Summary Report:

Integrated Farm and Land Management (IFLM) Method Framework Technical Workshop

Prepared by:

CMI Integrated Farm and Land Management (IFLM) Taskforce

Introduction

The CMI Integrated Farm & Land Management (IFLM) Taskforce hosted a 1.5 day expert workshop in Canberra on 12-13 June. The scope and purpose of the workshop was to discuss the key components and eligibility criteria of the IFLM Methodology that is currently in co-design, led by the Australian Government. The focus of discussions included the scientific basis, proposed eligible activities and potential methodology safeguards, with the goal of informing the co-design process and ensuring development of a high integrity, outcomes-based methodology.

The workshop agenda stepped through each of the key method components and proposed innovations detailed in this discussion paper on the IFLM Framework, developed by the CMI IFLM Taskforce and released publicly on 29 May 2024. The workshop sessions included an introductory briefing by Professor Karen Hussey, Chair of the Emissions Reduction Assurance Committee (ERAC) on ERAC method requirements and processes, as well as by Kath Rowley, Head of Emissions Reduction Division, Department of Climate Change, Energy, Environment & Water (DCCEEW) on the broader method co-design process. The independent facilitator explained the agenda, intended outputs, and expectations of engagement. The meeting organisers referred to the DCCEEW background above and identified what was in and out of scope for workshop discussions. Subsequent sessions included a discussion on case studies illustrating how IFLM could work in different ecosystems around Australia, and focused sessions on each key component in the discussion paper. The details of each session, summary of workshop discussions, action items arising from the sessions, and other issues that were identified by attendees as important matters to progress but were outside the workshop scope, are detailed in the following report.

Attendees at the expert workshop included a wide range of stakeholders and expertise based on a skills matrix to ensure diversity of expertise and perspectives. This included a range of scientific and academic fields (including ecology, soil science, modelling, forestry, law & policy), conservation organisations, agricultural expertise, carbon sector, state and federal government representatives. A list of attendees is provided at Appendix A. In addition, a broader range of stakeholders pre-reviewed the discussion paper and provided input to the workshop. The CMI IFLM Taskforce welcomes input from other stakeholders based on the information detailed in this report and the discussion paper which can be provided via the IFLM Taskforce Secretariat.

The objective of this expert workshop report is to summarise the discussions, including areas of agreement, disagreement or areas proposed for further work or discussion. Comments and discussion are not attributed to attendees, in line with the agreed workshop protocol. The report has been provided to attendees for comment prior to public release. The report has also been provided to ERAC and DCCEEW. Next steps for the CMI IFLM Taskforce include working collaboratively with interested stakeholders, including workshop attendees and others, to progress the identified action items to continue to support the ongoing Australian Government led IFLM method co-design process.

Feedback was sought from expert attendees on day two regarding their support for the general features of the IFLM framework (i.e. proposed innovations, five-step process) set out in the discussion paper as the basis for continuing to progress the IFLM methodology through a co-design process. 85% of respondents were supportive of the framework, with over 50% of respondents wanting further details to inform their further participation in the next phase of

development (see Appendix C for detailed results). A summary of the recommended action items arising from the expert workshop as immediate next steps to continue that co-design is provided below, followed by the details of each session.

Summary of Action Items Arising from Workshop*:

1. Develop guidelines on land management strategy, including a common framework for identification of barriers to carbon sequestration in the baseline and acceptable forms of management evidence in baseline and project period, were identified as being important to get greater consistency across projects and provide high confidence in management changes.
2. Attendees agreed to set up a sub-group to discuss some targeted and limited changes to the soil supplement, and further discuss options for mirroring or cross referencing the SC2021 method.
3. Sub-group to further discuss how fire is addressed in both methodology equations related to fire disturbance, and within land management strategy framework to consider scope for inclusion of fire management in phase 1 IFLM framework.
4. A sub-group of experts agreed to form to develop a taxonomy of language (i.e. established defined terminology) that could be used throughout the IFLM methodology, and ideally other carbon and nature repair methodologies).
5. A sub-group of experts to draft guidelines for design and sampling of carbon stock estimation processes for all five schedules, drawing from existing guidelines where relevant.
6. Develop draft guidelines for allometric calibration to ensure consistency of calibration approaches for carbon stock estimation processes.
7. Review and update monitoring and evidence requirements in the technical draft of the IFLM Methodology.
8. Draft guidelines for ecosystem benchmarks, including detailed steps for material gap analysis including duration requirements and supporting evidence.
9. Further test Leakage Assessment Framework with worked examples and develop a hardcoding of leakage assessment requirements for specific eligible activities in the IFLM Framework.

The CMI IFLM Taskforce will discuss these action items with DCCEEW following the workshop and propose to form sub-committees to assist with progressing these actions as part of the ongoing co-design process. Workshop attendees and other stakeholders are invited to nominate to participate in sub-committees arising from the above action items.

*Does not include action items dealt with in subsequent workshop sessions

Key issues for further discussion outside method and/or session scope:

There was widespread agreement across all participants on the importance and urgency of environmental data sharing for improved national environmental accounting. Engagement with government to accelerate the progress of Chubb Recommendation 4 was identified as needed, but out of scope for this workshop.

Schedules and Guidelines for estimating carbon stocks may be related to other market-based instruments (e.g. insetting, nature repair), or environmental accounting programs such as Climate Active. Interoperability of guidelines and terminology was widely supported, but outside the specific scope for this workshop.

Session 1: Overview of five-step process & example of application in diverse ecosystems & regions of Australia

Session Overview:

This introductory session presented the overall IFLM framework, five key innovations, and eight case studies demonstrating how the framework can be applied across a diverse range of ecosystems around Australia. Four of the case studies were presented in more detail to the audience, and views were sought on whether the five steps were comprehensive and provided sufficient safeguards for a successful method. Case studies 1, 2, 3 & 6 were presented and discussed in the session, with case studies 4, 5, 7 & 8 available as references though out the workshop.

The case studies were used to illustrate how the proposed "material gap analysis" could work in different ecosystems and land use contexts to show there is carbon storage potential at the project eligibility stage. The ecosystem benchmark that underpins the material gap analysis was a key discussion topic throughout the session.

See: Section 3 of the Discussion Paper.

