MISTRA FinBio

ANNUAL REPORT 2022-2023

March 2024

Funded by

Mistra FinBio is a transdisciplinary research programme centred on doing cutting-edge research while simultaneously developing science-based outputs that can promote real-world impact. It leverages key networks in the academic and finance sector alike, with the aim of serving as a testbed for piloting novel metrics and tools to achieve scalable impact.

Mistra FinBio is funded by Mistra.

www.finbio.org

Layout and graphics: Azote

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Chair's preface

In 2022 the Kunming-Montreal Global Biodiversity Framework was adopted, with the aim to protect and restore biodiversity. This landmark agreement calls for decisive measures from governments worldwide, but it also requires support from a broad range of other actors, including the finance sector. This is the point of departure of Mistra FinBio, Mistra Finance to Revive Biodiversity.

Decisions by financial actors are causing severe biodiversity loss. However, financial actors can also be part of the solution – "greening finance and financing green". The aim of Mistra FinBio is to play a significant role in this effort by contributing to the tools and scientific understanding that are needed.

Mistra FinBio is a unique research programme that brings together researchers from a breadth of disciplines with financial sector actors. This ensures scientific rigour and impact. Being chair of the board is both challenging and rewarding as we tackle a broad set of issues and sit at the interface of research and industry.

The Mistra FinBio board is responsible for monitoring the implementation of the programme. Since the board was formally appointed in June 2022 our priority has been to learn more about the broad scope of the FinBio programme and to enter more deeply into the implementation and management of the project. At the end of the first year we can certify, with satisfaction, that the programme is, all in all, on track, and that the demand for engagement on finance and biodiversity from impact partners is high.

It has been a privilege, as chair, to work together with engaged and experienced board members as well as with a deeply committed Executive Team. I look forward, with excitement, to the coming year.

Lena Sommestad,
chair of the board for Mistra FinBio

Board members

Victor Galaz

Katherine Richardson

Ian Thomson

Marten Winter

Magnus Emfel
(joining the board in 2024)

Director's view

Reflecting on the first year of Mistra FinBio, I am pleased with the growth of our research team, the breadth of activities we are undertaking, and the rapidly expanding interest around finance and biodiversity.

During the first year of Mistra FinBio, we have recruited new post-doctoral researchers, PhD students, masters students, and research assistants. In September 2023 we all met in person in Stockholm for two full days of workshops, where we got to know each other, build shared understanding, and gain deeper insights into each team member's expertise. The number of people in the room was three times the size of our kick-off meeting in September 2022. The expertise ranged from environmental DNA and Earth system modelling to trade-economics and financial ethics – and we are still recruiting new people.

Over the course of the year, we have been in active dialogue with our impact partners. Many of them have visited with us, and all have met with us online, both in meetings, and in our online "learnshops" that bring together researchers and impact partners. Their expertise spans across the financial system: from venture capital and private banks, to public (e.g., development banks) and private investors, to those developing standards and tools. They are key partners in the Mistra FinBio programme, and working in close collaboration with them will help us ensure that the tools we develop are not only based on rigorous science but also applicable and usable.

Since our kick-off meeting in September 2022, the interest and action around nature has grown, especially after the Kunming-Montréal Global Biodiversity Framework was adopted at the COP15 in late 2022. This framework has energized and spurred many actors to work to redirect finance from activities that undercut nature to more nature positive investments. The global demand for theory, tools, and strategies that can help diverse actors navigate the complex undertaking of reducing the impact of finance on nature and biodiversity is both immense and inspiring.

This expansion of interest has led to us connecting with a wide variety of actors. For example, the Task-force on Nature-related Financial Disclosures (TNFD) who are developing standards for corporate reporting, as well as the Network for Greening the Financial System (NGFS), who represent a collaboration among central banks and regulators.

Moving forward, I am grateful to have an exceptional board. We have now had several meetings and they have provided us with valuable input and guidance for operating an international project at the intersection of finance and biodiversity.

There are many emerging opportunities to improve alignment between investments and biosphere health. With our team, networks and support I believe FinBio is well positioned to move forward with our planned activities in 2024, and I am excited about what we can accomplish together.

Garry Peterson,
Programme director

This is FinBio

Mistra FinBio is a transdisciplinary research programme centred on doing cutting-edge research while simultaneously building on such insights to develop science-based outputs that can promote real-world impact. It leverages key networks in the academic and finance sector alike, with the aim of serving as a testbed for piloting novel metrics and tools alongside to achieve scalable impact. We do so by engaging strategically selected impact partners who can translate research into immediate real-world change.

Mistra FinBio aims to play a pivotal role in initiating and accelerating the inclusion of science-based sustainability criteria, particularly biodiversity, in decisions made throughout the financial sector. We take a holistic systems perspective on the financial service sector and address the information needs of various different types of financial actors.

The programme brings together researchers from diverse disciplines – computational biology and bioinformatics, ecology and systematics, financial and trade economics, and philosophy – to collaboratively develop meaningful ways of robustly incorporating biodiversity into financial decision-making. The programme also examines key ethical and governance concerns associated with the monetisation of biodiversity, synthesising lessons from past and ongoing efforts to develop markets for biodiversity and ecosystem services, and exploring future risks and opportunities.

By co-creating new research and testing novel metrics and tools to capture corporate biodiversity impacts with our impact partners, we are hoping to develop widely applicable use cases. The firm intention of Mistra FinBio is to demonstrate the benefits of integrating biodiversity into financial decision-making.

