



# SeaBOS Progress 2017-2022

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Seafood Business for Ocean Stewardship



# OUR COMMITMENTS

## IMPROVE TRANSPARENCY

Improve transparency and traceability in our own operations, and work together to share information and best practice, building on existing industry partnerships and collaborations.

## REDUCE IUU FISHING

Engage in concerted efforts to help reduce IUU fishing and seek to ensure that IUU products and endangered species are not present in our supply chains.

## ELIMINATE MODERN SLAVERY

Engage in concerted efforts to eliminate any form of modern slavery including forced, bonded and child labour in our supply chains.

## DEVELOP AND DEPLOY NEW TECH

Collaborate and invest in the development and deployment of emerging approaches and technologies for sustainable fisheries and aquaculture.

## REDUCE USE OF ANTIBIOTICS

Work towards reducing the use of antibiotics in aquaculture.

## REDUCE USE OF PLASTICS

Reduce the use of plastics in seafood operations, and encourage global efforts to reduce plastic pollution.

## DEVELOP SCIENCE-BASED SOLUTIONS

Engage in science-based efforts to improve fisheries and aquaculture management and productivity, through collaboration with industry, regulators and civil society.

## GROW AQUACULTURE SUSTAINABLY

Secure new growth in aquaculture, by deploying best practices in preventive health management, including improved regulatory regimes.

## SUPPORT INNOVATIONS

Support novel initiatives and innovations for ocean stewardship.

## REDUCE GHG EMISSIONS

Reduce our own greenhouse gas emissions.



## Ocean stewardship definition:

Ocean stewardship is an adaptive and learning based, collaborative process, of responsibility and ethics, aimed to shepherd and safeguard the resilience and sustainability of ocean ecosystems for human well-being.

To read the full details of the group's commitments and the establishment of SeaBOS, read the "Joint Statement" from the first Keystone Dialogue: [Seafood Business for Ocean Stewardship](#)

## SeaBOS mission:

To lead a global transformation towards sustainable seafood production and a healthy ocean.

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Participants gathered for the Phuket Dialogue in September 2019



## Foreword from HRH Crown Princess Victoria of Sweden

When I was first approached by scientists from the Stockholm Resilience Centre in 2015, to engage in a global dialogue with keystone actors in the seafood industry, I thought: "Interesting idea, but is change really possible? We can't afford not to try – this might be our only chance."

As a global advocate for the SDGs, I wanted to do more than to speak at meetings, and to serve as an ambassador for sustainability. I wanted to help drive change to the best of my abilities.

I also wanted to learn more. What were the ocean challenges, what were the opportunities, who were the actors, what were they doing, and how could they be stimulated to change? Was sustainability a fringe topic, and how could it become the core principle upon which all their operations were based?

During the last few years, I have learnt a lot: about the scale of the challenges, about the willingness of industry to lead by example, about the challenges faced by scientists seeking positive engagement with corporations, and the new opportunities that present themselves to companies and scientists that are able to embark on an uncomfortable journey together.

I have come to realize that we all want the same thing, regardless of our background and affiliations: A healthy ocean for everyone. This is good for business, good for the planet, and good for people.

This report is an opportunity for you to learn more. About SeaBOS, the vision that has brought this group together, the commitments that drive it forward, and about what the companies, and scientists, have achieved to date.

For some of you, this may be the first time you are learning about them, but I can tell you this: they have worked hard since I first met them.



Her Royal Highness Crown Princess Victoria of Sweden, Duchess of Västergötland and a Sustainable Development Goals Advocate Emerita

The companies in SeaBOS need to do more. Much more. We all need to do more. But they have started.

Although this is only a start, I feel proud to have been working with this group. I am happy to see that their hard work is starting to generate results – and that it is also starting to inspire others.

SeaBOS' ambition is not just to put its members on a firm path of sustainability and stewardship, but to set an example for the entire industry as well as for other industries active in the ocean space. Living up to that ambition means delivering on commitments, avoiding complacency, and continuously challenging conventional wisdom of what is possible.

More is possible. And the ocean requires it from all of us.



## Tackling urgent challenges together

Tackling the most significant challenges in the seafood sector is not for the faint hearted.

Doing so globally, within a collaborative framework linking science with ten of the largest seafood businesses is energising, exhilarating, frightening, and frustrating, all at the same time. It was clear in 2016, when this science and industry dialogue first began, that the problems in the seafood sector, for our ocean, and for our planet, were urgent. It is even more clear in 2022 that those problems still exist, and their immediate resolution is critical to the health of our ocean, the productivity and production of seafood, and the health and wellbeing of our human population.

The SeaBOS model is unique, and combines trans-disciplinary scientific expertise, with trans-national industry expertise. Spanning cultural and geographical boundaries, the aim of SeaBOS is to develop science-based solutions to address these challenges and provide leadership, guidance, stewardship, and examples for others to use. The original eight company signatories of SeaBOS rapidly expanded to become ten members, and we hope to continue growing and extending our learnings as others join, replicate, or improve on our efforts.

Since we launched SeaBOS at the UN Ocean Conference 2017, much has been achieved, particularly in creating the foundations for future. We have developed trust and constructive dialogue between and across science and industry, at new levels. We have created strong and growing collaborations. We have identified key areas of focus, and mechanisms to work together to create innovative solutions, based on science. And we have developed frameworks and processes which can be used, and are being used, to address the key challenges.

This report is the start of our accountability to each other, to ensure we deliver on our promises. More - this report is an update on



Martin Exel, Managing Director, SeaBOS

a journey we all share. It is a journey of hope towards transformation to a sustainable global seafood sector, and towards a healthy ocean. Transformation, and journeys, are rarely linear. Some things we tried didn't work. Others are still 'work in progress'. And we have had a few successes.

The reality is clear - we still have a long way to go. But we're aligned in our journey. We're agreed on our vision. And, at times, we recognise we are at different stages of that journey even amongst SeaBOS members. But we're making progress. And we're reporting publicly to help others understand the situation we see now; the vision of where we are headed; and to show how we plan to get there.

It is a privilege to be part of SeaBOS, and to be part of the seafood sector more broadly. Together with science, policy, and civil society, we can turn our vision into reality. That's worth reporting on.

A handwritten signature in blue ink that reads "Martin Exel". The signature is fluid and cursive, with a clear first name and a last name that is slightly more stylized.



# WHO WE ARE





## SeaBOS in a nutshell

- Seafood Business for Ocean Stewardship (SeaBOS) was launched in 2016 and is a unique collaboration between scientists and 10 of the world's largest seafood companies across the wild capture, aquaculture and feed production sectors.
- Company members were identified and invited based on research conducted at the Stockholm Resilience Centre at Stockholm University, identifying the Keystone Actors in the seafood industry - those with a significant ability to shape marine ecosystems. The paper from 2015 can be accessed here: "[Transnational corporations as Keystone Actors in marine ecosystems](#)".
- Member companies represent over 18% of global seafood trade value and comprise over 600 subsidiary companies across 95 countries.
- The mission of SeaBOS is to lead a global transformation towards sustainable seafood production and a healthy ocean.
- [Ten commitments](#) guide the work of SeaBOS and [six Task Forces](#) have been organized to operationalize the priorities described in the commitments.
- Science-based action is conducted in collaboration with a number of [strategic partners](#) across the SeaBOS commitments.
- HRH Crown Princess Victoria of Sweden is an Advocate Emerita of the Sustainability Development Goals, and HRH has been a keen participant and driver at the annual [CEO-level dialogues](#) and working meetings since the inception.
- SeaBOS is headquartered in Stockholm. The science team, secretariat and member companies are all located in various countries.

### Companies



### Scientific institutions



# The SeaBOS story

Seafood Business for Ocean Stewardship (SeaBOS) is a group of ten of the world's largest seafood companies that are collaborating with science to implement a joint vision to support more sustainable seafood production and improved ocean health. The initiative connects capture fisheries with feed producers and aquaculture businesses across Asia, Europe, and North America.

Together, SeaBOS companies represent over 10% of the world's seafood production and comprise over 600 subsidiary companies. SeaBOS members are Maruha Nichiro Corporation, Nissui, Thai Union, Mowi, Dongwon Industries, Cermaq, Cargill Aqua Nutrition, Nutreco/Skretting, CP Foods, and Kyokuyo. Read more about each company on the [SeaBOS website](#).

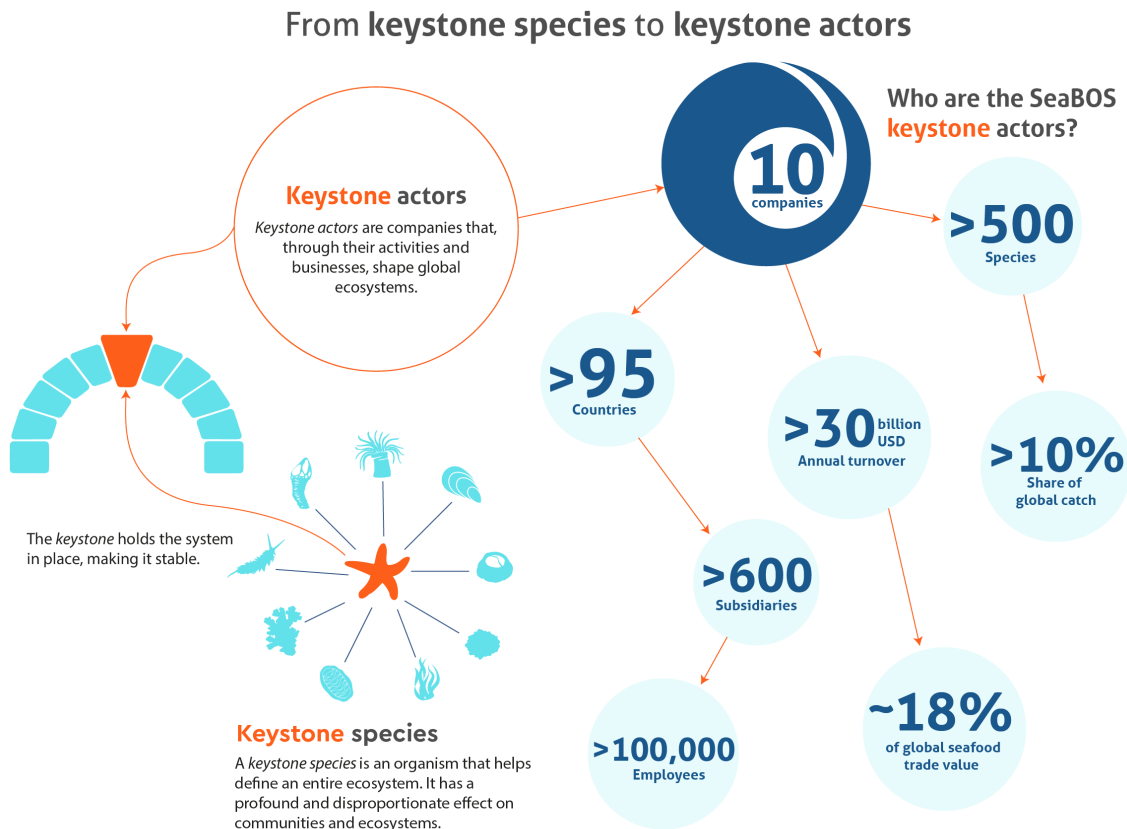
The collaboration was initiated (2016) and first coordinated (2016-2019) by the Stockholm Resilience Centre (SRC) at Stockholm University with the Beijer Institute of Ecological Economics at the Royal Swedish Academy of Science, the University of Lancaster, and the Stanford Center

for Ocean Solutions. The scientific work has been funded by the Walton Family Foundation, the Moore Foundation, and the Packard Foundation. Since 2019, SeaBOS is a legal entity, with a Secretariat and administrative activities funded by industry contributions, with a responsibility to coordinate this effort in close collaboration with scientists.

