscanthus amendment would be needed each year.

There are many benefits of integrating biomass crops into cultivated histosols. They assist in achieving carbon balance and enrich growth conditions by introducing coarse material, elevating soil porosity. These amendments bolster soil against erosion, provide protection from harsh winds when used as mulch, and curtail

Figure 2. Peat is moved to create soil thick enough to grow vegetables on.

Figure 3. Miscanthus grown at the field trial.

Figure 4. Jean Caron shows the Salix produced for soil amendments on the peat soil.

soil subsidence by adding recalcitrant materials and preventing compact layering, which is a significant challenge in cultivated histosols.

The conclusions from the research to date are:

1. On-farm biomass crop production can provide soil amendment in histosols.
2. Stability of the added plant material is essential for long-term carbon stocks.
3. Miscanthus and willow provide more stable amendment than sorghum crop.
4. Sustainable use of histosols can be achieved using simple conservation practices.

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Montérégie is an administrative region in the southwest part of Québec. The region had a population of 1,507,070 as of the 2016 census and a land area of 11,132.34 km^2. It is the second most populous region of Québec after Montréal. The majority of the population lives near the Saint Lawrence River. Montérégie is known for its vineyards, orchards, panoramas, and the Monteregian mountains. The economy is based on agriculture as well as goods & services. Source: Wikipedia

Afforested cutover peatland can be a net CO_2 sink after two years

In Finland, most areas released from peat extraction are afforested after peat extraction has ceased. Unlike in Canada or Germany, the landowner has no obligation to restore the areas to wetlands. Instead, the landowner can freely choose the after-use method (see, e.g., Laasasenaho et al. 2023). According to the Bioenergy Association of Finland (2022), approximately 75% of the areas are afforested and only 5% have been restored to wetlands.

This has raised concerns that afforested cutover peatlands will become a long-term net carbon dioxide (CO_2) source, when the drainage maintains the low water table and the residual peat continues to decompose and forms greenhouse gases.

Figure 1: Naarasneva measurement station. Photo: Kari Laasasenaho

In the case of afforestation, the direction of emission development is not straightforward. After afforestation, leftover peat (which can be up to 1 m thick) continues to decompose while, at the same time, the growing ground vegetation and trees start to sequester carbon and produce litter.

The few previous studies on the topic have separately quantified the different carbon cycle components to provide an estimate of the carbon balance on cutover peatlands (Jauhiainen et al. 2023).

However, measurement of the net ecosystem CO_2 exchange (NEE) is usually conducted via a method that disturbs the soil and vegetation. One method that does not present such disturbance is the eddy covariance method.

In the present work, we provide a preliminary snapshot of results of the initial phase of afforestation obtained in a project called “Forests on peatlands - solutions for reducing emissions and increasing of carbon sinks (TURNEE)”, funded by the Finnish Ministry of Agriculture and Forestry.

Future carbon sinks?

In the TURNEE project, a station measuring the overall climate effects of afforestation of a cutover peatland was established in Naarasneva, South