Summary of discussions:

- Several questions were raised about whether ecosystem benchmarks are intended to be control sites or reference sites, and if they need to be controls or paired sites, and how this could be effectively achieved across variable landscapes and through time. It was highlighted that a typology of ecosystem benchmarks may be needed to ensure consistent use of terminology and appropriate use of benchmarks.
- It was noted that the material gap analysis is not intended to be linked to carbon abatement calculations, but rather an upfront threshold to demonstrate a carbon stock deficit compared to carbon stock levels in a representative ecosystem benchmarks. Control or paired sites could be valuable for research but would need careful pairing and have a different purpose of expanding the body of science related to impacts of different management activities. As opposed to an eligibility test to show that a project site has carbon storage potential (which is what the proposed ecosystem benchmarks are designed to achieve).
- Concerns were raised that there may be an incentive to choose sites with poor correlation in a variable landscape to emphasise the gap and ignore broader landscape dynamics – it was discussed that there may be potential to game the system and manipulate benchmarks to show a gap if the reference site is not correctly correlated. It was suggested that the case study benchmarks are not representative of the project CEA and the gap analysis is therefore invalid. How do you ensure changes in carbon stock are linked to management change and not the variability of land and climate?
- In response to this, it was noted by attendees who had visited the case study sites that from their experience the benchmarks were representative. In response to concerns on misaligned incentives, it was suggested that a gap analysis is a safeguard to encourage conservativeness, as if you don't have confidence there is a carbon gap, then the project carbon estimation areas are unlikely to respond to management actions, and carbon stocks are not expected to increase. Since ACCUs would only be issued for proven outcomes (with abatement calculation

approaches for discussion in session 5), the gap analysis encourages realistic mapping of CEAs (no gap = no abatement potential = no ACCUs).

- Some participants highlighted that a gap analysis alone does not address the additionality of 'what might have happened anyway', since systems are influenced by natural drivers that may also produce gaps. It was widely agreed that the gap analysis alone is not sufficient, and hence the discussion paper highlights the importance of this analysis being coupled with management history evidence on the drivers of the gap.
- The proposal to expand the spectrum of eligible woody biomass beyond past requirements, based on change from below the forest threshold to above the forest threshold, was discussed. This provides more flexibility to include a broader range of woodland and forest ecosystems that have scope to store carbon in response to management change. It was asked whether the intention was to measure or model this change. It was noted this would be covered in session 5, but there were different options, and it was noted that projects that opted to continue to use FullCAM would
- Some attendees raised concerns about potential for crediting of biomass in more mature trees that are not impacted by the management change. Following these concerns, there was a request for clarification from another attendee on the case study data as to how the mature trees detected in the lidar data would be dealt with in HIR or IFLM projects. It was suggested that there remains a problem in current HIR projects, and that pre-existing trees are not removed from CEA and are being credited.
- In response, another attendee provided an explanation of how pre-existing trees are accounted for in FullCAM for HIR projects. They explained that forest must be removed from the CEA, but that not all paddock trees are removed from CEA. Rather, the FullCAM tree yield formula is calibrated using plots that have both pre-existing trees and regenerating trees. The calibration approach means that FullCAM only credits the regenerating cohort and does not credit biomass in mature trees even if they are not physically removed from the CEA. They noted that this is addressed in Component 3 from pg. 29 in the IFLM discussion paper which provides further details on scientific basis for the calibrations. It was also noted that this issue was already reviewed and addressed as part of the Chubb Review. CSIRO confirmed that FullCAM tree yield growth curve for regenerating cohorts is calibrated on sites that have pre-existing mature trees as explained above.
- Regarding concerns about potential for crediting of biomass in trees not impacted by management changes, it was noted that the discussion paper proposes a mechanism to exclude biomass in vegetation not impacted by the management change through the eligible carbon stock ratio (see Component 2 from pg. 26 in IFLM discussion paper). Eligibility is determined by likelihood of impact by proposed management activities. For example, short trees may respond to grazing management and tall trees may not. Carbon stock change from ineligible trees is removed from the abatement calculation through the carbon stock ratio
- It was suggested that one option for resolving the question of management impact is examining satellite imagery historical trends back to 1988. It was noted that baselines are proposed to be at least 10 years but may also draw from management histories over much longer timeframes, as proposed. Additionally, the Chubb Review recommended that long-run trends could be part of the evidence of suppression. Further, it was noted that persistent, long run gaps can inform the technical case for eligibility and potential to generate additional abatement in ecosystems that vary over long timeframes. For example, examining size structure in woody biomass can identify a gap representing decades of barriers to growth. In the case of fodder harvesting (QLD), cut down trees remain on the ground for long periods.

However, gap analysis is necessary but not sufficient and must be supported by evidence that attributes the gap to management history.

- The importance of having management history information for reference sites was broadly noted. TERN was suggested as one example of potential source of sites, but it was noted that only around 30 TERN sites had management history. The availability/reliability of land condition and management history data and evidence was recognised as being very variable, and thus this is a limiting factor if the reference site approach requires paired sites with same land condition and management history.
- It was discussed that the gap analysis does not require 'pristine' ecosystem benchmarks, just relevant benchmark sites that are in better condition than the CEA. This makes it easier to find suitable reference sites, whereas pristine sites may be very limiting.

Action Items:

Ecosystem benchmarks were identified as a critical concept and emerging issue requiring further in-depth discussion.

Key issues for further discussion outside method and/or session scope:

There was widespread agreement across all participants on the importance and urgency of environmental data sharing for improved national environmental accounting. Engagement with government to accelerate the progress of Chubb Recommendation 4 was recommended, but out of scope for this workshop.

Session 2: Woody biomass & five step process

Session Overview:

This session focused on how the IFLM framework could be applied to woody biomass CEAs. The proposed IFLM framework draws from the Society for Ecological Restoration Australasia (SERA) National Standards for Ecosystem Restoration as a general approach to targeting opportunity to improve ecosystem condition. It was proposed these principles can be applied to identify how project activities can be designed to increase carbon stocks in woody biomass.

Focus questions:

Q: Does the Society for Ecological Restoration Australasia (SERA) ecological restoration framework provide a suitable approach to analyse barriers to woody biomass regeneration and inform carbon project management activities?

Q: What should be the key criteria for selecting ecological benchmarks or reference sites?

Q: The gap analysis and eligible carbon stock ratio are designed to provide robust evidence of additionality. Are there any further refinements to these proposed safeguards?

