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2022 Operational Plan Appendix I



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Appendix I - Project descriptions (only those approved in 2022)

Advancing Supply Chain Transparency for Chemicals in Products

1. Project duration: 24 months

2. Budget = C\$270,000

3. Short statement of the issue(s) under this topic, need/gap identified; the project objective(s) and activities to address the issue; and expected outcomes and benefits/beneficiaries:

A fundamental assumption in a circular economy is that materials re-introduced within value chains are safe for human health and the environment. However, a lack of composition data for, and industry awareness of, chemicals in products poses challenges to identifying risks. Increased chemical supply chain transparency (SCT) will help governments and industry to:

- identify problematic chemicals or classes of chemicals, and suitable alternatives;
- inform trade and procurement decisions for raw materials, product components, and final goods at various points within value chains, including product design and end of life management;
- inform recycling and waste management systems to enable the conversion and re-introduction of materials safely into subsequent economically viable materials, goods, or processes;
- improve the ability of industry to comply with chemical reporting and other regulations; and
- meet growing consumer demand for product ingredient information.

The goal of this project is to foster collaboration among North American countries to improve SCT and enhance governments' ability to identify and prevent products containing chemicals of concern, or chemical substitutes of concern (e.g., regrettable substitution), from entering or re-entering the economy. The information derived from this project will also help industry build resilient supply chains that respond to consumer demand for safer products and information on their chemical composition.

4. Select the strategic pillar(s) from the 2021-2025 Strategic Plan that the project addresses:

- Clean Air, Land and Water
- Preventing and Reducing Pollution in the Marine Environment
- Circular Economy and Sustainable Materials Management
- Shared Ecosystems and Species
- Resilient Economies and Communities
- Effective Enforcement of Environmental Laws

5. Describe how the project uses strategic cross-cutting approaches in its implementation: Innovative and Effective Solutions and/or Diverse and Inclusive Stakeholder Engagement and Public Participation (including gender and diversity effects and opportunities, and youth):

This project will explore existing supply chain transparency instruments, both globally and in North America, including policies, data sharing systems, and environmental standards, to identify innovative approaches and digital tools supporting the identification and disclosure of chemical contents in goods and materials. The project is intended to foster best practices for information exchanges and collaboration and to engage different industry sectors, environmental experts, and government and technical authorities.

6. Explain how the project can achieve more impact through trilateral cooperation:

Strong trade linkages exist in North America within which chemicals and products move easily. For this reason, the goal of the project is to foster collaboration on SCT among the three countries to create the conditions for exporters, within and outside the region, to disclose the chemical contents of the products they produce and trade. This project will be most feasible and impactful by sharing information within the region, including lists developed in each country of chemicals that are of common concern or regulated under national programs and/or to meet international commitments.

7. Describe how the project complements, or avoids duplication with, other national or international work:

The project will build on the shared priorities relative to chemicals (or classes of chemicals) of common concern. Synergies with current national efforts that could be leveraged to inform and complement this project include:

- US EPA's Safer Chemicals Ingredients List, designed to find chemical alternatives that meet the criteria of the Safer Choice Program;
- consultations on SCT and mandatory labeling, in support of Canada's Chemicals Management Plan and the Canadian Environmental Protection Act;
- an ECCC project that will explore building a multi-stakeholder Centre of Excellence (or network) on informed substitution and alternatives; and
- Mexico's Sectorial Program on Environment and Natural Resources (*Programa Sectorial de Medio Ambiente y Recursos Naturales—Promarnat*), 2020-2024, aimed at promoting change and innovation in the production and consumption of goods and services, and the National Inventory of Chemical Substances (*Inventario Nacional de Sustancias Químicas*).

8. Describe how the project engages traditional ecological knowledge (TEK) experts or Tribal/First Nations/Indigenous communities, if applicable:

Stakeholder engagement activities will consider participation of experts from all relevant sectors, including Tribal/First Nations/Indigenous organizations.

9. Describe how the project engages new audiences or partners, if applicable:

This project will involve the participation of industry and government stakeholders during consultations to share information on best practices, identify barriers to SCT and explore opportunities for SCT implementation in North America. Project results will create opportunities for the development of pilot projects as well as future potential partnerships amongst industry sectors, government authorities, subject matter experts, and NGOs.

10. Identify the designated partner agencies or organizations committed to implementing this project, as well as other organizations that could be involved, or benefit from it, including through outreach efforts, collaborations or partnerships (e.g.: federal agencies, other levels of government, academia, NGOs, the private sector, civil society, and youth):

Lead agencies or organizations	Country
Environment and Climate Change Canada	Canada
<i>Instituto Nacional de Ecología y Cambio Climático – INECC (Semarnat)</i>	Mexico
Environmental Protection Agency, Office of Chemical Safety and Pollution Prevention	United States

Other organizations/individuals (if applicable)*	Country
Health Canada	Canada
<i>Dirección General de Industria – Semarnat</i>	Mexico
<i>Asociación Nacional de la Industria Química – ANIQ (National Association of the Chemical Industry)</i>	Mexico
US State Department	United States

*This effort will include participation from other organizations including NGOs, the private sector, and other stakeholders. Their engagement is in the process of confirmation.

11. In the following table, describe: the project objective(s) and the activities and subtasks planned to achieve the objective(s); the corresponding outputs, expected results, and how they will be measured (performance measures); baselines (if known), and targets by end of the project; and the timeline and budget.