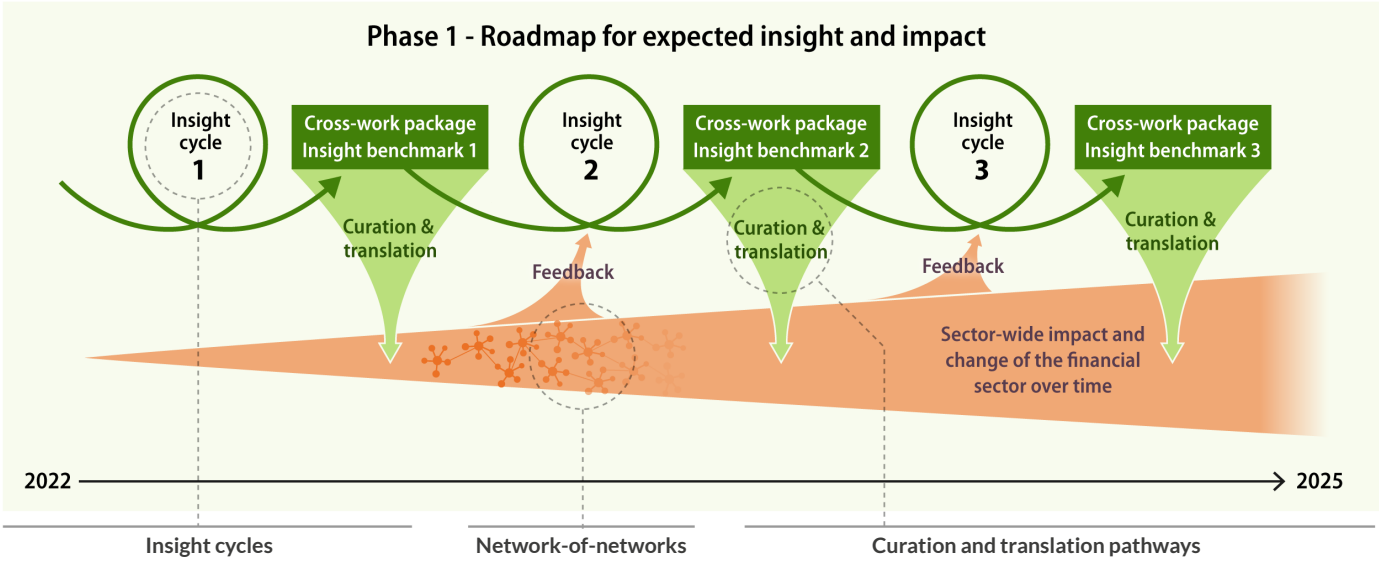
Mission and vision

Our vision is a future where financial investments promote and shape an economy that supports a resilient biosphere and prosperous societies.

To contribute to this vision, our mission is to facilitate real change in the financial system in a way that benefits biodiversity. We do so by developing theory and decision support tools, and by conducting empirical research that in various ways can inform financial actors' strategies and promote investments that enhance rather than harm nature.

Theory of change

Mistra FinBio's strategy for achieving impact is informed by a systems view of the financial sector, in which we recognise that different participants have different roles to play. For some, a focus on reducing the harm and changing practices of portfolio companies may be paramount, while for others delineation of nature positive business models are



most essential. Our various impact partners, and other financial actors whom we see as our ultimate audience, therefore often need biodiversity-relevant information in different formats.

To deliver this, and to promote more sustainable investments, Mistra FinBio's theory of change consists of a stepwise, cyclical and iterative approach centred around transdisciplinary research, but where curation and translation of scientific insights play a key role. Curation, is ensured through regular dialogue with our partners and convening of workshops and dialogues, prototyping and experimenting to determine 'most viable products'. Our explicit strategy to generate and accelerate impact in the financial sector is to rely on a "network-of-networks" approach. This entails working in close collaboration with strategic impact partners and leveraging their extensive networks to disseminate tools and recommendations for best practices, but also to inform policy makers, regulators, financial supervisors, and other relevant actors.

This first year has been a year where we focused on learning, both across disciplines within the consortium, but also promoting learning across Mistra FinBio team members and impact partners. We have hosted (and will continue into 2024) a series of seminars to increase our understanding of diverse biodiversity impact assessment methodologies. We have also spent the first year cementing our relationships with impact partners, developing trust and laying the ground for pilot testing some of our emerging tools and metrics.

Academic partners

The FinBio research team during the in-person meeting, august 2023. Left to right, back row: Carl Jan Risberg, Mark Sanctuary, Henrik Horn, Garry Peterson, Juan Carlos Rocha, Sasha Quahe, Axel Lavenius, Mats Töpel, Henrik Johansson, Fausto Corvino, Fredrik Ronquist. Front row: Megan Meacham, Beatrice Crona, Marika Haeggman, Emma Granqvist, Shruti Kashyap, André Pinto da Silva, Eliza Nobles, Joakim Sandberg, Jenny Hu, Divya Narain, Christophe Cristiaen, Giorgio Parlato.

Impact partners

FinBio has strategic impact partners that help us develop and translate our research outputs into real-world financial impact. Our impact partners are key actors that help us drive change across a significant portion of the financial services industry.

We engage with our impact partners through dialogues, learnshops, events and co-produced publications.

natural capital PROJECT

PICTET Asset Management

PRI Principles for Responsible Investment

SUSTAINABLE FINANCE LAB SWEDEN

Finance for Biodiversity Foundation

SISD Swedish Investors for Sustainable Development

Reflections from our Impact partners:

"Biodiversity is an important issue in sustainable investment, but it's a subject that commands a deep understanding of the Earth systems. Joining the Mistra FinBio consortium as an Impact Partner has allowed us to gain crucial scientific insights that are relevant for investment decision-making; and at the same time provide investment expertise and contribute to transdisciplinary research that can help bring about nature-positive changes in the financial system.

Our aim is to draw on scientific insights and adapt them for use in portfolios. The work on developing the ESI (Earth System Impact) score is proving particularly useful in helping us better understand the interactions between the biosphere and atmosphere. At Pictet AM, we have developed a proprietary biodiversity impact measurement tool, designed to provide estimates of species loss that a company risks causing for every dollar of revenue it generates. Our model is constantly evolving – and we will look to draw on the research undertaken by our partners at Mistra FinBio."

Natsuko Waki – Coordinator of science-business interaction, Pictet Asset Management, UK

"At the Finance for Biodiversity Foundation, we are fully committed to the need to reverse and halt biodiversity loss in the coming years. As such, we collaborate with leading financial actors across the globe and aim to contribute to cutting-edge initiatives and projects that help address the current disjunction between the economic and natural systems.

Mistra FinBio represents the international scientific ambition to support the financial sector's capacity to help recouple nature and the economy. In particular, the project addresses key topics within the biodiversity-finance nexus designed for real-world impact, including measurement approaches, risks and opportunities, funding mechanisms, and governance structures, which are highly relevant to our work. Science is a pivotal element of the Finance for Biodiversity Foundation, and being an impact partner in FinBio allows us to collaborate with key scientific partners and integrate the latest scientific developments of the field in our working groups with financial institutions."