## THE SCIENTIFIC BASIS

The starting point for SeaBOS dates back to 2012 when researchers at the SRC at Stockholm University and the Beijer Institute of Ecological Economics at the Royal Swedish Academy of Sciences, began research on the largest actors in the seafood industry, in the project "Nereus – Predicting Future Oceans", funded by the [Nippon Foundation](#).

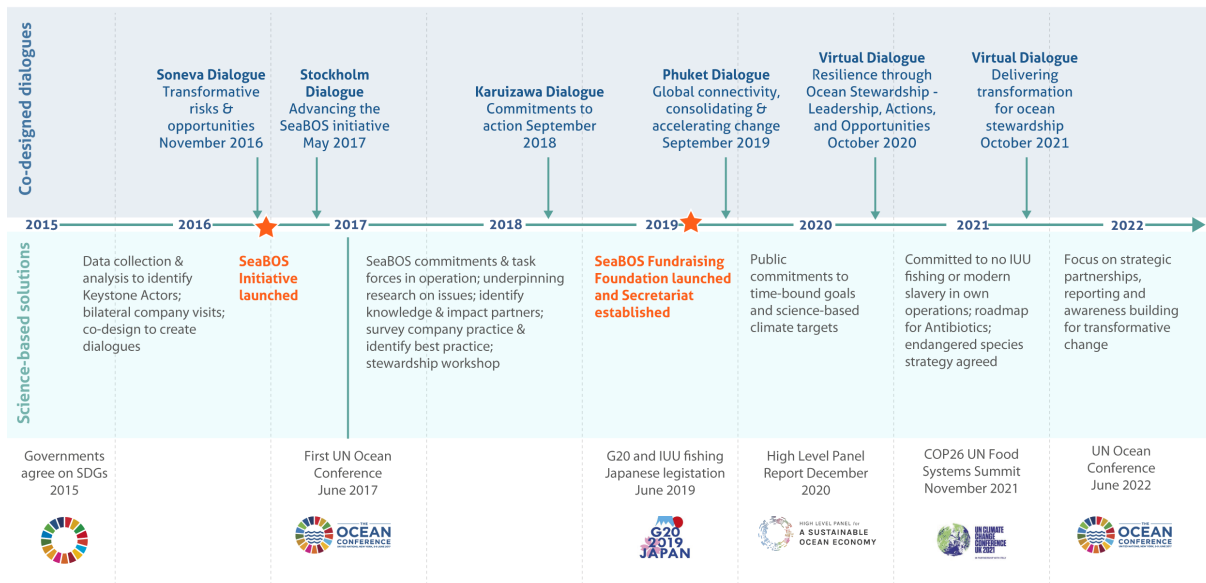
Their work was inspired by the scientific discoveries of "keystone species" in the ocean, from the late 1960s – species with a disproportionate effect on the structure and function of marine ecosystems. The question the



Reference: Paine, R. T. (1966) "Food web complexity and species diversity" American Naturalist 100: 65-75



## SeaBOS (ocean stewardship) timeline



research team in Stockholm asked was: are there also “keystone actors” within the seafood industry?

The answer came in a scientific [paper published in 2015](#) demonstrating that just 13 companies controlled 19-40% of some of the largest and most valuable stocks, and 11-16 % of the global marine catch. These keystone actors were defined as corporations that:

1. dominate global production revenues and volumes within a particular sector
2. control globally relevant segments of production
3. connect ecosystems globally through subsidiaries
4. influence global governance processes and institutions.

This publication led to the scientific hypothesis that keystone actors could be mobilized to lead a global transformation for ocean stewardship. A scientific project (the Keystone Dialogues project – see page 38) was initiated to test this hypothesis. After two years of bilateral contacts between scientists and company representatives, eight of the world’s largest seafood companies agreed to an initial meeting in November 2016 to explore transformative risks and opportunities for the global seafood industry, underpinned by a series of [scientific background briefs](#). This was the first keystone dialogue which resulted in CEOs of these leading companies publicly committing to a vision and set of [shared commitments](#) to ocean stewardship. This laid the foundation for a new science-business initiative: Seafood Business for Ocean Stewardship (SeaBOS). Since then, two more companies have joined the initiative.



HRH Crown Princess Victoria in discussion with Prof. Carl Folke, Chair of the Board of the Stockholm Resilience Centre, Director of the Beijer Institute of Ecological Economics, and one of the originators of the keystone actors concept.

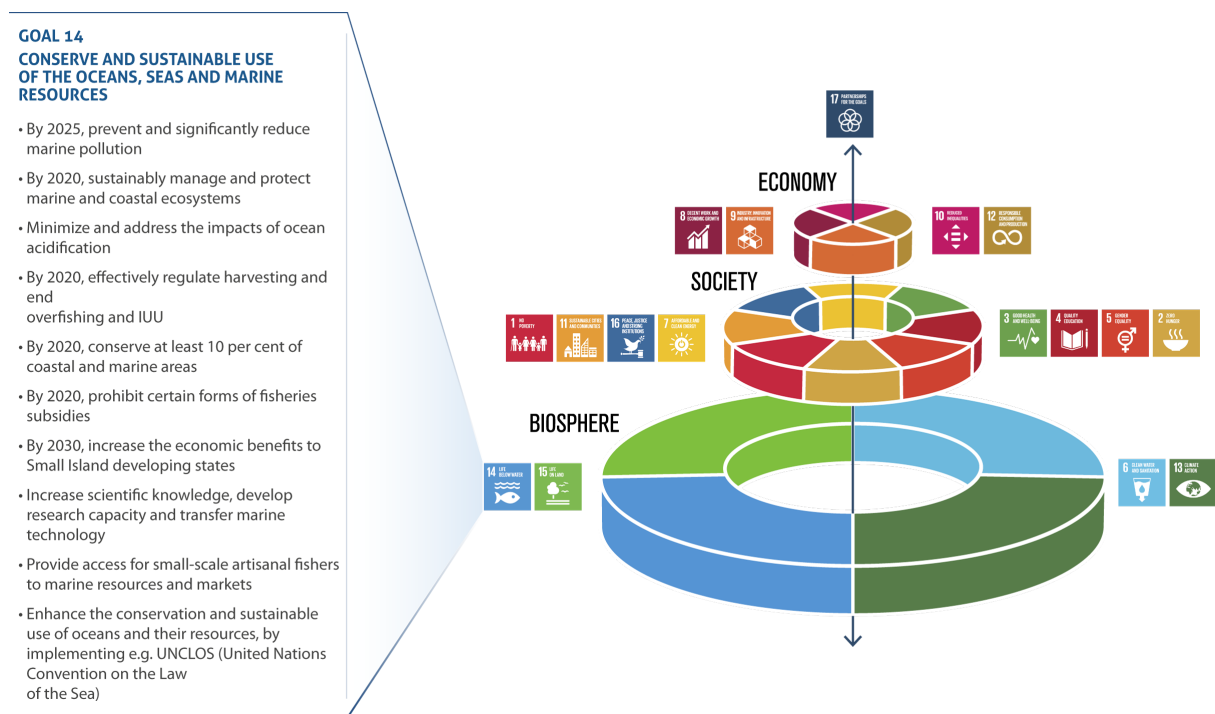
SeaBOS was launched shortly after the establishment of the Sustainable Development Goals (SDGs) and the Paris Agreement in 2015. Since then, SeaBOS has supported and aligned with several major global efforts, including the UN Ocean Conferences (2017 and 2022), the activities of the High-Level Panel for a Sustainable Ocean Economy (established 2018) and the development of the ocean-climate nexus towards COP26 in Glasgow. The SeaBOS commitments support progress on the SDGs that treat the biosphere as a basis for societal and economic development, as illustrated in the figure below.

### ENGAGING CORPORATIONS FOR COLLECTIVE ACTION

There are many ways to move complex systems towards ecologically sound and socially just outcomes. SeaBOS represents one way in

which this might be achieved: working with large corporate actors which is the essence of a keystone approach. A [recent article](#) lays out the multitude of ways in which collaboration can be structured and what collaborations seek to change.

SeaBOS is an example of an initiative that seeks to 'broker power' in that it works together with influential actors in a problem solving mode that addresses their ability to change their operations. Science partners spend time relating together and with industry members (formally through the dialogues and also on an ongoing basis to advance the commitments) to reframe problems as opportunities for innovation in support of ocean stewardship. Alongside SeaBOS activities, many other parts of a knowledge and action landscape will also drive ocean stewardship.







# WHAT WE DO AND WHY



## Working together to solve key challenges for ocean stewardship

In the following, you will see how we work in SeaBOS to progress science-based solutions on key challenges for ocean stewardship in the seafood sector.

The ocean sustainability challenge is fundamental for humanity, and we are convinced collective action between science and industry represents part of the solution. This is easier said than done.

Scientists are trained to describe problems and present hypotheses, rather than to engage in change processes. The focus is to publish papers, write grants, teach, and follow established career paths. CEOs and company staff are trained to deliver results that satisfy owners, shareholders and markets, rather than working with competitors. Such work is not only legally challenging from a precompetitive perspective, it may also seem counterintuitive – why would you want to help and obtain support from your rivals on a competitive market?

The realization that there is only one planet, and that existing institutions seem unable to deal with the complex challenges facing humanity, is also a realization that we have to work together to accelerate change towards a sustainable future.

This means that we have to push boundaries of our respective systems and institutions, in order to be able to stay within a safe operating space of the planet. Our collaborative work has been challenging over the last few years and it will continue to be a struggle. We are all outside of our comfort zone and there is always tension. Although it is challenging, it is the thought of the possible that inspires us to continue.

Our work rests on a bold vision of ocean stewardship, and an ambition to create cascading change towards new norms and practice within the industry. Our cooperation rests on a commitment for the long term, and trust. Learning is multidirectional: from science to business, between companies and from business to science. Diverse capacities are needed – across scientific

disciplines, across units in companies, with civil society, and governments.

This work is starting to generate results and it is inspiring others. It is an experiment that we are developing together, and our work has only just begun. This report includes information on tangible outcomes, but it is not easy to communicate what has truly changed within companies – how they are staffed and organized to address the ocean challenges, and how it has changed the priorities for all of us. Despite the challenge of communicating such “cultural changes” since the first meetings, I hope you will find that this report illustrates that companies are sincere in their commitment and that they are delivering results based on science. We are walking together, it is an exciting and rewarding journey, and we are learning as we move.