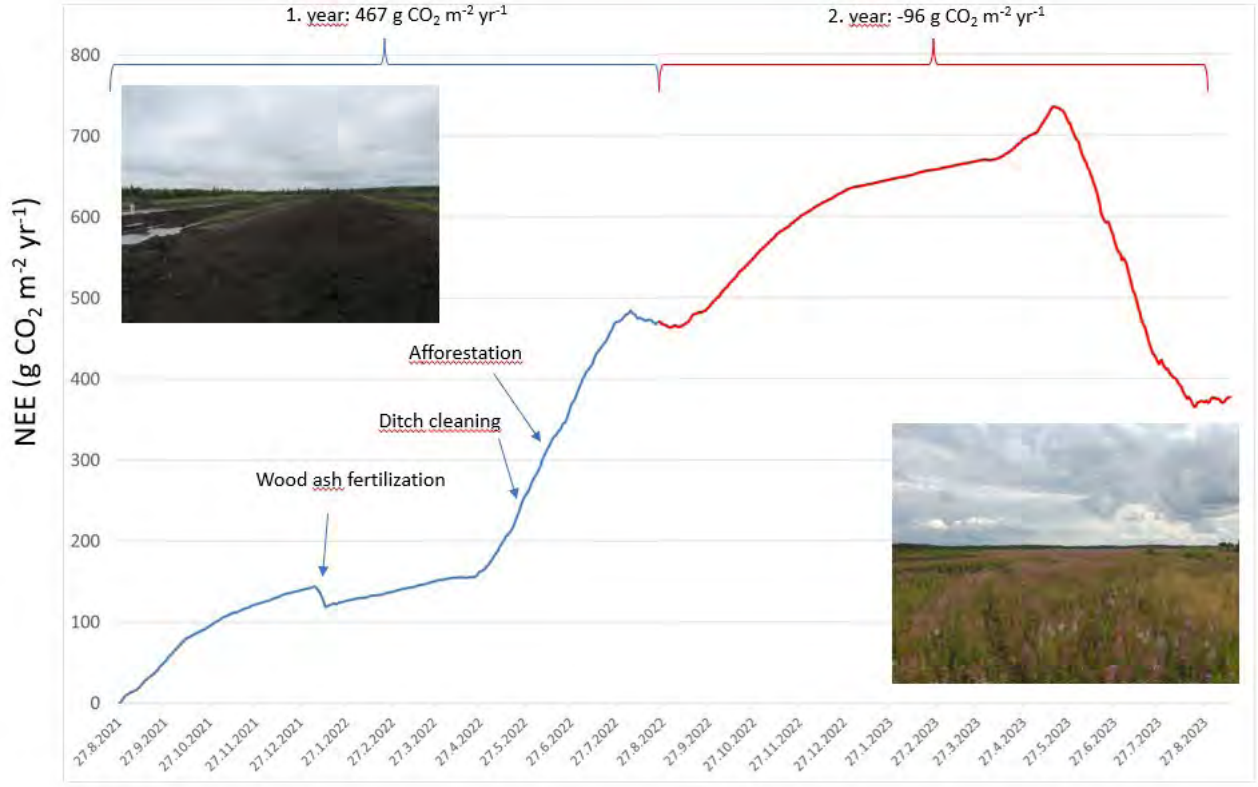

Figure 2. Daily cumulative net ecosystem CO_2 exchange (NEE) between an afforested cutover peatland and the atmosphere. Positive numbers indicate a source from the peatland into the atmosphere, negative indicate a sink. The slope of the curve illustrates the speed of net CO_2 emission or sink. During the first two years, the site has lost almost 400 g CO_2 m^{-2} into the atmosphere. Illustration: Annalea Lohila

Ostrobothnia, in 2021 (Laasasenaho et al. 2022). The peat extraction at Naarasneva ceased in 2020 and the area was fertilized with wood ash, maintained with ditch cleaning, and afforested with pine seedlings in 2022. NEE of carbon dioxide has been measured in the area for more than two years using the eddy covariance technique (Figure 1).

According to preliminary results, the area was a net source of CO_2 during the first measurement year, i.e., more CO_2 was released from the soil than was sequestrated by the vegetation (Figure 2). During the first summer, some weeds appeared at the site around late July and caused a small, short-lasting sink of CO_2, indicated by a decreasing cumulative NEE in August 2022.

However, the rapid growth of weeds such as the willowherb and downy birch that appeared in early summer 2023 (Figure 3) meant that the carbon sink strengthened in such a way that in the second year of measurement, the cumulative carbon balance became negative, i.e., more CO_2 was sequestrated to plants than was released into the atmosphere. In the first year, the area was a source of CO_2 at an approximate rate of 470 g CO_2 m^{-2}, while in the second year, the site acted as a CO_2 sink at a rate of almost 100 g CO_2 m^{-2}. These very preliminary results suggest that afforestation and its related management measures, such as fertilization, can relatively quickly create a new carbon sink on cutover peatland. Ash fertilization is crucial for producing vegetation cover quickly.

It is not yet clear how the NEE and the carbon sink will develop in the upcoming years and how the decomposition of vegetation and the litter production will evolve. These preliminary results indicate that it is possible to create rapid carbon sinks on cutover peatlands through afforestation, even though the area of restored cutover peatlands could remain small in Finland in the future.

