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Bear Head Energy Green Hydrogen and Ammonia Production, Storage and Loading Facility

Publication Date: April 12, 2023

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1	Kwilmu'kw Maw-Klusuaqn Negotiation Office (KMKNO)	March 29, 2023

Public

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1	Anonymous	February 22, 2022
2	Anonymous	February 24, 2022
3	Anonymous	March 10, 2023
4	Anonymous March 2	
5	Ecology Action Centre	March 23, 2023
6	Guysborough County Inshore Fishermen's Association	March 23, 2023



Environment and Climate Change

Date: February 21, 2023

To: Renata Mageste da Silva, Environmental Assessment Officer

From: Neil Morehouse, Manager, Protected Areas and Ecosystems

Subject: Bear Head Energy Green Hydrogen and Ammonia Project

Scope of review:

This review focuses on the following mandate: Protected Areas

Technical Comments:

No protected areas In vicinity of Project

Summary of Recommendations: (provide in non-technical language)

We have no comments on this project

IMPORTANT:

- Always provide a response back to the EA Branch, even if it is simply to confirm that there is "no comment."
- The comments will be published on the EA website on decision day (privacy review is NOT conducted on comments from government).

** EXTERNAL EMAIL / COURRIEL EXTERNE **

Exercise caution when opening attachments or clicking on links / Faites preuve de prudence si vous ouvrez une pièce jointe ou cliquez sur un lien

Hello Renata,

As per your email below regarding Bear Head Energy Green Hydrogen and Ammonia Project, please identify any project-related human health impacts to which you require advice and guidance from Health Canada.

HC's role in Impact/Environmental Assessment is founded in statutory obligations under the Canadian Impact Assessment Act, and its knowledge and expertise can be called upon by reviewing bodies (e.g., Impact Assessment Agency of Canada, review panels, Indigenous groups and/or other jurisdictions). In the absence of such a request from one of the above noted groups, HC is unable to carry out a comprehensive review of the project. **However, HC is able to accommodate specific requests for human health advice and guidance related to provincial environmental assessments within a reasonable timeframe.**

Health Canada currently possesses expertise in the following areas related to human health: air quality, recreational and drinking water quality, traditional foods (country foods), noise, and methodological expertise in conducting human health risk assessment.

To help with your review of human health impacts, I have attached a document of common human health considerations in project reviews and links to Health Canada's guidance documents.

Kind regards, Ellen

Ellen Chappell, MES (she | elle) Regulatory Operations and Enforcement Branch Health Canada / Government of Canada <u>ellen.chappell@hc-sc.gc.ca</u> /

Direction générale des opérations réglementaires et de l'application de la loi Santé Canada / Gouvernement du Canada <u>ellen.chappell@hc-sc.gc.ca</u> /



Human Health Considerations in Environmental Assessment

Health Canada (HC) provides the following generic considerations for evaluating human health impacts in environmental/impact assessment (EA/IA). Please note that this is not an exhaustive list of human health concerns that may result from projects, and that issues will vary based on project specifics. Please also note that HC does not approve or issue licenses, permits, or authorizations in relation to the IA. HC's role in Impact Assessment is founded in statutory obligations under the Canadian Impact Assessment Act, and its knowledge and expertise can be called upon by reviewing bodies (e.g., Impact Assessment Agency of Canada, review panels, Indigenous groups and/or other jurisdictions). In the absence of such a request from one of the above noted groups, HC is unable to carry out a comprehensive review of the project. However, HC is able to accommodate specific requests for human health advice and guidance related to provincial environmental assessments within a reasonable timeframe.

HC currently possesses expertise in the following areas related to human health: air quality, recreational and drinking water quality, traditional foods (country foods), noise, and methodological expertise in conducting human health risk assessment. Based on Health Canada's "*Guidance for Evaluating Human Health Impacts in Environmental Assessment*", please consider the following information on these topics to assist in your review.

	Consideration	Reference Document
Receptor Location(s)		
Please ensure the registration document clearly identifies the locations of all receptors that may be impacted by the proposed project, including any receptors located along the transportation route, if applicable.	• It is important to clearly describe the location and distance from the proposed site(s) to all potential human receptors (permanent, seasonal or temporary), taking into consideration the different types of land uses (e.g. residential, recreational, industrial, etc.), and identifying all vulnerable populations (e.g. in schools, hospitals, retirement or assisted living communities). Note that the types of residents and visitors in a particular area will depend on land use, and may include members of the general public and/or members of specific population subgroups (Indigenous peoples, campers, hunters, etc.)	Section 7.1.3 of <i>Health Canada. 2019.</i> <i>Guidance for Evaluating Human Health</i> <i>Impacts in Environmental Assessment:</i> <i>Human Health Risk Assessment.</i> <i>Healthy Environments and Consumer</i> <i>Safety Branch, Health Canada, Ottawa,</i> <i>Ontario.</i> <u>https://publications.gc.ca/site/eng/9.870</u> <u>475/publication.html</u>

	•	If there is the potential that project-related activities could affect human receptors, impacts to human health should be considered.	
Atmospheric Environment			
Project impacts to the atmospheric environment include changes to air quality and noise, and can occur in both the construction, operation and decommissioning phases of the project. Project impacts to air quality are commonly caused by emissions from equipment or vehicles as well as by dust. Noise impacts are commonly caused by equipment as well as by activities such as blasting.	•	If there are receptors that could be affected by project-related activities, impacts to the atmospheric environment should be considered. Changes to the atmospheric environment that may impact human health include: • impacts to air quality (dust or fumes including PM _{2.5} , NO _x , SO _x , PAHs) • increased noise from construction or operations If there are receptors who could be impacted by project-related noise, it may be necessary to inform receptors prior to loud activities, such as blasting. If there is the potential for impacts to human receptors from noise and/or air quality changes from the project, the proponent should consider establishing mitigation measures. If complaints are received additional mitigation measures may be required.	Health Canada. 2016. Guidance for Evaluating Human Health Impacts in Environmental Assessment: Noise. Healthy Environments and Consumer Safety Branch, Health Canada, Ottawa, Ontario. <u>http://publications.gc.ca/pub?id=9.8325</u> <u>14&sl=0</u> Health Canada. 2016. Guidance for Evaluating Human Health Impacts in Environmental Assessment: Air. Healthy Environments and Consumer Safety Branch, Health Canada, Ottawa, Ontario. <u>http://publications.gc.ca/pub?id=9.8023</u> <u>43&sl=0</u>
Recreational and Drinking Water	r Q	uality	
The proponent should consider whether any nearby waterbodies are used for recreational (i.e. swimming, boating, or fishing) of drinking water purposes, as well as whether there are any drinking	•	If there is the potential for impacts to drinking and/or recreational water quality from the project site, the proponent should consider establishing mitigation measures. If complaints are received additional mitigation measures may be required. The proponent should consider preparing a response plan in the	Health Canada. 2017. Guidance for Evaluating Human Health Impacts in Environmental Assessment: Water Quality. Healthy Environments and Consumer Safety Branch, Health Canada, Ottawa, Ontario.
water wells in the area potentially impacted by the project. Nearby drinking and/or recreational water quality may be impacted by accidents or malfunctions, such as a fuel spill; by dust and		event of an accident or malfunction with the potential to impact drinking and/or recreational water quality. Response plans should include a spill response kit, adequate spill response training, and a communication plan to notify all recreational and drinking water users in the impacted area as well as all relevant authorities.	http://publications.gc.ca/pub?id=9.8325 11&sl=0

increased sediment runoff; and by other chemical discharges to the environment. Additionally, wells in the area potentially impacted by the project may be impacted by activities such as blasting.	• In some cases, for projects that are likely to have an impact on drinking and/or recreational water quality, the proponent should consider conducting water monitoring prior to the start of the project (to establish a baseline). Monitoring would continue throughout the construction, operation and decommissioning phases of the project (as applicable) to monitor for any changes in water quality or quantity.	
Country Foods		
If there are plants or animals present in the area potentially impacted by the project that are consumed by humans, there may be potential for impacts to	• If there is the potential for impacts to country foods from the proposed project, the proponent should consider establishing mitigation measures. If complaints are received additional mitigation measures may be required.	Health Canada. 2017. Guidance for Evaluating Human Health Impacts in Environmental Assessment: Country Foods. Healthy Environments and Consumer Safety Branch, Health
country foods. The proponent should consider all country foods that are hunted, harvested or fished from the area potentially impacted by the project. Impacts to country foods may occur from the release of contaminants into soil or water (including from an accident or spill) or from deposition of air borne contaminants.	• The proponent should consider preparing a response plan in the event of an accident or malfunction with the potential to impact country foods. Response plans should include a spill response kit, adequate spill response training, and a communication plan to notify all potential consumers of country foods in the impacted area as well as all relevant authorities.	Canada, Ottawa, Ontario. <u>http://publications.gc.ca/pub?id=9.8555</u> <u>84&s1=0</u>

For more information on HC's guidelines for evaluating human health impacts in environmental assessments, please see:

Health Canada. 2017. Guidance for Evaluating Human Health Impacts in Environmental Assessment: Noise. Healthy Environments and Consumer Safety Branch, Health Canada, Ottawa, Ontario. <u>http://publications.gc.ca/pub?id=9.832514&sl=0</u>

Appendix B of this guidance document provides a checklist that may be beneficial in verifying that the main components of a noise environmental assessment are completed.

Health Canada. 2016. Guidance for Evaluating Human Health Impacts in Environmental Assessment: Air. Healthy Environments and Consumer Safety Branch, Health Canada, Ottawa, Ontario. <u>http://publications.gc.ca/pub?id=9.802343&sl=0</u>

Appendix A of this guidance document provides a checklist that may be beneficial in verifying that the main components of an air quality environmental assessment are completed.

Health Canada. 2017. Guidance for Evaluating Human Health Impacts in Environmental Assessment: Water Quality. Healthy Environments and Consumer Safety Branch, Health Canada, Ottawa, Ontario. <u>http://publications.gc.ca/pub?id=9.832511&sl=0</u>

Appendix A of this guidance document provides a checklist that may be beneficial in verifying that the main components of a water quality environmental assessment are completed.

Health Canada. 2017. Guidance for Evaluating Human Health Impacts in Environmental Assessment: Country Foods. Healthy Environments and Consumer Safety Branch, Health Canada, Ottawa, Ontario. <u>http://publications.gc.ca/pub?id=9.855584&sl=0</u>

Appendix A of this guidance document provides a checklist that may be beneficial in verifying that the main components of a country foods environmental assessment are completed.

Health Canada. 2019. Guidance for Evaluating Human Health Impacts in Environmental Assessment: Human Health Risk Assessment. Healthy Environments and Consumer Safety Branch, Health Canada, Ottawa, Ontario. <u>https://publications.gc.ca/site/eng/9.870475/publication.html</u>

Appendix B of this guidance document provides a checklist that may be beneficial in verifying that the main components of a human health risk assessment are completed.

Date:March 20, 2023To:Renata Mageste da Silva, Environmental Assessment OfficerFrom:Nova Scotia Office of L'nu Affairs – Consultation Division – Reviewed by Beata
Dera, Director of ConsultationSubject:Bear Head Energy Green Hydrogen and Ammonia Project

Scope of review:

The following review considers whether the information provided will assist the Province in assessing the potential of the proposed Project to adversely impact established and/or asserted Mi'kmaw Aboriginal and Treaty rights.

Technical Comments:

Summary of Technical Considerations: (provide in non-technical language)

Crown consultation with the Mi'kmaq of Nova Scotia is ongoing for this Project. The Mi'kmaq of Nova Scotia may provide additional information that informs the regulator in assessing the proposed Project's potential impacts to established and/or asserted Mi'kmaw Aboriginal and Treaty rights and appropriate accommodation and mitigation measures. Currently, OLA can provide the following comments and recommendations:

3.2 Mi'kmaq Engagement

This section states that the Proponent initiated engagement with the Mi'kmaq of Nova Scotia in 2021. Table 3.1 summarizes Mi'kmaq engagement efforts and includes communications with KMKNO, Potlotek First Nation, We'koqma'q First Nation and Eskasoni First Nation. Given the scope, scale and location of the proposed Project, OLA recommends that the Proponent initiates engagement with the remaining 10 Mi'kmaq communities and continues to provide Project information to all Mi'kmaq communities, including the KMKNO, throughout the duration of the Project.

6.5 Vegetation and Wetlands

The MEKS illustrates that the area of the proposed Project is known to have been used either historically and/or currently by the Mi'kmaq for traditional purposes such as gathering of significant plants. Although the Proponent does not anticipate further wetland alterations, if alterations cannot be avoided, OLA recommends that the Proponent engage with the Mi'kmaq of Nova Scotia by sharing draft mitigation and/or compensation plans.

Section 6.9 Fisheries, Aquaculture and Marine Harvesting

OLA understands that the Project area is used for Indigenous fishing activities, therefore Food-Social-Ceremonial (FSC) licenses and commercial licenses may be affected by the development of the proposed Project. OLA recommends that a Mi'kmaq Communication Plan be developed in consultation with the Mi'kmaq and that the Plan should consider aspects relating to fishing activities.

Section 6.10 Cultural and Heritage Resources

This section states that although no interactions are anticipated to occur during Project operations or decommissioning with cultural and heritage resources, the Proponent commits. to developing an Archaeological Contingency Plan. OLA recommends that the Proponent engages with the KMKNO-ARD Division in the development of the Archaeological Contingency Plan.

Section 8.0 Potential Impacts and Benefits to the Mi'kmaq of Nova Scotia

This section states that the proposed Project has the potential to remove areas historically and/or currently used by the Mi'kmaq for traditional purposes, such as hunting, fishing and gathering. As reported in the 2004 MEKS, Mi'kmaq land and resource use within the area includes marine harvesting, deer hunting and trapping, firewood harvesting, camping and a burial site.

OLA encourages the regulator to carefully consider the information contained in the MEKS and factor relevant information into the decision-making process. For example, information regarding current rights activities within the project area and potential impacts to those activities that may occur from this project. OLA recommends that the proponent continues to engage in discussions with the Mi'kmaq of Nova Scotia to address mitigation measures for potential impacts on traditional and current use activities within the Project area.



PO Box 2223 Halifax, Nova Scotia B3J 3C4

Fisheries and Aquaculture

Date:	March 23, 2023
To:	Renata Mageste da Silva, Environmental Assessment Officer, Nova Scotia Environment and Climate Change
From:	Lesley O'Brien-Latham, Executive Director, Policy and Corporate Services Nova Scotia Department of Fisheries and Aquaculture
Subject:	Bear Head Energy Green Hydrogen and Ammonia Project, Cape Breton Island, Nova Scotia – Environmental Assessment

Thank you for the opportunity to review the Bear Head Energy Green Hydrogen and Ammonia Project documents.

Based on the information you provided, the Department of Fisheries and Aquaculture has the following comments:

- The proposed Green Hydrogen and Ammonia Production, Storage and Loading Facility is a land-based project. Adherence to established policies and guidelines should result in a very little risk to marine activities and interests within Nova Scotia Department of Fisheries and Aquaculture's mandate.
- This project should not have any negative impact on sportfishing, however, it is recommended that electrofishing surveys of Streams A (both above and below the settling pond) and B (below the culvert) should be undertaken to identify what species are present to assist with understanding the impacts of any hypothetical incidents on site.
- Within a 25km radius of the proposed operation, there are 2 marine finfish sites, 11 marine shellfish sites and 6 proposed marine shellfish sites.

From: Dolan, Jeff <Jeff.Dolan@novascotia.ca>
Sent: Wednesday, March 22, 2023 1:52 PM
To: Mageste da Silva, Renata <Renata.MagestedaSilva@novascotia.ca>
Subject: RE: REMINDER: Bear Head Energy Green Hydrogen and Ammonia Project – Environmental Assessment – Comments due March 23_2023

Hi Renata,

Nothing further for Fuel Safety.