We hope that the SeaBOS actions will stimulate others to follow, that others will help us learn as well, and that it will encourage governments to take adequate action for our shared ocean.



Therese Log Bergjord (CEO of Skretting and chair of the SeaBOS Association)



Henrik Österblom (Science Director of Stockholm Resilience Centre, and chair of the SeaBOS Fundraising Foundation)

# Challenge 1: Ensuring transparency and traceability

## SEABOS COMMITMENT (2016):

- Improve transparency and traceability in our own operations, and work together to share information and best practice, building on existing industry partnerships and collaborations.

## SCIENTIFIC FOUNDATION:

- Background briefs on "[Inventory of transparency and traceability initiatives](#)" and "[Assessing the transparency of sustainability reporting by SeaBOS members](#)"
- Blasiak et al. 2021 "[Evolving Perspectives of Stewardship in the Seafood Industry](#)"

## KEY IMPLEMENTATION DOCUMENTS:

- [GDST Core Normative Standards](#)
- [GRI Standards](#)

**Problems:** Transparency and traceability are instrumental for corporate accountability, legal compliance and responsible use of natural resources. Seafood supply chains are complex and transparency across them has traditionally been limited, creating challenges to governance and monitoring of impacts across geographies.

**Science-based solutions:** Transparency is critical for seafood companies to build trust with customers and stakeholders. Public reporting and data sharing can facilitate stakeholder dialogue and help inform company decision making. Standards such as the Global Reporting Initiative (GRI) and Global Dialogue on Seafood Traceability (GDST) are important tools for advancing industry transparency across the supply chain, ultimately supporting enhanced sustainability performance. Technologies such as blockchain and Artificial Intelligence can contribute to sustainable sourcing of seafood products.

**SeaBOS actions:** One of the first collective steps of SeaBOS was setting a clear priority of performance based on transparent reporting. Public reporting in line with the GRI standards has been undertaken by all SeaBOS members since 2020 based on regular materiality assessments. Some SeaBOS companies are also reporting through the [Ocean Disclosure Project \(ODP\)](#) and making their marine products portfolio publicly

available. Four companies are currently engaging with GDST to implement traceability solutions, while new technologies are being piloted on commercial fishing vessels (see box). These efforts represent starting points for new norms of industry transparency and traceability.

### SeaBOS pilot for vessel and crew identification and tracking

SeaBOS has developed a Proof of Concept (PoC) to transform the level of transparency aboard commercial fishing vessels, using monitoring IT tools and machine learning. The PoC uses two core technologies: (1) Facial recognition software, to document crew members' commercial fisherman license and identity; and (2) deck cameras to identify species and catch volume, time and date and GPS lat/long coordinates, with automatic upload to a blockchain platform. Vessel tracking and identification of vessels entering Marine Protected Areas or no fishing zones were identified using digital logs. The PoC illustrated that it is possible to execute this level of transparency and traceability on fishing vessels.



## COMPANY CASES: ENSURING TRANSPARENCY AND TRACEABILITY

### NISSUI: MAPPING OF ALL PROCURED MARINE PRODUCTS

Nissui conducted a [survey of all marine products](#) procured by the Nissui group in 2019. The data was analyzed in 2020 using the database of Sustainable Fisheries Partnership (SFP) with disclosure of findings in 2021. The mapping includes fish species, catch area, gear type, quantity and the status of each stock. The objective of the mapping exercise was to get a comprehensive overview of all procured marine products and to use these findings to support more sustainable procurement in the future.

### THAI UNION: PARTNERSHIP TO IMPROVE TRANSPARENCY IN THE SUPPLY CHAIN

Thai Union Group has entered a [partnership with Sustainable Fisheries Partnership \(SFP\)](#) to further improve transparency in its supply chains and consider wider impacts on biodiversity. Specific objectives include to set up a metrics system for Thai Union's supply chains in Europe, Asia and North America, participate in the Ocean Disclosure Project, completion of a bycatch audit linked to the impact on ETP (Endangered, Threatened, Protected) species and support roundtables that are focused on improving the sustainability of seafood supply chains. Responsible sourcing is a pillar of Thai Union's [SeaChange strategy](#).

### EXTERNAL ASSESSMENT OF SEABOS COMPANIES

The Sustainable Seafood Index (SSI) measures the world's 30 most influential companies in the seafood industry on their contribution to the SDGs. SeaBOS companies are assessed across a range of topics, and all 10 SeaBOS companies actively provided data and input during the assessment process. The 2021 assessment is [accessible here](#).

## Challenge 2: Reducing IUU fishing and eliminating modern slavery

### SEABOS COMMITMENT (2016):

- Engage in concerted efforts to help reduce IUU fishing and seek to ensure that IUU products and endangered species are not present in our supply chains.
- Engage in concerted efforts to eliminate any form of modern slavery including forced, bonded and child labour in our supply chains.

### SCIENTIFIC FOUNDATION:

- Background briefs on [Defining Modern Slavery](#) and [Human and Labour Rights Reporting](#)
- Selig et al. 2022 "[Revealing global risks of labor abuse and illegal, unreported, and unregulated fishing](#)"

### KEY IMPLEMENTATION DOCUMENTS:

- [Tool kit in support of SeaBOS commitments](#)
- [Voluntary procurement actions](#)

**Problems:** Modern slavery in fisheries and aquaculture operations and illegal, unreported and unregulated (IUU) fishing have major impacts on human rights, food security, livelihoods and economic benefits for communities and governments. Both issues threaten the sustainability of seafood production by facilitating overfishing and violating human rights. Making progress on eliminating these practices has been challenged by many factors including limited regulatory enforcement in many regions, and engagement with fishers with regards to solutions. A poor understanding of where risks are greatest and the factors that drive them has also limited action.

**Science-based solutions:** Solving endemic and systemic problems requires a systematic approach, based on science. SeaBOS companies have requested guidance by science to identify areas of high risk. At the same time, they have co-developed a set of voluntary actions to address these risks with external stakeholders. Addressing modern slavery and IUU fishing critically relies on government action, including the ratification of global agreements, combined with adequate monitoring and enforcement. Companies working together with governments and civil society will be instrumental for making progress on this challenge.

**SeaBOS actions:** Member companies have made commitments to identify and remove IUU and forced, bonded and child labor from their own operations and from their Tier 1 and Tier 2 suppliers. These commitments and their associated actions can foster new industry norms and be a catalyst for more effective public policy and legislation. To address IUU and modern slavery risks, SeaBOS has created a Tool Kit to support their commitment and which companies can tailor to meet their specific needs. Actions include development of publicly available company policy documents that address responsible raw materials sourcing, issues of eliminating forced, bonded and child labor, protocols for auditing and compliance, advancing traceability and external reporting and accountability.

Scientists have mapped key risks for labor abuse and IUU fishing at port, at sea and associated with transshipment, and identified key risk drivers. Members are using these new risk maps to assist with mitigating risk and determining where and what kind of measures would be most effective (see "Science highlight" below). Four SeaBOS companies have, to date, shared high-resolution, operational data with the Science Team, and



more are set to follow. Now that key risk areas and potential actions have been identified, SeaBOS companies can take action. These risk maps also highlight opportunities for stewardship where collaboration can occur between companies, governments and key stakeholders to reduce risks through supply chains.

SeaBOS has engaged in multiple policy processes directly relevant to addressing IUU fishing and modern slavery. For instance, the first SeaBOS Chair co-authored an [op-ed with the Norwegian Prime minister \(2019\)](#), urging countries to ratify the UN Port State Measures Agreement. SeaBOS has also been [supportive of legislative change in Japanese fisheries law \(2021\)](#), and has engaged with multiple industry stakeholder groups to [support government actions to address IUU fishing \(2021\)](#), while also [pledging to increase their own efforts to improve traceability](#). Individual SeaBOS companies are working together in multiple fisheries improvement projects, with governments, civil society organizations, and industry groups. In May of 2022, SeaBOS also

publicly supported the removal of [harmful fishing subsidies](#), a key barrier for reducing IUU fishing. Science team members have engaged in dialogue with fishers and human rights organizations, and will continue to explore engagement with relevant policy processes with regard to modern slavery and labor abuse.

#### Science highlight: Risk mapping (2022)

Scientists have mapped key risks for labor abuse and IUU fishing at port, at sea and associated with transshipment, and identified key risk drivers. This research provides stakeholders, including businesses and governments, data on higher risk areas and vessel characteristics to inform meaningful actions that they can take to reduce labor abuse and IUU fishing in fisheries worldwide. The findings can be accessed through the 2022 *Nature Communications* paper: [“Revealing global risks of labor abuse and illegal, unreported and unregulated fishing”](#).





## COMPANY CASES: REDUCING IUU FISHING AND ELIMINATING MODERN SLAVERY

### CP FOODS: WORKER PROGRAM TO STRENGTHEN LABOUR RIGHTS

Since 2017, CPF has collaborated with the Labour Protection Network Foundation under the "[Worker Voice and Worker Training Program](#)". A key goal of the program is to certify over 200 shrimp farms and factories across the country in accordance with labour standards by 2022. Such a collaborative program has helped CPF promote labour protection and employees' well-being and manage risks of human trafficking and forced labour.

### DONGWON: FISHERY IMPROVEMENT PROJECTS (FIPS)

To improve fisheries, Dongwon is carrying out FIPs in three different Oceans: [Indian](#), [Atlantic](#) and [Pacific](#). By improving its fisheries in accordance with the Marine Stewardship Council (MSC) standards, Dongwon is contributing to the eradication of IUU fishing, conservation of marine resources and improvement of seafood traceability. In carrying out the FIPs, one of the numerous lessons learned was implementation of non-entangling FADs, which are designed to prevent entanglement of bycatch species

### CARGILL: FISHERY IMPROVEMENT PROJECTS (FIPS)

FIPs are an important tool to improve fishery management and fishing activities. Cargill is directly sponsoring FIPs in [Mauritania small pelagics](#), [Ecuador small pelagics](#), [Peru north-central anchoveta](#) and the north-east Atlantic with [NAPA](#) on [Atlantic mackerel](#), [Atlantic herring](#) and [blue whiting](#). Starting with the [MarinTrust IP](#) (improvers' program) this process works to eradicate IUU fishing from its supply chains and bring fishery management in line with the Maximum Sustainable Yield (MSY) concept.



## Challenge 3: Advancing protection of endangered species

### SEABOS COMMITMENT (2016):

- Engage in concerted efforts to help reduce IUU fishing and seek to ensure that IUU products and endangered species are not present in our supply chains.

### SCIENTIFIC FOUNDATION:

- Background brief on [endangered species](#)
- Briefs on [Seabirds](#) and [Elasmobranchs](#)
- [Best practices](#) for reducing negative impacts on elasmobranchs and seabirds

### KEY IMPLEMENTATION DOCUMENTS:

- [SeaBOS Endangered Species Strategy](#)

**Problems:** Global biodiversity loss represents a critical threat to ocean health and sustainable seafood production. The number of endangered species is increasing at an unprecedented rate with serious implications for ocean health, as well as human well-being and prosperity. Threats to the health of ecosystems that industry and food security rely on undermine the future of sustainable seafood. The seafood industry represents a key risk to endangered species through direct targeting, interactions with aquaculture, or as a result of bycatch. Habitat degradation is also a risk associated with both wild-capture fisheries and aquaculture fisheries, undermining the health of ocean ecosystems and increasing risks to endangered species.