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Figure 3. Naarasneva afforested cutover peatland in summer 2023. Vegetation cover has developed fast after wood ash fertilization. Photo: Kari Laasasenaho

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Take part in the Peat Quest!

PeatQuest is seeking the most crucial questions that still need answers in peatland research.

Please participate:
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World Wetlands Day
2 February 2024
Wetlands and Human Wellbeing

NGO calls for an immediate halt to peat extraction

Study by the NGO “Umweltforum Osnabrücker Land” evaluates the status of peat extraction in Lower Saxony - Analysis and response by the Industrieverband Garten (IVG)

In September 2023, the non-governmental organization (NGO) “Umweltforum Osnabrücker Land” (UFO) presented the results of its own working group’s research in connection with nationwide peat removal permits in in Lower Saxony, Germany.

The study analyses and models the duration of the approval, the amount of residual peat and the resulting emissions. The findings showed that, according to the current approval situation, an approved residual peat volume of 38 million m³ can be assumed which, after complete decomposition, corresponds to around 9.88 million t of CO_2 equivalents (CO_2 eq.).

Location of Lower Saxony. Google Maps.

According to the Environmental Forum, peat is currently being extracted on at least 8,100 hectares in Lower Saxony. Peat extraction is proposed to continue until the 2040s and there are two permits cited that are intended to extend into the period between 2050 and 2060.

The Garden Industry Association (IVG) has issued a counterstatement discussing some inconsistencies in the study. It has already highlighted elsewhere the illegality of the planned changes to the Lower Saxony Climate Protection Act and criticized the planned ban on peat extraction.

IVG's counterstatement

It is claimed that peat extraction “destroys important habitats for endangered animals and plants”.

This statement must be firmly contradicted. For at least 40 years, peat extraction in Germany has only been permitted on land previously used for agriculture and which has been drained for

decades. Peat extraction is only possible after an extensive approval process that examines all impairments.

The NABU-IVG concept (2014) presents a way in which the CO_2 emissions from peat extraction and use can be compensated for through additional measures on areas outside the extraction area.

The study concludes that, based on the current permit situation, an estimated remaining peat volume of 38 million m³ can still be extracted in Lower Saxony.

According to our findings (IVG 2012; data protection precludes publication of databases), this amount will be significantly lower. The annual amount of peat extracted in Germany has been falling continuously over the last few years. Due to ever-decreasing extraction areas, it was around 3 to 4 million m^3 in 2022.

According to the UFO, peat is currently being extracted on at least 8,100 hectares in Lower Saxony.

However, according to IVG projections (Schmatzler 2012), there are currently only around 5,200 hectares of approved extraction areas remaining in the Federal State. The carbon mainly escapes from the peat during horticultural use, and over a period of at least 10 years.

According to the national Swedish climate report to the United Nations (UN) and current research results from the University of Tallinn (still in progress), there is an annual oxidation rate of less than 2 percent and thus significantly longer periods can be assumed.

It is assumed that the emissions will be of comparable magnitude if the areas continue to be intensively used for agriculture.

The UFO's calculations most likely did not consider the fact that recent hot and dry summers have caused peat depletion and mineralization on the areas that are still to be extracted to progress much more quickly than expected and have reduced the peat reserves accordingly.

The statements made in the study regarding the actual remaining life of the supposedly still active extraction areas must be questioned. It is also misleading to suggest that "unlimited extraction permits" would allow peat extraction to continue in the long term.

The available amounts of peat are decreasing. Indefinite extraction permits are only available in connection with a maximum extraction depth.