Thank you,

Jeff

Jeff Dolan (902)266-9585 | jeff.dolan@novascotia.ca Date: March 22, 2023

- To: Renata Mageste da Silva, Environmental Assessment Officer
- From: Matthew Baker, Biologist, Fish and Fish Habitat Protection Program **Sign-off:** Chris Burbidge, A/Section Head, Marine Developments
- Subject: Bear Head Energy Green Hydrogen and Ammonia Project Point Tupper, Richmond County, Nova Scotia

Scope of review:

This review focuses on the following mandates:

- the fish and fish habitat protection provisions of the *Fisheries Act*;
- the permitting prohibitions of the *Species at Risk Act* for listed aquatic species at risk; and
- the introduction of aquatic invasive species, which is prohibited under section 10 of the *Aquatic Invasive Species Regulations*.

Technical Comments:

- The EA Registration Document provides adequate information to identify the potential environmental effects that may result in:
 - the death of fish;
 - the harmful alteration, disruption or destruction of fish habitat;
 - prohibited effects to listed aquatic species at risk; and
 - the introduction of aquatic invasive species.
- In 2016, Bear Head Energy Inc. was authorized under the *Fisheries Act* to carry on works, undertakings, and activities associated with a Liquefied Natural Gas export project that will result in serious harm to fish. The authorized impacts include the destruction of 6500 m² of marine fish habitat, the permanent alteration of 1800 m² of eelgrass habitat, and the incidental death of fish as result of the construction of a marine terminal and offloading facility. The period during which the authorized works, undertakings, and activities can be carried on expires on December 31, 2031. It is our understanding that no changes to the scope or footprint of the authorized works, undertakings, and activities are being proposed. Should the proponent propose changes to the project, which affect the authorized works, undertakings, and activities, or any new infrastructure in the marine environment, they should contact DFO, and further review may be required.
- Avoidance and mitigation measures can be implemented to avoid causing prohibited effects to fish and fish habitat associated with other components of the proposed project. The proponent should refer to DFO's Projects Near Water website for additional information about the Department's standards and codes of practice, and measures to protect fish and fish habitat. The website is available at the following link: <u>https://www.dfo-mpo.gc.ca/pnw-ppe/index-eng.html</u>.
- The proponent should implement these measures to avoid and mitigate impacts to fish and fish habitat. Project works, undertakings, and activities associated with the

proposed project may require a regulatory review by DFO if impacts to fish and fish habitat cannot be completely avoided or mitigated through the implementation of standard measures and best practices.

- Changes to the local catchment area, re-direction of overland flow, and alterations to wetlands and/or watercourses can impact ecological flow requirements for fish and fish habitat, and may result in the harmful alteration, disruption or destruction of fish habitat or death of fish. See DFO's Pathways of Effects for more information: https://www.dfo-mpo.gc.ca/pnw-ppe/pathways-sequences/frequency-frequence-eng.html. To avoid and mitigate impacts to fish and fish habitat (e.g., Stream A or Stream B), the proponent should avoid affecting or altering surface water flows and, quantity.
- The proponent should ensure proper erosion and sediment control by avoiding introducing sediment in aquatic habitats. An Erosion and Sediment Control Plan should be developed and implemented, and standard mitigation measures should be implemented.
- Any wastewater, stormwater, or effluent that may be discharged (e.g., via a marine outfall) from the site into the aquatic environments must meet all applicable guidelines. The proponent should refer to the Canadian Council of Ministers of the Environment guidelines for water quality and the protection of aquatic life.
- The following advice should be implemented to avoid and mitigate potential impacts to marine mammals and aquatic species at risk from vessel movements and transits:
 - Vessel movements and transits should adhere to Section A2 Marine Mammal Guidelines and Marine Protected Areas in the Canadian Coast Guard's 2021 Annual Notice to Mariners available here: <u>https://www.notmar.gc.ca/annual-annuel-en.php</u>.
 - Maintain a watch for marine mammals, sea turtles, and aquatic species at risk during vessel movements and transits.
 - Report any collisions with marine mammals, or sightings of entangled, injured or dead marine mammals as soon as possible to the Marine Animal Response Society at 1-866-567-6277 or mars@marineanimals.ca, and to DFO's Fish and Fish Habitat Protection Program at 902-426-3909 or <u>ReferralsMaritimes@dfo-mpo.gc.ca</u>.
 - Collect as much information as possible on any entangled, injured or dead marine mammals or aquatic species at risk observed during the exercise (e.g., date/time, GPS location, photos, species, number of individuals, condition, etc.).
 - Report live, free-swimming whale sightings to DFO at 1-844-800-8568 or XMARWhaleSightings@dfo-mpo.gc.ca

Aquatic Invasive Species (AIS) are fish, invertebrate or plant species that have been introduced into an aquatic environment outside of their natural range and can result in harm to indigenous species and subject to the AIS Regulations. It is important to ensure that you are taking necessary measures to prevent the spread of AIS, including:

- being aware of the different types of AIS. An AIS identification booklet can be found at this link: <u>https://waves-vagues.dfo-mpo.gc.ca/Library/40961242.pdf</u>;
- removing any aquatic plants and animals before moving vehicles or equipment from one water source to another;
- ensuring all machinery arrives on site in a clean condition; and
- checking to see if any materials being used in construction come from a contaminated area where an aquatic invasion already exists.

Additional information on AIS can be found at this following link: <u>http://www.dfo-mpo.gc.ca/species-especes/ais-eae/about-sur/index-eng.html</u>.

Summary of Technical Considerations:

DFO understands that the proponent will be piping freshwater from the Landrie Lake Water Utility to the project site. It is our understanding that the Water Utility has an existing water withdrawal approval, which will need to be renewed in the coming years, and there may be plans to upgrade the water system and/or expand the watershed. Upon application for renewal, DFO will review the proposed withdrawal of water from Landrie Lake and provide advice on avoiding and mitigating impacts to fish and fish habitat in Landrie Lake and/or contiguous watercourses. Information on the potential effects to the littoral zone in Landrie Lake and ecological flow requirements at the outflow of Landrie Lake will likely be required. Based on the water requirements of the proposed project and the Water Utility's other suppliers, the total withdrawal of water from Landrie Lake may result in cumulative effects on fish and fish habitat if water is withdrawn at the approved rate. If the Water Utility's operation were to result in prohibited effects to fish and fish habitat, it may require an authorization under the *Fisheries Act*.

Should the installation of the pipeline to transport raw freshwater from the Lake Landrie Water Utility to the proposed project site require any watercourse or wetland alteration approvals, DFO will review the works, undertakings, and activities through the existing referral process.

Given the nature of the proposed project, the extent of fish and fish habitat within the proposed project site, the existing authorization under the *Fisheries Act* for the marine terminal and offloading facility, and the description of the potential environmental effects, the proponent may be able to implement measures to avoid and mitigate any additional prohibited effects to fish and fish habitat.

Should the proponent plan to construct any infrastructure that may result in the harmful alteration, disruption or destruction of fish habitat and/or death of fish that is not covered under the existing authorization, they should contact DFO to seek advice on whether this work, undertaking, or activity may require further review.



Suite 200	Bureau 200
1801 Hollis Street	1801 rue Hollis
Halifax NS B3J 3N4	Halifax, NE B3J 3N4

Date:	March 23, 2023
То:	Renata Mageste da Silva, Environmental Assessment Officer, Nova Scotia Department of Environment and Climate Change
From:	Trevor Ford, A/Project Manager, Impact Assessment Agency of Canada
Subject:	Bear Head Energy Green Hydrogen and Ammonia Production, Storage and Loading Facility

The federal environmental assessment process is set out in the <u>Impact Assessment Act</u> (IAA). The <u>Physical Activities Regulations</u> (the Regulations) under IAA set out a list of physical activities considered to be "designated projects." For designated projects listed in the Regulations, the proponent must provide the Agency with an Initial Description of a Designated Project that includes information prescribed by applicable regulations (<u>Information and</u> <u>Management of Time Limits Regulations</u>).

Based on the information submitted to the Province of Nova Scotia on the proposed Bear Head Energy Green Hydrogen and Ammonia Production, Storage and Loading Facility, it does not appear to be described in the Regulations. Under such circumstances the proponent would not be required to submit an Initial Description of a Designated Project to the Agency. However, the proponent is advised to review the Regulations and contact the Agency if, in its view, the Regulations may apply to the proposed project.

The proponent is advised that under section 9(1) of the IAA, the Minister may, on request or on his or her own initiative, by order, designate a physical activity that is not prescribed by regulations made under paragraph 109(b) if, in his or her opinion, either the carrying out of that physical activity may cause adverse effects within federal jurisdiction or adverse direct or incidental effects, or public concerns related to those effects warrant the designation. Should the Agency receive a request for a project to be designated, the Agency would contact the proponent with further information.

The proposed project may be subject to sections 82-91 of IAA. Section 82 requires that, for any project occurring on federal lands, the federal authority responsible for administering those lands or for exercising any power to enable the project to proceed must make a determination regarding the significance of environmental effects of the project. The Agency is not involved in this process; it is the responsibility of the federal authority to make and document this determination.

The proponent is encouraged to contact the Agency at (902) 426-0564 if it has additional information that may be relevant to the Agency or if it has any questions or concerns related to the above matters.

Thank you,

Trevor Ford

A/Project Manager, Atlantic Regional Office Impact Assessment Agency of Canada / Government of Canada Trevor.Ford@iaac-aeic.gc.ca / Tel: 902-476-7635

l/Gestionnaire de projets, Bureau régional de l'Atlantique Agence d'évaluation d'impact du Canada / Gouvernement du Canada Trevor.Ford@iaac-aeic.gc.ca / Tél. : 902-476-7635



Floor 8 North, Maritime Centre 1505 Barrington Street PO Box 216 Halifax, NS Canada B3J 2M4 novascotia.ca

ΜΕΜΟ

Date:March 23, 2023To:NS Department of Environment and Climate ChangeFrom:Department of Municipal Affairs and HousingSubject:BEAR HEAD ENERGY INC. GREEN HYDROGEN AND AMMONIA PRODUCTION
FACILITY

As requested, the Department of Municipal Affairs and Housing (DMAH) has reviewed the Registration Documents provided by Bear Head Energy Inc. for the environmental assessment of the Bear Head Green Hydrogen and Ammonia Production Facility. All components considered under DMAH's areas of mandate have been adequately addressed.

Thank you for the opportunity to review the Registration Documents for the above-noted project.



Floor 8 North, Maritime Centre 1505 Barrington Street PO Box 216 Halifax, NS Canada B3J 2M4 novascotia.ca

SUBJECT:	Bear Head Energy Inc. Green Hydrogen and Ammonia Production Facility, Municipality of the County of Richmond
FROM:	Department of Municipal Affairs and Housing
то:	NS Department of Environment and Climate Change
DATE:	March 23, 2023

Scope of review:

This review focuses on the following mandates: the Statements of Provincial Interest and engagement with municipalities.

Technical Comments:

(Is the proponent aware of any relevant municipal zoning? Has the proponent met with the Municipality to discuss the project? Describe any potential impact to the Statements of Provincial Interest.).

The proponent considers current land use zoning in the proposal and has done significant consultation with municipalities and municipal entities on the project, as well as engaging associations, institutions and other potential stakeholders in the area.

Statements of Provincial Interest:

- Drinking Water: No anticipated impact. The Project's freshwater need combined with other current users would still be below the water draw limit; however, stakeholder municipalities have voiced concern about the cumulative effect of future proposed industrial projects in the area.
- Agricultural Land: No anticipated impact, as there is no agricultural land in the area.
- Flood Risk: No anticipated impact; not in an identified flood risk area, though the impact of sea level rise on the coastal infrastructure has had limited consideration.

• Infrastructure: No anticipated impact. The Project's freshwater need combined with other current users would still be below the water draw limit. The expected wastewater volume is also within current capacity limits. Stakeholder municipalities have, however, voiced concern about the cumulative effect of future proposed industrial projects in the area.

• Housing: No anticipated impact; however, stakeholder municipalities have voiced concern about the cumulative effect of future proposed industrial projects on limited available housing supply in the area.

Summary of Recommendations (Provide in non-technical language):

(Describe what outstanding information and/or conditions may be considered/required for the project.).

There is no outstanding information and/or conditions. All components considered under DMAH's areas of mandate have been adequately addressed.



Environment and Climate Change

Subject:	Bear Head Energy Green Hydrogen and Ammonia Production, Storage and Loading Facility Project
From:	ICE Port Hawkesbury & Sydney Offices
То:	Renata Mageste da Silva, Environmental Assessment Officer
Date:	March 23, 2023

Scope of review:

This review focuses on the following mandate: <u>Surface water, groundwater, air quality,</u> <u>watercourse alteration, erosion & sedimentation control, environmental and emergency</u> <u>management.</u>

Technical Comments:

- Numerous plans have been identified as needing to be provided for the project but do not exist in the EA submission documents.
- Limited details regarding power and water usage have been provided, including identification of delivery corridors and the assessment of the areas impacted by these key components of the project. Section 13.0 of submission states that "Approximately 15 million litres of water/day on average (4 million US gallons of water/day) will be required by the facility and will be supplied to the site via pipeline from the LLWU. Power supply for the Project will be provided from renewable power via the grid and/or direct power connection from primarily new onshore and/or potential future offshore renewable energy projects. Water supply and energy production and storage will be permitted (as required) separately by the proponent(s) of these utilities/projects."
- The registration document indicates that storage of up to 124,000 cubic metres of ammonia will be stored on the site. Additional details will be required to be submitted as part of an application Dangerous Goods Management Approval which will be incorporated into the Industrial Approval.
- Background noise data is from 2014 survey. Landscape and development changes may have occurred in the time since the data was collected therefore it is recommended the data should be updated.
- Marine water quality and sediment data is from 2004. 2015 data from outside the project area is referenced, however there was no correlation provided between the two data sets, therefore it is recommended the data should be updated.

• As part of the Industrial Approval, effluent may require treatment prior to discharge including, but not limited to, treatment of thermal impacts.

Summary of Recommendations: (provide in non-technical language)

EA Registration Sections 1-3

- 2.8 A preliminary decommissioning and reclamation plan must be provided with the Industrial Approval application submission.
- 2.11/2.12/Table 2.2 A Environmental Management Plan and Emergency Response Plan must be provided with the Industrial Approval application submission and include the following Management Plans as part of the submissions:
 - Green House Gas including mitigation of gasses released from the process (ex. oxygen)
 - o Flaring
 - Erosion and Sedimentation Control
 - o Stormwater
 - o Waste
 - o Contingency
 - o Solid and Hazardous Waste
 - o **Risk**
 - o Archaeological Contingency
 - o Traffic
 - o Complaint Resolution
 - o Releases of Hydrogen or Ammonia Gas and Liquid Ammonia

EA Registration Sections 5-14

- 6.1.1.1 Air Quality and Noise Monitoring Plans must be provided with the Industrial Approval application submission. The plans must acknowledge need for compliance with amendments to guidelines, standards, and regulations. This must include details regarding ammonia and hydrogen monitoring related to accidental releases.
- 6.2.5 A Groundwater Monitoring Plan must be provided with the Industrial Approval application submission.
- 6.3.5 A Surface Water Monitoring Plan must be provided with the Industrial Approval application submission.
- 6.5.5 A Wetland Delineation Survey must be provided for the site prior to commencement of any additional clearing or development on the site, including evidence the two wetlands indicated as exempt from legislation were formed in the

last 20 years. Applications for Wetland Alteration Approvals under Division I of the Activities Designation Regulations will be required prior to the alteration of any wetland.

<u>Other</u>

• Financial security should be included as a requirement in the EA Terms & Conditions

Guidance for Reviewers – Environmental Assessmer

Environmental Assessment Branch, Environment and CI

Barrington Place 1903 Barrington Street Suite 2085 Halifax, Nova Scotia Canada B3J 2P8



Environment and Climate Change

Subject:	Bear Head Energy Green Hydrogen and Ammonia, Richmond County, Nova Scotia
From:	Air Quality Protection Advisor, Air Quality Unit
То:	Renata Mageste da Silva, Environmental Assessment Officer
Date:	March 22, 2023

Scope of review:

This review focuses on the following mandate: Air Quality

Technical Comments:

The proposed Bear Head Energy project consists of green hydrogen/ammonia production, along with storage and a loading/shipping facility. It would be located close to Bear Head, in the Point Tupper Industrial Park near Port Hawkesbury. The site was previously approved for a liquified natural gas (LNG) facility which will now not proceed, although some of the site preparation work has already taken place. The completed groundwork will contribute to the construction of the green hydrogen/ammonia site if it is approved.