**Science-based solutions:** A range of species are negatively influenced by seafood production and SeaBOS has made a decision to focus on endangered seabirds and elasmobranchs (sharks and rays) as a starting point. Scientists

have identified best practices for these species groups with an aim to accelerate industry uptake and facilitate learning about how to advance protection of endangered species, with an ultimate goal to ensure that such best practices are adequately reflected in existing formal and market-based governance.

**SeaBOS actions:** In 2021, SeaBOS members established a strategy for addressing negative impacts on endangered species. The first step was to establish a scientific assessment of best practices, published in 2022. Companies are currently conducting internal due diligence processes to understand their exposure to risks in relation to endangered species, how to prioritize engagement with best practices, and how to innovate, while also developing a framework for reporting on progress in the coming years. Starting in 2023, SeaBOS will expand its scope to also include a focus on additional species groups.

## COMPANY CASE: ADVANCING PROTECTION OF ENDANGERED SPECIES

### MARUHA NICHIRO: COMPANY- WIDE SURVEY TO PROTECT MARINE RESOURCES AND ENDANGERED SPECIES

Maruha Nichiro Corporation has conducted their first [comprehensive surveys](#) to ascertain the volume of seafood products handled for raw materials and products procured from outside the Maruha Nichiro Group between April 2019 and March 2020. The survey covered fish species name, country of origin, fishing area (FAO fishing areas), weight and fishing method. The aggregated results were assessed by an external partner, the Sustainable Fisheries Partnership.



## Challenge 4: Reducing antibiotics use

### SEABOS COMMITMENT:

- Work towards reducing the use of antibiotics in aquaculture.

### SCIENTIFIC FOUNDATION:

- Background brief on [Aquaculture](#)
- Background brief on [Antibiotics in Aquaculture](#)

### KEY IMPLEMENTATION DOCUMENTS:

- [Antibiotics Stewardship Roadmap](#)

**Problems:** Improper and excessive use of antibiotics including in seafood production has contributed to the global spread of antimicrobial resistance (AMR), which jeopardizes healthcare, food production, and human life expectancy. Antibiotics are essential in human healthcare to treat common infections and carry out surgical procedures, and AMR results in approximately 700,000 human deaths per year.

The use of antibiotics in some parts of the aquaculture industry is substantial, but a comprehensive understanding of use is lacking. Antibiotic use in aquaculture differs greatly among species and regions, as is the control of use across different countries. Intensification of aquaculture in some regions has also resulted in higher risk of disease outbreaks, which in turn increases antibiotic use.

**Science-based solutions:** Spreading awareness and promoting transparency and accountability in antibiotic use is crucial and can support actions to address emergence of AMR as well as excessive and improper use of antibiotics in aquaculture. Core to any reduction in the use of antibiotics is an improvement in overall health management in aquaculture. A stewardship approach will include efforts to strengthen farm management practices and monitoring; support disease diagnostic capabilities and aquaculture veterinary health services; understand environmental stressors; develop and distribute fish vaccines; develop technologies, and impose stricter regulation and controls.

The risk of AMR must be reduced and the use in animals (and aquaculture) of highest priority critically important antimicrobials (HPCIA) and critically important antimicrobials (CIA) for human medicine (as defined by the World Health Organization) needs to be curtailed to reduce the risk of them

losing efficacy for human medicine. Other critically important antibiotics need to be used responsibly to ensure that they remain effective for animals and humans. The “One Health” approach implies that environmental health, human health, and animal health are all interrelated, and through improved management of animal health, human and environmental health can be improved as well.

**SeaBOS actions:** SeaBOS focuses on data collection from member companies, establishing a broad network of professionals and institutions in aquaculture and developing a Code of Conduct for responsible antibiotic use for implementation in SeaBOS. The Code will provide strategies for maintaining fish health and welfare and reducing use of antibiotics through preventative practices and interventions. These efforts have resulted in SeaBOS publishing its [Antibiotic Stewardship Roadmap](#), which guides members in the phasing out of HPCIA and CIA in line with World Health Organization (WHO) standards.

This work is supported by a review of regulations to assess national level support for stewardship of antibiotics in aquaculture and to better understand local regulations. In addition, diseases and treatments used across species have been evaluated, with a special emphasis on the most challenging species and systems for the SeaBOS portfolio of farmed species. Insights about portfolio diversity and the difference in company structures with respect to dependencies on subsidiaries have resulted in identifying different strategies for antibiotic stewardship. A unifying element is that the need for antibiotics can be reduced through a holistic approach that improves health management of the aquaculture species and the environment in which they are raised.



## COMPANY CASE: REDUCING ANTIBIOTICS USE

### CERMAQ: DEVELOPING VACCINES FOR FARMED SALMON

Together with biotech company Benchmark Animal Health, Cermaq works to [develop a vaccine](#) against salmon diseases caused by the *Tenacibaculum* bacteria. A preventative vaccine for these diseases would provide huge benefit for a sustainable development of the aquaculture industry.

### CARGILL: REDUCING ANTIBIOTICS USE IN AQUAFEED

Cargill's aqua nutrition business is working to reduce the risk of AMR in its supply chains through a number of measures. Antibiotics are only added to Cargill's aqua nutrition feeds on receipt of a veterinary prescription, detailing the product, dose and quantity of feed required. Only antibiotics listed as not critically important for human health are used. Since 2015, the company has [reduced the total level of active ingredients](#) by 80 percent.

### NUTRECO: TOOLS TO VIETNAMESE FARMERS TO REDUCE ANTIBIOTICS USE

To address the use of antibiotics in the aquaculture industry in Vietnam, Skretting developed a project aimed at creating more awareness on the responsible use of antibiotics and on AMR. This included training on responsible use and how to farm shrimp without antibiotics, development of AMR videos together with ShrimpTech Vietnam, and a medicine calculator app to provide appropriate dosing recommendations.

## Challenge 5: Reducing plastic pollution

### SEABOS COMMITMENT (2016):

- Reduce the use of plastics in seafood operations, and encourage global efforts to reduce plastic pollution.

### SCIENTIFIC FOUNDATION:

- Background brief on [Ocean Plastics](#)
- Background brief on [Ocean Plastic Pollution](#)

### KEY IMPLEMENTATION DOCUMENTS:

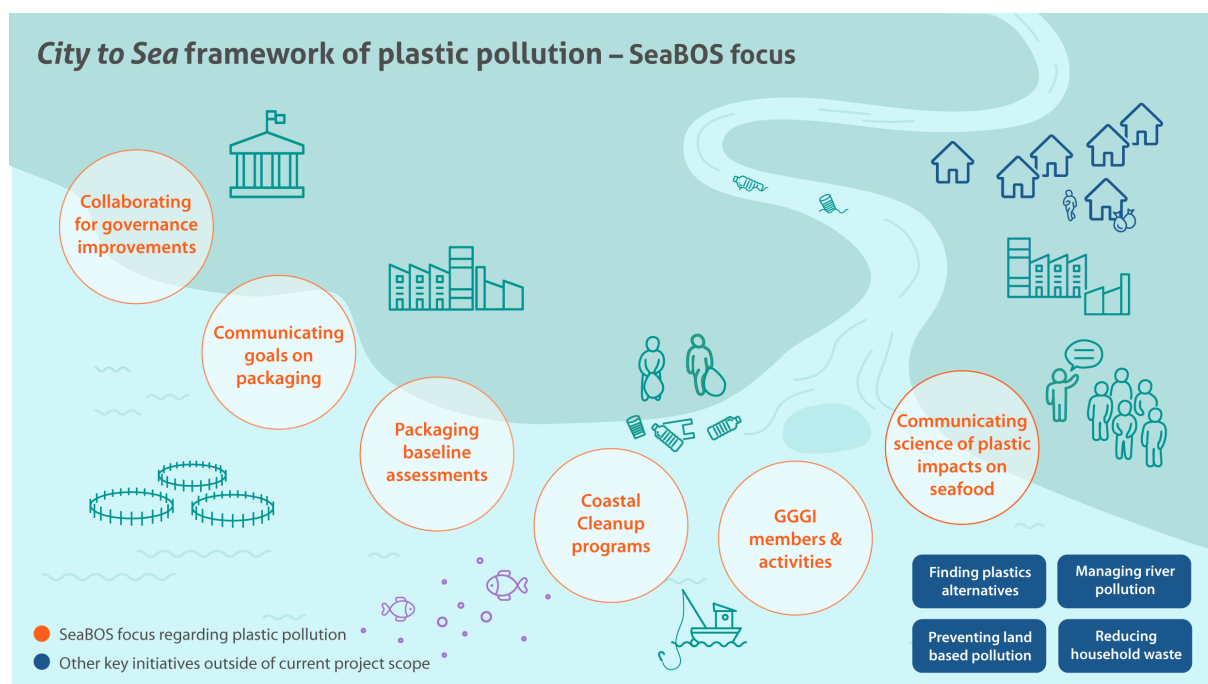
- [“City to Sea” Framework](#) of Plastic Pollution

**Problems:** Plastic pollution is a global problem that affects ocean health and seafood production. In 2015 alone, an estimated 322 million metric tons of plastic was produced – roughly equaling the combined weight of all 7.3 billion people on Earth. An estimated 79% of plastic has been deposited in landfills or entered the natural environment, including the ocean.

The majority of ocean plastic comes from land-based sources in densely populated regions, but the shipping and seafood industries are also primary contributors. Severe weather conditions and operational challenges can result in unintentional plastic pollution through

lost nets and fishing gear (“Ghost Gear”) which can entangle and kill marine life and seabirds. Due to physical stress from waves and other sources, large pieces of plastic are reduced into microplastics entering the water supply, and terrestrial and marine food webs, and impacting marine and aquaculture species.

**Science-based solutions:** Demand for plastic can be reduced by phasing out or banning the use of single-use plastics, as well as by developing novel product designs or using alternative materials which also safeguard the critical priority of food safety. Awareness-raising campaigns, establishment of waste management





infrastructure and cleanup programs can remove plastic from the environment. Most of these actions depend on collaboration from the public, industry and policymakers, as well as innovative solutions.

**SeaBOS actions:** To achieve meaningful action in SeaBOS, a 'City to Sea' framework has been created targeting six focus areas where the seafood business can have the greatest impact on reducing ocean plastic pollution, as illustrated in the figure above.

Companies are establishing their plastics footprints, and setting individual targets for

cutting plastics, including by reducing, re-using and re-cycling. Partnerships with the Global Ghost Gear Initiative (GGGI) and International Coastal Cleanup group have resulted in important educational and awareness raising programs in both aquaculture and wild-capture fisheries.

A first SeaBOS International Coastal Cleanup day took place in 2021 where member companies and their subsidiaries carried out cleanup activities in areas of operation. In addition, SeaBOS raises concerns with governments and civil society on the problem and will begin providing biennial reporting on plastics packaging footprints in 2022.