Refers particularly to Section 4 of the Discussion Paper, components 1-8 & 11

Summary of discussions:

- It was noted that the SERA Standards present a process for identifying physical, biological and process barriers preventing recovery, including identifying threatening processes – and though some adaptation may be required, these factors seemed relevant across all landscapes to inform the design of a land management strategy. Particularly, as there is a spectrum of degradation across the country.
- Another noted that the SERA framework of barriers is useful. The Australian Ecosystems Models Framework1 (AusEcoModels) also provides conceptual models (archetypes) for some woody ecosystems that may provide support for ecosystem benchmarks and land management strategies.
- A view was expressed questioning the role of regeneration in lands not comprehensively mechanically cleared, questioning the framework's ability to separate out impacts of activities like grazing management from natural variability and rainfall. It was stated that if the purpose was to look for a 'gap' then the simplest and best approach is to keep projects to land that has been mechanically cleared. Demonstrating a gap is one thing, but for additionality, the method needs to demonstrate the cause is anthropogenic and not because of inherent heterogeneity. Limiting the method to regions that have been comprehensively cleared may mean foregoing abatement opportunities in other regions where some have low confidence in abatement and carbon storage. It was suggested the literature was clear that grazing has no impact on regeneration and there is not clear and convincing evidence rangelands projects will generate abatement, noting that we have to have confidence that abatement will persist in the landscape. In designing a method to incentivise investment in land management of extensive

[1] The Australian Ecosystems Models Framework – Biodiversity Knowledge Projects (csiro.au)

ecosystems, not all change should be attributed to management or be eligible for crediting and the ecological benchmarks are flawed.

- While it was broadly agreed confidence in abatement is key, others strongly disagreed that the literature supported the position that grazing does not impact regeneration (including noting the extensive literature referenced in the discussion paper and with a zip file of the references available on request from the CMI IFLM Taskforce Secretariat). Further, it was noted that a method requirement for comprehensive mechanical clearing aligns with QLD and to some degree NSW contexts, but largely ignores decades of rangeland ecologist expertise which describe land condition versus land potential in great detail. It was noted that methods should be nationally applicable and there are options for robust gap analysis, including qualitative frameworks for assessing 'good' versus 'poor' condition. Others noted that definitions of comprehensive clearing are not straight forward and that a requirement for comprehensive clearing in the last 20 years that is observable by satellite would exclude partial clearing and other forms of land degradation and disturbance since settlement. This has the implication of excluding most of Australia's Indigenous estate as well as pastoral leases in WA, SA and NT from participation. Comments in the past session on eligible carbon stock ratio were also noted, as the draft IFLM Framework is an effort to attribute carbon stock change to management in a rigorous fashion.
- Additional comments pointed out that many degrading management actions and landscape modification impacts occurred closer to settlement, well before 1988 when the first time series satellite data becomes available. Original pastoral lease grants across the country typically involved an obligation to develop and modify the land to undertake pastoral enterprises, particularly through a requirement to clear trees. This early settlement clearing was followed by decades of pastoral activity that degraded the lands but would not meet the proposed comprehensive clearing definitions as it occurred pre satellite imagery. Additionally, settlement resulted in long run disruption of Indigenous practices, including cultural fire management. Management changes degrading land can include the absence of management, and rangelands pastoral and Indigenous states should not be excluded from any integrated vegetation method.
- Several attendees noted that crediting of woody biomass needs to be conservative and carefully managed, so as to manage the inevitable ups and downs through a project lifecycle. Other comments and suggestions related to this topic included:
  - The temporal aspect is important as ecosystems are naturally dynamic. Australian ecosystems, particularly in lower rainfall regions, follow boom and bust cycles.
  - Pulses of regeneration can occur slowly and over long periods. However, small improvements in tree recruitment over very large areas can contribute substantially to carbon storage.
  - Two key tests are 1) how much temporal variability in carbon stocks is indicated by scientific evidence? and 2) how variable are carbon stocks, currently, across the ecosystem?
  - Arguing for the exclusion of grazed lands because it's 'harder', is just giving up. Defining clearing as areas that have been detectably pushed over is a particularly narrow definition of tree removal across rangelands.
  - Degradation may not be well correlated to changes in woody cover. There are more modern techniques for identifying degradation now and can make a big difference to Australia.

  - Detecting areas cleared more recently is straightforward in that it can be identified by satellite monitoring but there is an inherent limitation that satellite imagery can only detect clearing post 1988.
  - Triangulation using long run management history, including stocking data and water point location (10 + years before) can help resolve additionality questions.
  - Representatives from SA and NT governments noted their different land management contexts, including how provision of water points and livestock management has been undertaken. One comment noted the discord about the potential for ecosystems to store carbon in woody biomass in response to grazing is preventing investment in good land management and preventing new philanthropic investment in rangelands conservation. On this, it was noted that benefits other than carbon are not relevant to the IFLM, but might be included in other emerging nature repair etc. programs.
  - It was noted that rain is important for all projects, whether rangelands or other ecosystems, spontaneous regeneration or facilitated regeneration through planting. In all instances, there is substantial investment and success if driven by rainfall following management changes.
- It was suggested that it is important to move away from the binary cleared/uncleared threshold requirements to a framework applicable to a broader range of ecosystems and land management contexts that ensures ACCUs are only issued for outcomes which deliver proven carbon storage. In this view, if it is agreed that the benchmarks or reference sites approach has potential, and rangeland ecologists can agree that there is degradation, then we can move forward. It was noted that the framework does not pre-judge what specific projects will or won't achieve abatement outcomes, rather it defines a framework for projects to be evaluated. The risk of whether a management change delivers that outcome sits with the proponent, as long as the method has the right safeguards. It's important to be diligent about which projects are allowed to participate but there are also checks and controls at ACCU issuance, which come later on. The balance to be struck is not overly restricting projects that have potential at the start, but ensuring checks are in place later on to issue credits based on abatement outcomes. In this view, this is the same as other agricultural or land-based ventures, in terms of investment risk.
- In an alternative view, it was noted that it is important to have confidence that the outcomes credited are real, as risk does not only sit with project proponent, but broader society risk if ACCUs are used for offsets and the credited abatement is not real, and that public resources are expended in monitoring and regulating the system. In response, the recent ANAO audit of the CER was noted which shows that we can have very high confidence in how the CER is implementing regulatory monitoring and safeguards, particularly when coupled with the Chubb Review and Academy of Science paper. As such, the focus needs to be on setting the right safeguards for the next phase.
- It was noted that the proposed IFLM framework is not intended exclusively for a rangelands context, but that the conversation had been overly focused on this ecosystem.
- A clarification was requested on whether the method was aligned with Australia's national accounting framework if there was a change away from reliance on forest threshold (transition from non-forest to forest classification), towards crediting of any proven increase in woody biomass. It was noted that the forest classification stems from a UNFCCC 'accounting bucket' that introduces unnatural splits and that it is not necessary to apply this threshold at a project scale. The IPCC has since shifted from activity to land-based accounting (replaced in 2003) and all natural and anthropogenic removals should be reported. What accounting bucket the

abatement sits in within the national account doesn't matter, but the focus should be on ensuring the outcome has been achieved and the carbon has been stored in the landscape.