When fully built, the project would operate using renewable energy, and would produce 2 million tonnes per annum of green ammonia. The ammonia (anhydrous liquified) will be shipped to the European market via forty to sixty shiploads per year.

The proponent has provided a qualitative assessment of impacts based on a comparison of the previously approved Bear Head LNG project and the current proposal for a green hydrogen and ammonia project. The predicted impacts are compared with the Air Quality Regulations, noting that the ambient air quality standards are under review.

Potential sources of air pollutants are reported to be emergency flaring and fugitive emissions, with low level emissions from the operation of vehicles, site machinery and the occasional use of a diesel generator (emergency/upset conditions). The site will be powered using renewable energy supplied via the grid. During operation, the process will release oxygen and water vapour to the atmosphere, while fugitive releases and flaring would result in emissions of hydrogen, ammonia, and nitrogen dioxide.

With respect to fugitive releases, it is noted that hydrogen and ammonia are the primary products of the process, and consequently, it makes business sense to reduce fugitive emissions of these pollutants to a minimum. The engineering design will place emphasis on leak detection to ensure minimal losses. Consequently, it is highly unlikely that

Guidance for Reviewers – Environmental Assessments Environmental Assessment Branch, Environment and Climate Change

ammonia emissions would exceed an applied ambient air quality standard (e.g., Ontario's ambient air quality criteria for ammonia is 100µg/m³ over 24 hours).

Flaring will not require the use of hydrocarbons. The products of flaring are anticipated to be water vapour and nitrogen oxides, which are rapidly converted to nitrogen dioxide in the atmosphere. Nitrogen dioxide is a pollutant of concern. The assessment of the impacts of nitrogen dioxide from flaring were based on an assumption that emergency flaring will occur for a maximum of 24 hours per year for the high-pressure flare, and 5 hours per year for the marine flare. This rate of flaring was compared with flaring modelled for the previously approved LNG project.

The LNG modelling study determined the maximum ground level nitrogen dioxide concentrations based on normal operating conditions and with a vessel hoteling. Flaring was anticipated to occur for 192 hours per year, contributing 16.7 tonnes of nitrogen oxides per year (1.4% of the anticipated total nitrogen oxide emissions from the site). Under these conditions, the maximum ground level nitrogen dioxide concentrations were lower than the current ambient air quality criteria reported in the Air Quality Regulations.

Given the change of process, the proposed green hydrogen/ammonia project is likely to result in lower emissions than the previously approved Bear Head LNG project. None of the ambient air quality standards reported in the Air Quality Regulations, or any that could be applied from other jurisdictions, are expected to be exceeded.

Summary of Technical Considerations: (provide in non-technical language)

If the project is approved, uncertainties (the number of hours that flaring may occur, for example) should be mitigated prior to project commencement and the applicant should re-assess impacts if necessary. The Department should be advised of any changes.

In addition, if the project is approved, the applicant should develop an Emergency Response Plan detailing the approach that will be taken to address fugitive releases of pollutants, particularly with respect to ammonia.

Guidance for Reviewers – Environmental Assessmer

Environmental Assessment Branch, Environment and CI

Barrington Place 1903 Barrington Street Suite 2085 Halifax, Nova Scotia Canada B3J 2P8



Environment and Climate Change

Subject:	Bear Head Energy Green Hydrogen and Ammonia, Richmond County, Nova Scotia
From:	Air Quality Protection Advisor, Air Quality Unit
To:	Renata Mageste da Silva, Environmental Assessment Officer
Date:	March 22, 2023

Scope of review:

This review focuses on the following mandate: Noise

Technical Comments:

The proposed Bear Head Energy project consists of green hydrogen/ammonia production, along with storage and a loading/shipping facility. It would be located close to Bear Head, in the Point Tupper Industrial Park near Port Hawkesbury. The site was previously approved for a liquified natural gas (LNG) facility which will now not proceed, although some of the site preparation work has already taken place. The completed groundwork will contribute to the construction of the green hydrogen/ammonia site if it is approved.

When fully built, the project would operate using renewable energy, and would produce 2 million tonnes per annum of green ammonia. The ammonia (anhydrous liquified) will be shipped to the European market via forty to sixty shiploads per year.

The proponent has undertaken a noise impact assessment comprising a baseline assessment of existing noise levels at receptor locations, and modelled impacts of noise from the proposed plant, using mitigation as appropriate. The impacts are compared with the Guidelines for Environmental Noise Measurement and Assessment along with relevant municipal and Federal requirements.

The baseline assessment was undertaken in 2014 as part of the environmental assessment application for the LNG plant. The proponent reports that there has been little to no change in the number and type of noise sources (e.g., birds, natural environment, wind turbines) since that time. Noise measurements were taken at three residential locations, across the Strait of Canso from the site, close to the village of Middle Melford, over a period of 24 hours in October 2014. Daytime A-weighted equivalent sound levels (L_{Aeq}) were consistently 50dBA while for the evening period sound levels were between 41 and 47dBA and for the nighttime period, sound levels were between 40 and 43dBA.

Guidance for Reviewers – Environmental Assessments Environmental Assessment Branch, Environment and Climate Change

Impacts from the proposed project were modelled using the CadnaA model. This is an acceptable model that is used widely for noise assessments. Noise levels were identified for outdoor sources, indoor sources, the Air Separation Unit and the Steam Turbine Building, with attenuation applied where appropriate. The impacts were modelled for twenty receptor locations: nineteen receptors were located across the Strait of Canso near the village of Middle Melford, and one receptor was located to the north of the proposed project site at Port Malcolm.

Sound levels were modelled using the worst case operating conditions (continuous operation, all sources operating simultaneously and at full capacity), and were reported for the daytime and nighttime periods. Impacts from the proposed project were predicted to be between 29.7 and 40.2dBA at all times. These impacts are below the measured daytime baseline noise level of 50dBA. This indicates that the project would not have an impact on noise levels experienced at receptor locations during the day. Daytime impacts are predicted to comply with the Guidelines for Environmental Noise Measurement and Assessment.

During the nighttime period, the modelled impacts are predicted to have little to no impact on the noise levels experienced at receptor locations. Using this worst case modelling, the receptor with the highest impact (baseline receptor 2 and impact study receptor 1) would experience an increase in nighttime noise level from 42dBA to 44.2dBA. The resulting impact would be an increase in the noise level of 2.2dBA. A change in noise level of less than 3dBA is not audible to the majority of the population. Nighttime impacts are predicted to comply with the Guidelines for Environmental Noise Measurement and Assessment.

Summary of Technical Considerations: (provide in non-technical language)

The noise impact assessment suggests that there will be no adverse impact on residents in the vicinity of the proposed project. However, if the project is approved, it is recommended that the proponent ensures that the mitigations presented in Appendix E Section 7.0 are employed at all times, and that a procedure is developed for the prompt resolution of complaints.



Date:	March 21, 2023
To:	Renata Mageste da Silva, Environmental Assessment Officer
From:	Resource Management Unit, Sustainability and Applied Science Division
Subject:	Bear Head Energy Green Hydrogen & Ammonia, Richmond County, Nova Scotia

Scope of review:

This review focuses on the following mandate: <u>solid waste, dangerous goods, waste</u> dangerous goods, petroleum management and alternative fuels, emergency response

Technical Comments:

s.2.4 Project Design and Code of Practice

This section is meant to provide a detailed overview of the production, storage/handling processes and components required to accomplish the main functions of the proposed project. In this case, the proponent has relied on a draft Code of Practice ("COP") which was not submitted with the EA Registration. Reviewers are unable to comment on information not submitted with the EA Registration.

Section 2.7.1.2 Electrolysis

The Registration document notes two possible technologies that are being evaluated, in addition to noting that for future development, new technologies may be developed that would then be assessed during the buildout of the facility. As a technology has not been determined, reviewers are unable to comment upon the possible environmental impacts from the process.

S.2.9.2 Diesel

The Registration document indicates that diesel will be used to provide emergency power during electrical grid outages and that it will be similar to what was proposed for the former Bear Head Liquified Natural Gas (LNG) facility. Reviewers have limited ability to comment on this aspect of the project given lack of project-specific details.

Section 2.10.1 Water Requirements

The maximum water demand for the project is noted at 15 million liters/day, while maximum daily consumption for 2020 was reported as 13.5 million liters/day and maximum permissible withdraw is 36 million/ liters/day. Through the proponent notes that they will work with LLWU to ensure that other water users will not be impacted by the project, it should be noted that current water chemistry is based upon historic water consumption and precipitation patterns. The reviewers note that changing climatic conditions, (i.e., drought or excessive precipitation events) coupled with changing water demand could alter water chemistry and thereby impact both the volume and quality of sludges produced from the reverse osmosis (RO) unit.

Section 2.11.5 Solid and Hazardous Waste

The Registration document notes various wastes that may be generated during construction and operational phases of the project. These wastes will be segregated and shipped to appropriate facilities for recycling or disposal, which is appropriate.

However, rather than provide project-specific information, the proponent indicates that wastes will be similar to what may have been produced at the proposed Bear Head LNG project and that the types and quantities of wastes will depend on the technology chosen for hydrogen production. The lack of project-specific details and pending technology selection limits the ability for reviewers to comment.

With respect to the sludges generated from the RO process, neither their quantity nor a chemical characterization is provided for the project. This information is required to determine whether the sludge would be required to be managed as a hazardous waste or if it can be managed within the solid waste system of the province.

The proponent describes a "temporary hazardous waste storage area". If the production process is continuous, it would appear to be more likely that any storage area would be permanent. The reviewers were uncertain whether the storage is considered temporary because the treatment or final disposal of these materials will be offsite at another facility. More details are required to assess if proposed storage and handling are appropriate.

S.2.12 Health, Safety and Environmental Management

This section relies on the proposed COP and past submissions for the proposed LNG facility. Reviewers are unable to comment on information not submitted with the EA Registration.

Appendix H Quantitative Risk Assessment

The proponent has prepared a detailed risk scenario assessment to determine if the proposed facility is in a location that minimizes the potential risk to public safety. It does not address potential environment impacts of catastrophic incidents or releases.

In addition, the events considered are single releases resulting in fires, explosions and toxic clouds. It does not appear to consider if damage to physical components, control systems or operational or support staff would affect other aspects of the proposed facility's operations, perhaps resulting in a series of cascading events that could extend impacts in size and duration.

Summary of Technical Considerations: (provide in non-technical language)

Because the Registration document relied on the proposed Code of Practice and past submissions for the proposed LNG facility for some aspects of the environmental assessment, if the project is approved, project-specific information that has not yet been provided should be requested prior to project commencement, including an assessment of the potential environmental impact based on the project-specific information. Specifically, the potential impact of the following items should be further considered:

- selected electrolysis technology
- diesel storage/usage with respect to emergency power generation
- solid and hazardous waste management, including the quantity and chemical characterization of sludges from the RO process and impacts on proper management
- the impact of changing climatic conditions and/or water demand on water chemistry and the resulting volume and quality of sludges produced from the RO unit

In addition, if the project is approved and prior to project commencement, the Quantitative Risk Assessment should be further developed to address potential environment impacts of catastrophic incidents or releases and to determine design and implementation of sufficient mitigation. It should also be expanded beyond single events to assess potential cascading effects from impact to the facility's operations (e.g., damage to physical components, control systems. or operational or support staff).



Communities, Culture, Tourism and Heritage

Date:	March 23, 2023
То:	Renata, Nova Scotia Environment & Climate Change
From:	Coordinator Special Places, Culture and Heritage Development
Subject:	Bear Head Energy Green Hydrogen and Ammonia Project – EA

Staff of the Department of Communities, Culture, Tourism, and Heritage has reviewed the Bear Head Energy Green Hydrogen and Ammonia Project – EA documents and have provided the following comments:

Archaeology

Staff reviewed the sections of the EA document pertaining to archaeology. We are glad to see Appendix K has been redacted given the archaeology site information enclosed.

Please redact Figure 4.27 in the document given it illustrates the locations of recorded archaeology sites adjacent and surrounding the project area.

Recommendations stemming from the ARIA that was completed are not listed in the document. The recommendations should align with those approved by CCTH/Special Places Program and be clearly presented in the archaeology section of the EA. As it is now, the EA does not say clearly, that the conclusions and recommendations developed by the archaeology consultant and approved by CCTH are as follows...

Additionally, as part of the archaeology section, the Heritage Research Permit Report number (the ARIA) should also be noted for easy reference.

Botany

No Staff were able to review the sections of the EA document pertaining to botany. If I receive comments back. I will forward along.

Palaeontology

Staff have reviewed the sections of the EA document pertaining to palaeontology. The geology

sections of the EA Registration for the Bear Head Energy project was reviewed. The document describes the bedrock geology of the project area as Cumberland Group, but a more detailed summary of the reference they provided (Barr and White 2017 (OFM ME 2017-09) would identify the area as Pomquet Formation, considered in Mabou Group. https://weblex.canada.ca/html/012000/GSCC00053012020.html

The bedrock is sandstone of geological period and rock type that has potential to contain vertebrate fossils. There appears to be some chance of encountering significant fossils during the course of excavation of bedrock. Suggestion to consider a plan to have a palaeontologist/geologist examine any exposed bedrock outcrop. If potential fossils are encountered the Museum can be contacted for advice.

Zoology

Staff have reviewed the sections of the EA document pertaining to palaeontology to zoology. At this point it appears to be an incomplete assessment of the zoological setting for the site and immediate-adjacent area as additional updated surveys are yet to be completed in 2023 (mammal, amphibian, reptile).

Acoustic surveys for bats took place over 27 nights. It is possible that this is too short a period to obtain a representative snapshot of bat activity through the year, and may not capture activity of migratory bat species, or bats on route to summer or fall hibernacula.

There are no additional zoological concerns at this point that fall outside of those currently highlighted in the assessment as they pertain to species at risk (SAR) and species of special concern under the Nova Scotia Endangered Species Act (NSESA), the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) and the Species At Risk Act (SARA). Mitigation plans for fauna within the project appear to be appropriate.

This project will result in an additional 40 - 60 ammonia carrier ships per year to the area. Consideration should be taken regarding the mitigation of whale/vessel interactions, not just for local species but also those traversing nearby waters. This is particularly important when large whale species (such as the North Atlantic right whale) are prevalent and transiting the area (April – November).

It is recommended that a plan for adaptive management be outlined to identify a strategy for evaluating and implementing: 1) how environmental impact mitigation might be improved over time as technology improves, and 2) ways that production methods might continually be improved to increase efficiency and to minimize environmental impacts and contributions to emissions as technology improves.



Date:	March 21, 2023
To:	Renata Mageste da Silva, Environmental Assessment Officer
From:	Environmental Health
Subject:	Bear Head Energy Green Hydrogen and Ammonia Project, Richmond County, NS

Scope of review:

This review focuses on the mandate to protect public health from physical, chemical and biological hazards originating in the environment. More specifically the review concentrates on possible health impacts arising from possible effects related to the Atmospheric Environment, Acoustic Environment, and Accidental Events and Malfunctions.

Atmospheric Environment

To assess project impacts on air quality the proponent had undertaken work to assess and characterize baseline air quality conditions within the Region. Work was then undertaken to assess impacts to air quality resulting from the construction, operation and decommissioning of the facility. The EA report concludes that impacts to air quality are expected to be negligible.

Recommendations:

Development and implementation of an Air Quality Monitoring Program for this Project will allow for verification of predicted air quality impacts.

Acoustic Environment

Appendix E contains a copy of the Noise Assessment Study that was undertaken to assess potential noise impacts on residential receptors. It should be noted that this study relates to the operations phase of the project only.

Section 1.0 of the Noise Assessment Study states that: "Noise emissions during construction were previously assessed as part of the Bear Head LNG Project and were found to meet regulatory requirements."

Section 6.8.2.1, page 6.43 of the EA states that pile driving activity associated with the construction of the jetty may cause a temporary nuisance, and affect the use and enjoyment of surrounding lands.