OBJECTIVE 1	Identify existing and emerging technologies and methods for product data sharing, potential barriers to industry, and possible approaches to overcome these barriers.	
Activity 1 Budget C\$85,000	Conduct a review and assessment of existing chemical supply chain transparency (SCT) current practices, tools, challenges, and regulations.	
Output(s)	<ul style="list-style-type: none"> - Interim internal assessment report - Identification of sector case study on best practices for SCT 	
Expected results, performance measures	The assessment provides the project context and framework of current SCT practices and challenges, based on an exhaustive review and supported by input from subject matter experts.	
Baseline (current status), if known	While some research on SCT has been conducted to support policy work, there is a general lack of knowledge of composition data for chemicals of concern that would ensure that materials are fit, in terms of safety for human health and the environment, to be re-introduced within value chains. Information is needed relating to existing North American and global experiences on the implementation of mandatory SCT requirements and the use of technology to support and guide policy to enhance and implement SCT practices.	
Target (by project end)	Relevant agencies will have a better understanding of SCT practices and gaps in the disclosure of chemical composition data that would help overcome obstacles to enhance such practices. This activity will also help identify industry sector(s) currently using SCT best practices.	
Subtask 1.1	Conduct comprehensive research on existing supply chain data-sharing systems, emergent technologies, best practices, relevant actors, environmental performance standards, ecolabels, procurement policies, and regulations. This assessment will also help identify recurring substitution challenges and barriers facing industry (i.e., regrettable substitution) and compare the level of SCT in different industries, with the aim of identifying one or more sectors for a case study.	When: late 2022
Subtask 1.2	Conduct an assessment review with relevant stakeholders for the selection of sector-specific case study/studies.	When: early 2023
Activity 2 Budget C\$85,000	Undertake a case study of one or more industry sector, selected on the basis of Activity 1, currently using best practices for supply chain transparency and knowledge of product composition.	
Output(s)	<ul style="list-style-type: none"> - One or more case studies of industry sector(s), using SCT best practices. 	

Expected results, performance measures	The case study/studies will complement the information compiled in the Activity 1 interim report.	
Baseline (current status), if known	N/A	
Target (by project end)	Relevant agencies and key industry stakeholders have experience-based information to identify gaps and opportunities relative to SCT implementation.	
Subtask 2.1	Conduct one or more case study of industry sector(s). The analysis will examine the means of SCT implementation, barriers addressed, and the impacts of SCT on the sector.	When: mid 2023
Subtask 2.2	Compilation of the case study report and integration into Activity 1 internal, interim report.	When: mid 2023
Activity 3 Budget C\$100,000	Based on results of activities 1 and 2, identify potential opportunities/pilot projects in each country to implement SCT practices and disseminate project results.	
Output(s)	Final report with recommendations for: potential approaches to enhance SCT in each country; opportunities for future work/pilot projects; and development of project outreach materials.	
Expected results, performance measures	The identification of future opportunities/potential SCT pilot projects will provide the steppingstones for future sector-based pilot projects, or country-specific capacity building plan(s) for SCT implementation.	
Baseline (current status), if known	Baseline information for this activity will be the information gathered in the interim report based on Activities 1 & 2.	
Target (by project end)	Relevant agencies, industry sectors, and other stakeholders have information and recommendations to support further work in this area.	
Subtask 3.1	Conduct workshop(s)/consultations (e.g., webinars, online workshop, surveys) with industry stakeholders and other experts aiming to disseminate project results and obtain additional recommendations for: a) potential pilot projects that could be implemented in a next phase/project,	When: early 2024

	b) approaches for developing capacity-building plan(s) for improving or implementing SCT, and c) the development of outreach materials for industry.	
Subtask 3.2	Compile recommendations and documentation in a final report (that includes the information from Activities 1 and 2) and outline possible next steps for each North American country.	When: mid 2024

12. Describe post-project expected impacts:

Expected impact (by when: month, year)	SMART performance measure(s)
By late 2024, the published document will provide relevant agencies and stakeholders in North America with a common understanding of the array of tools (emerging technologies), methods, and examples to guide future SCT implementation activities.	<ul style="list-style-type: none"> - Stakeholder perception surveys, before and after the implementation of the project, relative to: <ul style="list-style-type: none"> o Existing and emerging SCT technologies, practices, and regulations o Barriers for industry o Possible approaches to overcome these barriers
By late 2024, relevant agencies and stakeholders throughout North America will have a common regional understanding and network of contacts to support work on overcoming barriers to SCT implementation.	<ul style="list-style-type: none"> - Interest and engagement of survey participants relative to implementing pilot projects in the region, in a second phase or project.

Advancing Pollinator Conservation throughout North America

1. Project duration: from January 2022 to December 2023 (24 months)

2. Budget): C\$497,000

3. Short statement of the issue(s) under this topic, need/gap identified; the project objective(s) and activities to address the issue; and expected outcomes and benefits/beneficiaries:

Pollinators support the reproduction of 80% of wild vascular plants and 75% of crop species, and as such are crucial to food security, human well-being, and natural ecosystems. The number of pollinators has declined worldwide due to habitat loss and degradation, intensive agricultural management, pathogens, invasive species, climate change, and excessive use of agrochemicals, including pesticides. This decline requires urgent conservation actions and the engagement of stakeholders in different sectors.

Recognizing the urgency to act together for pollinator conservation, Canada, Mexico and the United States established foundations for regional collaboration on pollinator conservation through an initial project. Over two years, the project held targeted workshops and supported a literature review to inform the drafting of a first North American Pollinator Framework. Envisioned as a base on which to develop concrete actions in support of regional collaboration, the Framework includes a state of knowledge on pollinators in North America, recommendations for integrating human dimensions in conservation efforts, and priorities for collaborative action. The framework highlights the need for long-term, harmonized monitoring data to design and implement effective pollinator conservation strategies.

Building on this foundation and the lessons learned from trinational collaboration on monarch conservation, as well as ongoing national efforts on pollinator conservation (including Mexico's National Strategy on Pollinators and its implementation plan, and Canadian and US efforts to strengthen national and international coordination), the three countries can now identify a path forward for collaboration. By sharing best practices and strategies to organize and mobilize native bee inventory and monitoring, this project will lay the foundations for more robust and standardized data repositories to inform conservation actions across the continent. In addition, the project will develop tools and communication materials to raise awareness about native bees and their importance, and to drive action through citizen science and community involvement.

4. Select the strategic pillar(s) from the 2021-2025 Strategic Plan that the project addresses:

- Clean Air, Land and Water
- Preventing and Reducing Pollution in the Marine Environment
- Circular Economy and Sustainable Materials Management
- Shared Ecosystems and Species
- Resilient Economies and Communities
- Effective Enforcement of Environmental Laws

5. Describe how the project uses strategic cross-cutting approaches in its implementation: Innovative and Effective Solutions and/or Diverse and Inclusive Stakeholder Engagement and Public Participation (including gender and diversity effects and opportunities, and youth):

The project incorporates new and emerging tools to address the lack and disparity of data that creates challenges for pollinator conservation. These tools harness the data available to better target resources for increased conservation returns. The project also involves a community engagement and communications component that will identify opportunities for action and stewardship to educate and work with stakeholders who might not be aware of the important role native bees play in their environment, their livelihoods, and their wellbeing.