Julen Gonzalez Redin (PhD) – Technical Director at Finance for Biodiversity Foundation

Evidence of impact activities

International investment treaties and biodiversity

Halting the ongoing global loss of biodiversity will require an extensive phase-out of harmful production. However, international investment treaties can protect investments and production over many years. This begs the question: Do international investment treaties help or hinder efforts to protect biodiversity? Some argue that the treaties dissuade host countries from phasing out harmful economic activities. Others claim that they are needed to provide incentives to investors to undertake replacement investments. In a working paper published in 2023, FinBio researchers Mark Sanctuary and Henrik Horn investigate key conceptual issues and discuss options for reforming investment treaties.

IMF biodiversity course

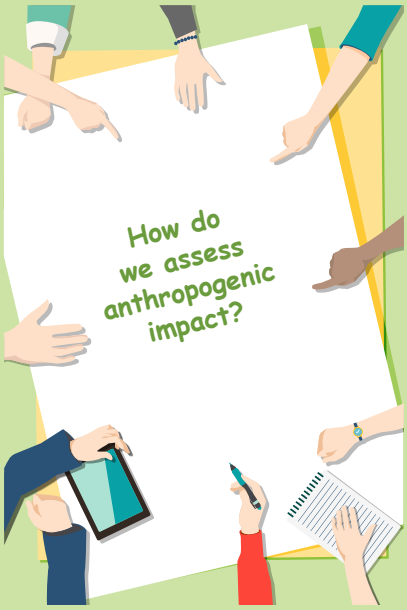
Programme director Garry Peterson was invited to give a three day introductory course on biodiversity and its links to finance and financial risk for staff at the Climate Finance Policy Unit at the International Monetary Fund (IMF) in Washington, DC in March of 2023.

The mission of IMF is "working to foster global monetary cooperation, secure financial stability, facilitate international trade, promote high employment and sustainable economic growth, and reduce poverty around the world". The IMF has not traditionally been concerned with environmental issues of sustainability. However, it has recently begun to assess the risks of climate change to financial stability, and now its funders are starting to request that it assess nature related risks to financial stability and they are aiming to build their capacity to understand and assess biodiversity and nature related issues.

How to create a Swedish platform for sustainable investment

FinBio member and WP6 lead Joakim Sandberg contributed to a policy report on the governance of sustainable finance, commissioned by the Swedish Environmental Protection Agency and published by the Sustainable Finance Lab. The report investigates how a Swedish platform for sustainable investment could be designed. The authors depart from the assumption that several market failures have created a structure in which it is difficult for the finance sector to contribute constructively to a green transition.

A Swedish platform for sustainable finance could correct these market failures and facilitate coordination between private and public actors to enable such a transition. The authors describe existing platforms, mainly in Nordic contexts, comparing different approaches to find the best way forward.



Mistra FinBio Learnshops

In 2023 we launched the concept Mistra FinBio learnshops where we convene the research and impact partners to dive into core concepts, central to understanding how to assess anthropogenic impact on nature and biodiversity, and to evaluate economic dependencies on nature. The role of the learnshop series is to create broad understanding across the Mistra FinBio programme. We began by exploring the diversity of biodiversity metrics and tools in use today, and are continuing with deep dives into the most common approaches to assessing biodiversity currently. The learnshop sessions provide a space for learning and discussions between researchers and practitioners and also helps situate Mistra FinBio and our research in the broader nature and finance space. They also serves to educate Mistra FinBio researchers and partners alike in the science, theory and practice behind some of the rapidly growing biodiversity impact assessment tools on the market.

Reflecting on the interactions between impact partners and Mistra FinBio, Senior Scientific Advisor Beatrice Crona notes, “the opportunity to present to, and interact with, various practitioners including those involved in designing investment strategies, has been instrumental for our ability to understand better how our science can really inform decision-making. It is proving fertile ground, and we look forward to see how we can expand our testing of novel tools in the year to come”.

Costing the Earth: measuring corporations’ impact on biodiversity loss

In December 2023, FinBio’s impact partner Pictet Asset Management published a white paper about the need to understand how investments impact biodiversity, written with input from, and in dialogue with, FinBio researchers. The paper underlines the importance of measuring environmental impacts – beyond climate and including biodiversity – delving into environmental DNA (eDNA) as one possibility for measuring.

“It is of fundamental importance for us in FinBio to have these exchanges with our impact partners. To be able to share our knowledge of eDNA and recent technological advances in biodiversity monitoring, and to learn more about the perspectives of the industry actors, ensures the societal relevance of our research,“ says Emma Granqvist, FinBio researcher.

The white paper also introduces the Earth System Impact score, developed in by FinBio researchers, as a tool for broadening environmental impact assessments.

Pictet expand on how they will draw on the insights from the ESI tool to enhance their investment framework. In their summary Pictet states that they “believe the Earth System Impact (ESI) model breaks new ground by accounting for key biosphere-atmosphere interactions that are essential for planetary health.”

FinBio in-person 2023

Research activities in Mistra FinBio

Themes		Work packages
1	Connecting biodiversity to finance Data collection, practical & diverse metrics	1 Biodiversity data and metrics 2 Capturing complexity
2	Financing systemic change Identifying & developing novel methods for funding natur-positive solutions for corporate & financial actors	3 Biodiversity markets 4 Diagnostic tools for complex decision making 5 Alternative pathways
3	Transforming practices Pilots & experiments with Impact Pratners	6 Biodiversity finance governance 7 Biodiversity-related financial risk
4	Biodiversity finance governance & risks Trade, history & ethical considerations	8 Testbed for novel approaches

Mistra Finbio thematic and work package structures

Theme 1: Connecting biodiversity to finance

Across the corporate world, there is growing interest in biodiversity monitoring and a wide range of methods have emerged for assessing impact. Unfortunately, by and large, the data, methods, and results of these assessment approaches are still not transparent - making claims based on these efforts difficult to verify in terms of both their accuracy and potential biases. Further, no single metric exists to fully capture the complexity of biodiversity or how it relates to people. However, in order to understand how changes in biodiversity impact financial systems, we need to understand how social-ecological interactions shape biodiversity and, in turn, how changes in biodiversity impact human wellbeing and economic activity and thus generate knock-on effects within the financial system.

Within the 'connecting biodiversity to finance' theme, the focus is therefore on testing and analysing different ways of measuring and describing biodiversity and its connection to finance. This theme consists of two work packages: work package 1 (WP1) led by Fredrik Ronquist and work package 2 (WP2) led by Juan Carlos Rocha.