Recommendation:

Development of a complaint handling process/procedure will allow the proponent to receive noise complaints from the public related to construction activities, and undertake activities to minimize impacts from construction noise.

Accidental Events and Malfunctions

Section 7 and Appendix H of the EA discuss the potential for environmental and human health impacts related to the unplanned release of hazardous materials.

Worst-case scenario modelling was undertaken for a number of potential scenarios, and concludes that "an unplanned release of hydrogen and/or ammonia could have significant adverse environmental effects on the biophysical and socio-economic environment, including potentially serious consequences on public health and safety."

Worst-case scenario modelling undertaken for a number of different scenarios has shown that an unplanned release of ammonia could result in human exposure to ammonia at levels that exceed the Acute Exposure Guideline Level (AEGL-2) for ammonia, resulting in inhalation toxicity in individuals located as far as 20 km from the project site.

Recommendation:

Though the likelihood of a worst case scenario event occurring is low, emergency planners should be mindful of the fact that such an event could potentially require wide-scale evacuation of the area, and plans to undertake such evacuations should be considered during the emergency planning process.



Date:	March 23, 2023
То:	Environmental Assessment Officer
From:	Climate Change Division Staff
Subject: Facility	Bear Head Energy Green Hydrogen and Ammonia Production, Storage and Loading

Scope of review:

This review focuses on the following mandate: <u>Climate Change - Adaptation and</u> <u>Mitigation</u>

Technical Comments:

Adaptation

- Section 4.1.7.2 of the EA registration document, *Tides, Storm Surge, and Sea Level Rise*, does not include any reference to storm surge. Storm surge impacts are worth considering for a project with coastal infrastructure; for example, the surge experienced during Hurricane Fiona raised coastal water levels by over 2 metres in some locations.
- Section 10.1.1 *Climate and Climate Change* shows a good understanding of the major climate change trends for this region, though no specific climate change projections are referenced. Additionally, these effects are not assessed within a risk management framework, as recommended in the 'Guide to Considering Climate Change in Project Development in Nova Scotia'.
- 10.2 *Mitigation* indicates that a climatology study will be conducted to inform detailed design. The parameters listed for the climatology study to consider seem to be based primarily on historical data; it is recommended that climate change projection data be considered and incorporated into site design.
- 10.2 *Mitigation* states that water management structures will be designed to attenuate the design storm event to prevent flooding, and that the design storm events will consider climate change. It would be helpful to know how this will be done. Climate change-adjusted IDF curves are available through ClimateData.ca for the Eddy Point weather station, located in close proximity to the project site.
- The registration document does not indicate the probability and severity of water quality and quantity impacts associated with the Landrie Lake freshwater supply as a result of the changing climate (e.g. has the Landrie Lake Water Utility incorporated climate change projections into seasonal and long-term water availability estimates?).

Mitigation

- The proponent indicates that no onsite power generation is included because power supply for the Project will be provided from renewable power via the grid.
- The proponent estimates that project-related releases of GHG emissions during the construction period are expected to be moderate (less than 100,000 t CO2e per year). The approach used to reach this estimate is acceptable. Estimated Greenhouse Gas Emissions from the Construction of the Proposed Project using published emission factors for diesel fuel and an estimate of volume of diesel to be consumed follows accepted standards. Mitigation measures were proposed.
- The GHG emissions released by the Project during operation are expected to be less than the GHG emissions anticipated to be released during the construction period, and these releases will be small in comparison to other industrial sources of GHG emissions in Nova Scotia. This assertion can be considered accurate.

Summary of Recommendations: (provide in non-technical language) Adaptation

- During detailed design of project infrastructure components (e.g., stormwater system and wastewater ponds) the proponent should use current design guidance from Environment and Climate Change Canada and the latest available climate change projection data.
- The proponent should provide more detail on the Landrie Lake water system and whether the system can accommodate the estimated freshwater requirements over the longer term based on climate projections and during seasonal periods of drought conditions so that opportunities for mitigation may be identified.
- The proponent should assess the probability and severity of sea level rise/storm surge impacts to the existing marine terminal infrastructure over the term of the project so that opportunities for mitigation may be identified.
- The proponent should consider adopting a risk management framework as recommended in the 'Guide to Considering Climate Change in Project Development in Nova Scotia' to determine which impacts present the highest risks to the project and to assist in the determination of priorities for implementing adaptation measures where required.

Mitigation

• No further recommendations.



Agriculture

Date:	March 24, 2023
To:	Renata Mageste de Silva, Environmental Assessment Officer
From:	Heather Hughes, Executive Director, Policy and Corporate Services, Nova Scotia Department of Agriculture
Subject:	Bear Head Energy Green Hydrogen and Ammonia Project Strait of Canso, Cape Breton, Nova Scotia

Thank you for the opportunity to review the documents for the above-noted project.

No agricultural impacts are anticipated given that:

- The Bear Head Energy Green Hydrogen and Ammonia Project is located on class 7 soil, Canada Land Inventory, which is unsuitable for agriculture.
- A ten-kilometer buffer was created around the industrial facility, in which there are approximately 34 hectares of active agriculture land and no commercial farms.
- The closest active agricultural land, 2.5 hectares, is 3 km from the industrial facility.
From NRR – Clean Electricity

From: Miller, David J <David.J.Miller@novascotia.ca>
Sent: Friday, March 24, 2023 8:52 AM
To: Mageste da Silva, Renata <Renata.MagestedaSilva@novascotia.ca>
Subject: RE: REMINDER: Bear Head Energy Green Hydrogen and Ammonia Project – Environmental Assessment – Comments due March 23_2023

Hi Renata

I will not be submitting any comments for the Bear Head project assessment.

David

Email 3 of 3

From: Zwicker, Stephen (ECCC) < stephen.zwicker@ec.gc.ca>

Sent: Tuesday, March 28, 2023 4:03 PM

To: Mageste da Silva, Renata < Renata. Mageste da Silva@novascotia.ca >

Cc: Hingston, Michael (il, lui | he, him) (ECCC) < Michael. Hingston@ec.gc.ca>; Worthman, Sydney (elle, la | she, her) (ECCC) < Sydney. Worthman@ec.gc.ca>

Subject: RE: Bear Head Energy Green Hydrogen and Ammonia Project – Environmental Assessment – Comments due March 23_2023

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Hi Renata,

As I indicated, ECCC has tried to review the Bear Head EA Registration Document in as timely a manner as possible. In addition to the comments we provided earlier, there is one final set of comments from ECCC below and attached. Thank you for your patience.

Please note that the following documents are attached to this email for inclusion with the response:

- Environment and Climate Change Canada (2022). Guidelines for effective wildlife response plans.
- Editable template 'Appendix A' to accompany "Guidelines for effective Wildlife Response Plans".
- The Canadian Nightjar Survey Protocol (2022)
- The Canadian Nightjar Survey: Quick Reference Protocol Summary (2022)
- The Canadian Nightjar Survey Datasheets (2022)
- Guidance for Developing Systematic Stranded Bird Survey Protocols for Vessels and Platforms (March 2021)
- Procedures for handling and documenting stranded birds encountered on infrastructure in offshore Atlantic Canada (ECCC, 2017).
- Atlantic Canada Shorebird Surveys Survey Protocol and Guidelines (2014)

Specific Comments:

- If the project proceeds, the proponent should be advised that provincial conditions of approval do not supersede their responsibility to ensure that activities comply with the MBCA and associated regulations. For <u>all</u> activities and during all Project phases, the proponent must take measures to avoid the disturbance or harm of migratory birds, nests, and eggs.
- 2. The proponent should retain raw data (e.g., information on individual tracks) until appropriate data standards have been developed. Proponents are encouraged to share and store data with:
 - a. The Atlantic Canada Conservation Data Center (<u>http://accdc.com/en/contribute.html</u>), and,
 - b. The Canadian Wind Energy Association (CanWEA) database (<u>https://canwea.ca/)</u> (Birds Canada 2022).

3. ECCC-CWS recommends targeted field surveys to evaluate the effects of the Project *in habitats that host species at risk and species of conservation concern* that could be difficult to detect incidentally on the landscape, such as migratory bird species at risk (e.g., Common Nighthawk), bat species at risk and residences (i.e., maternity roosts), and lichen.

Section 4.2.5 - Birds / Section 6.6 - Wildlife and Wildlife Habitat

4. Quote (page 4.35) "Information on the distribution and abundance of birds in the vicinity of the Project Area has been obtained mainly through published sources including Maritime Breeding Bird Atlas (MBBA) database (MBBA 2013), a review of the ACCDC database (ACCDC 2003, 2014, 2022); review of Important Bird Areas mapping (Bird Studies Canada 2022) field surveys (April, June, July 2003); site reconnaissance (Pulsifer 2022a); and literature review (e.g., Lock et al. 1994).

Quote (page 4.49) "Additional bird surveys will be conducted in 2023 prior to further site development including breeding bird surveys for forest passerine species and nightjar surveys."

ECCC-CWS notes that the proponent has not provided any information on the survey methodologies used to collect the existing baseline information, or the proposed studies for 2023, and so ECCC-CWS is not able to assess whether the methods were appropriate.

ECCC-CWS recommends that the proponent provide a description of the methodologies used during the 2003 surveys and site reconnaissance in 2022 to inform the assessment. Additionally, the proponent should provide a proposed survey approach to ECCC-CWS for review prior to its implementation in 2023.

5. Quote (page 4.35) "Given the site location at the junction of the Strait of Canso, Inhabitants Bay and Chedabucto Bay, it is likely to be comparatively more important as a route for migratory movements for songbirds and other species. It has been suggested that the Bear Head area may be a "migration trap" for migrating songbirds about to cross the Strait of Canso to mainland Nova Scotia...Coastal headlands such as Bear Head can also be major points of concentration for disoriented, off-course, or re-orienting migrants."

ECCC-CWS notes that the Project Area has a potential to affect migrating birds and species at risk, including songbirds, seabirds and waterfowl. It is possible that migratory birds may be attracted to artificial light and flares at the site and may potentially be disoriented and stranded on-site.

ECCC-CWS recommends that the proponent develop a site-specific stranded bird monitoring plan following the ECCC-CWS (2021) Guidance for Developing Systematic Stranded Bird Survey Protocols for Vessels and Platforms. Although this document has been developed for offshore platforms, modifications can be made to the protocol to ensure that it is suitable to an onshore facility.

Additionally, ECCC-CWS has provided general beneficial management practices for the proponent's consideration in the "Effects of Construction/Operations on Migratory Birds – Stranded Birds" section below.

- 6. ECCC-CWS notes that the proponent did not conduct any surveys or report any observations of shorebirds in the Project Area. ECCC-CWS recommends that when the proponent conducts their surveys in 2023, they should also do a dedicated shorebird survey following the Atlantic Canada Shorebird Survey protocols.
- 7. ECCC-CWS notes that there are a number of seabird colonies (hosting Common, Arctic and Roseate Tern, Great Blue Heron, Double-crested Cormorant, various gull species, and Leach's Storm-petrel) within a 30 km radius of the approximate centroid of the proposed wind farm (see attached), most of which are in the southwestern area of the Strait of Canso. Activities in these potential sensitive areas should be avoided.

Additionally, ECCC-CWS notes that Country Island, which is home to a population of Roseate Tern (listed as Endangered on Schedule 1 of the *Species at Risk Act*), Leach's Storm-petrel (assessed as Threatened by COSEWIC) and large numbers of Common and Arctic Tern and Black Guillemots is located approximately 50 km from the Project Area.

ECCC-CWS recommends that shipping routes for this Project be at least 300 m from any seabird colonies.

8. Ground-nesting species of migratory birds such as Common Nighthawk, Eastern Whip-poor-will, Killdeer, Snipe and American Woodcock, may be found in the study area and may be attracted to previously cleared areas and industrial zones (see https://www.mba-aom.ca/pdfs/atlas_en_210-239.pdf#page=5). ECCC-CWS recommends identifying mitigation measures for protecting ground nesters in previously cleared areas should project construction activities be scheduled during the breeding season. Note: Killdeer are early breeder and may start nesting as early as March.

9. Quote (page 4.44) "Barn Swallows typically nest in artificial structures (e.g., barns and bridges), and foraging is concentrated in areas with flying insects near ground or water surfaces...no barn swallows were seen during the field surveys undertaken in 2004 and it is unlikely that they will nest at the site."

ECCC-CWS notes that Barn Swallows may nest in existing site infrastructure (such as buildings, jetties, etc.) and the ACCDC report (2022) indicated that Barn Swallow may occur in the Project Area. As a result, ECCC-CWS recommends that a qualified biologist should conduct a survey to confirm Barn Swallow presence/absence prior to construction activities.

10. Section 6.6.2.2 (page 6.33) "BHE developed an Avifauna Management and Monitoring Plan for the Bear Head LNG Project to address concerns raised by NRR and Canadian Wildlife Service (CWS), particularly with respect to flaring and lighting. The Avifauna Management and Monitoring Plan identified key factors that would influence the design and likelihood of adverse impacts to birds and bats at the LNG facility and explored management and monitoring options."

Section 6.6.3 (page 6.33) "The existing Bear Head LNG Avian Management and Monitoring Plan (CBCL 2016b) will be updated for this Project."

ECCC-CWS recommends that the proponent provide the updated Avian Management and Monitoring Plan to ECCC-CWS for review, prior to its implementation.

Additionally, ECCC-CWS notes that it would be beneficial for the proponent to include a summary of the concerns that were raised by NRR and CWS and include information on how they addressed these concerns in the Avian Management and Monitoring Plan.

11. Section 6.6.3 (page 6.33) "Vegetation clearing and grubbing will avoid the bird and bat breeding season (May 1 to August 31). Where this is not feasible, avoidance and mitigation measures will be developed in consultation with NRR and CWS and incorporated into the EMP. This may include nest searches, bat maternity roost surveys and established buffer zones."

ECCC-CWS does not recommend the use of nest searches or pre-clearing surveys for active bird nests during the breeding season, as a mitigation, given the difficulty associated with finding nests reliably and the high likelihood of disturbing nesting birds when searching. The proponent should consider the information provided at "Guidelines to avoid harm to migratory birds" (Guidelines to avoid harm to migratory birds - Canada.ca).

Section 4.2.3 - Wetlands / Section 6.5 - Vegetation and Wetlands

- 12. ECCC-CWS recommends that following the wetland delineation survey in summer 2023, the proponent update Figure 4.5 (page 4.23), labelling Wetlands 1, 2 and 5 as "infilled" (rather than "intact", as they are currently shown). This would clarify the previous wetland alteration that occurred during the Bear Energy LNG project.
- 13. Quote (page 4.27) "Small parts of two wetlands (Wetlands 1 and 2) were partially infilled, and a third small wetland (Wetland 5) was infilled entirely to construct the base pad for the previously approved project."

ECCC-CWS recommends that the proponent provide an estimate of infilled versus intact areas (in hectares) of Wetland 1 and 2, to provide clarity on the previous wetland alteration that occurred during the Bear Energy LNG project.

14. ECCC-CWS acknowledges that wetlands will not be directly altered by this project, and that clearing and grubbing will be minimal surrounding the previously altered portion of the Project Area. However, ECCC-CWS recommends that the proponent avoid clearing during the migratory bird breeding season, to reduce potential impacts to migratory birds and species at risk.

Section 4.2.4 - Rare Plants / Section 6.5 - Vegetation and Wetlands

15. ECCC-CWS recommends that the proponent contact the Province of Nova Scotia's Department of Natural Resources and Renewables for technical expertise and advice on SAR plants and lichen (e.g. Blue Felt Lichen).

Section 4.2.6 - Mammals / Section 6.6 - Wildlife and Wildlife Habitat

16. ECCC-CWS recommends that the proponent consult provincial SAR biologists at the Nova Scotia Department of Natural Resources and Renewables for technical expertise and advice on bat SAR under their responsibility and jurisdiction (contact: Donna Hurlburt at: <u>Donna.Hurlburt@novascotia.ca</u> and Pam Mills at: <u>pamela.mills@novascotia.ca</u>).