6. Explain how the project can achieve more impact through trinational cooperation:

Pollinators are of critical importance for food security and other ecosystem services, and each country in North America has initiatives in place to counter pollinator decline. Following on the example of the CEC's successful model of collaborative work on monarch conservation, the project will be a first step in implementing the recommendations of the North American Pollinator Conservation Framework, beginning with filling crucial knowledge and information gaps that are best addressed through collaborative action. Given the challenges associated with data collection and monitoring pollinators across the three countries, there is an opportunity to leverage existing national efforts to share knowledge and develop innovative tools to better target conservation actions. The project will also promote the exchange of lessons learned associated with the development of monitoring protocols and citizen science on native bee conservation.

7. Describe how the project complements or avoids duplication with other national or international work:

While there are various local and national efforts to support the conservation of pollinators in Canada, Mexico and the United States, trinational collaboration has been limited to date, with the exception of efforts exclusively focused on the monarch butterfly. The previous project initiated the process of building inclusive North American collaboration on pollinator conservation, and this project will build upon the strategies and knowledge gaps identified by stakeholders to support and link local and regional efforts.

8. Describe how the project engages traditional ecological knowledge (TEK) experts or Tribal/First Nations/Indigenous communities, if applicable:

Across North America, there is a diverse collection of traditional ecological knowledge on pollinators, particularly as to how they relate to food production. In Mexico, Mayan people have an extensive ancestral knowledge on native bee management that could be included in this project. Indigenous and local communities will be engaged as applicable under the project's scope and timeline.

9. Describe how the project engages new audiences or partners, if applicable:

The project will engage the general public through accessible and inclusive communications tools to raise awareness about the environmental, social, and economic benefits of native bees for communities, food production, and natural ecosystem functioning, and to spur action at the community level.

10. Identify the designated partner agencies or organizations committed to implementing this project, as well as other organizations that could be involved, or benefit from it, including through outreach efforts, collaborations or partnerships (e.g., federal agencies, other levels of government, academia, NGOs, the private sector, civil society, and youth):

Lead agencies or organizations	Country
Environment and Climate Change Canada, Agriculture and Agri-Food Canada, Parks Canada	Canada
Conabio, Semarnat, , Conanp, Sader	Mexico
USFWS, USGS, US Dept of Agriculture	United States
Other organizations/individuals	Country
NGOs	Canada, Mexico, United States
Provincial and State agencies	Canada, Mexico, United States
Local/ municipal/ regional authorities	Canada, Mexico, United States
Community partners	Canada, Mexico, United States
Academic experts	Canada, Mexico, United States

11. In the following table, describe: the project objective(s) and the activities and subtasks planned to achieve the objective(s); the corresponding outputs, expected results and how they will be measured (performance measures); baselines (if known) and targets by end of the project; and the timeline and budget:

OBJECTIVE 1	Share strategies to organize and mobilize native bee inventory and monitoring across North America	
Activity 1	Share best practices for native bee inventories and monitoring through an emerging North American community of practice	
Budget	C\$60,000	
Output(s)	<ul style="list-style-type: none"> - Virtual workshop on native bee inventories and monitoring with experts from North America - Workshop report, including case studies, protocols, and/or best practices for native bee monitoring 	
Expected results, performance measures	<ul style="list-style-type: none"> - Information to develop inventories and monitoring protocols is available to practitioners - Community of practice is established to share knowledge on native bee monitoring 	
Baseline (current status), if known	- Strategies and methodologies for native bee inventories and monitoring exist in some parts of North America	
Target (by project end)	- A workshop report including case studies, protocols, and/or best practices on native bee inventories and monitoring is published	
Subtask 1.1	Hold a virtual workshop to share case studies, available protocols, and insights on native bee inventories and monitoring with experts from across North America	mid 2022

Subtask 1.2	Develop a collection of case studies, available protocols, best practices, and the information drawn from the workshop to serve as a reference for practitioners	late 2022 – early 2023
Activity 2 Budget C\$247,000	Develop strategies and tools to organize and prioritize native bee inventories and monitoring in Canada, Mexico and the United States	
Output(s)	<ul style="list-style-type: none"> - Workshop on geospatial decision-making tools with experts from North America - Geospatial decision-making tools, such as the National Bee Distribution Tool, updated and customized to meet North American needs - Geospatial priorities for native bee inventories and monitoring mapped for each country 	
Expected results, performance measures	<ul style="list-style-type: none"> - Experts from Canada, Mexico and the United States are introduced to geospatial decision-making tools (such as the National Bee Distribution Tool) - Updated geospatial decision-making tools customized for North American users is available - Geospatial priorities for native bee inventories and monitoring have been discussed and can be identified 	
Baseline (current status), if known	<ul style="list-style-type: none"> - The National Bee Distribution Tool is in development, with use in the United States. Geospatial tools for pollinators are currently in development in Mexico. 	
Target (by project end)	<ul style="list-style-type: none"> - A geospatial decision-making tool has been customized for North American users - Priorities for native bee inventories and monitoring are identified for the three countries - At least two experts per county are able to use geospatial decision-making tools, such as the National Bee Distribution Tool 	
Subtask 2.1	Hold workshop to introduce North American experts to geospatial decision-making tools, such as the National Bee Distribution Tool, and to explore expanded functions that would be useful to organize inventories and monitoring efforts	late 2022
Subtask 2.2	Support further development of geospatial decision-making tools, such as the National Bee Distribution Tool, as needed	early 2023
Subtask 2.3	Hold workshop to share updates to geospatial decision-making tools, such as the National Bee Distribution Tool, and to pilot mapping and identifying geospatial priorities for each country	mid 2023
Subtask 2.4	Produce report on how geospatial decision-making tools, such as the National Bee Distribution Tool, was applied and leveraged during the workshops to identify geospatial priorities for inventories and monitoring	mid-late 2023
OBJECTIVE 2	Develop tools and communication materials to drive action	
Activity 3 Budget	Communicate the environmental, social, and economic benefits of native bees for communities, food production, and natural ecosystem functioning.	