WP1: Mapping and tracking biodiversity

The first of these work packages (WP1) explores the potential of environmental DNA (eDNA) techniques to track and map biodiversity change in ways that produce open-source data to inform financial decisions. It also seeks to evaluate current frameworks for assessing corporate biodiversity impact in terms of what parameters they capture, and their scientific basis, verifiability and transparency.

WP 1 lead: Fredrik Ronquist, Swedish Museum of Natural History

During 2023, the work of WP1 has focused on completing data collection and processing this data. This work will now provide the foundation for the analysis and evaluation of eDNA, Earth Observation data and traditional biodiversity monitoring in the next stage of the project. As the data collection stage is now complete, and the final elements of sequencing will be completed in Spring 2024, quantification methods for eDNA are being developed and further tested on real datasets. Additionally, at least two suitable pilot projects for testing eDNA methods have been identified. Researchers from WP1 contributed to a white paper published by FinBio's impact partner Pictet Asset Management, underlining the importance of measuring impact on biodiversity and presenting eDNA as a potential way forward.

WP2: Biodiversity change as an indicator for risk

Within WP2, the focus is on assessing how local changes in biodiversity can be used to assess systemic risk through changes in ecosystem services, risk of ecological surprises and disruptions in key earth system processes. A main focus for WP2 in 2023 was hiring a postdoctoral researcher and setting up the case studies their work will focus on. This postdoctoral role has now been filled by André Pinto da Silva, whose work will focus on modelling the role of biodiversity for finance through coupled models that approximate how biodiversity is affected through changes in land use. Two models have already been developed to further investigate the link between financial actors and biodiversity.

WP2 lead: Juan Carlos Rocha, Stockholm Resilience Centre

Collaborations with external partners, notably Victor Galaz (Stockholm Resilience Centre/Beijer Institute and FinBio board member), have also been advanced allowing for the development of a methodology for identifying financial actors exposed to tipping points - applying this to a case study focused on fisheries. A paper published in the second half of 2023 presented how a relatively small number of powerful financial institutions, such as investment companies, pension funds, and banks could help accelerate action that mitigate the risks of new pandemics.

Theme 2: Financing systemic change towards sustainability

There is an urgent need for transformative change that reverses biodiversity loss and degradation of nature. The financial sector, pivotal in generating and directing capital to support this change, currently faces a three-fold challenge regarding transformation: a lack of reliable market architecture, insufficient payment mechanisms, and shortage of funding. For finance to successfully support nature-positive change there is also a need for suitable performance indicators and incentive structures.

The 'financing systemic change towards sustainability' theme, therefore, focuses on exploring, developing and supporting a shift in the financial architecture toward structures, metrics and pathways that support biodiversity both now and in the future. The theme is made up of three work packages: work package 3 (WP3) led by Ben Caldecott, work package 4 (WP4) led by Beatrice Crona, and work package 5 (WP5) led by Garry Peterson.

WP3: Developing a biodiversity market architecture

In WP3 the focus is on conceptualising and developing a scientifically informed flexible biodiversity market architecture and funding mechanisms. In this first programme year, WP3's focus was on starting to map out the current 'nature recovery finance' market structure, together with the barriers and enablers for financing nature recovery. Based on a review of various public, private and blended finance case studies, this allowed a categorisation of the challenges linked to the 'bankability' of nature recovery projects. Stakeholder engagements with financial institutions have also started through an in-person workshop in Oxford. The workshop enabled >60 researchers and financial institutions practitioners to learn about the journeys taken by financial institutions in integrating biodiversity considerations across their portfolios or through financing biodiversity projects. Interactions between the research and finance community exposed capacity challenges, knowledge gaps, and potential research priorities for future work.

WP3 Lead: Ben Caldecott, Oxford Sustainable Finance Group

WP4: Developing a toolbox for improved biodiversity-savvy financial decision making

WP4 builds on the research developed within the programme, with the ambition of developing a portfolio of scientifically grounded diagnostic tools for complex decision settings. During 2023, WP4's main focus has been on engaging with impact partners through bilateral discussions and round tables; a notable example being the launch of the FinBio 'learnshops' and several webinars with Pictet AM.

A key outcome of this first year was the presentation of the Earth System Impact assessment tool, which was tested on the mining sector and published in December 2023. The ESI tool was presented to the wider FinBio programme and impact partners through a research seminar which led to significant bilateral discussions with Stockholm Nasdaq, AP7, and Pictet AM on how to potentially test the tool with their operations. As a result, Pictet has begun this process. However, by presenting the ESI tool at various venues, including the Norrsken Impact Week (Sept) WP4 has also been able to disseminate knowledge about the tool to a wider audience. This has led to additional engagement with practitioners external to the Mistra

WP4 lead: Beatrice Crona, Stockholm Resilience Centre

FinBio project, and to establishment of piloting studies to test the ESI tool in the context of impact investing. We hope to be able to continue this testing in the years to come (WP8).

Through the work on developing and testing the ESI we have deepened our insight around the data necessary for this kind of analysis and we have been able to contribute this knowledge to a number of efforts for developing reporting standards, such as TNFD and the GRI mining standard.

WP5 lead: Garry Peterson, Stockholm Resilience Centre

WP5: Scenarios for examining risk

WP5 uses scenarios and other futures methods to examine what novel risks and opportunities emerge in the interface between finance and biodiversity now and in the future, and develop scenarios of alternative pathways forward for finance and biodiversity. The main focus in 2023 for WP5 has been to make sense of the landscape of biodiversity and finance through engagement with the process of 'Network for Greening the Financial System (NGFS)' and developing a set of draft biodiversity scenarios. This engagement, along with consultations with the project's academic and impact partners, has allowed an assessment of the state of the art in connecting biodiversity to finance in scenarios, and also identified knowledge gaps. Subsequently, three streams of work to have been initiated within WP5 to address these. The first is to identify and assess potential 'seeds' of transformative change in the financial sector. The second addresses the need to assess how nature loss could produce shocks to the financial system. To address this WP5 has started a review of shocks and their pathways to impacting the economy, and a mapping of how different biodiversity and finance actors identify the potential links between nature loss and the economy. The third stream has been to identify in what ways 'nature positive' economic activities can be defined. A review of both academic literature and industry information has been undertaken and will be completed during 2024.