Action Items:

Guidelines on land management strategy, including a common framework for identification of barriers to carbon sequestration in the baseline and acceptable forms of management evidence in baseline and project period, were identified as being important to get greater consistency across projects and provide high confidence in management changes.

Ecosystem benchmarks and regional applicability were identified as a critical concept and emerging issue requiring further in-depth discussion, with a minority counterview that rangelands should be excluded.

Session 3: soil & five step process

Session Overview:

This session focused on how the IFLM framework should be applied to soil organic carbon CEAs. The IFLM framework draws from the 2021 Soil Carbon Method (SC2021) and aligns with both eligible management activities and carbon estimation approaches.

Focus questions:

Q: It is largely proposed to mirror the requirements from the recent Soil Carbon Method 2021 given it was recently reviewed and legislated. However, is there an opportunity to include biochar as one of the eligible management activities for soil under IFLM method?

Q: Are there any additional considerations, including logistics, that should be considered when accounting for soil sequestration under woody biomass?

Refers particularly to Section 4 of the Discussion Paper, components 9-10 & 12

Summary of discussions:

- A question was raised on the potential for the IFLM method to either cross reference or 'mirror' the 2021 soil method. It was discussed that there was not yet a final position on this, but the legislative lifecycle and methods sunset process likely make mirroring the most viable option, as otherwise projects might cease to have legal basis if SC2021 sunsets prior to proposed IFLM method. It was noted that both methods could refer to the same supplement which provides strong continuity between the two methods.
- It was also noted that there are some inherent differences between the SC2021 Method and proposed IFLM method due to the modular nature, including the fact that soil would be combined with vegetation and that offset reports needed net project level equations across all included carbon pools. It was noted that there is generally considerable potential to increase soil carbon through incorporation of woody vegetation, although this needs to be considered in a project context and is not universally the case.
- It was discussed that some updates may be needed to the supplement to accommodate new modules, including potentially related to biochar, rules related to destocking and ecological thinning of woody biomass. There was a discussion on how woody biomass and soil carbon CEAs relate. There was a question on whether tree roots or biochar could result in double counting. It was noted that double counting is avoided because there are requirements to sieve coarse roots, and for biochar this must be subtracted from the soil project abatement. It was noted that the logistics of sampling under trees can be challenging, but otherwise the accounting practices are established.
- There was a strong argument to support broader inclusion of biochar in the methods, and most attendees were supportive of this proposal, noting that biochar should be credited at the point of creation, not introduction to soil. It was noted that extensive work both in Australia and overseas had been undertaken on lifecycle analysis of biochar production to specifically assess system leakage, and it would be important to apply if biochar is included in IFLM.
- There was a question around whether the IFLM methodology could impact agricultural productivity. It was noted that the IFLM Framework operates in the context of broader ACCU Scheme regulatory requirements, and there are existing safeguards to appropriately manage

this, including some established approval processes by DAFF. The Land Management Strategy (LMS) also provides a good basis for planning appropriate management changes.

- Some soil experts raised concerns on rainfall variability and whether there remains a risk of over crediting in the short term. It was agreed this could be discussed in follow up discussions on whether any changes are required to the existing Supplement. Further, experts also suggested that operators of in-house labs / spectroscopy machines (i.e. soil core scanners) should participate in the Australian Soil and Plant Analysis Council (ASPAC) assurance program to ensure confidence in calibrations.
- The potential to use flux towers to monitor and estimate biomass and soil carbon changes was briefly discussed. This topic could be included in further in discussions on modelling and measurement schedules and the supplement

Action Items:

Attendees agreed to set up a sub-group to discuss some targeted and limited changes to the soil supplement, and further discuss options for mirroring or cross referencing the SC2021 method.

Key issues for further discussion outside method and/or session scope:

Leakage flagged as important, but issue parked for discussion in Session 7.

Session 4: Fire management & six step process

Session Overview:

This session focused on how fire is proposed to be incorporated into the IFLM framework in the initial phase. Initially, it is proposed that fire management is included as an activity in relation to increases in woody biomass only. In the future, there is also some potential to include avoided emissions from fire, but this is not proposed in phase 1. It is also proposed that the application of IFLM may be limited to areas outside the savanna methodology update that is also in co-design led by the Australian Government. This regional limitation may be reconsidered in the future, but is initially proposed to facilitate smoother roll-out of both methods.

Focus questions & specific responses:

Q: Would a regional baseline or a dynamic baseline approach be most suitable for changes to fire management?

Q: Should there be regional restrictions on fire management as an eligible activity? Is there a need to manage the regional overlap with the savanna burning method?

Refers particularly to Section 4 of the Discussion Paper, component 6

Summary of discussions:

- The application of fire in carbon projects (other than for managing permanence or as a disturbance) has implications for Indigenous participation, particularly as the potential opportunity to use/manage cultural fire occurs across a large Indigenous estate (areas owned by, managed by or have the legal right to direct or influence management) outside of the savanna burning footprint.
- It was proposed to have clear separation between areas eligible under the savanna burning method (i.e. drivers for the project mechanism and the ecosystems and geographical region in which they occur) and IFLM regions which might include alternative fire management practices to minimise confusion and ensure consistency of application of activities within zones/regions neighbouring properties.
- It was noted that fire is a 'natural' element of the Australian landscape, and therefore suggested important not to exclude management of fire as an eligible activity. Fire is an integral part of many Australian ecosystems and is currently only included in existing ACCU Scheme methods (HIR and EP) as a disturbance. The architecture for calculating abatement from fire management already exists in methodology equations and is able to be incorporated in the IFLM Framework,
- It was noted that fire ecology is complex and should be thought of in terms of a 'fire regime' that includes frequency, intensity, return interval and heterogeneity. While fire scars from the 1970s until now can be analysed remotely, separating causes ('natural' vs management based) requires further work.
- Several experts described their understanding of how fire might act either as a preventive measure to protect the loss of standing carbon store (with a particular focus on semi-arid and arid environments and dry woodlands) as well as a potential stimulant that may change plant community dynamics that favour woody sequestration. Much of the discussion was very

system specific. For the Greater Western Woodlands (WA), fire can act as both depending on the age of the system.