C\$190,000		
Output(s)	<ul style="list-style-type: none"> - Communications tools and materials communicating the importance of native bees, as well as pollinators as a public good - Communications material piloted in 3 communities 	
Expected results, performance measures	Communications tools and materials are available in three languages to communicate the importance of native bees, as well as pollinators as a public good, and how North Americans can take action	
Baseline (current status), if known	<ul style="list-style-type: none"> - Communication materials on pollinators in general is available in the three countries - Public awareness of native bees and their co-benefits is limited 	
Target (by project end)	<ul style="list-style-type: none"> - Communications tools and materials communicating importance of native bees are available to stakeholders - Target audiences in pilot communities have an increased awareness of native bees and their importance 	
Subtask 3.1	Scoping workshop with Project Steering Committee and relevant experts to determine target audience (e.g., producers, urban gardeners, communities adjacent to national parks), key messages, and calls to action	early 2022
Subtask 3.2	Create communications materials based on available information to educate target audience on the existence and importance of native bees for nature and people and pollinators as a public good.	mid-late 2022
Subtask 3.3	Develop and implement communications/educational material in 3 pilot communities (1 per country)	early-mid 2023

12. Describe post-project expected impacts:

Expected impact (by when: month, year)	SMART performance measure(s)
By December 2025, a North American community of practice has knowledge and references to develop effective inventories and monitoring strategies	Evidence that practitioners in the three countries are implementing innovative or new inventories and monitoring strategies
By December 2025, practitioners have the knowledge to leverage a geospatial tool to prioritize and organize monitoring efforts	Evidence that the National Bee Distribution Tool is being used to prioritize and target monitoring resources
By December 2025, communities and partners are using CEC communication tools to help communicate the importance of native bees as a public good	Evidence based on surveys that pilot communities and target audiences are better informed on the public good provided by native bees

Air Quality Improvement for Environmental Justice

1. Project duration: 2022–2025

2. Budget C\$1,000,000 (Including operational and administrative costs)

3. Short statement of the issue(s) under this topic, need/gap identified; the project objective(s) and activities to address the issue; and expected outcomes and benefits/beneficiaries (max. 200 words):

Black carbon (BC) or “soot” (a component of fine particulate matter, PM) is an important air contaminant that not only affects public health but also our climate. Sources of these emissions include agricultural burning, domestic wood combustion, and fossil fuel combustion from transportation and industrial activities. Our countries’ systems for monitoring air pollution have limited coverage, with millions of people across North America living in communities that have no means of measuring local air quality conditions. This initiative aims to build partnerships that will respond to community-identified poor air quality conditions from exposures to high levels of BC and particulate matter (PM_{2.5}) emissions, as well as communities that potentially experience disproportionate environmental harm or risk, and/or have environmental justice concerns. A specific objective of the project is to work with local stakeholders to identify emission sources and monitor air quality, as well as to formulate potential emission mitigation strategies, assess their benefits, and implement them. The initiative will select and deploy low-cost air pollution sensors (in at least one community per country) to better document, understand, and mitigate PM_{2.5}/BC exposures in these communities, while increasing transparency and access to air quality information for local populations and decision makers.

4. Select the strategic pillar(s) from the 2021–2025 Strategic Plan that the project addresses:

- Clean Air, Land and Water
- Preventing and Reducing Pollution in the Marine Environment
- Circular Economy and Sustainable Materials Management
- Shared Ecosystems and Species
- Resilient Economies and Communities
- Effective Enforcement of Environmental Laws

5. Describe how the project uses strategic cross-cutting approaches in its implementation: Innovative and Effective Solutions and/or Diverse and Inclusive Stakeholder Engagement and Public Participation (including gender and diversity effects and opportunities, and youth) (max. 100 words).

The direct collaborative involvement of communities and consideration of local needs and knowledge are crucial to the success of this initiative. The project will seek to engage local government, community leaders, academic institutions, and relevant civil society

organizations to ensure the efficient implementation of activities. The project will establish collaborative partnerships to set up capacity-building plans and activities to address community-identified poor air quality conditions through PM_{2.5}/BC monitoring and mitigation initiatives. Access to information generated through this process contributes to the community's environmental education, can provide a better understanding of environmental and health conditions, and enable the public to play an active role in environmental governance. Furthermore, low-cost sensors offer a way to increase public access to and awareness of air pollution information, as well as to supplement regulatory monitoring networks.

6. Explain how the project can achieve more impact through trinational cooperation (max 100 words):

By working together to assess suitable low-cost technologies and strategies for BC monitoring in communities, the three countries can create a shared understanding of potential ways to improve the coverage of their air quality monitoring networks. While the challenges and priorities of addressing air quality issues and environmental justice concerns in each of the North American countries may differ, the approach to implementation through community engagement can set a road map for further improvement in acquiring priority health information and enhancing governance in communities across North America.

7. Describe how the project complements other national or international work, or avoids duplication with it (max 100 words):

As national systems for monitoring air pollution in the three North American countries have limited spatial coverage, the deployment of low-cost sensors provides a way to increase public access to and awareness of air pollution information near where they live and work, as well as to supplement the information collected by regulatory networks. Although some efforts exist for the deployment of low-cost PM_{2.5} sensors in areas that are not currently covered by regulatory monitoring, these are not necessarily intended to address community-identified air quality pollution problems.

8. Describe how the project engages traditional ecological knowledge (TEK) experts or Tribal/First Nations/Indigenous communities, if applicable (max 100 words):

The project will prioritize the engagement of communities experiencing environmental justice concerns, which may include Indigenous communities with poor air quality conditions. Information on local air quality relative to PM_{2.5}/BC will increase local decision-making capacity on mitigation strategies intended to improve air quality and population health.

9. Describe how the project engages new audiences or partners, if applicable (max 100 words):

This project will foster collaboration with interested communities in Canada, Mexico, and the United States disproportionately affected by PM_{2.5}/BC air pollution and that need ambient air quality monitoring and mitigation. The project will also seek to engage local government, community leaders, academic institutions, and relevant civil society organizations, to ensure support of and effective implementation of activities, and to ensure the efficient and accessible translation of knowledge in the post-project stage. Other potential collaborations include one or more manufacturer(s) and/or supplier(s) of low or mid-cost PM_{2.5}/BC sensors,

and the engagement of technical experts from other existing efforts for technology selection, monitoring design, and data management, analysis, and interpretation.