Theme 3: Governing biodiversity finance and identifying biodiversity-related risk

Finance will need to play an important role in supporting biodiversity, but any intervention, however well intended and well founded, has potential negative side-effects which need to be understood. At the same time, biodiversity loss in itself poses a significant yet poorly understood threat to economies and the finance sector. These risks also need to be investigated and understood in developing well-functioning governance systems for biodiversity finance. The 'governing biodiversity finance and identifying biodiversity-related risk' theme focuses on these knowledge gaps. It consists of work package 6 (WP6) led by Joakim Sandberg and work package 7 (WP7) led by Mark Sanctuary.

WP6: Governance structures and ethical risks

WP6 examines how the governance structures that shape biodiversity finance link and generate outcomes and risks, and evaluates ethical risks associated with biodiversity finance. The first year's work of WP6 has been devoted to questions pertaining to so-called "climate justice"; i.e., roughly how the costs of halting climate change and biodiversity loss should be distributed in society. This has entailed examining for example how costs should be distributed between individuals, public institutions, and polluting industries, and if it is fair to transfer some of the cost to future generations. The work has generated a stream of peer-reviewed papers on these various aspects of environmental justice. The work of WP6 was also presented at the Annual Member Meeting of the Gothenburg Global Biodiversity Centre.

WP7: Stress-testing the Swedish economy

WP7 will investigate two types of biodiversity-related risks to investors: transition risk and physical risk. Over the first year of the programme, WP7 has focused on addressing the first of these by initiating work to understand transition risks under the current international investment agreement (IIA) regime. This has meant assembling data on thousands of International Investment Agreements to develop criteria to determine which agreements could pose a threat to biodiversity positive investment Further, WP7 has accessed and cleaned data on biodiversity conservation – drawing from IUCN's Red List initiative, and international investment data describing the flows and stocks of FDI between countries - going forward to analyse these to identify opportunities to reform certain investment agreements to support biodiversity protection. Resulting from this work, is a unique dataset that now serves as the basis for our analysis during the year to come.

WP6 lead: Joakim Sandberg, University of Gothenburg

WP7 lead: Mark Sanctuary, IVL

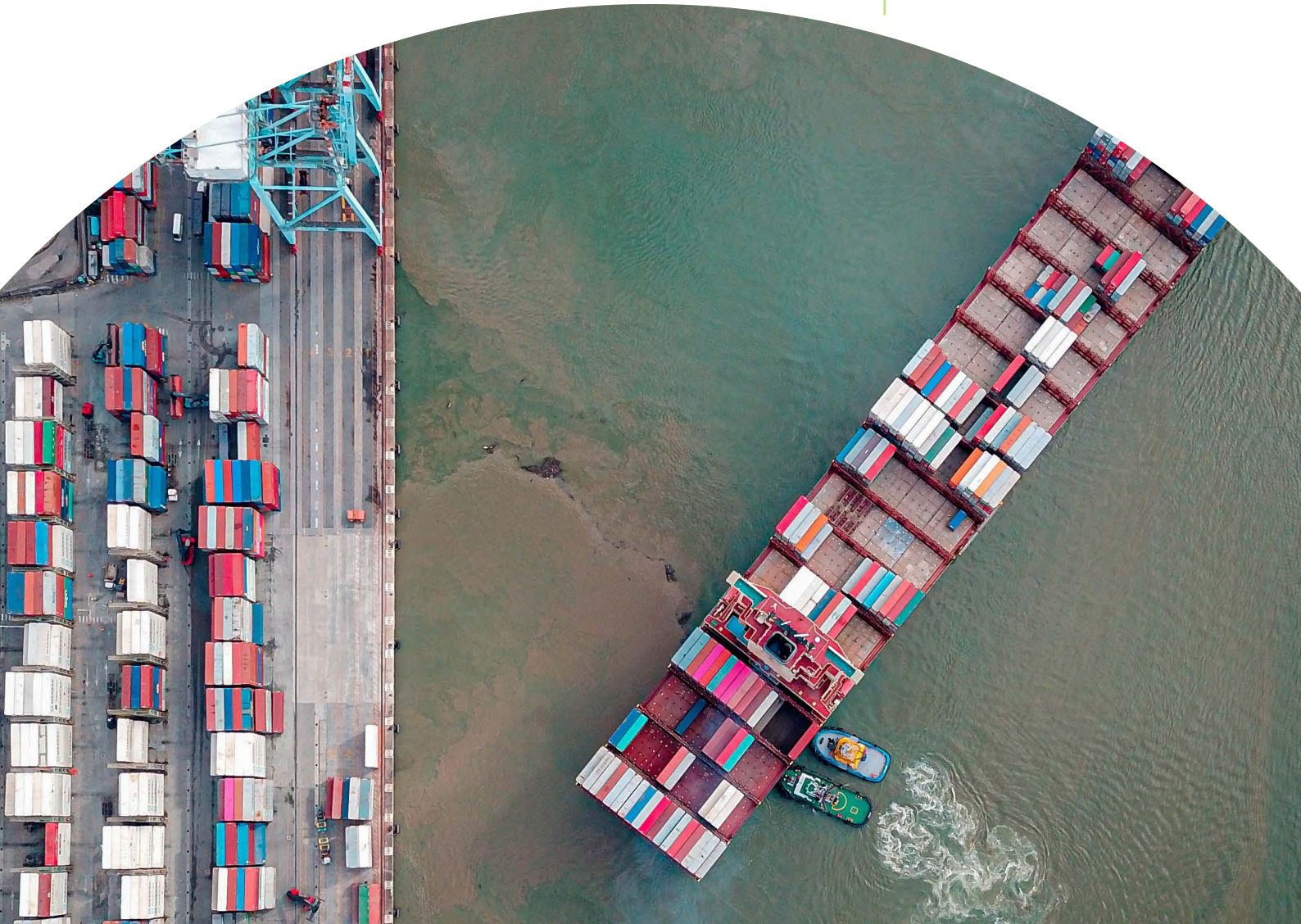
Theme 4: Initiation and coordination of transformation processes

The ultimate goal of Mistra FinBio is to support real innovation in and transformation of financial markets, in relation to biodiversity. We seek to transform current practices by developing new and innovative instruments for capturing and addressing biodiversity. To ensure that the research outcomes are useful in practice we are working with seven carefully selected impact partners operating in different parts of the financial system.

The fourth theme, on 'initiation and coordination of transformation processes' consists of work package 8 (WP8) led by Megan Meacham.