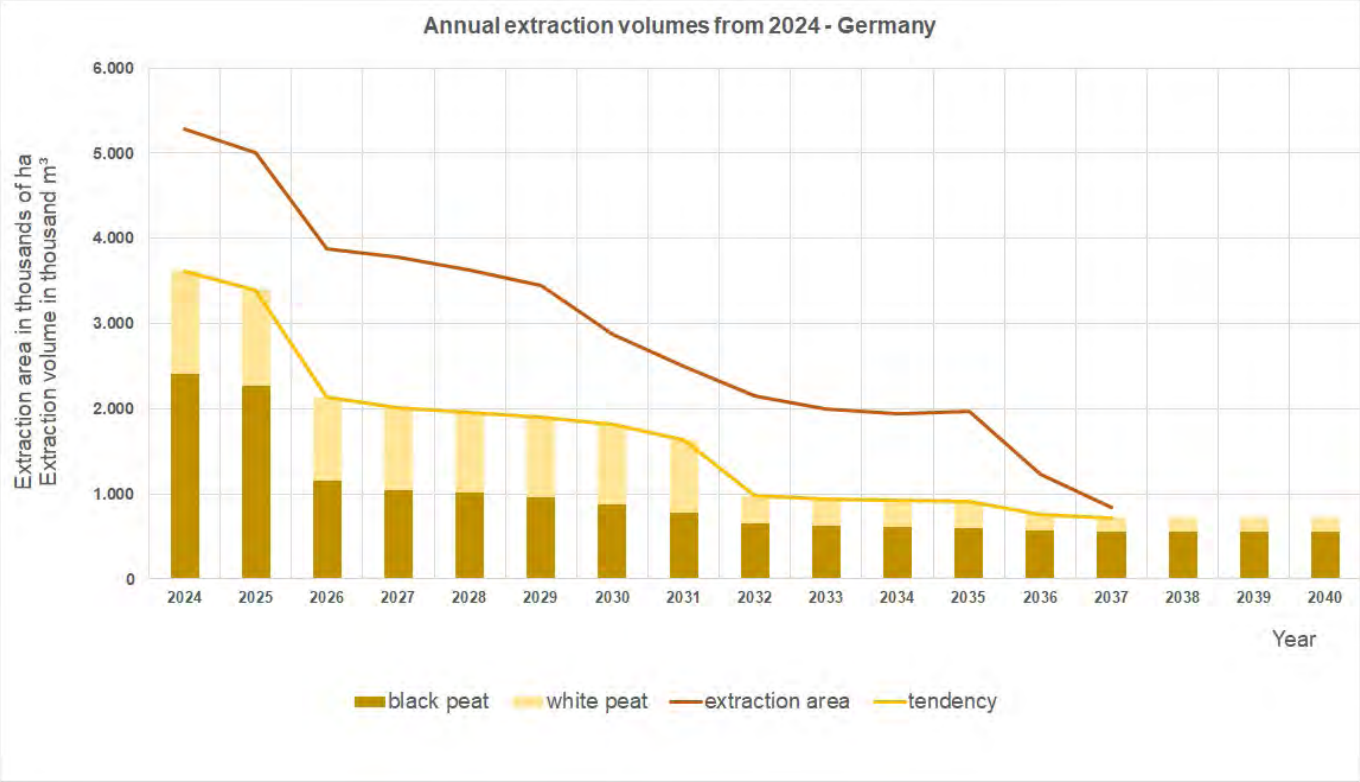
Accordingly, the latest an unlimited permit ends is when the maximum excavation depth that still allows rewetting has been reached. It can be assumed that this depth will be reached within the next 15 years because of the high demand for peat.

The Greifswald Mire Centre (2023) is quoted as saying that the emissions calculated for Lower Saxony of 18 million t of CO_2 eq. per year from drained peatlands (approximately 20 percent of the country's greenhouse gas (GHG) emissions) could be reduced with an immediate ban on extraction.

However, a closer inspection of the original source shows that this information was calculated without any emissions from peat use.

With an extraction volume of 4 million cubic metres of peat (using the 260 kg CO_2 equivalent

Lueneburg Heath in Lower Saxony. Photo by S. Widua



per cubic metre of peat assumed in the study), these amount to around an additional 1 million tonnes of CO_2 eq. Stopping peat extraction would thus not reduce the value of 18 million tonnes of CO2 eq. per year.

Two of the criteria used to calculate the CO_2 eqs. can be criticized as being too imprecise. It was assumed that the peat would be "absorbed evenly within the limited period" and that the dismantling would begin on the date the permit was issued and would end with the permit period.

In fact, the quantities of peat extracted are subject to strong annual fluctuations from weather and demand. They have been decreasing for years.

Some extraction processes begin in parallel with rewetting. These areas may still be listed as extraction areas in the authorities' records, even though they are already waterlogged.

Furthermore, sub-areas on which no more extraction is taking place are still considered as extraction areas if the district has not yet accepted this categorization because a larger approval unit is being considered.