10. Identify the designated partner agencies or organizations committed to implementing this project, as well as other organizations that could be involved, or benefit from it, including through outreach efforts, collaborations, or partnerships (e.g.: federal agencies; other levels of government; academia; NGOs; the private sector; civil society; and youth):

Lead agencies or organizations	Country
Environment and Climate Change Canada (ECCC)	Canada
National Institute of Ecology and Climate Change (<i>Instituto Nacional de Ecología y Cambio Climático</i> —INECC, Semarnat)	Mexico
US Environmental Protection Agency, (USEPA), Office of Air Quality Planning and Standards	United States
Local government agencies, NGO, and local Community environmental and health organizations*	Canada, Mexico, United States

Other organizations/individuals (if applicable)*	Country
Health Canada	Canada
<i>Secretaría del Medio Ambiente y Recursos Naturales</i> (Semarnat)	Mexico
<i>Instituto Nacional de Salud Pública</i> (INSP)	Mexico
US Department of State (US DOS)	United States
Centers for Disease Control and Prevention (CDC)	United States
Other USEPA relevant Programs (e.g., Smoke Sense Program)	United States
Manufacturers or suppliers of a low-cost PM _{2.5} (or black carbon) sensors	Canada, Mexico, United States

*This effort will include participation from other relevant agencies, organizations, and stakeholders. Their engagement will be confirmed during the community selection process.

11. In the following table, describe: the project objective(s) and the activities and subtasks planned to achieve the objective(s); the corresponding outputs, expected results, and how they will be measured (performance measures); baselines (if known) and targets by end of the project; and the timeline and budget.

OBJECTIVE 1	Create collaborative partnerships with at least one community/region in each North American country directly affected by air pollution and with a need for air quality monitoring and mitigation efforts
Activity 1 Budget C\$560,000	Selection of and partnership with communities interested in air quality monitoring and pollution abatement (at least one per country) and identification of the PM _{2.5} /BC sources, monitoring strategy, and mitigation priorities
Output(s)	<ul style="list-style-type: none"> - Engagement of at least three North American communities (one per country). - Collaborative community action plan for PM_{2.5}/BC monitoring and mitigation. - Procurement and quality assurance of low/mid-cost sensors.
Expected results, performance measures	Engage relevant actors in selected communities, collaborative action plans set the roles and responsibilities and identify objectives, sources, technology, and priorities for monitoring PM _{2.5} /BC levels.
Baseline (current status), if known	<p>Several air quality monitoring campaigns using low-cost sensors have been conducted in Canada, Mexico, and the United States. Moreover, assessments of low-cost air quality sensors have been conducted by academic institutions, as well as by national and international environmental organizations. However, many of these do not address black carbon or do not use a community-based approach. This activity can leverage existing sensor assessment efforts that have been conducted by environmental agencies in the three countries, such as:</p> <ul style="list-style-type: none"> - EPA Air Sensor Toolbox (https://www.epa.gov/air-sensor-toolbox)

	<ul style="list-style-type: none"> - WMO Low-Cost Sensor Report (https://library.wmo.int/index.php?lvl=notice_display&id=21508#.YjtiC-rMKUk) - South Coast AQMD Air Sensor Performance Evaluation Center (http://www.aqmd.gov/aq-spec) - Assessment of DTS Black Carbon Sensor (see: https://www.mdpi.com/1424-8220/18/3/738) - Source apportionment of diesel-related contributions to black carbon emissions (https://pubs.acs.org/doi/10.1021/acs.est.1c03913) - Making the invisible visible: A guide for mapping hyperlocal air pollution to drive clean air action. Environmental Defense Fund (EDF, https://www.edf.org/sites/default/files/content/making-the-invisible-visible.pdf) - Tecnología Cívica (Redspira initiative in Baja California) (https://www.redspira.org/index.php/tecnologia) - Climatological and Air Quality Network (<i>Red Climatológica y de Calidad del Aire UACJ</i>; http://cathi.uacj.mx/handle/20.500.11961/10898) - Development and Evaluation of Correction Models for a Low-Cost Fine Particulate Matter Monitor; Environment and Climate Change Canada & University of Northern British Columbia. https://amt.copernicus.org/preprints/amt-2021-425/ 		
Target (by project end)	<ul style="list-style-type: none"> - Three or more communities (at least one per country) are engaged in air quality improvements and monitoring, and black carbon mitigation efforts. 		
Subtask 1.1	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 70%; padding: 5px;"> Identify and engage partner communities (at least one per country) interested in PM_{2.5}/BC monitoring and mitigation of emissions. Community(ies) selection should consider whether the community has a relevant air quality issue with concrete opportunities for improvement and could be used to develop a case study. Similar case studies and best practices will be taken into consideration during the implementation phase. Other considerations include the availability of suitable infrastructure and engagement of community partners (academia, local government, NGOs) to support continuity of the project, opportunities to support or supplement existing local air quality </td> <td style="width: 30%; padding: 5px; vertical-align: top;"> When: First year </td> </tr> </table>	Identify and engage partner communities (at least one per country) interested in PM _{2.5} /BC monitoring and mitigation of emissions. Community(ies) selection should consider whether the community has a relevant air quality issue with concrete opportunities for improvement and could be used to develop a case study. Similar case studies and best practices will be taken into consideration during the implementation phase. Other considerations include the availability of suitable infrastructure and engagement of community partners (academia, local government, NGOs) to support continuity of the project, opportunities to support or supplement existing local air quality	When: First year
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	initiatives, allowing measuring mitigation impacts during the duration of the project.	
Subtask 1.2	Convene community representatives and experts from the three countries to form a technical committee to: a) define monitoring objectives; b) diagnose PM _{2.5} /BC source priorities; c) draft a monitoring plan; and d) discuss possible mitigation strategies.	When: First year
Subtask 1.3	Review, identification, and selection of the most suitable PM _{2.5} /BC measurement technologies and sensor data reporting for each community.	When: First year
Subtask 1.4	Procure PM _{2.5} /BC sensors. Update collaborative action plan based on the selected sensor technology.	When: First year
OBJECTIVE 2	Implementation of monitoring activities, documentation, and mitigation of PM_{2.5} and BC levels	
Activity 2	Development and implementation of community-based air quality improvement project	
Budget	C\$360,000	
Output(s)	<ul style="list-style-type: none"> - Monitoring and capacity-building plan for implementation - Appropriate spatial and temporal data on PM_{2.5}/BC levels in each community - Results report and collaborative mitigation strategies 	
Expected results, performance measures	Information on PM _{2.5} /BC levels and its principal sources are available for the community and decision-makers. Partner communities have the capacity of implementing the monitoring and a set of mitigation strategies options.	
Baseline (current status), if known	NA	
Target (by project end)	At least three North American communities have air quality data and information on potential exposure levels to support PM _{2.5} /BC source mitigation strategies.	
Subtask 2.1	Develop monitoring and capacity-building plan, based on the selected technology, along with the technical committee and partners for each country.	When: First year