17. Quote (page 4.50) "To determine the presence of bats near the Project Area, bat acoustic surveys were conducted in the fall of 2022. Four Wildlife Acoustics Song Meter Mini Bat Detectors (autonomous recording units [ARUs]) were deployed within the Project Area on August 24. The detectors were programmed to record daily from sunset to sunrise, and were retrieved on September 20, for a total of 27 recording nights"

ECCC-CWS notes it is not clear from the project description whether the vegetation removal that remains as part of the project is occurring in forested or non-forested areas. Clearing in forested areas presents a potential concern for the destruction of residences (maternity roosts) for SARA-listed bats. Additionally, ECCC-CWS notes that the proponent started the bat acoustic surveys in late-August, which misses the maternity roosting season for bats in this area.

ECCC-CWS recommends that the proponent conduct a habitat assessment to determine whether suitable maternity roosting habitat is present for SARA-listed bats. If suitable habitat is found, ECCC-CWS recommends that the proponent conduct an additional year of acoustic bat surveys during the breeding period.

- 18. ECCC-CWS notes that there are two records of nearby maternity roosts within 10 km of the Project site (from 2013 and 2014, pre-White-nose Syndrome), so spring and fall acoustic surveys could potentially indicate peaks in activity as to whether this site is associated with movement to/from these maternity roosts.
- 19. ECCC-CWS notes that further surveys would be required to understand whether the Project site is located along an important migration route for bats (e.g., "resident" SARA-listed bat species and "migratory" bat species, both of which exhibit migratory movement), which would be a particular concern as it pertains to the flaring schedule. ECCC-CWS recommends that if the proponent conducts an additional year of acoustic surveys that these should cover the spring and fall migration periods.
- 20. Section 6.6.3 (page 6.33) "Vegetation clearing and grubbing will avoid the bird and bat breeding season (May 1 to August 31). Where this is not feasible, avoidance and mitigation measures will be developed in consultation with NRR and CWS and incorporated into the EMP. This may include nest searches, bat maternity roost surveys and established buffer zones."

ECCC-CWS notes that avoiding the bat breeding season (as suggested) does not provide adequate mitigation when a maternity roost is present. Maternity roosts are protected until there is documented evidence that the site has been unoccupied for two consecutive years.

21. Section 6.6.5 (page 6.34) "Nocturnal acoustic monitoring will be conducted prior to attain better understanding of the scale and composition of the migratory movements that may take place over the headland."

It is not clear to ECCC-CWS whether nocturnal acoustic monitoring will be conducted for bat species. If yes, ECCC-CWS recommends that the proponent ensure that nocturnal monitoring is conducted during the spring and fall migration periods, as well as the breeding season.

22. Section 6.6.5 (page 6.35) "Bird and bat mortalities will be reported to NRR and CWS where five bird mortalities are observed on one given night or, where 10 or more bird mortalities are recorded within any seve-day calendar period."

ECCC-CWS notes that the proponent has not provided a threshold for reporting bat fatalities to NRR and CWS.

Section 4.2.7 - Herpetofauna (Reptiles and Amphibians) / Section 6.5 - Wildlife and Wildlife Habitat

23. Quote (page 4.51) "A herpetofaunal survey will be conducted in the Project Area in spring or summer of 2023 with a focus on SAR/SOCC (I.e., wood turtle)."

ECCC-CWS notes that the detection rate of Wood Turtle (and other turtle species) during surveys can be low, and determining the presence/absence of individuals from a single survey can be challenging. ECCC-CWS recommends multiple passes to improve turtle detectability.

Additionally, ECCC-CWS recommends that the proponent contact the Province of Nova Scotia's Department of Natural Resources and Renewables for technical expertise and advice on Wood Turtle to ensure that survey methodology and proposed mitigation measures are aligned with the Province of NS' turtle special management practices.

General Comments:

Migratory Birds

Migratory birds, their eggs, nests, and young are protected under the Migratory Birds Convention Act (MBCA). Migratory birds protected by the MBCA generally include all seabirds (except for cormorants and pelicans), all waterfowl, all shorebirds, and most landbirds (birds with principally terrestrial life cycles). The list of species protected by the MBCA can be found at

<u>https://www.canada.ca/en/environment-climate-change/services/migratory-birds-legal-</u> <u>protection/convention-act.html</u>. Bird species not listed may be protected under other legislation.

Under Section 5(1) of the Migratory Bird Regulations, 2022 (MBR), it is forbidden to capture, kill, take, injure or harass a migratory bird; or damage, destroy or take a nest or egg of a migratory bird, excluding under the exceptions listed in 5(2) of the MBRs, or under the authority of a permit. It is important to note that under the MBR, no permits can be issued for the harm of migratory birds caused by development projects or other economic activities.

Furthermore, Section 5.1 of the MBCA describes prohibitions related to depositing substances harmful to migratory birds:

"5.1 (1) No person or vessel shall deposit a substance that is harmful to migratory birds, or permit such a substance to be deposited, in waters or an area frequented by migratory birds or in a place from which the substance may enter such waters or such an area.

(2) No person or vessel shall deposit a substance to be deposited in any place if the substance, in combination with one or more substances, result in a substance – in waters or an area frequented by migratory birds or in a place from which it may enter such waters or such an area – that is harmful to migratory birds."

It is the responsibility of the proponent to ensure that activities are managed so as to ensure compliance with the MBCA and associated regulations.

Vegetation Clearing

Clearing vegetation may cause disturbance to migratory birds, and may inadvertently cause the destruction of their nests and eggs. Most migratory bird species construct nests in trees (sometimes in tree cavities) and shrubs, but several species nest at ground level (e.g., Common Nighthawk, Killdeer, sandpipers), in hay fields, pastures or in burrows. Some bird species may nest on cliffs or in stockpiles of overburden material from mines or the banks of quarries. Some migratory birds (including certain waterfowl species) may nest in head ponds created by beaver dams. Some migratory birds (e.g., Barn Swallow, Cliff Swallow, Eastern Phoebe) may build their nests on structures such as bridges, ledges or gutters. In developing mitigation measures, it is incumbent on the proponent to identify the best approach, based on the circumstances, to complying with the MBCA. The following should be considered during project planning:

• Avoid scheduling high disturbance activities, such as vegetation clearing, during the regional nesting period for migratory birds. Information regarding regional nesting periods can be found at: https://www.canada.ca/en/environment-climate-change/services/avoiding-harm-migratory-birds/general-nesting-periods.html. Some species protected under the MBCA may nest outside these timeframes.

• The risk of impacting active nests or birds caring for pre-fledged chicks discovered during project activities outside of the regional nesting period can be minimized by measures such as the establishment of vegetated buffer zones around nests and minimization of activities in the immediate area until nesting is complete, and chicks have naturally migrated from the area.

• In developing and implementing a wildlife management plan, preventative measures to minimize the risk of impacts on migratory birds should be considered (see "Avoiding harm to migratory birds: guidelines to reduce the risk to migratory birds" at https://www.canada.ca/en/environment-climate-change/services/avoiding-harm-migratory-birds/reduce-risk-migratory-birds.html).

Nest Searches

Generally, ECCC-CWS does not recommend nest searches or sweeps in vegetation prior to clearing during the breeding season. Nests in complex habitat are difficult to locate, and adult birds avoid approaching their nests in a manner that would attract predators to their eggs or young. In many circumstances, harm to migratory birds is still likely to occur even when active nest searches are conducted prior to development activities, except when the nests searched are known to be easy to locate without disturbance (e.g., previously cleared area, simple habitats, low vegetation).

Some ground nesting species of migratory birds, including the threatened Common Nighthawk, may be attracted to previously cleared areas for nesting in the spring and summer if there is a delay between clearing activities (e.g., clearing conducted in the fall/winter and construction scheduled in the spring and summer).

Nest surveys may be carried out successfully by experienced observers using scientific methodology in the event that activities would take place in simple habitats (often in human-made settings) with only a few likely nesting areas or a small community of migratory birds. Examples of simple habitats include:

- An urban park consisting mostly of lawns with a few isolated trees;
- A vacant lot with few possible nest sites;
- A previously cleared area where there is a lag between clearing and construction activities and where ground nesters may have been attracted to nest in cleared areas or in stockpiles of soil; or,
- A structure such as a bridge, a beacon, a tower or a building (often chosen as a nesting spot by robins, swallows, phoebes, Common Nighthawk, gulls and others).

Nest searches can also be considered when looking for:

- Conspicuous nest structures (such as nests of Great Blue Herons, Bank Swallows, Chimney Swifts);
- Cavity nesters in snags (such as woodpeckers, goldeneyes, nuthatches); or,
- Colonial-breeding species that can be located from a distance (such as a colony of terns or gulls).

Should any nests or unfledged chicks be discovered, protection with an appropriate-sized buffer is expected. Note: Nests should not be marked using flagging tape or other similar material as this increases the risk of nest predation. ECCC CWS can be contacted for further advice on bird monitoring and/or mitigation if a nest is found.

Fuel Leaks

The proponent must ensure that all precautions are taken by the contractors to prevent fuel leaks from equipment, and that a contingency plan in case of oil spills is prepared. Furthermore, the proponent should ensure that contractors are aware that under the MBR, "no person shall deposit or permit to be deposited oil, oil wastes or any substance harmful to migratory birds in any waters or any area frequented by migratory birds." Biodegradable alternatives to petroleum-based chainsaw bar oil and hydraulic for heavy machinery are commonly available from major manufacturers. Such biodegradable fluids should be considered for use in place of petroleum products whenever possible, as a standard for best practices. Fueling and servicing of equipment should not take place within 30 meters of environmentally sensitive areas, including shorelines and wetlands.

Provisions for wildlife response activities should be identified in the Oil Spill Prevention and Response Plan to ensure that pollution incidents affecting Wildlife are effectively and consistently mitigated. The document "Guidelines for Effective Wildlife Response Plans" (ECCC, 2021) is attached and is provided to offer guidance on the development of wildlife response activities.

The following information should be included in any Oil Spill Prevention and Response Plan:

- Mitigation measures to deter migratory birds from coming into contact with the oil.
- Mitigation measures to be undertaken if migratory birds and/or sensitive habitat becomes contaminated with the oil.
- The type and extent of monitoring that would be conducted in relation to various spill events.

Working near Waterbodies or Riparian Environments

ECCC-CWS has the following recommended beneficial management practices for working on/near waterbodies or riparian environments:

- Project staff should not approach concentrations of migratory birds (e.g. seabirds, shorebirds, waterfowl, etc.).
- Project staff should use the main navigation channels or access roads to get to and from the site; and should have well muffled vessels and machinery.

- Project staff should undertake any measures that may minimize or eliminate discharge of oily waste into the marine or riparian environment.
- Food scraps and other garbage left near waterbodies or riparian environments can artificially enhance the populations of avian and mammalian predators of eggs and chicks. The proponent should ensure that no litter (including food waste) is left in coastal areas by their staff and/or contractors
- If there is any noticeable change in migratory bird numbers or distribution at the location during operations, ECCC-CWS should be notified.

Revegetation

A variety of species of plants native to the general project area should be used in revegetation efforts. Should seed mixes for herbaceous native species for the area not be available, it should be ensured that plants used in revegetation efforts are not known to be invasive.

Invasive Species

Measures to diminish the risk of introducing invasive species should be developed and implemented during all project phases. These measures could include:

- Cleaning and inspecting construction equipment prior to transport from elsewhere to ensure that no vegetative matter is attached to the machinery (e.g., use of pressure water hose to clean vehicles prior to transport).
- Regularly inspecting equipment prior to, during and immediately following construction in areas found to support Purple Loosestrife to ensure that vegetative matter is not transported from one construction area to another.

Noise Disturbance

Anthropogenic noise produced by construction and human activity can have multiple impacts on birds, including causing stress responses, avoidance of certain important habitats, changes in foraging behavior and reproductive success, and interference with songs, calls, and communication. Activities that introduce loud and/or random noise into habitats with previously no to little levels of anthropogenic noise are particularly disruptive.

ECCC-CWS recommends the following best management practices:

- The proponent should develop mitigations for programs that introduce very loud and random noise disturbance (e.g. blasting programs) during the migratory bird breeding season for their region.
- The proponent should, where possible, prioritize construction works in areas away from natural vegetation while working during the migratory bird breeding season. Conducting loud construction works adjacent to natural vegetation should completed outside the migratory bird breeding season.
- The proponent should keep all construction equipment and vehicles in good working order and loud machinery should be muffled if possible.

Lighting Attraction and Migratory Birds

Attraction to lights at night or in poor visibility conditions during the day may result in collision with lit structures, or with other migratory birds. Disoriented migratory birds are prone to circling light sources and may deplete their energy reserve and either die of exhaustion or be forced to land where they are at risk of depredation.

To reduce the risk of disturbance or harm to migratory birds related to human-induced light, ECCC-CWS recommends implementation of the following beneficial management practices:

- Use the minimum amount of pilot, warning and obstruction lighting needed on tall structures. Warning lights should flash and completely turn off between flashes.
- Use the fewest number of site-illuminating lights possible in the project area. Only use strobe lights at night, at the lowest intensity and the smallest number of flashes per minute allowable by Transport Canada.
- Reduce lighting levels during severe weather events that may force migratory birds to land to prevent birds from landing in areas that would cause injury, harm, or death.

• Avoid or restrict the time of operation of exterior decorative lights such as spotlights and floodlights whose function is to highlight features of buildings or to illuminate an entire building. These lights, especially on humid, foggy or rainy nights, can draw birds from far away. Turn off these lights during the migratory season when the risk to birds is highest and during periods when birds are dispersing from their nests or colonies.

- Shield safety lighting so that the illumination shines down. Only install safety lighting where it is needed, without compromising safety.
- Shield street and parking lot lighting so that little escapes into the sky, and it falls where it is required. Consider using LED lighting fixtures as they are generally less prone to light trespass.
- The proponent should make all reasonable attempts to limit construction activities to the day and avoid illuminating the habitat adjacent to the worksite.

Effects of Construction/Operations on Migratory Birds – Stranded Birds

Due to the propensity of seabirds from nearby colonies to be attracted to light, it is possible that migratory birds may be attracted to and potentially be stranded on the site. ECCC-CWS recommends that a site monitoring plan be developed for the migratory bird breeding season as well as the spring and fall migration periods and implemented while floodlights are being used during nighttime hours. A site monitoring plan could include protocols such as dusk and dawn site inspections to look for stranded birds that may have landed on site, and/or inclusion of migratory bird searches into standard occupational health and safety daily inspections, etc. ECCC-CWS recommends, at minimum, daily searches during early morning hours, particularly during early September to late November, to search for migratory birds that may become stranded on-site.

Should birds become stranded on the project site, both during construction and operations phases, the proponent is recommended to adhere to Procedures for handling and documenting stranded birds encountered on infrastructure offshore Atlantic Canada (attached; it should be noted that this reference document has been developed for offshore vessels, and may require modification for use on an onshore facility). ECCC-CWS should be notified if bird stranding incidents occur. A seabird handling permit will be required to implement the instructions in this reference document and the proponent must be advised that such a permit would have to be in place prior to the initiation of proposed activities. Please note that MBCA permit applications can be obtained from ECCC-CWS via email at <u>Permi.atl@ec.gc.ca</u>.

Infrastructure, Buildings and Bridges

Certain species of migratory birds may nest on the sides of buildings, bridges or other pieces of infrastructure. Additionally, some species may nest on equipment, if they are left unattended/idle for long periods of time.

ECCC-CWS recommends the following beneficial management practices:

• The proponent should ensure that project staff are aware of the potential of migratory bird bests on infrastructure, buildings, and bridges, if applicable.

• If a nest is discovered, the proponent should conduct no activities around the nest that cause the nest to be abandoned or destroyed. Activities should be suspended until the chicks have fledged and left the area.

• If the proponent anticipates that birds may nest on infrastructure, the proponent should install anti-perching and nesting exclusion devices (e.g. mesh netting, chicken wire fencing, etc.) before any nest attempts are made.

Species at Risk

The section 32 of the Species at Risk Act (SARA) "General prohibitions" apply to this project. In applying the general prohibitions, the proponent, staff and contractors, should be aware that no person shall:

- kill, harm, harass, capture or take an individual species at risk (SAR);
- possess, collect, buy, sell or trade an individual, or any part or derivative;
- damage or destroy the residence of one or more individuals.