WP8's main aim is to take 'late-stage' ideas and outputs, particularly from WP4, and facilitate testing of these outputs with impact partners. The insights and outcomes from piloting and prototyping will also feed back to our work packages to inform the continued development of scientific theories and methods. The main focus in 2023 for WP8 has been to connect the diverse academic and impact partners within FinBio. This has been done through several different workshops and seminars to create shared understandings of both the financial system, its impact and dependence on biodiversity, and the main hurdles for addressing biodiversity in practice. As a result, FinBio has become established as a connected programme, with shared understandings across academic partners, as well as being positioned as a trusted, scientifically-grounded resource for exploring the links between biodiversity and finance. A key example of this was the full programme meeting held in August 2023, where for the first time, researchers, impact partners, and the programme board met and engaged together in person.

WP8 lead: Megan Meacham, Stockholm Resilience Centre



Initiatives enabled by Mistra FinBio

The funding provided by Mistra for Mistra FinBio has enabled connected projects and additional funding.

FinBio researchers Steve Lade, Juan Carlos Rocha and Beatrice Crona are co-principal investigators on a project that will enable an expansion beyond the ESI tool to more fully capture aspects of biodiversity. Results from the project will be tested with FinBio partners. “Capturing and measuring multiple and systemic environmental impacts of companies and investments: a new tool that accounts for climate, water and biodiversity and their interaction”. Funded by Formas, 14MSEK over 4 years.

FinBio researchers Ben Caldecott, Christophe Christiaen, Philippa Lockwood and Tom Bunting at the Oxford Sustainable Finance Group have joined a project to look at nature risk mitigation strategies for businesses and financial institutions. The work will complement Finbio’s work on ‘financing systemic change towards sustainability’, will build on other FinBio expertise as well as connect us with leading European partners on nature finance such as UNEP WCMC, Capitals Coalition, ShareAction and WBCSD. Approximately €550k was secured as part of a Horizon Europe grant.

FinBio researchers Joakim Sandberg and Beatrice Crona, together with Kent Eriksson at FinBio impact partner Sustainable Finance Lab, will develop metrics for sustainable finance that are based on robust insights from both natural and social science. The project will leverage the FinBio work of developing a natural-scientific understanding of the most important targets with regards to nature-related Earth system boundaries, and develop an applied-science understanding of how to best translate these results into concrete and user-friendly metrics for financiers by convening a set of highly distinguished scholars from management science, accounting, financial economics, and sustainability science, to work together through a series of working group meetings. The project “Science-Based Metrics for Sustainable Finance” is based at University of Gothenburg, 2023-2025 and received 3 MSEK from Vinnova - Sweden’s Innovation Agency.

FinBio researcher Richard Endörfer investigates so-called “climate bargain” approaches to the renewable energy transition. Climate bargain approaches underlie public policies which seek to transition the economy away from fossil fuels and biodiversity loss at, purportedly, no cost to either current or future generations. The project aims to scrutinize these approaches from an ethical perspective. “The Climate Bargain Approach Towards A Sustainable Economy” is based at University of Gothenburg, 2024-2027 and received 3.6 MSEK from the Swedish Research Council (Vetenskapsrådet).

FinBio Director Garry Peterson and researcher Megan Meacham, together with impact partner the Natural Capital Project, will compliment FinBio work through developing and testing alternative environmental accounting strategies, as well as, expanding work on cooperate biosphere stewardship. “Advancing the Research Frontier of Biosphere Stewardship, A Strategic Research Collaboration and Postdoc Program between The Stockholm Resilience Centre, Stockholm University, and The Natural Capital Project, Stanford University” Funded by the Marianne and Marcus Wallenberg Foundation, 20 MSEK, 5 years.

Financial summary

Mistra FinBio started in September 2022. Its total funding from Mistra over a four-year period amounts to 50 MSEK. In addition, the programme receives co-funding from its impact partner Pictet Asset Management amounting to 5 MSEK over the four years.

A total of 5 MSEK was set aside in a strategic reserve from the start of the programme. The strategic reserve is meant to allow the programme board to act on unforeseen, emergent research tracks and activities that show promise and potential.

The main budget posts for 2022 and 2023 were salaries and overhead costs. The total budget for the first year shows an underspending compared to the plan, but is on target for completion.

Expenditure 2022-2023	SEK
Salaries	3 891 578,44
Overhead cost	1 362 052,45
External services (including subcontractors)	888 986,5
Workshops	59 656,65
Travel	215 961,744
Material	156 624
Total	**6 574 859,79**

Appendices – Mistra FinBio Outputs

FinBio staff

Programme office

Garry Peterson, programme director, work package 5 lead, *Stockholm Resilience Centre*

Beatrice Crona, senior scientific advisor, work package 4, *Stockholm Resilience Centre*

Megan Meacham, programme manager, work package 8 lead, *Stockholm Resilience Centre*

Marika Haeggman, communications, *Stockholm Resilience Centre*

Work package leaders

Fredrik Ronquist, work package 1, *Swedish Museum of Natural History*

Juan Rocha, work package 2, *Stockholm Resilience Centre*

Ben Caldecott, work package 3, *Oxford Sustainable Finance Group*

Joakim Sandberg, work package 6, *University of Gothenburg*

Mark Sanctuary, work package 7, *IVL Swedish Environmental Research Institute*

Researchers

Christophe Christiaen, research coordinator, *Oxford Sustainable Finance Group*

Harry Cook, master student, *Stockholm Resilience Centre*

Fausto Corvino, postdoctoral researcher, *University of Gothenburg*

Natalie Danielsson, research assistant, *IVL Swedish Environmental Research Institute*

Jasmine Elliott, deputy researcher, *University of Gothenburg*

Richard Endörfer, deputy researcher, *University of Gothenburg*

Emma Granqvist, Researcher, *Swedish Museum of Natural History*

Mattias Gunnemyr, postdoctoral researcher, *University of Gothenburg*

Henrik Horn, researcher, *Research Institute of Industrial Economics*

Steven Lade, researcher, *Stockholm Resilience Centre*

Axel Lavenius, data science researcher, *IVL Swedish Environmental Research Institute*

Felicia Liu, researcher, *Oxford Sustainable Finance Group*

Divya Narrain, researcher, *Oxford Sustainable Finance Group*

Eliza Nobles, PhD candidate, *University of Gothenburg*

Giorgio Parlato, research assistant, *Royal Swedish Academy of Sciences*

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Carl Jan Risberg, research assistant, *Stockholm Resilience Centre*

Mats Töpel, senior researcher, *IVL Swedish Environmental Research Institute*

Bianca-Ioana Voicu, master student, *Stockholm Resilience Centre*

Sasha Quahe, research assistant, *Royal Swedish Academy of Sciences*

Scientific publications

Andina, T, & Corvino, F. 2023. Transgenerational Social Structures and Fictional Actors: Community-Based Responsibility for Future Generations. *The Monist* 106 (2): 150–164.