Subtask 2.2	Deploy PM _{2.5} /BC sensors, measure and gather data over a set period, based on identified source priorities in the three communities. Ensure proper sensor calibration with reference monitors, and setup data reporting.	When: Second year
Subtask 2.3	Define and implement pollution mitigation strategies.	When: Second/ Third year
Subtask 2.4	Evaluate and disseminate the impact of mitigation strategies in each community using air quality monitoring.	When: Third year
OBJECTIVE 3	Communicate shared experiences on communities' engagement for monitoring and mitigation of PM_{2.5} and BC sources	
Activity 3 Budget C\$80,000	Dissemination and publication of project results, guidance, and recommendations.	
Output(s)	- Publication of results and project guidance documents	
Expected results, performance measures	The published information shares the experiences of the three locations and provides knowledge sharing and transfers to other communities on the steps and implementation suggestions for monitoring and addressing poor air quality conditions.	
Baseline (current status), if known	The basis of the report will be the results and documentation of the implementation of the previous activities in the three communities.	
Target (by project end)	- The final assessment compilation describes results and methods for engaging communities in air quality monitoring and mitigation plans.	
Subtask 3.1	Compile community-based project results and lessons learned, and development and publish guidance and recommendations document.	When: Third year

12. Describe post-project expected impacts:

Expected impact (by when: month, year)	SMART performance measure(s)*
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By early 2025, at least three communities (one per country) previously lacking air quality monitoring coverage, will now have the capability to measure and access ambient air quality conditions and information on potential pollution sources.	<ul style="list-style-type: none"> • Participatory evaluation of community engagement level (index through survey) • Access to monitoring data (tracked via web platform or dissemination campaigns) • Coverage of monitoring (area of effective monitoring)
Spatial and temporal magnitude of PM _{2.5} /BC in each community is diagnosed and mitigation strategies are in place.	<ul style="list-style-type: none"> • Mitigation strategies implemented
Improvements in air quality conditions are achieved.	<ul style="list-style-type: none"> • Ambient monitoring information confirms improvement
Project results provide best practices for community-based air quality monitoring.	<ul style="list-style-type: none"> • Number of communities replicating similar campaigns. • Evaluation of usefulness of information (through survey)

**Additional performance measures will be determined in the monitoring plan of each community (subtask 2.1)*

Addressing Ghost Gear in North America

- 1. Project duration: from December 2022 to December 2025 (36 months)**
- 2. Budget: C\$ 1,000,000**
- 3. Short statement of the issue(s) under this topic, need/gap identified; the project objective(s) and activities to address the issue; and expected outcomes and benefits/beneficiaries (max. 200 words):**

Ghost gear has been referred to as “the most harmful form of marine debris”.¹ It is usually caused by severe weather, snags with natural features, other gear or objects, vessel interactions or, more rarely, intentional discard. Globally, at least 640,000 tonnes of abandoned, lost or discarded fishing gear (ALDFG) enter the ocean every year, harming marine life, reducing fish stocks, and impacting livelihoods.

The Global Ghost Gear Initiative (GGGI) is the largest cross-sectoral alliance dedicated to solving this issue, around three main goals: improving the health of marine ecosystems, safeguarding human health and livelihoods, and protecting marine life. The GGGI works to build evidence, define best practice, inform policy, and generate and replicate solutions, through a diverse group of participants stemming from the fishing industry, private sector, academia, government, IGOs and NGOs. Canada, Mexico, and the United States are all government members of the GGGI, recognizing it as a key partner to address ghost gear reduction, retrieval, and disposal.

Through this project, the three countries will work with the GGGI to determine priority activities. These could include ghost gear retrieval activities in high-priority geographical areas, such as known areas of high-risk gear loss identified through the completed foundational hotspot mapping, or areas of past or current fishing activity that species at risk are known to frequent or use as a migratory route. The project could also support better facilitation of retrieval activities in a transboundary area by every country according to its territorial constituency, through compliance with the relevant local regulations and under the supervision of federal authorities, such as the Mexico/US Gulf of Mexico or Tijuana Estuary border areas, hotspots for crab trap loss. To improve management of end-of-life gear, a key aspect of ensuring that gear is not disposed or left in the marine environment after its use, the project could support field research on volume and turnover of gear in select fisheries and help fill other knowledge gaps to advance recycling of end-of-life gear.

As it builds relationships and promotes dialogue between policy makers and fish harvesters in the region, identifying challenges and capacity limitations, and increasing awareness of ALDFG amongst the fishing industry, the project will reduce and retrieve

ALDFG, assist in developing protocols and strategies to address ALDFG best practices in fisheries, build fishing industry understanding and collaboration, identify knowledge and data gaps, and support responsible management of end-of-life fishing gear in coastal fishing communities.

4. Select the strategic pillar(s) from the 2021-2025 Strategic Plan that the project addresses:

- Clean Air, Land and Water
- Preventing and Reducing Pollution in the Marine Environment
- Circular Economy and Sustainable Materials Management
- Shared Ecosystems and Species
- Resilient Economies and Communities
- Effective Enforcement of Environmental Laws

5. Describe how the project uses strategic cross-cutting approaches in its implementation: Innovative and Effective Solutions and/or Diverse and Inclusive Stakeholder Engagement and Public Participation (including gender and diversity effects and opportunities, and youth) (max 100 words).

The project is designed to actively engage the diverse stakeholders that are affected by ghost gear and can be part of the solution for its reduction, addressing the cycle of ghost gear from different entry points for more effective solutions developed through inclusive participation.

6. Explain how the project can achieve more impact through tri-national cooperation (max 100 words):

The project will strengthen existing cooperation by providing opportunities for targeted exchanges of knowledge and expertise across the three countries that will allow the identification and development of best practices applicable across North America. It will also create a new space for collaborative and coordinated ghost gear reduction efforts in transboundary areas, protecting and leveraging national investments in those areas.