- It was also noted that some areas have a 30-year or longer fire return cycle. This led to some concerns around how fire is included, and whether carbon sequestration would be retained over the long term. It was noted by an expert that methods are available to age woodlands where the last burn prior was to remote sensing availability. Fire history is being used to calibrate remotely sensed data from LiDAR/satellite.
- It was noted that permanence plans are already a feature of the ACCU Scheme requirements, but improved fire management, particularly cultural fire, is not expressly permitted as an activity outside the savanna context which can exclude Indigenous participation in the ACCU Scheme where this is their key management change to re-introduce cultural fire management that has been absent/lacking since management of their traditional lands was disrupted.
- Experts had different views on what an appropriate regional dynamic baseline might entail. Concern was raised regarding the ability to benefit from starting projects immediately post-fire in each area and benefit from the potential uplift as the vegetation community recovers. To demonstrate additionality, separation of natural variability of fire and vegetation response from anthropogenic management is required. It was noted that fire is not distributed evenly across landscape with different risk profiles and it was not clear how this was proposed to be addressed.
- One proposal was to use a regional baseline, similar to approaches that are proposed for a risk-based avoided clearing method. This would involve an assessment of the likelihood that this pixel would have burnt in any given year. Similarly to risk-based avoided clearing, this would be based on several spatial layers as inputs to a model to predict risk that fire will happen on a given pixel in a given year based on time since last burn (for clearing, a similar model is proposed for whether clearing will happen in a given year given time since last clearing).
- An alternative approach may be to follow the VERRA example and use a pixel-by-pixel comparison between the management area and a regional (or other) benchmark and only credit where biomass has changed.
- It was noted that a simpler regional baseline / model approach may be more practical versus a more complex project-by-project dynamic baseline that may reduce overall participation due to implementation challenges.
- It was noted that issues around additionality would remain important to address, and are not addressed by a risk-based approach for baselines but require additional safeguards and requirements.
- It was noted that application of fire management for any carbon project would need to be considered within the Land Management Strategy and would outline the planned fire management change, which would consider the local ecology, fire history, Indigenous cultural knowledge among other things, and in discussion paper it was proposed that this would be subject to expert review (including Indigenous knowledge / expertise).
- It was noted the large datasets generated from the Black Summer fires on burning and recovery could be used to help link modelling and remote sensing.

Action Items:

Sub-group to further discuss how fire is addressed in both methodology equations related to fire disturbance, and within land management strategy framework to consider scope for inclusion of fire management in phase 1 IFLM framework.

Session 5: Integrated accounting – measure-model approaches for woody biomass & soil (including fire) & availability of model only for selected activities

Session Overview:

This session focused on the process of carbon stock estimation under the IFLM Framework. Discussions focused on the proposed framework for how the method can be organised into key documents, including the IFLM Methodology Determination, Schedules & Supplements for carbon stock estimation and Guidelines specifying key technical processes and criteria for various phases of a project lifecycle. Supplements and Guidelines can be updated independently of the IFLM Methodology, and the proposed framework is intended to facilitate modularity of the IFLM methodology so that it can be updated over time with additional modules and improvements based on emerging science, technology or lessons from implementation.

Focus questions & specific responses:

Q: Do these schedules provide the right breadth of options and model validation requirements?

Q: Some additional restrictions are proposed for projects opting to apply the national model (i.e. FullCAM). Is that appropriate? Should there be any targeted research or data collection to fill any gaps?

Refers to: Section 2 of the Discussion Paper, Section 3 - step 3, and Section 4 - components 2 & 3.

Summary of discussions:

- The discussion centered on the role of models in carbon stock estimation and the necessary requirements for the correct usage. All models used to estimate carbon stocks should have quantified biases, robustness and have a clear framework for model calibration. Guidelines should provide rules by which model appropriateness is determined and set thresholds for uncertainty, precision and bias. It was noted that the Shared Environmental Analytics Framework[2] (SAFE) principles could be leveraged to provide assurance that carbon stock estimates were undertaken with rigorous and transparent processes. There was broad support for the importance of a common framework for evaluating models to ensure there is high confidence and a trusted suite of agreed approaches.
- Two key elements were broadly agreed as important to provide trust in models: a) appropriate data sharing frameworks that enable project data to feedback into national model calibrations (i.e. the importance of Australian Government implementation of Chubb Review Recommendation 4); b) common guidelines for sampling and validation protocols.
- There was a lot of discussion around terminology and how terms maps, model, measurement, sampling, inventory, variables, reference sites, benchmarks etc. were being used differently by different people and in different carbon farming methods. It was broadly agreed that developing a consistent taxonomy of language to be applied across the ACCU Scheme and Nature Repair methods would be highly beneficial.

[2] SAFE: Shared Analytic Framework for the Environment - The Western Australian Biodiversity Science Institute (wabsi.org.au)

- The discussion highlighted the need for comprehensive assessment of uncertainty. The inclusion of a probability of exceedance in Schedules 2-5 was supported, noting its alignment with the SC2024 and other greenhouse gas accounting programs. It was noted that the current requirements in SC2024 were that after accounting for uncertainty, the carbon stock estimates must not overlap by more than 40%. Small carbon stock changes require very high precision (i.e. substantial sampling) to be reported. Carbon stock change is then subject to further discounts for permanence and scheme wide buffers.
- The suitability and applicability of the different schedules was discussed. Schedule 1 is a low cost, conservative approach that may underestimate carbon stock estimates. Schedules 2-5 rely on more expensive sampling to validate carbon stock estimates to provide additional nuance and flexibility. Schedules 1, 3 & 5 (woody biomass) are suitable for both spontaneous and facilitated regeneration. Schedule 1 is intended to be limited to woody regeneration that will transition from non-forest to forest and must apply the FullCAM guidelines (which may require a review and potential update to be relevant to the method). Schedules 2 & 4 mirror the SC2024 schedules. It was discussed that different schedules would be selected based on the package of management changes a project selected to implement in their land management strategy.
- It was discussed that the key differences between Schedule 3 (spatially referenced) & Schedule 5 (spatially explicit) for woody biomass is the efficiency of the sampling design. Simple random sampling of permanent inventory plots may be a robust and straightforward design, but it requires a very high number of samples and can be manipulated (for example by harvesting trees exclusively outside established inventory plots). For Schedule 5, the Committee on Earth Observation from Satellites (CEOS) offer best practices for validating remote sensing products that estimate woody biomass and include a comprehensive approach for uncertainty estimation.
- It was noted that pre-registered sampling designs and precise georeferencing are important controls to ensure that measurements for validating carbon stock estimates are not manipulated to identify only high carbon areas. Techniques that can provide carbon stock estimates over very large areas significantly reduce the effect of sampling bias. The CEOS Land Product Validation Guidelines specifically highlight the need to conduct validation measurements of an appropriate size.
- A question was raised about the capacity of auditors to assess the different models and schedules. The Regulator affirmed that auditors must be registered under the NGER Scheme and have specific expertise to assess carbon stock estimation, including requirements that might be specified in the Schedules, Supplements and Guidelines. There must be specific criteria for model calibration versus validation and rigorous protocols to enable an auditor and the CER to assess against these specifications.
- It was discussed that validation data must be independent of the calibration set and the monitoring requirements for a project should be designed to report on biases and robustness.
- It was also suggested that it was possible for the CER or auditors to conduct independent forest inventories as a point of comparison to estimates conducted by the proponent, which is already common practice as part of standard and routine compliance audits commissioned by the CER. Further, it was suggested that, allometric calibration provides a particularly useful opportunity for intercomparison across the project portfolio, as trees are not expected to vary allometrically at local scales. The CER and Auditors could take a risk-based management approach and there would be clear risk flags if a project is proposing to use an allometric calibration that is substantially higher than nearby projects. Allometric calibration should take