## COMPANY CASE: REDUCING PLASTIC POLLUTION

### CP FOODS: OCEAN TRASHFORMATION PROJECT

CP Foods (CPF) launched the "[Ocean Trashformation project](#)" in 2021 to reduce plastic waste in the ocean by collecting plastic waste from fishing activities and recycling them into valuable products. This is to [promote the recycling of plastics](#) and the use of less damaging products, including generating additional income for people in the community. The company has a target that [100% of plastic packaging](#) for food products will be recyclable, reusable or compostable by 2030 and is engaged in R&D for sustainable packaging design and management.

### NUTRECO AND MOWI PILOT: COMPOSTABLE FEED BAGS

Nutreco's feed company Skretting together with Mowi has finalized a pilot project for [compostable feed bags](#). The bag material is made from a degradable biopolymer which breaks down in as little as four months under ideal composting conditions. Skretting is now scaling up the project to review additional parameters to evaluate longevity in storage, temperature sensitivity and safety. Sustainable packaging is one of Mowi's strategic programs and Nutreco has set a [2025 target](#) of 100% recycled, reusable or compostable plastic.

### KYOKUYO: RIVER CLEAN-UP ACTIVITIES

Since 2017, Kyokuyo has been supporting the Japan Canoe Federation as an official partner with a view to engage in [environmental conservation activities](#) across the country. Sports teams as well as the spectators are invited to join in clean river activities along the competition course. As of 2021, a total of 1,585 people have participated.

## Challenge 6: Addressing climate change

### SEABOS COMMITMENT (2016):

- Reduce our own greenhouse gas emissions.

### SCIENTIFIC FOUNDATION:

- Background brief on [Climate Change](#)
- Background briefs on [Climate Change Impacts on Fisheries and Aquaculture](#) and [Corporate Climate Change Strategies](#)

### KEY IMPLEMENTATION DOCUMENTS:

- [Setting science-based targets in the seafood sector: Best practices to date](#)

**Problems:** The Intergovernmental Panel on Climate Change (IPCC) concluded in its sixth assessment report that greenhouse gas emissions will need to be cut in half by 2030 to limit global warming to 1.5°C. Both mitigation and adaptation measures will need to be implemented across sectors.

Fisheries and aquaculture will face increasing challenges as a result of the impacts of climate change on ocean ecosystems. The ocean is changing due to climate impacts causing rising sea levels, marine heatwaves, ocean acidification and deoxygenation. Evidence is growing that these changing conditions may contribute to disease outbreaks, loss of kelp and seagrass meadows, and toxic algal blooms.

The size and distribution of marine fish populations are also affected as temperatures rise, creating new challenges for their management and governance. Likewise, the increased intensity and frequency of storms increases risk to coastal infrastructure and generates safety risks for both aquaculture and fishing operations. Understanding and adapting to such changes to build climate resilience is critical for the seafood industry.

**Science-based solutions:** The seafood industry can demonstrate that it can be part of the solution by mapping and reducing emissions. At the same time, developing resilience is critical to managing climate related risks in seafood operations. Key solutions include collecting and assessing operational data to decarbonize seafood operations and supply chains. Enabling tools

include the use of financial instruments to support innovation and transformation, and advancing the understanding and practice of blue carbon ecosystem conservation and restoration.

**SeaBOS actions:** SeaBOS works to ensure that every member takes action to reduce greenhouse gas emissions in line with science-based targets. To date, all members have set science-based climate goals, of which six have committed to the Science Based Targets Initiative. Work is currently underway for all companies to implement key actions to reduce GHG emissions in their own operations and supply chains, and to report publicly on their scope 1, 2 and 3 emissions.

In March 2022, SeaBOS launched the [SBT Seafood Guide](#) with the UN Global Compact and WWF, to share experiences in setting and implementing climate targets in the seafood industry. In 2021, SeaBOS members contributed to the UN Framework Convention on Climate Change (UNFCCC)'s work to develop a [climate action pathway for 2050 for Oceans and Coastal Zones](#) which was launched at COP26.

A key objective of SeaBOS climate action work is also to spread awareness of the positive role that sustainable seafood and dietary shifts can play in addressing climate change while ensuring food security worldwide. An important task going forward will be to support industry action on the scientific findings of the [High Level Panel for a Sustainable Ocean Economy](#), emphasising the role of sustainable seafood and a healthy ocean as a solution to climate change.



## COMPANY CASES: ADDRESSING CLIMATE CHANGE

### MOWI: ELECTRIFICATION AND HYBRID GENERATORS TO REPLACE FOSSIL FUELS

In accordance with its [Leading the Blue Revolution plan](#), Mowi has established a climate target in accordance with the Science Based Targets Initiative (SBTi) framework. Nearly 70% of Mowi's farming sites in Norway are connected to land power. In 2021, Mowi also installed 8 hybrid generators leading to an estimated reduction of GHG emissions of 1500 tonnes of CO<sub>2</sub>e per year.

### KYOKUYO: GHG EMISSION REDUCTION IN REFRIGERATION

To reduce GHG emissions, Kyokuyo selected non-freon refrigeration for its Fukuoka cold storage facility. This choice will contribute to reducing freon emissions and about 350M/T of annual CO<sub>2</sub> emissions. The Kyokuyo Group will [continue to shift to refrigeration](#) alternatives with a lower environmental footprint.

### CARGILL: REDUCING GHG EMISSIONS THROUGH SUPPLIER COLLABORATION

Through its [SeaFurther Sustainability Initiative](#), Cargill's Aqua Nutrition business is aiming to help seafood farmers reduce their Scope 3 GHG emissions by at least 30 percent by 2030 against a 2017 baseline. Cargill focuses on three pillars for reducing the footprint of its feed: Sourcing of low carbon raw materials, optimization of nutrition relative to GHG footprint, and animal health and welfare to ensure optimal sustainability.

### CERMAQ, NUTRECO/SKRETTING, CARGILL AND MOWI WITH PARTNERS: DEFORESTATION FREE SOY FROM BRAZIL

Following collaboration within the global salmon industry, Brazilian soy suppliers CJ Selecta, Caramuru and Imcopa have agreed to implement a [100% deforestation and conversion-free](#) soybean value chain with 2020 as their cut-off date. This is the first time an animal protein industry has set such a voluntary and sector wide benchmark to ensure a deforestation free supply chain.

## Challenge 7: Triggering change beyond SeaBOS

### SEABOS COMMITMENTS:

- Engage in science-based efforts to improve fisheries and aquaculture management and productivity, through collaboration with industry, regulators and civil society.
- Collaborate and invest in the development and deployment of emerging approaches and technologies for sustainable fisheries and aquaculture.
- Support novel initiatives and innovations for ocean stewardship.

### SCIENTIFIC FOUNDATION:

- [Emergence of a global science–business initiative for ocean stewardship](#)
- Background brief on [SeaBOS Commitments and the High Level Panel for a Sustainable Ocean Economy](#)
- [Science-Based Overview Background Brief on Blue Carbon](#)
- [Scoping brief on Ocean Equity](#)
- [Scoping brief on Ocean Finance](#)
- Background Brief on [Innovations and Market Dynamics](#)

**Problems:** The population on the planet is growing, and so is the demand for protein. Seafood plays a central role in food and nutrition security for billions of people and supports livelihoods and economies worldwide. Seafood can play a vital role in the transformation of the global food system towards sustainability, but there are still significant challenges to be solved to grow the sector sustainably – including related to acknowledging the sectoral issues and addressing our internal challenges first, and to regulatory regimes and law enforcement, transparency and governance of the industry across geographies.

**Science-based solutions:** Collaboration, committed action and knowledge sharing are central tools to develop solutions and bridge science, policy and business. By taking a more active part in the sustainable development conversation and contributing pro-actively to Agenda 2030, SeaBOS and the broader seafood industry is in a good position to help develop solutions across the SDGs, including on key issues such as IUU fishing, endangered species, climate change and food security.

The scientific outcomes of the [High-Level Panel for a Sustainable Blue Economy](#) and the [Blue Foods Assessment](#) both provide a strong basis for articulating the benefits of sustainable seafood production and the potential for increasing production of nutritious food, while remaining within planetary boundaries.

### Engaging in key forums to scale impact

SeaBOS engages actively in collaborations with groups such as the Global Sustainable Seafood Initiative (GSSI) and UN Global Compact, and presents at workshops and events worldwide. Past arenas have included the UN Ocean Conference (2017, 2022), Seafood Expo (2020, 2022), COP26 (2021), the UN Food Systems Summit (2021), North Atlantic Seafood Forum (2018 - 2021), Tokyo Sustainable Seafood Summit (2017-2021), World Fisheries Congress (2021), the Boston Seafood Show (2019), Our Oceans (2019), and Aquavision (2018).



**SeaBOS actions:** The mission of SeaBOS is to lead a global transformation for sustainable seafood production and a healthy ocean. To contribute to transformational change, SeaBOS has engaged with international organizations such as the [UN Food and Agriculture Organization \(FAO\)](#), science initiatives such as the [Blue Food Assessment](#), and policy initiatives such as the [High-Level Panel for a Sustainable Blue Economy](#). SeaBOS companies are investing in research and innovation in digitalization and technology development, and

driving change by developing frameworks for sustainable, blue finance.

SeaBOS has developed skills, practices and networks to be able to deliver results on their commitments. Going forward, SeaBOS will increasingly share experiences and best practice, strengthen existing collaborations and working strategically with partners to accelerate progress and scale impact.

### SeaBOS policy statements

- [Our pledge for ocean stewardship – our plea to governments](#) (2017)
- [Op-ed with the Norwegian Prime minister urging countries to ratify the UN Port State Measures Agreement](#), Financial Times (2019)
- [SeaBOS calls on governments to support boat crews and ocean workers](#) (2020)
- [Joint Statement on Traceability and Port State Measures to address IUU fishing](#) (2021)
- [Global seafood coalition joint statement in support of Japanese government on actions to eliminate IUU fishing](#) (2021)
- [Climate Resilience and Equity Highlighted in COFI Declaration](#) (2021)
- [SeaBOS statement on harmful subsidies](#) (2022)



## COMPANY CASES: TRIGGERING CHANGE BEYOND SEABOS



### NISSUI, MARUHA NICHIRO AND KYOKUYO – COLLABORATION FOR VACCINE DEVELOPMENT

Nissui is actively working on the use of vaccines for disease prevention together with pharmaceutical company Kyoritsu Seiyaku, Government offices (Food Safety and Consumer Affairs Bureau; Ministry of Agriculture, Forestry and Fisheries) and the Japan Fisheries Research and Education Agency with the aim to reduce antibiotic use and develop vaccines that enable transfer away from HPCIA. In addition, Nissui has initiated collaboration on the use of antibiotics with SeaBOS members Maruha Nichiro and Kyokuyo.




### CERMAQ – IFARM TECHNOLOGY

The [iFarm digital cage system](#) represents a technological leap in aquaculture away from group-based operations to individualized aquaculture. The use of computer vision recognizes and records individualized data for each fish based on their specific dot pattern as they naturally pass by the sensor chamber. Key objectives of iFarm are to strengthen sustainability and animal welfare.