General prohibitions only apply automatically:

- on all federal lands in a province,
- to aquatic species anywhere they occur,
- to migratory birds protected under the Migratory Birds Convention Act (MBCA) 1994 anywhere they occur.

Section 33 of SARA prohibits damaging or destroying the residence of a listed threatened, endangered, or extirpated species. For migratory bird SAR, this prohibition immediately applies on all lands or waters (federal, provincial, territorial and private) in which the species occurs.

In federal environmental assessment (EA), ss.79(2) of SARA requires that person(s) responsible for an EA to: 1) identify adverse effects on all listed species 2) if the project is carried out, ensure that measures are taken to avoid or lessen those effects; and, 3) monitor them. While there is not a federal EA for this project, ECCC advocates a similar approach for the provincial EIA.

For species which are not listed under SARA, but are listed under provincial legislation only, or that have been assessed and designated by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC), it is best practice to consider these species in EA as though they were listed under SARA.

Avian species at risk:

The following avian species at risk (as listed on Schedule 1 of the Species at Risk Act) may occur within the study area: Bank Swallow (Threatened), Barn Swallow (Threatened), Bobolink (Threatened), Canada Warbler (Threatened), Chimney Swift (Threatened), Common Nighthawk (Threatened), Eastern Meadowlark (Threatened), Eastern Whip-poor-Will (Threatened), Olive-sided Flycatcher (Threatened), Eastern Wood-Pewee (Special Concern), Evening Grosbeak (Special Concern), Rusty Blackbird (Special Concern). ECCC-CWS requests that any species at risk sightings be reported to ECCC-CWS. SAR observations should also be submitted to the Atlantic Canada Conservation Data Centre, directions on how to contribute data can be found at: http://accdc.com/en/contribute.html.

Non-avian species at risk:

The following non-avian species at risk (listed on Schedule 1 of the Species at Risk Act or assessed as "at risk" by COSEWIC) may occur within the study area: Little Brown Myotis (Endangered), Northern Myotis

(Endangered), Tri-Colored Bat (Endangered), Wood Turtle (Threatened), Blue Felt Lichen (Special Concern). ECCC-CWS requests that any species at risk sightings be reported to ECCC-CWS. SAR observations should also be submitted to the Atlantic Canada Conservation Data Centre, directions on how to contribute data can be found at: <u>http://accdc.com/en/contribute.html</u>.

Bats

The Government of Canada published factsheets providing information on the Emergency Listing Order, the disease threatening bats, the requirements of SARA, and ways to protect and preserve bat populations. The factsheet "Factsheet on the Emergency Listing Order for the Little Brown Myotis, the Northern Myotis and the Tri-Colored Bat" is available on the SARA registry at: Factsheet on the Emergency Listing Order for the Little Brown Myotis, the Northern Myotis and the Tri-colored Bat - Document search - Species at risk registry (canada.ca).

 ECCC-CWS recommends that the proponent consult the Province of Nova Scotia's Department of Natural Resources and Renewables regarding mitigations and management for this species.

<u>Wetlands</u>

ECCC-CWS recommends that the project proponent follow the mitigation options outlined in the Federal Policy on Wetland Conservation (FPWC). The FPWC was introduced "to promote the conservation of Canada's wetlands to sustain their ecological and socio-economic functions, now and in the future". The policy recognizes the importance of wetlands to the environment, the economy and human health and promotes a goal of No Net Loss of Wetland Function as a result of the Government of Canada exercising a duty, function, or power in areas of Canada where wetland loss has reached critical levels. In support of this goal, the FPWC and related implementation guidance identify the importance of planning siting and designing a project in a manner that accommodates a consideration of mitigation options in a hierarchical sequence – avoidance, minimization, and as a last resort, conservation allowances (i.e. compensation). A copy of the FPWC can be found at:

http://publications.gc.ca/site/eng/9.686114/publication.html.

While the Federal Policy on Wetland Conservation does not appear to apply to this project, ECCC advocates for the conservation of wetlands in areas where wetland losses have already reached critical levels and regionally important wetlands. ECCC-CWS recommends that project effects on wetlands be avoided. Where they cannot be avoided they should be minimized, and for residual impacts there should be compensation to mitigate the effects. ECCC recommends the development of a Wetland Compensation Plan that fully describes the mitigation hierarchy, including:

- Identification of wetlands potentially affected by the project,
- A detailed description of potential effects, and the reasons why avoidance and minimization of impacts were determined to be not possible, and
- Identification and justification of proposed offset ratios.

As a mitigation measure to compensate for the lost habitat function for wetland associated landbird species at risk and species of conservation concern, in instances where such habitat cannot be avoided, ECCC-CWS recommends the use of conservation allowances as a third step in the mitigation hierarchy of avoidance, mitigation and compensation.

 General Beneficial Management Practices
 In order to promote wetland conservation, ECCC-CWS recommends the following general beneficial management practices:

- o Developments on wetlands should be avoided.
- o Where development does occur in the vicinity of wetlands, a minimum vegetation buffer zone of 30 metres should be maintained around existing wetlands areas.
- o Hydrological function of the wetland should be maintained.
- o Runoff from development should be directed away from wetlands.

o The use of a 30 metre buffer from the high water mark of any water body (1:100 Flood Zone) in order to maintain movement corridors for migratory birds. Please see

https://www.canada.ca/en/environment-climate-change/services/avoiding-harm-migratorybirds/reduce-risk-migratory-birds.html

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From: Zwicker, Stephen (ECCC) <stephen.zwicker@ec.gc.ca>
Sent: Friday, March 24, 2023 3:48 PM
To: Mageste da Silva, Renata <Renata.MagestedaSilva@novascotia.ca>
Cc: Hingston, Michael (il, lui | he, him) (ECCC) <Michael.Hingston@ec.gc.ca>; Kabanguka, Carl Lewis
(ECCC) <CarlLewis.Kabanguka@ec.gc.ca>
Subject: PE: Rear Head Energy Green Hydrogen and Ammonia Broject - Environmental Accessment

Subject: RE: Bear Head Energy Green Hydrogen and Ammonia Project – Environmental Assessment – Comments due March 23_2023

** EXTERNAL EMAIL / COURRIEL EXTERNE **

Exercise caution when opening attachments or clicking on links / Faites preuve de prudence si vous ouvrez une pièce jointe ou cliquez sur un lien

Hi Renata,

As I indicated, ECCC has also reviewed the Registration Document for issues related to our mandate and expertise on environmental emergencies. Please see the comments below for your consideration:

Spill Management and Control

Overall the Registration Document provides sufficient information on the management of potential environmental emergencies with the exception of information on the location of surface drains and how they will be protected/avoided/deviated during a spill.

The document mentions the use of secondary containment around the ammonia storage tank (section 4.2.4, appendix H) but this information does not address issues relating to potential contaminants entering surface drains. Additionally, in section 7.2.2 it is stated that "In the event of a vapor release or a liquid release resulting in a vapour cloud, a water fog, water jets, and/or fine water spray will be employed to knock down the ammonia. Given that ammonia is highly soluble in water, this will prevent or reduce the ammonia from escaping a controlled area." Although, the response measure is adequate, surface runoff from the knocked down vapors turned liquid may enter surface drains if no measures are in place to avoid this from occurring. In the event that no protection measures are considered to avoid contaminants from entering surface drains, there is still a risk of contaminants entering the surrounding environment. ECCC recommends the proponent provide additional information on mitigation measures to avoid this occurrence.

Environmental Emergency Regulations

The Environmental Emergency Regulations contain a list of substances under the CEPA, and other hazardous substances which, if they enter the environment as a result of an environmental emergency, (i) have or may have an immediate or long-term harmful effect on the environment or its biological diversity, (ii) constitute or may constitute a danger to the environment on which human life depends, or (iii) constitute or may constitute a danger in Canada to human life or health. From the information provided in the EA Registration Document (Appendix H, Section 2.5) the proponent should be aware that the volume ammonia to be stored (124 000 m³) would trigger the threshold for that substance under the Regulations.

The Regulations set out specific requirements for the preparation of environmental emergency plans and reporting of accidental releases. It is the responsibility of the Proponent to ensure that environmental emergency plans are consistent with the requirements of CEPA and the associated Regulations.

Further information on the requirements, including *Implementation Guidelines for the Environmental Emergency Regulations* can be found at: <u>https://www.canada.ca/en/environment-climate-change/services/environmental-emergencies-program/regulations.html</u>.

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From: Zwicker, Stephen (ECCC)
Sent: Friday, March 24, 2023 3:21 PM
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<<u>Brian.Drover@ec.gc.ca</u>>
Subject: RE: Bear Head Energy Green Hydrogen and Ammonia Project – Environmental Assessment – Comments due March 23_2023

Hi Renata,

Environment and Climate Change Canada (ECCC) has reviewed the Bear Head Energy Green Hydrogen and Ammonia Project Environmental Assessment Registration Document for issues related to our mandate and expertise on water quality and related site conditions. Please find our comments below for consideration in the environmental assessment of this project. ECCC continues to review the Registration Document for issues related to migratory birds, species at risk and environmental emergencies and we will forward any additional comments to you as soon as they are available.

Water and Sediment Quality

Fisheries Act

The proponent has indicated in the EA Registration that they are "seeking regulatory approval to discharge to the marine environment". In terms of federal regulations, it should be noted that there is no permitting mechanism under the Fisheries Act to approve such a discharge. The proponent should be aware of the following:

- Subsection 36(3) of the Fisheries Act prohibits the deposit of any deleterious substances in water frequented by fish or to any place where it may enter water frequented by fish, regardless of the ability of the receiving water to assimilate the deposit, unless authorized by federal regulations. Deleterious substances include any substance that, if added to water, would degrade, alter or form part of a process of degradation or alteration of the quality of water so that it is rendered deleterious to fish or fish habitat or to the use of fish by humans.
- There are currently no regulations under the Fisheries Act that authorize the deposit of industrial effluents from a facility, such as the one described in this project, into water frequented by fish. If these deposits were determined to be deleterious, they would be prohibited under the Fisheries Act.
- For more information on the pollution prevention provisions of the Fisheries Act, please visit https://www.canada.ca/en/environment-climate-change/services/managing-pollution/fisheries-act-registry/frequently-asked-questions.html.

Current Site Conditions

As any monitoring and sampling programs are developed and implemented for the project, the proponent should identify any relevant data or information from previous environmental assessments or other monitoring programs in the project area that could help inform these programs.

Section 4.2.2 (Freshwater fish and fish habitat) states that: "To inform the current EA, further surveys were completed in November 2022 to confirm stream conditions had not changed substantively from 2003 and 2014 and to provide an updated description of fish habitat characteristics in Streams A and B." Section 4.3 (Marine Biological Environment) states that "No new studies were undertaken to characterize the marine environment for this EA Registration." Section 4.3 also states that "The description of the marine environment relies primarily on the Bear Head LNG Updated Registration Document (SNC Lavalin 2015), which incorporated information from the Environmental Assessment for the Proposed Bear Head LNG Terminal (JW 2004). Benthic habitat surveys undertaken in the Strait of Canso (Stantec 2016) and the Project Area (CBCL 2016a) have also been referenced where appropriate." It is important that the baseline conditions described are confirmed to be current and relevant in order to verify the appropriate parameters for any required monitoring of discharges to the marine environment and to accurately identify the potential environmental receptors.

Section 4.3.2 (Marine water and sediment quality) states that: "*PCB levels below guidelines in silt clay sediments but elevated in other areas (Tay et al. 2010)*". Given the potential to resuspend PCB impacted sediments, the possibility for construction or operational activities to occur in these other areas of the marine environment should be discussed. Much of the sediment data is quite dated and without more recent sediment baseline data, it may be difficult to differentiate potential future contamination from site activity from pre-existing contamination from other sources.

In section 5.2.4 (*Assessment Boundaries*), Project Area, Local Assessment Area (LAA) and Regional Assessment Area (RAA) are defined. It is not always clear to what extent baseline conditions have been established in soils, sediments, or water to facilitate conclusions with respect to the predicted severity of environmental effects within these boundaries. In general, baseline quality data should be collected prior to any construction or operational phases of the project to accurately monitor any possible effects on the receiving environment.

Water Use and Discharge Characterization

Section 1.2 (*Project Overview*) discusses the raw water demand (estimated 15 million litres of water/day) from this project and compares it to existing demand on water resources from other users. It is not clear that there is an up-to-date water balance model to verify that all water demands can be accommodated through all seasons and expected water reservoir conditions even if other projects are built in the area (e.g. proposed Everwind project).

Section 2.11.4 (*Site Water Discharges*) states that "*Stormwater runoff will be attenuated in water management pond(s) prior to discharge into the Strait of Canso*". It is not clear what is meant by "attenuate" in this context.

APPENDIX F (Assimilative Capacity Study) states that "The production of hydrogen requires deionized water as a feedstock. Approximately 4 million gallons (15 million litres) of raw water will be treated on average through a two-stage reverse osmosis and deionization process prior to use in the electrolyser. It is estimated that the reject discharge volume per day from the treatment process will be approximately one-third the volume of the intake water (approximately 5 million litres per day on average)". If there are any other wastewater components associated with hydrogen and ammonia production that will be discharged the proponent should provide a full characterization of the effluent.

Monitoring and Mitigation

In section 5.2.4 (*Assessment Boundaries*), Project Area, Local Assessment Area (LAA) and Regional Assessment Area (RAA) are defined. It is not always clear to what extent baseline conditions have been established in soils, sediments, or water to facilitate conclusions with respect to the predicted severity of environmental effects within these boundaries. In general, baseline quality data should be collected prior to any construction or operational phases of the project to accurately monitor any possible effects on the receiving environment.

Section 5.4 (Assessment of Residual Effects) states that "In consideration of potential interactions and effects, and proposed mitigation, residual effects are then predicted for each VC. Residual effects are generally characterized in terms of magnitude, geographic extent, duration, frequency, reversibility and ecological and/or socio-economic context. Table 5.3 defines descriptors used to characterize residual environmental effects." For each VC, it is not always clear how the descriptors in Table 5.3 are assigned which creates uncertainty around assessment of direct and indirect residual effects and subsequent conclusions of significance.

Section 5.5 (Follow-up and Monitoring) states that "In cases where there may be uncertainty around effects predictions and/or effectiveness of mitigation, follow-up and/or monitoring programs may be proposed. Monitoring may also be required to demonstrate regulatory compliance Recommended follow-up and monitoring programs are described as appliable for each VC." Note that monitoring for regulatory compliance has a different goal than follow-up monitoring to address uncertainty associated with environmental effects predictions in an environmental assessment process. It is important that follow-up monitoring be designed to ensure it is reflective of the descriptors as discussed in the comments on Section 5.4 above.

Section 6.3.1.1 (Regulatory and Policy setting) states that "CCME guidelines are often used to inform project-specific discharge criteria during the regulatory permitting process." Note that the use of CCME guidelines, which are non-regulatory environmental benchmarks, should be done with caution, as they may not satisfy all regulatory requirements

Section 6.7.1.1 (*Marine Environment: Regulatory and Policy Setting*) states that the "federal Fisheries Act protects fish and fish habitat and addresses national interests in marine and fresh waters with the goal of protecting the long-term sustainability of aquatic resources." This reference to the Fisheries Act should be added to 6.3.1.1 (*Surface Water Resources: Regulatory and Policy Setting*).

Section 6.3.5 (Follow up and monitoring) states that: "A quarterly surface water monitoring program will be undertaken to monitor the freshwater receiving environment at the site." Details on the proposed monitoring program (e.g sampling locations, the number of samples for each location, monitoring parameters, etc.) as well as a summary of the baseline data should be provided. Similar details for any monitoring programs planned for the marine environment (including surface water and sediment) should also be provided. Baseline monitoring can be used to support and interpret future monitoring and as noted above it should be verified that any baseline monitoring program design effectively monitors all potential sources of contaminants from the Project considering exposure pathways and receptors.