Conclusions

- Peat extraction in Germany does not threaten any rare ecosystems.
- Stopping peat extraction would not reduce the value of 20 percent (18 million t CO_2 equivalent per year) stated in the study for GHG emissions from peatlands in Lower Saxony; it would only reduce a maximum of 1 million t.
- In order to reduce emissions from peatland, larger areas would have to be rewetted. The peat industry contributes to this through rewetting after extraction and with new approvals for external climate compensation (NABU-IVG concept from 2014).
- The approved reserves do not include the 38 million m³ predicted in the study. According to the Schmatzler (2012) study, the reserve still amounts to 25 million m³.
- One reason why these reserves tend to be overestimated is the fact that warm and dry summers caused by climate change lead to high volume losses on the extraction areas. Recent analyses show that thickness losses due to slumping, shrinkage and oxidation of 1 cm (up to 2 cm) per year can be expected. An annual loss of 1 cm means a calculated volume of 520,000 m³ for a total extraction area of 5,200 hectares.
- The value of 8,100 hectares given in the study

for the current extraction area was clearly overestimated. According to the data collected by Schmatzler (2012), there are currently 5,200 hectares that are still available for extraction.

- The areas for which there are already permits for extraction should be rewetted after peat removal. If the extraction was not carried out as planned, rewetting would not take place and agricultural use would continue. This would also cause the peat body to decompose over time. Emissions would not be saved in the long term, as the peatlands would not be preserved as suggested, but would continue to release CO_2 under further agricultural use until the peat body was completely used up.
- Once extraction has begun, it cannot simply be stopped, as extraction planning is also accompanied by extensive restoration planning. The success of the rewetting measures depends on the planned extraction depths being achieved.
- A ban on peat extraction does not prevent emissions, since a loss of German peat production would inevitably have to be compensated for by importing peat from other countries, with corresponding additional transport emissions.
- The graph on page 20 clearly shows that annual extraction volumes will decrease dramatically in the coming years and will remain at a level of just under 2 million m^3 by 2031.

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The 10th International Symposium on Testate Amoebae in Madrid

A week full of delicious tapas with red wine cheaper than Coca-Cola, summer-like warmth lingering in October, meeting colleagues from all around the world and, of course, insightful presentations about testate amoebae: ISTA 10 was all this and more.

Testate amoebae are unicellular protists highly abundant in peatlands and commonly used to reconstruct peatland water table fluctuations. They also act as apex predators in microbial food webs, which makes them important for many key ecosystem functions. Their hard test preserves well and can be identified under a microscope. Scientists also believe that there is potential for testate amoebae to serve as a biomonitoring tool, for instance, in peatland restoration.

Testate amoebae were a common interest for the scientists who gathered in the capital of Spain at the beginning of October and attended ISTA 10, organized by Enrique Lara and his team. The meeting was held in the Royal Botanic Garden, where all attendees could fit in the same room, creating a very cosy atmosphere. Lots of thoughts, ideas and practical tips were exchanged between presentations.

The first seminar day was focused on testate amoebae as palaeoecological indicators. We heard about studies from peatlands in Siberia, the UK, the Azores and, in my presentation, Finland. I presented a sub-study from my PhD project, which assesses the effects of climate-induced drying on peatland microbial communities.

The participants in sunny Spain. Photo: Jésus García Rodrigo

The author during her presentation. Photo: Brunella Palacios Ganoza

I showed preliminary results from a comparison of testate amoeba communities between pristine sites and experimental water-level drawdown sites.

During the week, we learned about molecular studies, taxonomic diversity and biogeography. There was an important discussion about taxonomic biases and inconsistent nomenclature that is currently posing challenges for the scientific community. The week ended with a field excursion to the Ventorrillo research station in the Guadarrama Mountains.

All in all, ISTA 10 was a great opportunity to learn more about testate amoebae and their potential applications in peatland science and management, to present my own data and to become part of the community.

I would like to take the opportunity to thank the International Peatland Society for the Allan Robertson Grant that made my participation possible.

More information is still available at https://ista10madrid.csic.es.

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Apply for the Allan Robertson Grants for Research Students and Young Professionals 2024!