### THAI UNION – BLUE FINANCING

Launching a series of sustainability-linked bonds was a major step Thai Union implemented in 2021 to move from traditional financing toward [Blue Finance](#) — financing for projects that benefit the oceans, and the seafood industry as a whole.



### MARUHA NICHIRO – EEL GRASS MEADOW RESTORATION

The Maruha Nichiro Group has been actively working since 2014 to [restore eelgrass beds](#) in the Tokyo Bay area. Eel grass is a species of seaweed that plays a significant role in fighting climate change by absorbing carbon dioxide and methane. In addition, eel grass promotes healthy ecosystems by cleaning and filtering water, stabilizing the shoreline and providing food and habitat for coastal birds and fish.





# What's next? Towards transformational change

Since 2017, SeaBOS has been establishing the foundations of trust, a shared vision and a commitment to long term value creation. Establishing and sharing best practice to deliver on the SeaBOS commitments in own operations and supply chains has been the central focus.

This work will continue. But going forward, the direction of the organization will also be more externally oriented. The SeaBOS mission is to lead a global transformation towards sustainable seafood production and a healthy ocean. From 2022 onwards, SeaBOS is stepping up its actions for global change.

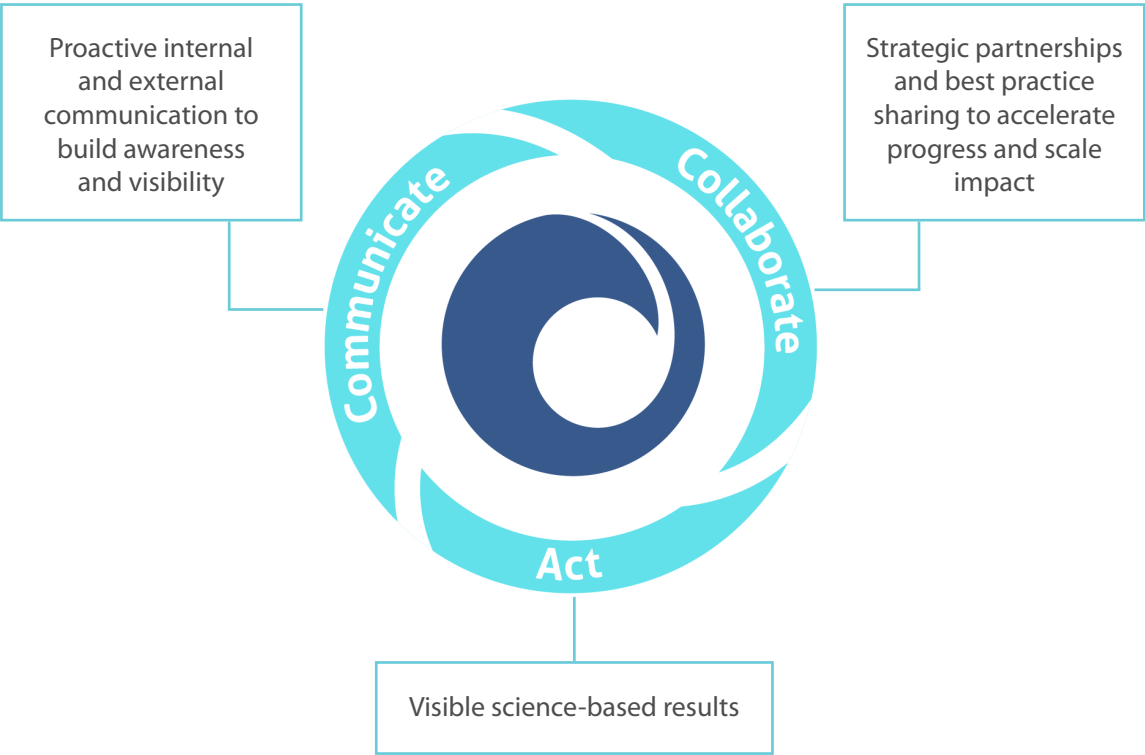
The SeaBOS approach is based on communication, collaboration and action. This implies communicating what SeaBOS does, sharing key learnings and proactively building awareness about the importance of ocean stewardship. It also involves delivering visible results on the commitments, including by strengthening monitoring and reporting. Finally, collaboration

is a key tool for transformation. A key priority going forward will be to conclude and implement the SeaBOS partnership model to accelerate progress and scale impact on SDG14 and SeaBOS commitments.

The SeaBOS science-business partnership model focuses on progressing ocean stewardship on different levels, while always remaining anchored in a strong scientific foundation, as the figure on page 31 shows. This involves deepening existing partnerships as well as engaging in new strategic collaborations within and outside of the seafood sector from 2022 onwards. Partnerships are guided by a set of Principles for engagements approved by the SeaBOS Fundraising Foundation.

The model is based on performance by each organization in accordance with set time-bound goals (page 39-41) and SeaBOS commitments (page 2). To achieve this, science-based action, sharing best practices and monitoring of performance are key elements.

## The SeaBOS approach to drive industry transformation

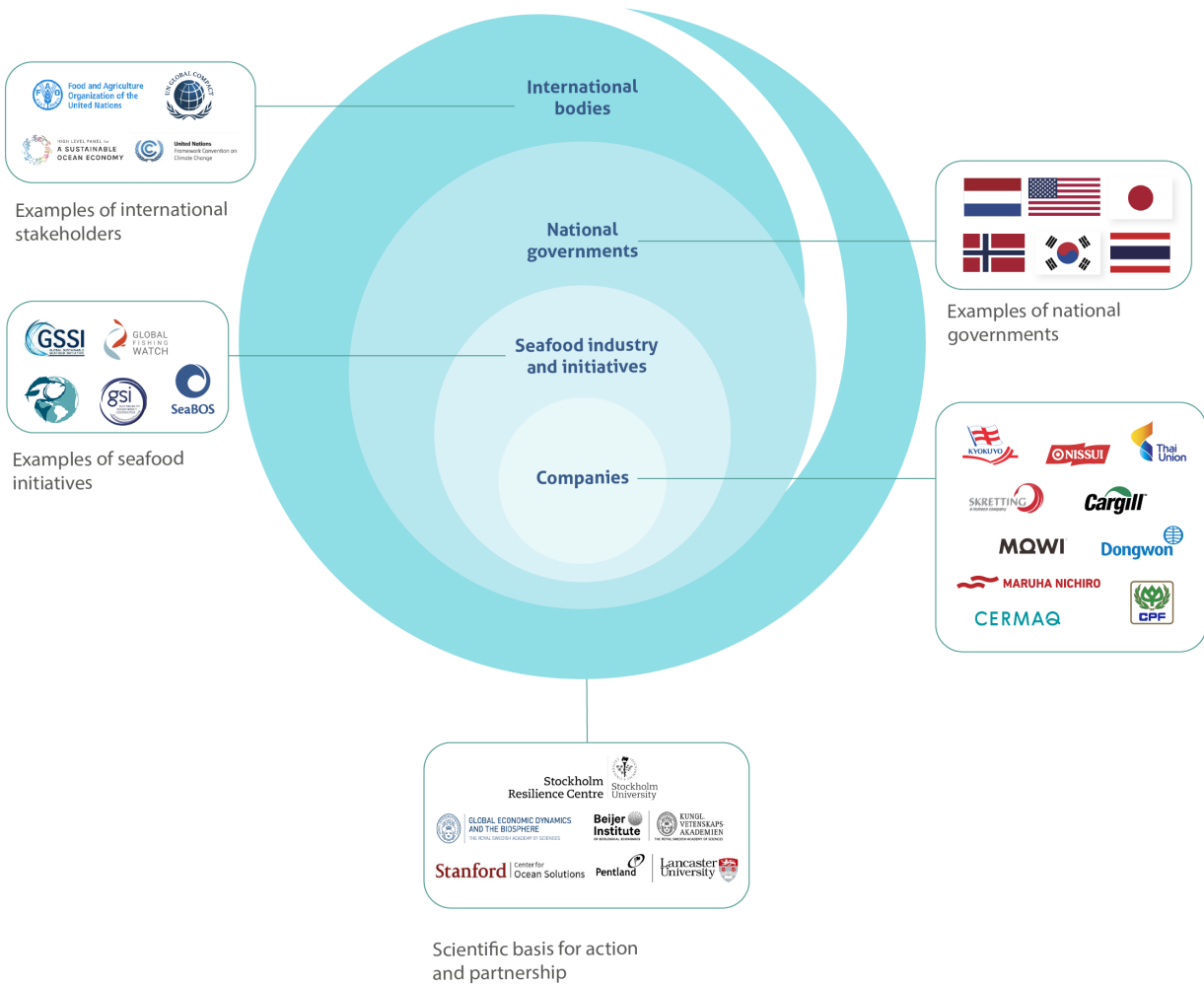


At the next level, SeaBOS engages with other seafood initiatives to impact seafood value chains. SeaBOS companies are engaging pre-competitively with different initiatives, where the goal is to advance joint priorities.

In 2022, SeaBOS refining its' strategy for for working with governments and key stakeholders. This strategy will guide the work on the SeaBOS engagement with relevant United Nations agencies such as the UN Global Compact, policy initiatives such as the High-Level Panel, international collaborations promoting sustainable seafood and healthy oceans, as well as to public consultations and supporting national policy development relevant for SeaBOS commitments.

The science team is firmly embedded across all levels of the partnership model, providing both a foundation as well as a connecting element across the levels. Examples include developing and leading scientific outputs of the High Level Panel for a Sustainable Ocean Economy (e.g. "[Towards Ocean Equity](#)" and "[The Ocean Genome](#)"), scientific inputs to the UN Global Compact Ocean Stewardship Coalition (e.g. the "[Ocean Stewardship 2030](#)" report), and joint research with groups such as Global Fishing Watch (e.g. "[Revealing global risks of labor abuse and illegal, unreported and unregulated fishing](#)").