7. Describe how the project complements, or avoids duplication with, other national or international work (max 100 words):

The project will work with the GGGI as lead implementation partner, recognizing this as the most efficient and effective way to deliver coordinated, non duplicative action and leverage existing knowledge, expertise, and experience in delivering ghost gear reduction efforts.

8. Describe how the project engages traditional ecological knowledge (TEK) experts or Tribal/First Nations/Indigenous communities, if applicable (max 100 words):

The project will engage with Tribal/First Nations/Indigenous communities when they are part of the local communities selected as priorities for on-the-ground efforts but is not designed to specifically focus on these communities.

9. Describe how the project engages new audiences or partners, if applicable (max 100 words):

The project will engage GGGI as a lead partner and is built around promoting dialogue between policy makers and fish harvesters and promoting partnerships between the fishing industry, coastal communities, non-government organizations, waste management organizations and all levels of government to achieve ghost gear reduction.

10. Identify the designated partner agencies or organizations committed to implementing this project, as well as other organizations that could be involved, or benefit from it, including through outreach efforts, collaborations, or partnerships (e.g.: federal agencies; other levels of government; academia; NGOs; the private sector; civil society; and youth):

Lead agencies or organizations	Country
Global Ghost Gear Initiative (GGGI)	International (Canada, Mexico and the U.S. are members)
Fisheries and Oceans Canada	Canada
NOAA	United States
CIMARES https://digaohm.semar.gob.mx/CIMARES.html	Mexico

Other organizations/individuals (if applicable)	Country
NGOs such as Pesca ABC, Sistema Pronatura, Manta Caribbean Project, and others	Mexico
Fishing industry within chosen areas of retrieval and engagement	
Communities and organizations involved in ghost gear hotspot mapping and retrieval	

11. In the following table, describe: the project objective(s) and the activities and subtasks planned to achieve the objective(s); the corresponding outputs, expected results and how they will be measured (performance measures); baselines (if known), and targets by end of the project; and the timeline and budget.

Objective 1	Prevent ALDFG in local communities
Activity 1.1 Budget C\$ 91,400	Promote best practices for responsible fishing to prevent the loss of fishing gear.

Output(s)	<ul style="list-style-type: none"> • Workshops to engage communities and share information on the Best Practice Framework for the Management of Fishing Gear (C-BPF). • Coordination of letters of support, social media posts and/or participation in forums to support strategic national legislative initiatives that align with and directly promote ALDFG prevention, mitigation and/or remediation in Mexico and bring different groups together. Needs will be identified through legal analysis (sub-task 2.1). 	
Expected results, performance measures	<ul style="list-style-type: none"> • Engaged groups, regions or communities are active participants in the reduction of ADLFG in their community. 	
Baseline (current status), if known	<ul style="list-style-type: none"> • GGGI has engaged two regions (northwestern Mexico and Yucatan Peninsula) in ALDFG reduction (as of July 2022). 	
Target (by project end)	<ul style="list-style-type: none"> • 3 new groups, regions or communities in Mexico have been engaged in ALDFG reduction. 	
Sub-task 1.1.1	Support coordination of advocacy initiatives for prevention, mitigation and/or remediation of ghost gear via communication tactics that include but are not limited to: letters of support, social media posts and/or participation in forums to support strategic national legislative initiatives that align with and directly promote ALDFG prevention, mitigation and/or remediation in Mexico.	When: Year 1
Sub-task 1.1.2	Conduct theoretical-practical workshops to provide training on best practices for small scale fishing groups, cooperatives, and private sector vertically integrated companies in Mexico to facilitate changes in their supply chains down to fisher level.	When: Years 1, 2
Activity 1.2 Budget C\$ 72,310	Develop support material to implement ALDFG best practices.	
Output(s)	<ul style="list-style-type: none"> • Gear removal protocols for specific regions in Mexico. • Trilingual guidelines, best practices, lessons learned, and other support material (such as, but not limited to: requirements related to gear management over its lifecycle; costs and opportunities, protocols, and strategies to support implementation; predictive model identifying locations of fishing gear loss or accumulation in marine waters of Pacific and Atlantic Mexico; as well as institutional GGGI materials such as 2-pager, annual reports, ALDFG videos, etc.). 	
Expected results, performance measures	<ul style="list-style-type: none"> • Communities and stakeholders have material (including in Spanish) to guide them in the reduction of ALDFG. 	

Baseline (current status), if known	<ul style="list-style-type: none"> Some support materials on best practices for the management of fishing gear, predictive model of occurrence of ghost gear in Mexico, GGGI institutional promotional materials such as annual reports or two-pagers exist in English, while others exist in Spanish or both English and Spanish (e.g., Mexico's National Action Plan on ghost gear)
Target (by project end)	<ul style="list-style-type: none"> All GGGI-led materials that apply for the North American Net Collection Initiative (NANCI) project in the US, Mexico and Canada are bilingual or where relevant trilingual. Additional capacity-building materials are developed.
Sub-task 1.2.1	Create a protocol for ghost gear removal in Mexican waters per relevant region, based on other GGGI-led ghost gear removal protocols. When: Year 2
Sub-task 1.2.2	Translate to/from Spanish/English a series of essential materials to ensure understanding and comprehension of information for preventing, mitigating, and remediating ghost gear. Materials such as, but not limited to predictive model identifying locations of fishing gear loss or accumulation in marine waters of Pacific and Atlantic Mexico; as well as institutional GGGI materials such as 2-pager; annual reports; and videos of ALDFG, among others. When: Years 1, 2, 3
Activity 1.3 Budget C\$ 312,375	Pilot market-ready new technology to reduce ghost gear and its impacts.
Output(s)	<ul style="list-style-type: none"> Delivered technology devices to selected groups. Training for fishers and authorities to use technology. Data on efficacy of gear location technology and efficacy of harm-reduction fishing techniques.
Expected results, performance measures	<ul style="list-style-type: none"> Fishers and authorities using technology. Technology transfer and strengthened capacity to use new gear. Reduction in gear loss and ease of gear retrieval.
Baseline (current status), if known	<ul style="list-style-type: none"> Limited gear loss technologies are currently being used in Mexican fisheries. No gillnet marking technologies operational in Canadian fisheries.
Target (by project end)	<ul style="list-style-type: none"> Three different gear technologies trialed in pots or traps, gillnets, and FADs fisheries. Gear technologies trialed in two different MPAs in Mexico. Different gillnet marking technologies (number of technologies TBD) trialed in one pilot Canadian fishery.
Sub-task 1.3.1	Identify, acquire, and deliver technologies for pilot testing, and agree on pilot test approach, in consultation with potential partners, such as fishers, other fishers' groups and/or fishing authorities (INAPESCA) interested in testing technologies to secure fishing gear for reducing economic losses and protecting underwater wildlife. When: Year 2