Allan Robertson from the United Kingdom was the First Honorary President of the IPS and one of its founding members.

The €500 Grants are awarded each year to:

a) young peatland and peat researchers carrying out research or practical work or
b) young professionals in early stages of their career in managing peatlands or peat industry.

Grant recipients are normally under the age of 30. Undergraduates are ineligible. The winners are selected by the IPS Executive Board and announced in March, or in a festive manner at the IPS Annual Assemblies.

In 2024, grants are provided for travelling to or registering to the 17th International Peatland Congress in China in August, as well as to fund diverse peat and peatland projects - do not hesitate to apply!

The next deadline is 31 January 2024.
We will open the the application form as soon as possible in December/January at https://bit.ly/3rEMpVS. Good luck!

New resources to help crofters navigate peatland restoration in rural Scotland

If you're a crofter in Scotland, wanting to restore the peatland ecosystems within your communal grazing land, how do you go about it? If you have the opportunity to take advantage of public funds so that restoration costs you nothing, should you take it? Or should you agree to sell the carbon locked up in your newly restored peatland to a company or a broker, to provide you with extra revenue and them with credits to offset their emissions? What are the costs and benefits of different pathways to restoration? And how might you gain, or lose, from peatland restoration itself?

Peatland ACTION assisted restoration of peatlands underway in the north of Lewis, Outer Hebrides. Photo: Lydia Cole

In October of 2023, colleagues and I launched an online set of resources designed to answer these questions for crofting communities living in rural Scotland, to assist them in making decisions about how to navigate peatland restoration.

Crofters are individuals who have tenure or use of a small plot of land, i.e., a croft, traditionally in the Highlands and Islands of Scotland, where commonly part of their income is obtained from farming that croft and a larger area of communal land to which they have rights to graze animals.

The website housing these resources: Peatland Restoration: A Guide for Crofting Communities, contains a downloadable Executive Summary and extended Booklet outlining some of the key considerations for crofting communities embarking on, or under pressure to engage in peatland restoration activities.

Alongside these, we provide responses to common questions that arose during a period of field research carried out in the spring of 2023 in Lewis, Outer Hebrides, in the form of FAQ, as well as a glossary of terms, to facilitate understanding of the unfamiliar words and complex phrasings common in discussions around carbon credits and associated carbon markets. All of these resources (bar the FAQ) are available in English and Gáidhlig (Scots Gaelic), reflecting the languages spoken in the communities they have been designed for.

These crofter-facing guidance materials are the result of a nine-month project funded by the St Andrews Interdisciplinary Research Support scheme, awarded from the University of St Andrews, Scotland. The research underpinning the resources was carried out by a team from the University of St Andrews, led by myself and Dr Cornelia Helmcke, with Ewan Jenkins employed as a Research Fellow, and Dr Bobby Macaulay, (coordinator of the Community Landownership Academic Network (CLAN), University of the Highlands and Islands) and Drs Shona Jenkins and Milinda Banarjee (University of St Andrews), as Co-Investigators.

At project inception, Cornelia and I engaged various people to understand if our research questions were pertinent and could yield information of use in the development of informed policies on peatland restoration in rural Scotland.

Bobby Macaulay provided invaluable feedback on our ideas and contacts for the project, one of which was the Peatland ACTION Officer in Lewis, Ben Inglis-Grant. We thank him for the time and wisdom he shared with us over the full course of the project.

Peatland ACTION is the government scheme that funds and provides logistical support for the restoration of peatlands in Scotland. Peatland ACTION is not to be confused with the Peatland Code, a UK Government-backed scheme that acts as a standard against which carbon credits resulting from peatland-based restoration projects can be verified, enabling them then to be sold on the domestic voluntary carbon market.

Our project explored the challenges and opportunities associated with the different pathways to restoring peatland ecosystems within crofting communities in rural Scotland, in order to provide insights for what is necessarily a rapidly developing area of policy around natural capital markets and net zero accounting. For an important critique of the carbon market in the context of achieving net zero in the UK, pertinent to the drive for peatland carbon credits, we recommend Andy Wightman's blog.