### SeaBOS partnership model



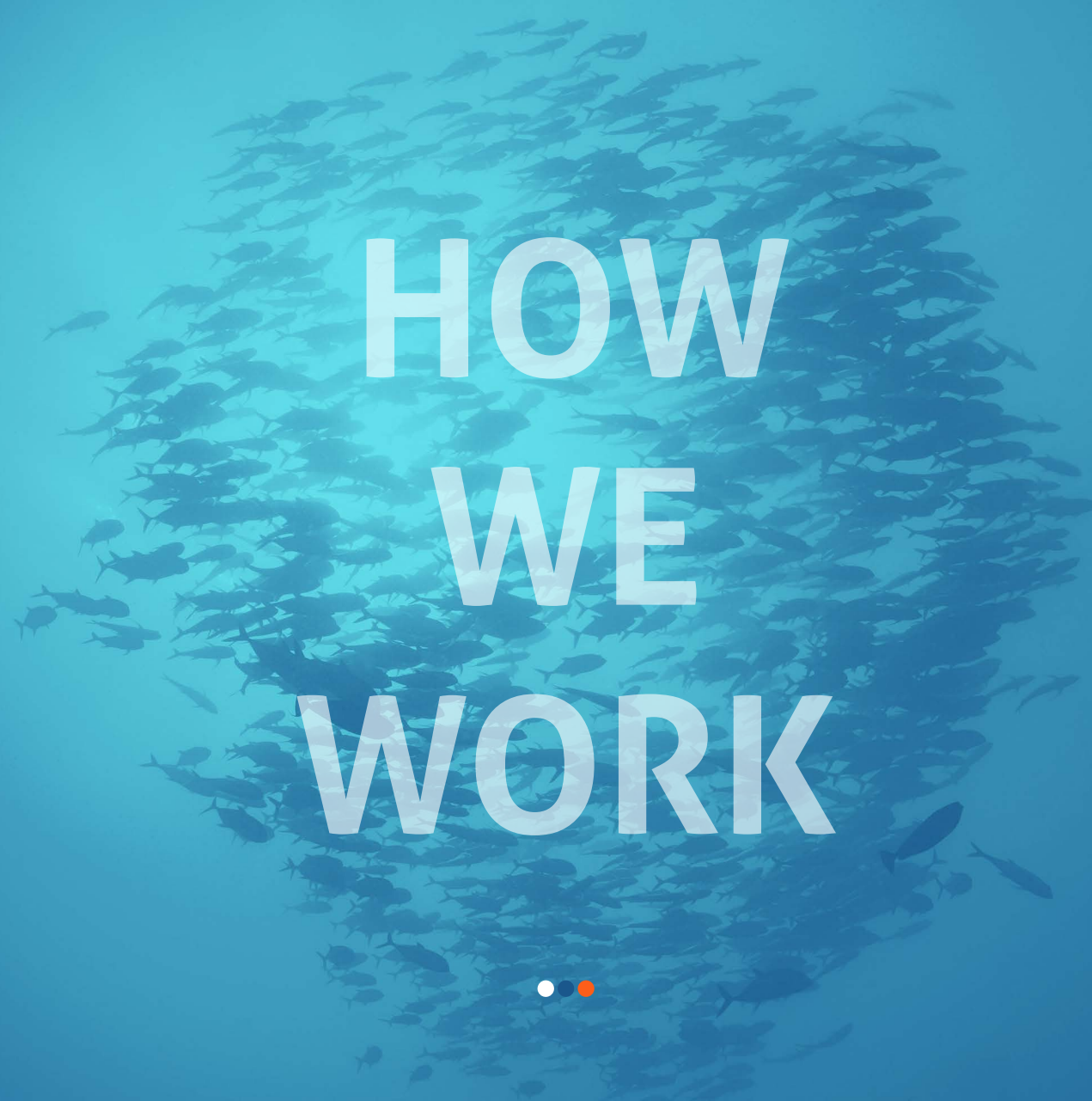


# SeaBOS progress on commitments as of June 2022

The mission of SeaBOS is to lead a global transformation towards sustainable seafood production and a healthy ocean. During the 2020 and 2021 keystone dialogues, time-bound goals were agreed by the CEOs of the SeaBOS companies

(see pages 39-41). Below is an overview of progress on SeaBOS commitments as of June 2022. This table illustrates joint progress only. Please consult each company’s web page and annual reports for details on each company’s results.

SeaBOS commitments (2016)	Companies that have	2017	2022
Improve transparency and traceability in our own operations, and work together to share information and best practice, building on existing industry partnerships and collaborations	Assessed materiality	7/10	10/10
	Reported with GRI	6/10	10/10
	Disclosed production volumes (with ODP)	4(2)/10	8(3)/10
	Completed internal traceability assessment	0/10	9/10
	Used GDST	0/10	4/10
Engage in concerted efforts to help reduce IUU fishing and seek to ensure that IUU products and endangered species are not present in our supply chains	Compliance policy for IUU	9/10	10/10
	Assessed IUU fishing risks	0/10	4/10
	Time-bound goal on IUU fishing	0/10	10/10
	Time-bound goal on endangered species	0/10	10/10
Engage in concerted efforts to eliminate any form of modern slavery including forced, bonded and child labour in our supply chains	Time-bound goal on modern slavery	0/10	10/10
Work towards reducing the use of antibiotics in aquaculture	Shared high-resolution data with scientists	0/10	6/10
	Road-map for reducing antibiotics	0/10	10/10
Reduce the use of plastics in seafood operations, and encourage global efforts to reduce plastic pollution	Plastic inventory	0/10	10/10
	Strategy for reducing plastics	0/10	10/10
	Time-bound goal on plastics	0/10	10/10
Reduce our own greenhouse gas emissions	Time-bound goal on climate (committed to SBTi)	4/10	10(6)/10
Engage in science-based efforts to improve fisheries and aquaculture management and productivity, through collaboration with industry, regulators and civil society	Eight policy statements have been signed. See Challenge 2 and Challenge 7 Four collaborations have been established, including with GDST, GFW, GGGI, HLP and UNGC		
Support novel initiatives and innovations for ocean stewardship			
Secure new growth in aquaculture, by deploying best practices in preventive health management, including improved regulatory regimes	Progress indicators not yet specified but see Challenge 4 and Challenge 7 Established Antibiotics Strategy and development of Code of Conduct underway		
Collaborate and invest in the development and deployment of emerging approaches and technologies for sustainable fisheries and aquaculture	Progress indicators not yet specified but see Challenge 4 and Challenge 7		



# HOW WE WORK



# The SeaBOS model

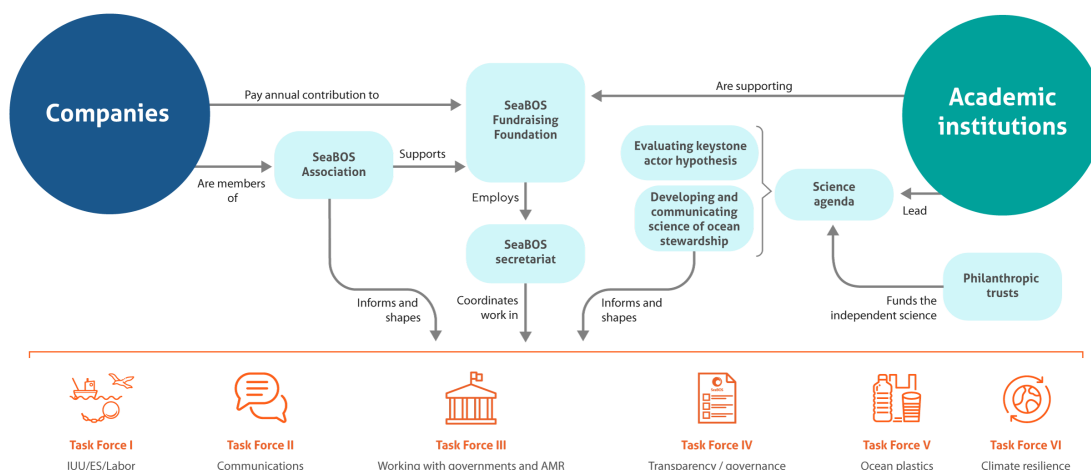
The SeaBOS model is based on a unique legal construct that is different from other industry-only associations or science-industry organizations. Developing and implementing a governance model that ensures independent science on the one hand, and science-based company action on the other, has been a core priority.

The SeaBOS governance model of science-industry collaboration is separated in two core bodies: the SeaBOS Association and the SeaBOS Fundraising Foundation. The companies are members of the SeaBOS Association (with each of the CEOs as members), while the SeaBOS Fundraising Foundation consists of five science and industry Directors of an independent board.

Ensuring independent research is a critical element of the initiative, to ensure academic and scientific integrity, and to enable lessons learned (both positive and negative) to be shared with

others. The science activities are funded and supported by agencies and external philanthropic trusts separate to industry funds. Industry contributions are made to the Fundraising Foundation, and disbursed towards administration of the Fund as well as external programs or projects as determined by the Board.

There is ongoing dialogue to guide and navigate the SeaBOS process in line with the mission of transformative change as well as exploring new areas for ocean stewardship. A small Secretariat, led by a managing director, connects the activities across the Task Forces, and between the companies and the science team. This structure is chosen to increase the involvement of all participants, which helps embed the collaborative elements, and share learning from science to industry, across industry members and between industry and science partners in the process.



## MEMBERS OF THE SEABOS ASSOCIATION

**Therese Log Bergjord** CEO Skretting, COO Nutreco (Chair)

**Thiraphong Chansiri** CEO Thai Union (Vice Chair)

**Myoung Woo Lee** President and CEO Dongwon Industries (New member selection committee)

**Martin Exel** (Managing Director)

## BOARD OF DIRECTORS OF THE SEABOS FUNDRAISING FOUNDATION

**Henrik Österblom**, Science Director, Stockholm Resilience Centre (Chair)

**Carl Folke**, Founder, Chair of the Board and Science Director, Stockholm Resilience Centre; Director of the Beijer Institute of Ecological Economics at the Royal Swedish Academy of Sciences

**Therese Log Bergjord**, CEO Skretting, COO Nutreco

**Thiraphong Chansiri**, CEO, Thai Union

**Naoko Ishii**, Director, Centre for Global Commons, Tokyo University

**Martin Exel** (Managing Director)



# The Task Forces of SeaBOS



## THE TASK FORCES

Each Task Force is led by a member company representative (or jointly by company representatives), responsible for driving the work and progress towards agreed time-bound goals. Both companies and science team members

contribute to the Task Force activities. The companies separately report on their individual progress annually towards meeting the goals of SeaBOS, and outline priorities for the coming year in an annual CEO meeting.

## TASK FORCE I – IUU fishing, modern slavery and endangered species

The Task Force is investigating new ways to ensure that fisheries resources are sourced and procured in a sustainable, socially responsible, and ethical manner, using the best available science. The Task Force is also investigating avenues to minimise the impacts of seafood production on endangered species.

### TASK FORCE LEAD



Jose Villalon,  
Corporate  
Sustainability  
Director, Nutreco

### CEO SPONSORS



Helene Ziv-Douki,  
President and  
Group Leader  
Cargill Aqua  
Nutrition



Thiraphong  
Chansiri, CEO,  
Thai Union

### LEAD COMPANIES



### SCIENTIFIC GUIDANCE

Jan Bebbington, Liz Selig, Colette Wabnitz,  
Shinnosuke Nakayama, Guillermo Ortuño  
Crespo, Henrik Österblom

## TASK FORCE II – Communications

Communication and awareness building is critical in SeaBOS' efforts to lead a global transformation towards sustainable seafood production and a healthy ocean. This Task Force is an essential part of SeaBOS' larger strategy to accelerate ocean transformation.

### TASK FORCE LEAD



Sophie Noonan  
Skretting, Global  
Communications  
Manager,  
Skretting (Until  
June 2022)



Sturle Hauge  
Simonsen,  
Head of  
Communication,  
Stockholm  
Resilience Centre

### CEO SPONSORS



Therese Log  
Bergjord, CEO  
Skretting

### LEAD COMPANIES



### SCIENTIFIC GUIDANCE

Karolin A. Johansson

## TASK FORCE III – Working with governments and AMR

This Task Force aims at developing solutions with governments on key threats to sustainable seafood and ocean health. The work includes improving the knowledge and understanding surrounding health, climate, and societal benefits of sustainable seafood production. Special focus is on achieving improved antibiotic stewardship in SeaBOS and the industry. The overall aim is to avoid the development and spread of antimicrobial resistance, in humans and animals.