Sub-task 1.3.2	Conduct training workshop and gear trials in Mexico with potential partners, such as fishers, fishers' groups and/or fishing authorities (INAPESCA), to strengthen capacity for implementing the C-BPF and new gear-tracking/marking technology (smart buoys [ResqUnit, Satlink, Blue Ocean Gear and CLS]).	When: Year 2
Sub-task 1.3.3	Conduct gear trials of new technology for the marking of gillnets in Canadian fisheries (technologies TBD).	When: Year 3
OBJECTIVE 2	Remove ALDFG in North American waters.	
Activity 2.1 Budget C\$56,760	Support gear retrieval efforts in priority areas.	
Output(s)	<ul style="list-style-type: none"> • Workshops on ghost gear removal and gear removal protocol. • Retrieval activities at selected sites in Mexican waters. • Updated ghost gear hotspot maps for Mexico. 	
Expected results, performance measures	<ul style="list-style-type: none"> • Reduction in the immediate threat posed by ghost gear in Mexican waters. • Retrieval efforts in transboundary areas are addressed collaboratively. 	
Baseline (current status), if known	<ul style="list-style-type: none"> • Hotspot mapping is available for Pacific and Atlantic Mexico (showing accumulation as of August 2022) but there is no data available for other North American waters. • Retrievals in transboundary areas are addressed only through national efforts. 	
Target (by project end)	<ul style="list-style-type: none"> • Training of a group of multi-sectoral stakeholders in Mexico on ghost gear removal. • At least two ghost gear removal exercises in Mexico. • Hotspot mapping updated for Mexico. 	
Sub-task 2.1.1	Identify two priority areas for retrieval efforts and convene multi stakeholders' workshops on ghost gear removal training based on the ghost gear removal protocols (See Sub-task 1.2.1). Site selection will be based on the hotspot mapping and predictive model of fishing gear loss or accumulation in marine waters of Pacific and Atlantic Mexico.	When: Years 2,3
Sub-task 2.1.2	Conduct retrieval efforts in the two priority Mexican sites mentioned in Sub-task 2.1.1.	When: Years 2, 3
Sub-task 2.1.3	Collect data for hotspot map and update the existing predictive model.	When: Year 3
OBJECTIVE 3	Build knowledge to inform and enhance end-of-life gear collection, disposal, and recycling in North America.	
Activity 3.1 Budget C\$345,395	Conduct cost-benefit analysis to understand end-of-life gear management opportunities in the United States, Canada, and Mexico.	

Output(s)	<ul style="list-style-type: none"> • New ports, communities and companies contributing gear to NANCI effort across North America. • One additional collection point for EOL fishing nets in a region other than northwestern Mexico; and set-up of additional collection “bins” in other locations in Mexico. • One new collaboration with a local Mexican recycling partner for materials other than nylon and PPE. • Analysis of EOL issues in select project geographies across North America and recommendations on better EOL management options, given local conditions, etc. 	
Expected results, performance measures	<ul style="list-style-type: none"> • Improved understanding of the issue of EOL gear and the challenges to more sustainable approaches in managing EOL gear across North America. • Improved ability to address end-of-life gear management and ghost gear. • Improved and expanded gear recycling at select sites. • Increased number of communities and companies participating in the NANCI program. • Identification of EOL gear recycling opportunities across the North American region. 	
Baseline (current status), if known	<ul style="list-style-type: none"> • The North American Net Collection Initiative (NANCI), focused on Mexico’s Baja California and the US state of California, has established one hub in Ensenada, Mexico, for collecting and pre-processing end-of-life nets from northwestern Mexico (as of June 2022). • GGGI works with Bureo, whose proprietary net processing facility (based in Oxnard, California) can currently only take multifilament material. Most of the small-scale fishing industry in Mexico uses monofilament mesh. 	
Target (by project end)	<ul style="list-style-type: none"> • Increased number of net collection points and/or pre-processing hubs. • Expanded GGGI collaboration with at least one new company who recycles monofilament. • Research study on EOL gear management across North America. 	
Sub-task 3.1.1	Conduct a study on opportunities to enhance gear disposal, especially gear recycling across North America (<i>select a few locations where data and information on gear type, turnover and quantity of EOL gear being generated by certain fisheries or ports would be collected</i>).	When: Year 2
Sub-task 3.1.2	In collaboration with Bureo, establish one additional collection point for EOL fishing nets from a region other than northwestern Mexico and set-up collection “bins” in other areas.	When: Year 3
Sub-task 3.1.3	Explore new partnerships with companies that recycle other fishing net materials to broaden our current spectrum of recycling partners.	When: Year 3
OBJECTIVE 4	Share knowledge from cooperative effort.	

Activity 4.1 Budget C\$121,760	Outreach to showcase project results.	
Output(s)	<ul style="list-style-type: none"> Events to inform partners and engage new audiences. 	
Expected results, performance measures	<ul style="list-style-type: none"> Increased communications and collaboration to address ALDFG in North America. 	
Baseline (current status), if known	<ul style="list-style-type: none"> The NANCI project has published two blogs and participated in 1 regional festival (as of June 2022). 	
Target (by project end)	<ul style="list-style-type: none"> NANCI project featured in at least three events (one per year). 	
Sub-task 4.1.1	Develop communications material for participation in conferences, festivals, or congress to position NANCI/CEC initiatives and support attendance at targeted events.	When: Year 2
Sub-task 4.1.2	Hold virtual event on project results and lessons learned.	When: Year 3

12. Describe post-project expected impacts:

Expected impact (by when)	SMART performance measure(s)
By 2025	Cross border retrieval efforts in select transboundary areas are addressed through collaborative actions.
By 2028	Hotspot mapping shows a net decrease in hotspot numbers and volume of gear at hotspots.
By 2030	Small fishing communities in the North American region have options for the collection and recycling/reuse of end of life fishing gear, contributing to promote a circular economy.

ⁱ <https://www.ghostgear.org/>