Andina, T., & Corvino, F. 2023. Climate Change, the Non-Identity Problem, and the Metaphysics of Transgenerational Actions, In *Handbook of the Philosophy of Climate Change*, edited by Gianfranco Pellegrino and Marcello Di Paola. New York: Springer, pp. 1-22.

Crona, B., & Sundström, E. 2023. Sweet Spots or Dark Corners? An Environmental Sustainability View of Big Data and Artificial Intelligence in ESG. In *Handbook of Big Data and Analytics in Accounting and Auditing* (pp. 105-131). Singapore: Springer Nature Singapore.

Crona, B., Parlato, G., Lade, S., Fetzer, I., & Maus, V. 2023. Going beyond carbon: An" Earth system impact" score to better capture corporate and investment impacts on the earth system. *Journal of Cleaner Production*, 429, 139523.

Corvino, F., & Andina, T. eds. 2023. *Global Climate Justice: Theory and Practice.* Bristol, UK: E-International Relations.

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Galaz, V., Rocha, J., Sánchez-García, P., Dauriach, A., Roukny, T. & Søgaard Jørgensen, P. 2023. Financial influence on global risks of zoonotic emerging and re-emerging diseases: an integrative analysis. Lancet Planetary Health.

Sandberg, J. 2023. Sustainable Finance as a Moral Obligation, *The Reasoner* 17 (3): 22-23.

Rossi, C., J. G. D. Byrne, C. Christiaen. 2024. Breaking the ESG rating divergence: An open geospatial framework for environmental scores, Journal of Environmental Management, Volume 349. Available online 7 November 2023.

Reports

Horn, H., Sanctuary, M. 2023. Investment Treaties and the Replacement of Stranded Investment. IFN Working Paper No. 1479. Stockholm: Research Institute of Industrial Economics (IFN).

Lenton, T. M., Laybourn, L., Armstrong McKay, D.I., Loriani, S., Abrams, J.F., Lade, S.J., Donges, J.F., Milkoreit, M., Smith, S.R., Bailey, E., Powell, T., Fesenfeld, L., Zimm, C., Boulton, C.A., Buxton, J.E., Dyke, J.G., Ghadiali, A. 2023. Global Tipping Points Report 2023: 'Summary Report' in [T. M. Lenton, D.I. Armstrong McKay, S. Loriani, J.F. Abrams, S.J. Lade, J.F. Donges, M. Milkoreit, T. Powell, S.R. Smith, C. Zimm, J.E. Buxton, L. Laybourn, A. Ghadiali, J.G. Dyke (eds), 2023, The Global Tipping Points Report 2023. University of Exeter, Exeter, UK.

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Christiaen, C. 2023. State and trends of spatial finance 2023. White paper.

Other media featuring FinBio research

Crona, B. Biodiversity: why investors should care. Commentary with Pictet Asset Management. October 2022. https://am.pictet/en/uk/global-articles/2022/expertise/esg/biodiversity-why-investors-should-care#overview

Crona, B. Ekonomiekot: Så kan finanssektorn bromsa klimatförändringarna. Swedish National Radio (Sveriges Radio P1). March 2023 https://sverigesradio.se/avsnitt/sa-kan-finanssektorn-bromsa-klimatforandringarna--3

Crona, B. No natural commodity can ever be sustainable if everyone wants it. Expert interview in Robeco's Insight series. May 2023. https://www.robeco.com/en-int/insights/2023/05/no-natural-commodity-can-ever-be-sustainable-if-everyone-wants-it

Peterson, G. Why COP-15 marks a turning point for environmental investing. Commentary with Pictet Asset Management. January 2023. https://pictet.prezly.com/why-cop-15-marks-a-turning-point-for-environmental-investing

Sandberg, J. et al. Bankerna driver på klimatkrisen , op-ed in Aftonbladet, 2023-09-19. https://www.aftonbladet.se/debatt/a/VPwjOJ/forskare-m-fl-bankerna-driver-paklimatkrisen

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Conference presentations featuring FinBio research

Christiaen, C. "Geolocated asset data: The fundamental building block for geospatial nature risk analysis by financial institutions" GEO BON Global Conference: Monitoring Biodiversity for Action in Montreal. October 2023.

Christiaen, C. "New sources of environment-related information" Workshop: harnessing technology for a sustainable economy by Banco de España, BIS Innovation Hub, and Eurosystem Climate Change Forum in Madrid, November 2023.

Corvino, F. 'The compound injustice of the EU carbon border adjustment mechanism (CBAM)', *13th Braga Meetings on Ethics and Political Philosophy – Panel 5 European Union*. The University of Minho, Braga (PT). June 2023.

Corvino, F. 'The compound injustice of the EU carbon border adjustment mechanism (CBAM)', *Financial Ethics Workshop*. University of Gothenburg (SE). June 2023.

Corvino, F. 'Intergenerational climate justice: risks and advantages of going distributive and non-isolationist', *Issues of Intergenerational Justice – Seminario EDEN: Etica, Diritto ed Economia Normativa*. University of Milan (IT). May 2023.

Corvino, F. 'Ethics and climate policy: an introduction', *Climate Change: Ethics and Social Dimensions*. The Polytechnic University of Turin (IT). May 2023.

Corvino, F. 'The forward-looking polluter pays principle for a just climate transition'. *Swedish Network's political theory conference*. Department of Political Science, University of Gothenburg (SE). May 2023.

Corvino, F. 'Social-Cost Carbon Price or Target-Consistent Carbon Price? An Ethical Assessment'. *Climate Ethics Workshop #2*. Aarhus University, King´s College, UCLouvain, University of Oslo. April 2023.

Corvino, F. 'The compound injustice of the EU (provisional) agreement on the CBAM, and possible solutions', *Just Climate Transitions, Seminar series*. University of Potsdam (DE). April 2023.