a regression sampling approach and ensure support across the full range of expected tree sizes. This is particularly important where outliers (large trees) have undue influence on total carbon stocks.

- The eligibility of different activities and requirements for projects to enter the ACCU Scheme was raised with reference to the discussions in Session 1 & 2. While this session focused on general approaches to carbon stock estimation, the importance of controls for additionality, model uncertainty, risk and integrity throughout the project lifecycle be considered, so that they are not 'double-layered' (meaning multiple discounts are applied at different stages of the project lifecycle). It would be detrimental to be discounted for undertaking an innovative project, even if a robust approach to carbon stock estimation provided evidence that carbon stocks had increased.

Action Items:

A sub-group of experts agreed to form to develop a taxonomy of language (i.e. established defined terminology) that could be used throughout the IFLM methodology, and ideally other carbon and nature repair methodologies)

A sub-group of experts to draft guidelines for design and sampling of carbon stock estimation processes for all five schedules, drawing from existing guidelines where relevant.

Draft guidelines for allometric calibration to ensure consistency of calibration approaches for carbon stock estimation processes.

Review and updated monitoring and evidence requirements in the technical draft of the IFLM Methodology.

Key issues for further discussion outside method and/or session scope:

Data collected by projects to implement requirements of the Schedules and Guidelines would be useful for updating the national carbon accounting models (i.e. FullCAM). However, discussions related to data sharing frameworks and the national environmental information supply chain are outside the scope of the workshop.

Schedules and Guidelines for estimating carbon stocks may be related to other market-based instruments (e.g. insetting, nature repair), or environmental accounting programs such as Climate Active. The interoperability of guidelines and terminology was widely supported, but outside the specific scope for this workshop.

Session 6: Issues Emerging from sessions 1-5

Session Overview:

This session was dedicated to continuing discussions on ecosystem benchmarks were identified as a critical concept and emerging issue requiring further in Day 1. The CMI IFLM Taskforce proposed an additional element to the material gap analysis described in the discussion paper in response to earlier workshop discussions. The proposal was to add an element that in addition to demonstrating the site was below its carbon storage potential, there is a requirement to show that this gap in potential has been persistent for a substantial period of time. This proposal was intended to add an additional control in the IFLM Framework to address concerns that the gap is temporary and due solely to environmental or natural variability.

Summary of discussions:

- It was suggested that the importance of a carbon potential gap appeared broadly accepted but noted that alone this was insufficient. The question was whether the addition of a persistent gap (coupled with management history evidentiary linkage requirements already specified in the discussion paper) addressed the concern that the system was simply in temporary flux.

- Three types of ecosystem benchmark have been presented: 1) the ecosystem's maximum sustainable carbon stock), 2) binned tree size data, or 3) continuous tree size data. In general, it was discussed that the first option was the simplest to apply in all ecosystems. It was noted that it would be important to define the applicable area for the ecosystem benchmark and avoid point based comparisons as maximum sustainable carbon stock can vary on a pixel-by-pixel basis, so the benchmark would need to be more regional.
- Guidelines could specify the regional area requirements and the minimum duration of a gap. The guidelines could be different for different ecosystems and projects would still need to rely on historical management evidence to attribute the cause of the gap. Guidelines should also specify how not to misuse tools.
- One proposal suggested that ecosystem benchmarks could be built from a library of reference sites, rather than requiring a single reference site for each project. However, it was also noted that reference sites could be hard to find and there are always arguments about why they were left under a different management regime in the first place. It was noted that it may be a burden on project proponents to find reference sites. There was some concern that all reference sites are unique, and no two sites are ever actually the same.
- It was noted that agreed terminology is critical, as reference or control sites and benchmarks may be being used differently. A benchmark is only intended to show there is a gap in current stored carbon and potential. A reference site would be helpful for research but may serve a different function. Strictly and in experimental terms, a control site is a closely comparable area that is left without changed management, allowing comparison, implying leaving a possibly degraded area in that state under stable management conditions.
- There was further discussion on whether the aim requirement is for a benchmark or a control. There was a proposal that, methodologically, accepting the difficulty of genuine control sites, the 'control' in terms of a project is the change detected by LiDAR, and you can compare cohorts to similar areas. For example, in ground cover monitoring programs properties are assessed in comparison against similar land types (25-50% region) to unpack the climate signal. Rather than using ecosystem benchmarks or controls, ground cover change is assessed against a cohort of similar areas. However, it was noted that there are problems when landscapes are spatially variable or when all areas are undertaking the same management (i.e. all properties are carbon farming projects or implementing similar practices).
- There was a proposal that Governments could fund LiDAR surveys nationally or at least across key areas and reference sites, potentially utilising existing aerial resources and flight paths.
- It was suggested that benchmarks could be consolidated from hundreds of reference sites. Monitoring networks can provide a hierarchy of data, and at a minimum, geo-referenced net biomass should be reported, along with the management history of the site. But it was discussed that further information / data types would be great to add to expand the data utility.
- The IFLM Framework proposes additionality controls throughout the project cycle, including long monitoring and project gateways. It was generally agreed that a gap is an important first step and that the up-front test should be as simple as possible, reserving energy for project implementation and monitoring. The technical case for carbon farming projects will depend on the evidence of barriers preventing carbon stock increases to explain why the ecosystem is in poor condition. Building this case up-front enables the regulator and auditors to know what we're looking for and assess how well justified the expected carbon stock change is. But the same activities cannot be expected to work on all projects, in all places.
- Gap analysis must take care to use ecosystem benchmarks that represent the 'average' expected carbon stock for the ecosystem. It does not make sense to compare areas to the 'top-

end' of the distribution, which might only be achievable for the most productive sites within that ecosystem or region (e.g. lower slopes, richer soils, favourable aspect).