Section 6.7.3 (Mitigation) states that: "BHE will adhere to the conditions of the existing Fisheries Act and Canadian Navigable Waters Act authorizations and will implement the following mitigation: Site water discharges (stormwater, domestic wastewater, reject process water) will be managed and discharged in accordance with applicable regulatory discharge criteria. BHE will work with NSECC and DFO to confirm appropriate discharge criteria and treatment design (if required) and obtain the necessary regulatory approvals prior to operations commencing." As noted above, all discharges must also be in compliance with Section 36(3) of the Fisheries Act.

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Canada

Guidelines for Wildlife Response Plans











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 $\ensuremath{\mathbb{C}}$ Her Majesty the Queen in Right of Canada, represented by the Minister of Environment and Climate Change, 2022

Aussi disponible en français

Abstract

Environment and Climate Change Canada's Canadian Wildlife Service (ECCC-CWS) is responsible for the management and conservation of Wildlife under its jurisdiction. The Guidelines for Wildlife Response Plans outline the rationale, objectives, and process for developing, implementing and evaluating the efficacy of Wildlife response planning for Pollution and Non-Pollution Incidents. This document supports the standardization of the planning process according to ECCC-CWS's recommendations. The purpose of this document is to guide governments, Indigenous organizations, industry, Response Organizations, and other stakeholders in developing Wildlife Response Plans that consider all aspects of planning throughout the full life cycle of an incident with regards to Wildlife specific to ECCC-CWS's mandate.

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List of Acronyms

CWA	Canada Wildlife Act, 1985		
CWS	Canadian Wildlife Service		
ECCC	Environment and Climate Change Canada		
ECCC-CWS	Environment and Climate Change Canada's Canadian Wildlife Service		
ICP	Incident Command Post		
ICS	Incident Command System		
IPIECA	International Petroleum Industry Environmental Conservation Association		
MBCA	Migratory Birds Convention Act, 1994		
MBR	Migratory Birds Regulations		
MBSR	Migratory Bird Sanctuary Regulations		
NWA	National Wildlife Area		
RP	Responsible Party		
SARA	Species at Risk Act, 2002		
WRP	Wildlife Response Plan		
WRO	Wildlife Response Organization		

Definitions

Chain of Custody: A written record for a legal sample documenting the continuity by tracing the possession of the sample from the point of collection through introduction into evidence.

CWS Co-ordinator: A person who leads and implements regional Wildlife Emergency preparedness and response on behalf of ECCC-CWS and represents ECCC-CWS's policies and interests when liaising and integrating with other federal and provincial/territorial government departments, Indigenous governments and organizations, and stakeholders involved in the response during Wildlife Emergencies. CWS Co-ordinators may also fulfill some of the on-site roles of responder.

CWS Responder: Emergency response personnel that provide on-site support on behalf of ECCC-CWS, as directed by the CWS Co-ordinator, during Wildlife Emergencies.

Environmental Emergency: Any uncontrolled or unexpected incident involving the release (or the likelihood thereof) of a polluting substance into the environment that results or may result in an immediate or long-term harmful effect on the environment, or constitutes or may constitute a danger to human life or health. It may be caused by an industrial activity, natural emergency or by a wilful act.

Field Stabilization Site: Facility that provides initial triage, care and/or euthanasia as well as shortterm holding (sometimes overnight) for Wildlife prior to transport to an Oiled Wildlife Rehabilitation Centre. It is not meant for washing oiled Wildlife and not designed for long-term care.

Incident Command: Responsible for overall management of the incident and consists of the Incident Commander, either single or unified command, and any assigned supporting staff.

Incident Commander: The individual responsible for all incident activities, including the development of strategies and tactics and the ordering and release of resources. The Incident Commander has overall authority and responsibility for conducting incident operations and is responsible for the management of all incident operations at the incident site.

Lead Agency: The governmental authority that regulates or has legislative authority over the responsible parties' response and is responsible for overseeing the appropriateness of the response.

Migratory Bird: As defined in the <u>Migratory Birds Convention Act, 1994</u>, a Migratory Bird referred to in the Convention, and includes the sperm, eggs, embryos, tissue cultures and parts of the bird of species listed under Article 1 of the Convention (Government of Canada 2017).

National Environmental Emergencies Centre (NEEC): Environment and Climate Change Canada's 24/7 focal point for pollution-related emergencies, providing technical/scientific advice, assistance and coordination to the Lead Agency, as well as management of an incident when required.

National Wildlife Area: A protected area created under the <u>Canada Wildlife Act</u> that contains nationally significant habitats for plants and animals and that is managed for the purposes of wildlife conservation, research and interpretation.

Non-Pollution Incident: An uncontrolled or unexpected Wildlife injury or mortality event other than a Pollution Incident.

Oiled Wildlife Rehabilitation Centre: Facility used for the triage, stabilization, cleaning, prerelease conditioning and/or euthanasia of oiled Wildlife. The centre may be a permanent purposebuilt facility, an existing Wildlife rehabilitation centre, a mobile facility, or a temporary facility established during an incident.

Pollution Incident: The release or deposit of a substance that is harmful to Wildlife into an area or waters that are frequented by Wildlife or into a place from which the harmful substance may enter an area or waters frequented by Wildlife.

Resource Agency: Any department or agency, other than the Lead Agency, that has jurisdiction or interest in the response, which provides support to the Lead Agency.

Response Organization: Any qualified person or organization that has been certified and designated by the Minister of Transport to carry out emergency response activities (as per the revised <u>Canada Shipping Act (2001)</u>). In Canada, there are four Response Organizations as follows: Atlantic Emergency Response Team, Eastern Canada Response Corporation Ltd., Western Canada Marine Response Corporation, and Point Tupper Marine Services Ltd.

Responsible Party: Any person or organization who might be responsible for the source or cause of an environmental emergency and/or a Wildlife Emergency.

SARA-listed Species: A wildlife species listed on the List of Wildlife Species at Risk set out in Schedule 1 of the Species at Risk Act (SARA).

Species at Risk: As defined in the *Species at Risk Act* (S.C. 2002, c.29), means an Extirpated, Endangered or Threatened species, or a species of Special Concern.

Unified Command: An application of the Incident Command System, used when there is more than one agency with incident jurisdiction or when incidents cross political jurisdictions. Agencies work together through the designated members of the Unified Command to establish a common set of objectives and strategies and a single Incident Action Plan.

Wildlife: In this document, "Wildlife" is used to refer to the terms Migratory Birds as defined under the *Migratory Birds Convention Act,* and listed Species at Risk as those terms are defined under the *Species at Risk Act* for species falling within the jurisdiction of the Minister of Environment and Climate Change (with the exception of individuals of SARA-listed Species that are located on lands administered by Parks Canada). This term also refers to all wild species occurring in the National Wildlife Areas set out on Schedule I of the *Wildlife Area Regulations* (C.R.C., c. 1609).

Wildlife Emergency: A Pollution or Non-Pollution Incident that results or may result in an immediate and/or long-term harmful effect on the life or health of Wildlife and/or their habitat.

Wildlife Response Organization: Organizations that provide expertise, capabilities and trained personnel to undertake one or several aspects of response, including planning, implementation and reporting of activities related to Wildlife Emergencies. Wildlife Response Organizations (or representatives thereof) are authorized under applicable federal, provincial, and/or territorial legislation to capture, transport, clean, rehabilitate, euthanize, and release Wildlife.

Wildlife Response Plan: A document that outlines the initial and ongoing Wildlife-related strategies that are needed to support any Wildlife response objectives that may occur at the onset of a Pollution or Non-Pollution Incident

1.0 Introduction

Environmental protection legislation in Canada at the federal, provincial or territorial level contains provisions to have approved contingency plans in the event of an environmental emergency for construction, operation or decommissioning activities that may impact the environment. Projects undergoing an environmental assessment may include additional conditions upon approval to develop and implement an environmental protection plan. All contingency plans/environmental protection plans for which a threat to Wildlife is identified may have specific sections dedicated to Wildlife response in order to be in compliance with applicable federal, provincial, or territorial legislation.

Environment and Climate Change Canada's Canadian Wildlife Service (ECCC-CWS) oversees and/or leads Wildlife Emergency response activities in association with Environment and Climate Change Canada (ECCC)'s responsibilities under the Migratory Birds Convention Act, 1994 (MBCA) and its regulations (Migratory Birds Regulations (MBR) and Migratory Bird Sanctuary Regulations (MBSR)), the Species at Risk Act, 2002 (SARA), the Canada Wildlife Act, 1985 (CWA), and Wildlife Area Regulations. Through these pieces of legislation, ECCC-CWS is responsible for the management and conservation of all Migratory Birds and Species at Risk under its jurisdiction (hereafter "Wildlife") and how they are managed during a Pollution or Non-Pollution Incident. In the case of Migratory Birds, including SARA-listed Migratory Bird species, this document applies to wherever they are found in Canada. For other SARA-listed Species, this document applies to individuals that are located on federal lands in the provinces, on lands under the authority of the Minister of Environment and Climate Change in the territories, or in the exclusive economic zone or on the continental shelf of Canada (with the exception of individuals of SARA-listed Species under the jurisdiction of Parks Canada or Fisheries and Oceans Canada) (see also Section 2.2 for additional details). For greater clarity, this document does not apply to any wildlife species, including aquatic species (which include fish, marine mammals, marine turtles, and marine plants, as defined in Sections 2 and 47 of the *Fisheries Act*), located on any lands or in any waters administered by Parks Canada or under the jurisdiction of Fisheries and Oceans Canada. The CWA and Wildlife Area Regulations broaden the responsibility of ECCC-CWS to include habitats and all wild species within designated National Wildlife Areas (NWAs).

1.1 Scope

Wildlife Emergencies, in the context of this document, include Pollution or Non-Pollution Incidents that result or may result in an immediate and/or long-term harmful effect on the life or health of Wildlife and/or their habitat. Pollution Incidents with potential harm to Wildlife are prohibited under the MBCA and SARA. Non-Pollution Incidents are uncontrolled or unexpected Wildlife injury or mortality events other than a Pollution Incident, which may include things such as disease outbreaks, mass strandings, or other unexplained Wildlife deaths. The degree to which any Pollution or Non-Pollution Incident may be deemed a Wildlife Emergency is dependent on a number of factors such as the scope and severity of the incident (e.g., numbers of animals or area of habitat impacted), the likelihood of an incident expanding, potential for impacts to Species at Risk, and potential link to human health, among other factors. The appropriate level of response expected to incidents should be reasonable and commensurate with the risks. ECCC-CWS is responsible for informing various aspects of response to Wildlife Emergencies, including the development and implementation of Wildlife response strategies and activities, as outlined in the *National Policy on Wildlife Emergency Response* (ECCC-CWS 2021).

During an incident, Responsible Parties (RPs) must demonstrate their ability to safely, efficiently, and effectively respond in a manner that incorporates measures designed to avoid or minimize harm to Wildlife, while managing the public's understanding of response decisions and activities. In the absence of an RP during an incident (e.g., mystery spill), or for planned operations with a potential to impact Wildlife (e.g., oil removal from wreckages), the Lead Agency is deemed responsible for implementing Wildlife response appropriate to that incident.

Wildlife Response Plans (WRPs) are documents that formalize the guidance and strategy for responding to incidents with potential to impact Wildlife. A WRP should include the following elements:

- The objectives of implementing a WRP with respect to managing or preventing harm to Wildlife and its habitat during a Pollution or Non-Pollution Incident
- A description of the incident management structure for Wildlife response and how it is integrated into an incident-specific response command system (e.g., an Incident Command Post (ICP))
- Background information on responsibilities of the RP as well as regulatory requirements, permits, and authorizations to engage in Wildlife response activities
- Information on Wildlife and its habitat known or potentially impacted by an incident
- A description of Wildlife response procedures to be implemented immediately following an incident (e.g., deterrence and dispersal, surveillance)
- A description of the operational structure and implementation of ongoing Wildlife response efforts throughout all phases of an incident
- Procedures for information management and communication, including to key stakeholders (e.g., local communities, hunters)
- Health and safety, security, and training requirements for personnel, equipment, and facilities required to support Wildlife response activities

The purpose of this document is to guide federal, provincial/territorial and Indigenous governments, Indigenous organizations, industry, Response Organizations, and other stakeholders in developing a WRP that considers all aspects of planning throughout the full lifecycle of an incident. This document outlines the attributes that are necessary for effective implementation of Wildlife Emergency response. Proponents should keep in mind that the guidance provided within this document is developed by ECCC-CWS for species' protection within their mandate. As such, proponents developing comprehensive WRPs should also consult with other federal, provincial/territorial and Indigenous governments or agencies where applicable (e.g., for mammals, reptiles, amphibians, fish and some bird species not under the jurisdiction of the MBCA).

2.0 Regulatory Requirements

2.1 Applicable Legislation

ECCC-CWS is responsible for ensuring that all Wildlife response activities are coordinated, enacted, and carried out in compliance with applicable federal law. Federal legislation applicable to Wildlife response includes:

• *Migratory Birds Convention Act* (MBCA): Section 5 of the MBCA prohibits the deposit of harmful substances into waters or areas frequented by Migratory Birds, unless authorized under the *Canada Shipping Act, or* the substance is of a type and quantity, and the deposit is made

under conditions, authorized under an Act of Parliament other than the *Canada Shipping Act, 2001* or authorized for scientific purposes by the Minister of Environment and Climate Change. Section 6 of the *Migratory Birds Regulations* (MBR) made under the MBCA prohibits the disturbance, destruction, taking of a nest, egg, nest shelter, eider duck shelter or duck box of a Migratory Bird, or anyone from having in his possession a live Migratory Bird, or a carcass, skin, nest or egg of a Migratory Bird. The MBR regulate the hunting of Migratory Birds and other circumstances under which the killing, capturing of and harming of Migratory Birds may be authorized. The *Migratory Bird Sanctuary Regulations* (MBSR) further regulate activities related to Migratory Birds and their habitats within designated Migratory Bird Sanctuaries. Permits may be issued to authorize the permit holder to undertake activities that are otherwise prohibited (Government of Canada 2017).

- **Species at Risk Act (SARA):** SARA permits are required for activities affecting a SARA-listed Species, any part of its critical habitat or the residences of its individuals. For the purpose of SARA, an "activity affecting" means any activity prohibited under the Act or its regulations. Section 73 of SARA authorizes the issuance of permits for activities affecting a SARA-listed Species, any part of its critical habitat or the residences of its individuals, and sets out conditions that must be met before a competent minister can issue a permit. SARA prohibitions apply to any species listed on Schedule 1 as Threatened, Endangered or Extirpated, but do not apply to species listed as Special Concern.
- **Canada Wildlife Act (CWA):** The CWA allows for the establishment of National Wildlife Areas (NWAs), which protect wildlife habitat in Canada. The *Wildlife Area Regulations* identify all NWAs and prohibit certain activities from occurring within NWAs, but Section 3.4 of the *Wildlife Area Regulations* provides exemptions for the prohibited activities within the NWAs in the event of an emergency response effort (e.g., ensuring public safety and national security). The Scott Islands marine NWA has its own regulations, *Scott Islands Protected Marine Area Regulations*, which also provide exemptions for the prohibited activities in the event of an emergency response effort.

Further to these Wildlife specific pieces of legislation, other environmental protection legislation in Canada at the federal, provincial or territorial level contain additional provisions which require approved contingency plans in the event of an environmental emergency for construction, operation or decommissioning activities that may impact the environment. Projects undergoing an environmental assessment may require the development and implementation of an environmental protection plan, conditional upon approval.

Where contingency plans/environmental protection plans identify a threat to Wildlife, ECCC-CWS considers a WRP to fulfill some of these requirements if contingency and emergency response planning efforts adequately address the identified Wildlife issues.

ECCC-CWS recommends that strategic WRPs be developed prior to incidents for activities or areas where the potential for, or associated risk of a Wildlife Emergency is high (see <u>Section 3.2</u> for more details). These strategic plans may be standalone plans or components (or annex) to overarching response plans (e.g., operators' facilities response plans). Incident-specific WRPs are routinely developed as part of the ICP to standardize and document Wildlife response activities during an incident (<u>Section 3.2</u>). Both approaches are in keeping with international standards for Wildlife response planning (International Petroleum Industry Environmental Conservation Association (IPIECA) 2014).