Corvino, F. 'Shifting (At Least Part of) the Economic Burden of the Energy Transition Onto Future Generations: a Pragmatic and Non-ideal Solution to the Present Generation's Egoism or an Application of Transgenerational Equity?', *International Chair of Philosophy "Jacques Derrida"/Law and Culture 8th Edition*, University of Turin (IT). March 2023.

Corvino, F. 'The ethical reasons for a carbon tax on luxury emissions: fairness and fair limits'. *Colloquium on Moral and Political Philosophy*, Institute of Philosophy, University of Graz (AT). December 2022.

Elliott, J. Presentation at University of Amsterdam Sustainable Global Economic Law Conference. June 2023

Elliott, J. Presentation at University of Lausanne Business and Human Rights Conference. May 2023.

Gunnemyr, M. "Harming Others". Department of Philosophy, Lund University. April 2023.

Gunnemyr, M. "Divestment and Collective Harms". *Financial Ethics Workshop*, University of Gothenburg. June 2023.

Meacham, M. "Finance for Biodiversity - working with the private sector", Bosch Postdoc Academy for Transformational Leadership, Stockholm University. October 2023.

Meacham, M. "Swedish exploration of ecosystem service evaluation" *1st International Research Conference on the Realization of Ecological Product Value*, the Chinese Academy of Sciences, Beijing. October 2023.

Peterson, G. Keynote: "Diverse values of nature, lessons for the IPBES Nature Futures Framework" 1st International Research Conference on the Realization of Ecological Product Value, Chinese Academy of Sciences, Beijing. October 2023.

Peterson, G. Keynote "DMZ Visioning-Seeds of Good Anthropocene" [DMZ OPEN Festival] EcoPeace Forum Sept, 2023, Gimpo & Goyang, South Korea

Rocha, J. "Identifying financial actors exposed to tipping points" Workshop on critical transitions at Potsdam Institute of Climate Research, Potsdam, Germany. December 2023.

Sandberg, J. "Do Pension Funds Have Social Responsibilities?" Legal Research Masters Conference, Utrecht University. May 2023.

Sandberg, J. "Bör min pensionsfond ta ansvar för miljön?" Royal Society of Arts and Sciences in Gothenburg. March 2023.

Other events featuring FinBio research

Caldecott, B., F. Liu. Nature Based Solutions to Global Challenges Foundation Course, online executive education. November 2022.

Christiaen, C., Bunting, T., and Meacham, M. Workshop: Shaping research priorities on nature finance in Oxford. November 2023.

Christiaen, C. OMFIF Sustainable Policy Institute: Mobilising finance to solve the climate crisis. March 2023.

Crona, B. Biodiversity: Why investors should care, webinar for Pictet Asset Management. October 2022.

Crona, B. MacDonald Nordics leadership group. Why corporates should care about biodiversity. November 2022.

Crona, B. Round table conversation on the topic of corporate sustainability reporting frameworks, practices, and impacts. Co-organized with Sustainable Finance Lab (SFL) and the Global Economic Dynamics and the Biosphere Programme at Royal Academy of Science. December 2022

Crona, B. Participation in panel discussion on *Standards and regulations of sustainable finance in the EU and China and where further interoperability should be sought to boost green* investments, at Investing in a Sustainable Future Event. Arranged through a collaboration between the Swedish Embassy in Beijing and Asian Infrastructure Investment Bank. April 2023

Crona, B. Presentation at UN PRI Nordics signatory event, hosted by Alecta, on the topic of *Biodiversity, Nature-related risks & Investor voice*. April 2023

Crona, B. Participated in roundtable discussion with the Minister for Climate and the Environment, and the Minister for Financial markets on the topic of sustainability and investments. Present were also representatives

from the majority of the Swedish investment sphere. May 2023

Crona, B. Participation in a dialogue with the Crown Princess of Sweden on biodiversity, climate, finance and the Swedish forestry sector – arranged as a competency building event for her Royal Highness at her residence. May 2023

Crona, B. Presented at a side-even at the Norrsken Impact Week, hosted by Gullspång Re:Food. The topic of the event was Transformative investing, and Crona presented on "Sustainable financing that facilitates real change - for the benefit of people and planet". September 2023

Crona, B. Presentation of the Earth System Impact assessment tool to the wider FinBio programme, including impact partners. March 2023.

Peterson, G. "Roundtable on Introducing environmental risks into central banking: From climate- to nature-related scenario analysis" closed door workshop, Zurich, Online. September 2022.

Peterson, G. Seminar for Network for Greening the Financial System, Online. October 2022

Peterson, G. Training programme for the IMF. Washington, DC. March 2023.

Peterson, G. OECD-inspire workshop on assessing biodiversity-related risks, impacts and dependencies for the financial sector. Paris/ Online. April 2023.

Rocha, J. Presentation of preliminary results of marine analysis for FinBio board and impact partner. September, 2023

Ronquist, F. Talk and workshop, Business @ Biodiversity Sweden network event. October 2022.

Ronquist, F. Talk, Stakeholder meeting, Insect Biome Atlas project, Madagascar Biodiversity Centre. January 2023

Ronquist, F. Talk, seminar. "Vad vet vi egentligen om Sveriges insekter?". RIFO - Bringing together Swedish MPs and Researchers. April 2023.

Ronquist, F. Talk, seminar. "Vad händer med våra insekter?". Royal Swedish Academy of Sciences. September 2023.

Ronquist, F. Talk, seminar. "Vad händer med våra insekter?". Swedish Research Council. September 2023.

Sanctuary, M. Presentation at Sweden-US roundtable on sustainable finance. October 2022.

Sandberg, J. Workshop on "Biologisk mångfald, vetenskap och politik – Att verka för myllrande liv", Jonsereds Herrgård. September 2022

Sandberg, J. Participation in Bokmässans klimatmiddag. Gothenburg. September 2022.

Voora, V. Presentation at internal Meeting with Formas and NV. Online. November 2022.

Academic partners

Stockholm Resilience Centre | Stockholm University

University of Gothenburg

ivl Swedish Environmental Research Institute

Naturhistoriska riksmuseet

Oxford Sustainable Finance Group

University of Oxford

Impact partners

SISD Swedish Investors for Sustainable Development

natural capital PROJECT

PICTET 1805 Asset Management

PRI Principles for Responsible Investment

Sustainable Finance Lab Sweden

Finance for Biodiversity Foundation

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