- Woody cover probably isn't sufficient as a standalone indicator for separating the effect of project activities from background environmental variation. At large scales, or in variable ecosystems, it may also be necessary to control for background change such as climatic variability.
- The proposed 'eligible carbon stock ratio' attempts to quantify, empirically, how much of net biomass change can be attributed to management activities based on tree size. Assessing change in two distinct cohorts (eligible & ineligible, based on tree size) could provide evidence of the productivity during the project period. New trees only enter the population from the smallest size class, and therefore the cohort of ineligible trees must be constant during the project period. Schedules 3 & 5 should outline how to track the contribution of each cohort to overall carbon stock change.

Action Items:

Draft guidelines for ecosystem benchmarks, including detailed steps for material gap analysis including duration requirements and supporting evidence

Session 7: Risk based leakage worked examples & discussion

Session Overview:

This session included a step through of the Leakage Assessment Tool provided in the discussion paper. Examples of project activities were worked through to show how various risks would be assessed under the framework.

Focus Questions:

Q: Is the proposed risk-based leakage assessment tool fit for purpose? Do you agree that displacement of clearing is the main risk of material leakage?

Q: In the Australian context where national reporting of emissions takes place, is there a need for a leakage assessment at a project level? Or is leakage accounted for under existing or scheme-wide buffer deductions?

Refers to Section 2.4 of the Discussion Paper, and Section 4, components 11 & 12

Summary of discussion:

- There was wide support for a leakage assessment, which is a new safeguard proposed for the IFLM method.
- Several comments were made regarding the difficulty of defining 'operational or management control'. Alignment with other greenhouse gas and climate reporting protocols was recommended.

- Concerns were raised that some landowners may intentionally run a property down rather than maintain it in good condition to maximise sale price, as a carbon-oriented strategy. It was stated that a market is emerging for degraded properties that have the maximum opportunity to benefit from a carbon project due to the large potential uplift. An alternate view noted that for most property owners, running a property to the ground is counter-productive as that typically impacts farm production benefits and lowers farm value. Also, the foregone production value involved in deliberate degradation would be unlikely to be less than any 'premium' achievable.
- Concern was expressed regarding the detail and complexity of the proposed leakage assessment tool (Figure 5 of discussion paper). This was acknowledged, but it was explained that for many projects reaching exit from that tool – i.e. identifying low or moderate risk – would not be time consuming, and also it was under discussion that the outcomes from the tool could be hardcoded rather than requiring project-by-project assessment.
- Discussions indicated that the leakage assessment tool provided a good framework to analyse leakage, and largely seemed to capture the key risks but needed further worked examples and testing.
- The risk of leakage from changing stocking and grazing strategies was thought to be limited if this practice change is linked to increasing agricultural productivity from healthier soils. Any declines in agricultural productivity and farm revenue are likely to be temporary if the carrying capacity of the land is increased as part of project activities. The 'materiality' of cattle movements (sale or shift to other properties controlled by the company group) was questioned in regard to the potential for leakage given the dynamic nature and size of the national herd.
- Discussions explored the definition of leakage associated with the management of feral animals and whether preventing access through exclusion fencing, displacing grazing pressure onto neighbours, but this was thought to be immaterial. There was clear support for direct, objective rules and a preference for a simple approach that minimised choices for project proponents. Hardcoding the outcomes of leakage assessment tool was viewed as a preferable approach in the method, which would provide a clearer and more consistent outcome for proponents, auditors and the CER.
- It was largely agreed that displacement of clearing seemed the biggest material risk, subject to further testing of the assessment tool with worked examples and hardcoding of activities against the framework. A requirement to identify properties within the same corporate group was proposed, with a commitment to manage material leakage across the group. It was noted that while mapping properties under the same corporate group can be challenging, there are some other examples such as Climate Active which have definitions of corporate group which could be mirrored to ensure cross-scheme consistency.

Action Items:

Further test Leakage Assessment Framework with worked examples and develop a hardcoding of leakage assessment requirements for specific eligible activities in the IFLM Framework.

Appendix A: Expert Workshop Attendees

In person participation

Andrew MacIntosh ANU Professor, College of Law*

Dr Annette Cowie NSW Department of Primary Industries Senior Principal Research Scientist, Climate

Chris McCosker, Soil Carbon Industry Group Representative, Carbon Link, Chief Operating Officer

Conor Hilton, Nature Foundation, Natural Capital Accountant

Dr Cris Brack, ANU Associate Professor

Dave Tarrant, WA Department of Biodiversity, Conservation and Attractions, Coordinator Carbon Farming

Dr Dean Revell, Select Carbon, CEO

Dr Don Butler, ANU Professor, College of Law

Dr Elaine Mitchell, QUT, Research Fellow

Ella Rudland, Kimberley Land Council, Carbon Program Manager

Emma Flannigan, DCCEEW, Acting Branch Head, Carbon Crediting Branch

Hazif Stewart AI Carbon Head of Science & Innovation

Jarrad Holmes, Indigenous Carbon Industry Network Representative, Indigenous Desert Alliance Representative

John Connor,CMI, CEO

Dr John Kanowski, Australian Wildlife Conservancy, Chief Science Officer

Jonathan Green, Indigenous Land and Sea Corporation Manager, Sector Strategy

Kerry Charles, TNC, Conservation Policy Specialist

Dr Keryn Paul, CSIRO, Senior Principal Research Scientist (*virtual day 1*)

Lachlan Walmsley, DCCEEW, Senior Policy Officer, Carbon Crediting Branch, Land, Forest and Blue Carbon Methods Section

Mark Ashley, Nature Foundation, Deputy CEO

Meg Yates, SA Department for Environment and Water Principal Policy Adviser, Native Vegetation, Pastoral Land Management and Landscape Services