### TASK FORCE LEAD



Dave Robb,  
Cargill Animal  
Health and  
Nutrition,  
Sustainability  
Program Lead



Wenche  
Grønbrekk,  
Global Head  
of Sustainable  
Development,  
Cermaq (Until  
January 2022)

### CEO SPONSORS



Geir Molvik,  
CEO Cermaq  
(Until March  
2022)



Dr. Sujint  
Thammasart,  
COO Aquaculture  
Business, Char-  
oen Pokphand  
Food Company  
Limited (CPF)

### LEAD COMPANIES



### SCIENTIFIC GUIDANCE

Max Troell, Patrik Henriksson

**TASK FORCE IV – Transparency and governance**

The focus of this Task Force is to ensure good governance of the SeaBOS organization, as well as monitoring and tracking of progress towards SeaBOS commitments. To achieve transformational change, a priority is to extend and expand actions and learnings beyond SeaBOS.

**TASK FORCE LEAD**



Martin Exel,  
Managing  
Director, SeaBOS

**LEAD COMPANIES**



**SCIENTIFIC GUIDANCE**

Jan Bebbington, Madlen Sobkowiak,  
Robert Blasiak, Beatrice Crona

**TASK FORCE V – Plastics**

SeaBOS members are committed to reduce ocean plastics pollution through the development and implementation of a strategy based on scientific knowledge, existing best practices, and the frontiers of innovation. The work of this Task Force includes members systematically working to minimize their plastic footprints and establish a comprehensive plastics strategy for further action.

**TASK FORCE LEAD**



Jae Hwa Lee,  
Sustainability Manager/  
External Affairs Officer,  
Dongwon Industries  
(until May 2022)

**LEAD COMPANIES**



**SCIENTIFIC GUIDANCE**

Robert Blasiak, Patricia Villarubia Gomez

**TASK FORCE VI – Climate resilience**

SeaBOS works within this task force addresses the complexity and diversity of climate change impacts on sustainable seafood production and seeks to pilot and develop corresponding solutions to build resilience. Climate change mitigation activities are another key focus of this Task Force, as well as demonstrating how sustainable seafood production and a healthy ocean can play a positive role for humanity in the mitigation of and adaptation to climate change impacts.

**TASK FORCE LEAD**



Catarina Martins,  
Chief Technology and  
Sustainability Officer,  
Mowi

**LEAD COMPANIES**



**SCIENTIFIC GUIDANCE**

Robert Blasiak, Jean-Baptiste Jouffray, Jan Bebbington, Patrik Henriksson



## "SCIENCE OF SEABOS" AND "SCIENCE FOR SEABOS"

The Keystone Dialogues project was initiated in 2016 to test the hypothesis that keystone actors can lead a global transformation for ocean stewardship. The project's interdisciplinary science team (see below for past and present members) brings together expertise across disciplines such as marine science, organizational science, and sustainability science to both guide the SeaBOS initiative and to monitor and assess its development and changes over time.

The SeaBOS initiative continues to inspire broad scientific output, which can be roughly split into two categories. The first of these, the "Science of SeaBOS" is a recognition of the unique position of scientists as co-equal partners within the initiative, co-developing solutions, strategies and priorities. The science team recognizes that it bears a special responsibility to not only continuously track and monitor the initiative over time, but to publish peer-reviewed papers that document this process. The aim here is twofold: to enable transparency and understanding of the initiative, but also to enable like-minded efforts in other sectors and led by other groups

to learn from the experience, to side-step and overcome challenges, and to more rapidly achieve lasting change.

The second broad category of scientific output associated with this initiative is the "Science for SeaBOS". While a construct has emerged over the years of task forces in which scientists and industry representatives continuously interact under the umbrella of focused activities, the annual working meetings and CEO dialogues are key milestones for action and exchange. Since 2016, the science team has developed over 40 scientific background briefs on topics as diverse as "Slavery in marine fisheries", "Ocean plastic pollution" and "Endangered species", and introduced these in the context of annual meetings. These briefs provide an opportunity for the science team to engage with external experts and synthesize the latest information of relevance for an ocean stewardship agenda. These briefs are made freely available on the SeaBOS website as a resource not only for the initiative, but all interested parties.

### PAST AND PRESENT MEMBERS OF THE SCIENCE TEAM

#### Stockholm Resilience Centre

Carl Folke, Frida Bengtsson, Abigayil Blandon, Robert Blasiak, Wijnand Boonstra, Florencia Cerutti, Alice Dauriach, Radhika Gupta, Patrik Henriksson, Karolin A. Johansson, Jean-Baptiste Jouffray, Andrew Merrie, Guillermo Ortuño Crespo, Johan Rockström, Lisen Schultz, Sturle Hauge Simonsen, Jessica Spijkers, Patricia Villarubia-Gómez, Henrik Österblom

#### Royal Swedish Academy of Sciences

Beatrice Crona, Sophia Käll, Peter Søgaard Jørgensen

#### Beijer Institute of Ecological Economics

Max Troell

#### Lancaster University (Pentland Centre for Sustainability in Business)

Jan Bebbington

#### Stanford Center for Ocean Solutions

Elizabeth Selig, Shinnosuke Nakayama, Colette Wabnitz

#### Other collaborators have included

Nuria Descalzo and Carlos Larrinaga (University of Burgos), Jane Lubchenco (Oregon State University), Ola Luthman (Södertörn University), Shona Russell and Bert Scholtens (University of St Andrews), Juliette Senn (Montpellier Business School), Madlen Sobkowiak (University of Birmingham), Nobuyuki Yagi (University of Tokyo)

## SeaBOS time-bound goals

### REDUCING IUU FISHING AND ELIMINATING MODERN SLAVERY

*Goals agreed to in October 2020*

1. Have no IUU fishing products or modern slavery in our own seafood operations by Oct 2021. (Note: see October 2021 [press release](#))
2. Put science-based measures in place that, when combined, substantially reduce the risk of IUU fishery products or modern slavery being in our supply chains. These measures and their associated time plan for implementation, will be publicly announced by SeaBOS by 31 December 2020. (Note: see resulting [Voluntary Procurement Actions](#) and [Toolkit](#))
3. In recognition that IUU fishing and modern slavery are endemic within the global seafood industry and require continuous vigilance by all actors, we will act swiftly and transparently on any evidence that these activities exist within our operations and/or supply chains. Taking these challenges in to account, we are convinced that the science-based measures that will be put in place, along with continued policy engagement, will support the elimination of both IUU fishing and modern slavery in our supply chains. We will report in October 2022 and October 2025 on progress towards meeting our goals.

### ADVANCING PROTECTION OF ENDANGERED SPECIES

*Goals agreed to in October 2020*

1. Recommend clear time-bound goals on minimising impacts on endangered species for approval by CEOs by Oct 2021. (Note: see resulting [Endangered Species strategy](#))

*Goals agreed in October 2021*

1. Put science-based and operational measures in place that, when combined, substantially reduce the risk of harm to endangered elasmobranch (sharks & rays) and seabird species from our own operations by October 2022; and substantially reduce the risk of harm to these species in operations which are part of our supply chains.
2. We will publish, by January 2022, a list of “best practice” measures for limiting harm to endangered elasmobranch and seabird species. (Note: see resulting [Best Practices](#) document)
3. By May 2022 we will develop a monitoring and reporting framework for interactions with endangered elasmobranch and seabird species for adoption in October 2022.
4. We will report in October 2023 and October 2025 on progress towards meeting Goal 1 and the rapid action intended to mitigate harm to endangered species whenever identified.
5. Drawing on lessons learned from focusing on elasmobranchs and seabirds in this initial phase of endangered species work, initiate process in October 2023 to expand the scope and focus of the SeaBOS endangered species work, with an aim to eliminate, in a step wise fashion, all negative impacts on endangered species.

## REDUCING ANTIBIOTICS USE

### *Goals agreed to in October 2020*

1. Establish a roadmap by October 2021 to identify ways to significantly reduce and/or phase out from aquaculture operations “High Priority Critically Important Antimicrobials for human health, and Critically Important Antimicrobials for human health” [as defined by WHO](#). As part of that process, SeaBOS will develop a recommended Code of Conduct for antibiotic use including preventive practices, recommended therapeutic treatments, and collaborative, pre-competitive Research & Development by October 2021; and contribute with higher resolution data enabling refinement of the conducted antibiotic survey of SeaBOS members; and establish collaborations and exchanges with relevant expert organisations towards identifying alternative approaches. (Note: see resulting [Antibiotics Stewardship Roadmap](#))

### *Goals agreed in October 2021*

1. Agree to the stepwise process of the road map proposed in this paper that will form a “SeaBOS Antibiotics Code of Conduct” by October 2022
2. Agree that the scope of the SeaBOS Antibiotics Code of Conduct includes members’ own operations and to extend that into their supply chains engaged in aquaculture and feed production
3. Agree to cease the use of HPCIA and CIA\* in all areas of aquaculture production where their use is not specifically enabled through national legislation\*\*
4. Agree to a virtual workshop in February 2022 to refine the actions required and the metrics to demonstrate progress
5. Agree to engage with annual SRC surveys on antibiotics stewardship in our own aquaculture operations, including from supply chains engaged in aquaculture production, to monitor and measure progress

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\* HPCIA and CIA = High Priority Critically Important Antimicrobial and Critically Important Antimicrobial for human health, as defined by the World Health Organisation (WHO).

\*\* Where region-specific national legislation does exist providing for the use of HPCIA or CIA, members will work collaboratively with a range of appropriate experts, such as pharmaceutical companies, veterinarians, intergovernmental agencies, or governmental departments, to determine or develop effective alternatives such as vaccines or lower category antimicrobials, to ensure the health and wellbeing of those seafood products and reduce the use of HPCIA and CIA. We will report back in October 2023 on progress towards this goal.

## REDUCING PLASTIC POLLUTION

### *Goals agreed in October 2020*

1. Provide at least biennial reporting on plastics packaging footprints, along with shared learning webinars during 2021 on innovative solutions to make plastics lighter; re-use, reduce, recycle, or make plastics compostable.

### *Goals agreed in October 2021*

1. To continue City to Sea plastics strategy including reporting on our plastics footprints and reduction actions by October 2022.



## **ADDRESSING CLIMATE CHANGE**

### *Goals agreed in October 2020*

1. Companies will establish science-based goals and reporting approaches for reduction of greenhouse gas emissions by October 2021. (Note: see October 2021 [press release](#))

### *Goals agreed in October 2021*

1. To all have time-bound GHG reduction targets aligned with the Paris Agreement announced by May 2022
2. To take actions on climate resilience including to publicly report our scope 3 emissions by October 2022; surveys and GHG emission transformation workshop late 2021; raising awareness of the benefits of dietary shifts as part of the solution to climate change in our communications strategy









The SeaBOS logo showcases three core elements of the way we are working to address the challenges. It represents: The wave of change; The integration of wild capture, aquaculture, and fish food production; and a reminder on the limits of the planet we all share.