The website and associated resources are being disseminated to crofting communities and organisations, researchers and policy groups, and anyone who might be able to make use of the information to better understand what support and regulation is needed to help communities navigate the new potential to earn money from carbon held within, or in the case of peatlands, not emitted from landscapes if they are restored (i.e., avoided emissions if 'Business as Usual' scenarios continued).

If you have feedback on the resources and/or would like physical copies of the Executive Summary or Booklet, please email peatlandguide@st-andrews.ac.uk.

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Sphagnum transplant Experiment Methodology following 2019-2020 fires in Kosciuszko National Park

Introduction

The *Sphagnum cristatum* transplant experiment was undertaken on the southern side of the Snowy Mountains Highway at Delaneys Swamp (Figure 1), a subalpine peatland complex situated in the Australian Alps in south Eastern Australia at an altitude of 1358m, following a large wildfire that burnt the peatland surface in January of 2020. The peatland is in Kosciuszko National Park (KNP) west of the small town of Adaminaby.

Figure 1: Work area overview, showing location of the transplant quadrats south of the Snowy Mountains highway. Credit: B. Lai

Methodology

12 x 15cm *Sphagnum* plugs were collected using a sharp knife (Step 1). The proposed use of the 200mm post hole digger pincers to take the plug was problematic as the blade was not sharp enough to cleanly cut the *S. cristatum* and some tearing of the *S. cristatum* was observed. Instead a knife was used to neatly cut a 200mm plug. The post hole digger was very useful for placement of *S. cristatum* (Step 2, 3 and 4).

The 200mm plug size is a large enough aggregate size to give the transplant some resilience (Robroek *et al.*,2009) but minimises damage at the donor site. The top of the transplant should be adjusted to approximately surface height and snuggly fitted into place.

For monitoring two 50cm x 50cm quadrats were marked out using tent pegs for reference, one that was treated and the other a control. The percentage cover of plant species was then observed and recorded, along with the alignment of the quadrat and the placement of the tent peg. The site will be revisited annually for the three years and then the experiment concluded. To minimise risk of introduced pathogens and weeds no cross over occurred between the *Sphagnum* transplant footprint, and the shade cloth footprint.

Step 1: The living *S. cristatum* plug. Photos: Jackie Hattingh

Step 3: Plug jammed into in ground using post hole digger.

Step 2: Plug placed in post hole digger for placement.

Step 4: Expanding the jaws and removing post hole digger at Quadrat 5.

Results

There were some promising results after half a year (Plates 1 and 2), with most of the transplants well established. The aim is to have the results published in a peer-reviewed journal after three years of consistent data collection and monitoring.

Discussion

Transplant sites were mostly selected based on the presence of favourable micro-habitat features. These traits include hummocks with shaded flanks and moist shaded hollows, as this micro-habitat has been known for optimal survival and subsequent recovery of *Sphagnum* moss (Whinam *et al*., 2010). Although large areas of severely burnt peat are a poor substrate for *Sphagnum* establishment and growth (Prior *et al*., 2023), some diversity of site types were investigated to study the optimal conditions for growth and the environmental envelope of *S. cristatum* translocation.

Acknowledgments

I would like to acknowledge the traditional owners of the country on which the research was carried out - the Ngarigo people. I also acknowledge the

Plate 1: Healthy transplant at Quadrat 6 after half a year. Photo: Ben Keaney

Plate 2: Detail of transplant at Quadrat 12 after 6 months. Photo: Ben Keaney

work of B. Lai and B. Byrne from NSWNPWS, and Jackie Hattingh for help with fieldwork and the manuscript.

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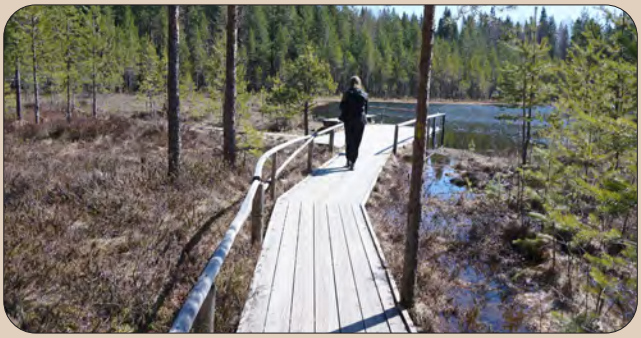

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