Michael Davis WWF Australia Senior Specialist Carbon Markets and Natural Capital

Mitchell Lendrum, DCCEEW, Assistant Director, Biodiversity Markets

Olivia Dun, DCCEEW Acting Director, Carbon Crediting Branch, Land, Forest & Blue Carbon Methods Section

Dr Peter Grace, QUT Professor, Centre for Agriculture and the Bioeconomy

Dr Peter Scarth, Cibo Labs, Full Stack Remote Sensing Scientist

Rachel Clarke NRM Australia Knowledge Broker, Carbon and Environmental Markets*

Dr Rob Waterworth, FlintPro, Co-founder and Chief Science & Innovation Officer*

Dr Robyn Cowley, NT Department of Primary Industry and Fisheries, Senior Rangeland Scientist

Dr Rod Keenan, University of Melbourne, Honorary Professorial Fellow

Dr Ron Hacker, Ron Hacker Rangelands Consulting Services

Saravan Peacock, SA Department for Environment and Water Manager, Pastoral Land Management

Sean Hoobin, Atlas Carbon, Director Carbon Services

Dr Susan Orgill, Select Carbon Senior Science Advisor, Soils and Farming Systems

Dr Thomas Davidson, University of New England,National Coordinator Livestock Productivity Partnership

Dr Thomas Orton, Queensland Government, Department of Environment, Science and Innovation, Senior Data Scientist

Warwick Ragg National Farmers Federation General Manager, Natural Resource Management*

Prof Willem Vervoort, The University of Sydney, Professor in Hydrology and Catchment Management, Director of the ARC Training Centre in Data Analytics for Resources and the Environment (DARE)*

Virtual Participation

Dr Aaron Simmons, NSW Department of Primary Industries, Senior Research Scientist

Dr Bradd Witt UQ, Rangelands Journal Senior Lecturer, School of the Environment

Dr Carl Gosper, CSIRO & WA Department of Biodiversity Conservation and Attractions, Research Scientist*

Dr Emma Carmody UNSW Visiting Fellow, Faculty of Law*

Dr Hedley Grantham, Bush Heritage Australia, Chief Scientist

Dr James Fitzsimons TNC Senior Advisor, Global Protection Strategies

Dr Karen Hussey, ERAC Chair**

Dr Kenneth Clarke, RegenCo

Dr Marnie Telfar, Anthesis, Director

Emma Winslow, SA Department of Primary Industries and Regions, Climate Change Program Manager

Kath Rowley DCCEEW Division head, Emissions Reductions**

Ramesh Raja Segaran, RegenCo

Workshop Facilitation & Scribes

Dr Stephen Dovers, Workshop Facilitator

Dr Andrew O'Reilly-Nugent, Workshop Scribe, Climate Friendly, Head of Research & Commercialisation

Leila Macadam, Workshop Scribe, Anthesis, Senior Consultant

IFLM Taskforce Co-Chairs & Secretariat

Adam Townley, Co-Chair CMI IFLM Taskforce, AI Carbon CEO

Skye Glenday, Co-Chair CMI IFLM Taskforce, Climate Friendly, Co-CEO

Dr Tim Moore, RegenCo, Head of Science & Strategy

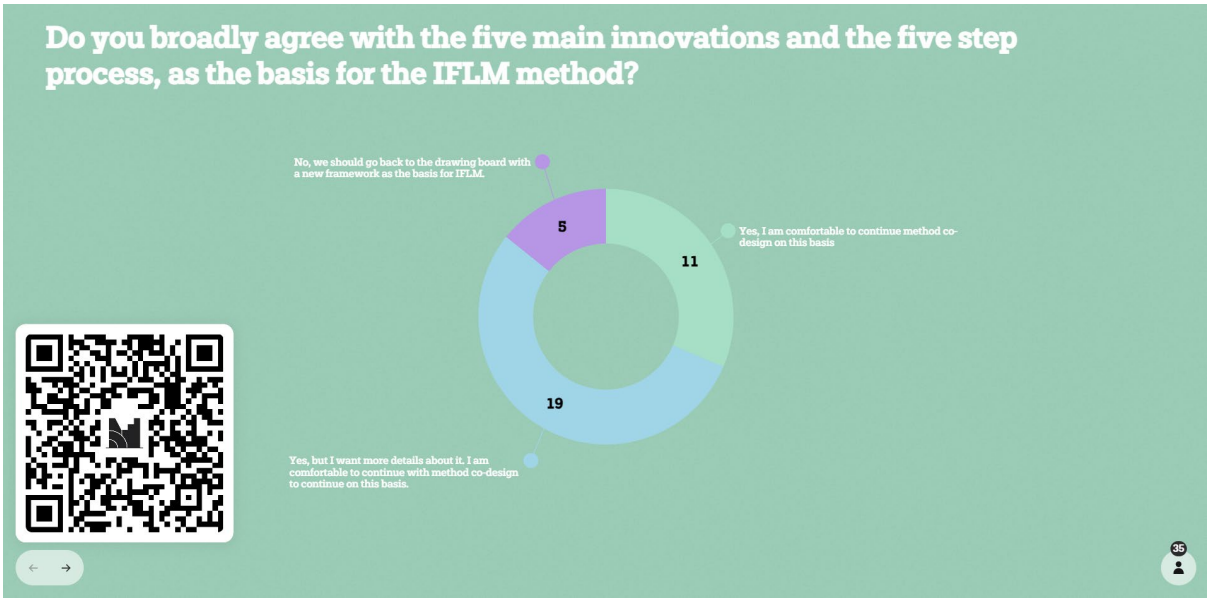
Zoe Ryan, Climate Friendly, Chief Innovation Officer

Jen Barwick, Co-Chair CMI IFLM Taskforce Stakeholder Engagement Sub-Committee, The Pew Charitable Trusts, National Climate and Nature Coordinator

Janet Hallows, CMI Director, Climate Programs & NbS

**Partial or split online/in person attendance*
***Attended introductory session only*

Appendix B: Expert Workshop Survey Results



Do you broadly agree with the five main innovations and the five step process, as the basis for the IFLM method?

35 of 35 responded

Yes, I am comfortable to continue method co-design on this basis	11 responses 31%
Yes, but I want more details about it. I am comfortable to continue with method co-design to continue on this...	19 responses 54%
No, we should go back to the drawing board with a new framework as the basis for IFLM.	5 responses 14%
No, I do not support an IFLM method regardless of the framework	No response 0%