2.2 Permits and Authorizations

As part of Wildlife Emergency response, Wildlife Response Organizations (WROs) are often responsible for undertaking response activities involving direct interaction with Wildlife including the capture, collection, transport, and care/rehabilitation, release, and/or euthanasia of impacted Wildlife. Some WROs operating in Canada may retain annual permits that allow certain levels of immediate response, assuming permits are renewed and standards are maintained. Qualifications of these organizations to perform certain activities are assessed during the permit application process. Otherwise, a WRO will work with ECCC-CWS to obtain incident-specific permits for aspects of Wildlife Emergency response requiring authorizations. Other qualified individuals, working for or contracted by WROs, Response Organizations, the RP, or government agencies, may also apply for permits, as required. Permit and authorization requirements are summarized in <u>Table 1</u>.

ECCC-CWS recognizes deterrence and dispersal as a beneficial practice during Wildlife Emergencies. If proponents plan to use deterrence and dispersal tactics during a Wildlife Emergency, this should be described in a WRP (<u>Section 4.5.5</u>), and ECCC-CWS should be consulted to provide guidance on effective tactics for species, seasons, and habitats.

For most of the activities listed in <u>Table 1</u>, activities affecting SARA-listed Migratory Birds may be permitted through the issuance of SARA compliant MBCA-permit (Scientific Permit or Banding Permit). It is important to note that a SARA permit cannot be issued for an activity that would have a prohibited effect on a listed Migratory Bird for which a permit is not available under the MBCA and its regulations. For activities affecting SARA-listed Species, other than a Migratory Bird, permits may be issued under Section 73 of SARA. Specifically, ECCC-CWS SARA permits are required for SARA-listed Species that, a) are located on federal lands in the provinces, b) are located on lands administered by the Minister of Environment and Climate Change in the territories; c) are located in the exclusive economic zone or on the continental shelf of Canada; or d) are the subject of an order of the Governor in Council under SARA, including an order pertaining to the species' critical habitat or habitat that is necessary for the survival or recovery of the species (except for species under the jurisdiction of Parks Canada or Fisheries and Oceans Canada). <u>Table 1</u> outlines examples of activities that require permits for SARA-listed Species. For additional clarification on the permitting provisions and how to apply for a SARA permit, please consult the *Species at Risk Public Registry Policies and Guidelines* (Government of Canada 2020).

For emergency response activities occurring on Migratory Bird Sanctuaries, permits are required on a site-specific basis (<u>Table 1</u>). Some types of activities that require authorization on Migratory Bird Sanctuaries include carrying firearms and other weapons, and possession/handling of any animal, carcass, skin, nest, egg or part of those things. These activities may be authorized by permits issued under the MBSR.

With respect to NWAs, a permit is not required to carry out emergency relief activities, as per Section 3.4 of the *Wildlife Area Regulations*. With respect to the Scott Islands marine NWA, a permit is not required to carry out emergency relief activities, as per Section 3 of the *Scott Islands Protected Marine Area Regulations*.

Table 1. Wildlife-related Permits and Authorization Requirements that may be issued by ECCC-CWS¹ during a Wildlife Emergency.

Wildlife	Permit Type	Examples of Activities that Require Permits or Authorization	Permit Holders
Migratory Birds (including SARA- listed Species)	Scientific (for collection)	 Possession Transportation Collection/capture Treatment/rehabilitation/care Euthanasia 	Individuals of WROs are generally permitted for most activities. Subcontractors or independent contractors may be permitted for specific activities through one or several permits.
	Scientific (for capture and banding)	 Capturing Banding Using auxiliary markers (e.g., color bands and GPS transmitters) Collection of biological samples 	
	SARA Section 73/74 permit	 Destruction of protected critical habitat Damage or destruction of any critical habitat that could result in harming individuals of a SARA-listed Migratory Bird Damage or destruction of residences² of a SARA-listed Migratory Bird 	SARA permits are issued on site and situation-specific basis and must be discussed early in response activities, as appropriate.
Any SARA-listed Species other than Migratory Birds (on any federal land including NWAs, and any land affected by an order or regulation made under SARA)	SARA Section 73 permit	 Collection, taking, possession Transportation/relocation Capture/marking Treatment/rehabilitation/care Euthanasia Harassing, including deterrence and dispersal Exclusion barriers / trenches Damage or destruction of critical habitat Damage or destruction of residences² Any activity specifically prohibited by a Section 80 emergency order, or by a regulation made under SARA 	SARA permits are issued on a site and situation-specific basis and must be discussed early in response activities, as appropriate.

Wildlife	Permit Type	Examples of Activities that Require Permits or Authorization	Permit Holders
Migratory Bird Sanctuaries	Scientific (collection)	 Operations occurring on Migratory Bird Sanctuaries³ 	Migratory Bird Sanctuary ³ permits are issued on a site- specific basis and will be developed early in response activities.

Notes:

¹ The permitting process and the types of activities requiring permits is subject to change periodically as regulations are updated. Individuals/organizations should seek up to date advice on permitting from ECCC-CWS permit officers.

² For the purpose of SARA, "residence" means a dwelling-place, such as a den, nest or other similar area or place, that is occupied or habitually occupied by one or more individuals during all or part of their life cycles, including breeding, rearing, staging, wintering, feeding or hibernating.

³ Permits issued under the MBSR.

3.0 Elements of Wildlife Response Planning

3.1 Wildlife Response within the Incident Command System

Any activities with potential to result in a Wildlife Emergency may warrant immediate implementation of response actions. Guidance on Wildlife response concerns and actions may be provided through the Environmental Emergencies Science Table, which is chaired by ECCC's National Environmental Emergencies Centre (NEEC). Increasingly, within industries or the Government of Canada, emergency incidents are managed and structured using the Incident Command System (ICS) approach, including the establishment of an ICP for major incidents. It is therefore recommended to stakeholders to use ICS for emergency response. Wildlife experts, such as ECCC-CWS, may be situated in the Environmental Unit of the Planning Section within an ICP, a role which may be titled Wildlife Technical Specialist. The Environmental Unit would develop and refine response plans as well as incident-specific tactics. Depending on the scale of the incident and scope of potential or actual impacts to Wildlife, ECCC-CWS may assist in establishing a Wildlife Branch which is typically situated within the Operations Section of the ICP (IPIECA 2014; Figure 1). An Environmental Unit Liaison position may also be staffed in the Wildlife Branch (Figure 1) to facilitate the dissemination of planning and operational information between the Environmental Unit and the Wildlife Branch. WRPs may also be developed and used for Wildlife Emergencies that are not managed with an ICP or a Wildlife Branch.

The WRP should identify, schematically, the structure and function of the Wildlife Branch and its integration into the Operations Section of the ICP, as well as how it liaises with other ICP sections (e.g., Planning). The WRP should anticipate structuring and scaling the Wildlife Branch according to how the incident is expected to proceed.

It is essential to identify and implement Wildlife response activities within the first 24, 48, and 72 hours of an incident. These response activities are formalized within a WRP to structure and guide response

activities. The RP is responsible for the development of WRPs, to address all of the procedures and strategies required to mount an effective Wildlife response. During an incident, ECCC-CWS will provide advice to support the Wildlife response consistent with the components outlined in <u>Section 4</u>. However, the RP typically leads the development of a WRP and may contract the WRO to develop it on their behalf to ensure the WRP is operationally feasible. While ECCC-CWS does not have the authority to assign, recognize, or approve specific WRPs, ECCC-CWS may provide advice to the Lead Agency, the RP, and WROs regarding the direction and content of a WRP, based on available science and expertise. A WRP does not necessarily equate with statutes and regulations; rather, developing a WRP identifies actions that support compliance with the MBCA, MBR, MBSR, SARA, and the CWA. A WRP receives formal approvals within an ICP through sign-off by the Incident Command and RP.



Figure 1. Example of a scalable Wildlife Branch within an ICS setting (adapted from IPIECA 2014).

3.2 Types of Wildlife Response Plans

There are two main types of WRPs, strategic response plans and incident-specific response plans (described below). ECCC-CWS may support the development of various WRPs, including providing technical expertise, permit support, and incident-specific guidance. However, WRP approvals are the responsibility of the RP and the Incident Command (or Unified Command).

3.2.1 Strategic Response Plans

Strategic response plans are often created for specific activities, where there is a recognized risk of a Wildlife Emergency, or for designated areas or specific locations which may warrant special planning
considerations (e.g., protected areas, geographic response areas). Strategic WRPs describe the likely activities to be enacted during a response, but may lack incident-specific actions or tactical plans which may only be developed once the parameters of the incident are known or tested. Thus strategic WRPs are refined and adapted throughout the incident based on incident-specific considerations (Hebert and Schlieps 2018).

Activity-specific Plans: Accidents or malfunctions that may occur at certain types of facilities or infrastructure (e.g., oil-handling facilities, offshore petroleum platforms, liquid natural gas marine terminals), projects (e.g., exploratory drilling), or routine activities (e.g., transport of oil by rail or vessel) have an associated increased risk for Wildlife Emergencies. However, given the static nature of these sites, the characteristics of a Pollution or Non-Pollution Incident and the procedures for mounting a response can be anticipated to a certain degree. Industries or other stakeholders determine whether it is appropriate to develop strategic WRPs to structure a response that aligns with internal policies and procedures (e.g., industry best practices, contract with WROs), and incorporates site-specific considerations for implementing effective response actions (e.g., pre-determined Wildlife rehabilitation areas, standardized methods for Wildlife surveillance). As with other types of plans, activity-specific WRPs need to be adaptable and scalable, depending on the nature of the incident. Activity-specific WRPs should be reviewed and revised on a regular basis to accommodate changes to infrastructure, activities, and operational procedures, and to reflect current guidance on Wildlife response planning. In cases where activity-specific plans are identified for development, ECCC-CWS can review and provide recommendations on WRP components based on site-specific information.

An example of an activity-specific WRP is one that is developed as part of planned vessel salvage or oil recovery activities, where there is potential for impacts to Wildlife. In the case of a planned salvage, the initial draft of the WRP should be developed and approved in advance of initiating salvage activities. As with other incidents, the WRP will evolve over the course of the salvage to address specific response conditions.

Area-specific Plans: Wildlife Emergencies can also occur in land tenures or aquatic areas of significant biological importance, with specific management objectives, and/or where there is otherwise concerted interest in having a response plan in place (e.g., protected areas, geographic response areas). As with activity-specific plans, the procedures for mounting a response to a Pollution or Non-Pollution Incident may be anticipated and planned for to a certain degree. Managers of these areas may determine it is appropriate to develop strategic WRPs to structure a response that aligns with local or regional management objectives. Stakeholders' input that incorporates site-specific WRPs need to be adaptable and scalable, depending on the nature of the incident. Managers of these areas need to identify zones of higher sensitivity that are to be protected and those of lower sensitivity to allow an efficient response (access points for machinery, ICP, response personnel, etc.). WRPs should be reviewed and revised on a regular basis. In cases where area-specific plans are identified for development, ECCC-CWS can review and provide recommendations on WRP components based on site-specific information.

3.2.2 Incident-specific Response Plans

The most common type of WRP is typically one that is developed in the early phases of a Wildlife Emergency as part of the ICS and is specific to the incident (IPIECA 2014). Incident-specific WRP, sometimes referred to as Wildlife Management Plans, take into account the actual circumstances of a specific incident, particularly factors related to the scope of the incident (e.g., quantity, location and dispersion of pollution), environmental considerations (e.g., weather), and seasonal considerations

(e.g., Wildlife abundance and distribution). A comprehensive strategic WRP may fulfil most of the information needs for an incident-specific plan, but might require further details on implementation given the available resources, weather, and time of year.

For incidents where an RP has been identified, the RP has the first responsibility for initiating effective countermeasures to a Wildlife Emergency and has financial responsibility for damage and cleanup costs incurred during an incident. Upon the establishment of an ICP, the RP and Incident Command will outline planned Wildlife response activities. ECCC-CWS will contribute to the development of an incident-specific WRP by participation in the Wildlife Branch (or Environmental Unit) of the ICP, or by reviewing plans and providing expert advice to individuals working within the ICP. Here, ECCC-CWS may provide guidance on the scope of a WRP and direct the RP, or its contracted response personnel, towards resources that support its development. In particular, ECCC-CWS will inform on any Wildlife response activities that require authorization (i.e., permits), or technical expertise. ECCC-CWS will review and make recommendations on a WRP and subsequent iterations, but the Incident Command ultimately approves the plan. For incidents where an RP has not been identified, ECCC-CWS may contribute to the development and implementation of a WRP.

3.2.3 Plan Development

It is important to recognize that Wildlife Emergency response and WRP development is an iterative process that will evolve as an incident unfolds. A WRP should be structured and implemented in a way that it is adaptable and scalable over the course of an incident, and may accommodate needs for post-incident monitoring.

The Wildlife Branch will determine the appropriate level of response based on specific needs of the incident. The need for greater or fewer resources, equipment, facilities, and response personnel will be based on incident-specific factors including:

- the present and future geographic extent of the incident
- the species, numbers of individuals, and types of habitats present in the geographic extent
- the known or potential risk for injury or mortality
- the timeframe for which incident response actions are implemented

Plans that are developed prior to an incident may also consider tiered response planning to appropriately manage various degrees or types of Wildlife Emergencies. *Wildlife Response Preparedness* (IPIECA 2014) describes tiered response planning in more detail.

3.3 Habitat Considerations for Response Planning

The various habitats occupied by Wildlife require different considerations with regards to response planning. For emergency response involving pollutants such as oil, the key variable in a response plan is the presence of bodies of water that may act as a carrier for contaminants discharged into the environment, causing contaminants to spread over large areas where Wildlife may become affected. In Canada, habitats occupied by Wildlife requiring similar response approaches during an emergency response involving contaminants can be grouped into the following three main landscape categories: a) marine and open fresh water, b) aquatic, and c) terrestrial.

3.3.1 Marine and Open Fresh Water

Pollution Incidents that occur in the marine environment or large freshwater bodies of open water tend to affect Wildlife that spend a high proportion of their time on the water, such as alcids and waterfowl.

The effect on Wildlife is influenced by the location of the incident, persistence and toxicity of the contaminants, and duration of the incident. In seasons and areas of high concentrations of vulnerable Wildlife, the number of impacted individuals may reach the thousands, even when a relatively low volume of contaminant is discharged. Affected Wildlife may eventually come ashore either alive or dead, requiring systematic search and collection effort on accessible shorelines. Contaminants discharged offshore may eventually travel inshore and reach the coastline, affecting other Wildlife communities associated with aquatic habitats (see Section 3.3.2). A Wildlife response in the marine and open fresh water landscape focuses on preventing Wildlife from utilizing the affected area, recovering affected individuals if they come to shore, and assessing the impact of the incident on Wildlife (Table 2).

3.3.2 Aquatic Habitats

For the purpose of this document, aquatic habitats consist of any land saturated with water long enough to take on the characteristic of an ecosystem and promote aquatic processes, such as salt marshes, wetlands, fens, lagoons, and bogs, but also include small ponds, creeks, rivers, tidal flats, marshes, and reed beds, or any combination of such categories. Unlike the other landscapes, aquatic habitats are vulnerable to activities that occur both on land and in the marine environment. During a response to a Pollution Incident, aquatic habitats are priority areas for protection as they can trap large quantities of contaminant, are difficult to clean, and can take years or decades to recover due to the retention of contaminants in these environments. Because of the large variety of aquatic habitats and biotypes that they accommodate, removing contaminants from the environment and operationalizing a Wildlife response may be complex. Rivers will carry and spread pollutants over potentially large distances, and shorelines may be inaccessible. Wildlife diversity may be high and include a mix of aquatic (waterfowl, shorebirds, inland waterbirds) and terrestrial (landbirds) Migratory Bird species and Species at Risk from a variety of groups, including mammals, birds, amphibians, reptiles, plants, and fish. Additional survey effort and resources may be required for reconnaissance and surveillance surveys as well as collecting affected individuals. Small lakes and ponds may be attractive for large concentrations of Migratory Birds during migration, molting, and staging periods and may require extended resources to exclude Wildlife from the area. In addition to deterrence activities, a Wildlife response in aquatic habitats may also focus on prioritizing protection and containment strategies to minimize the spread of contaminants to key habitats, denying Wildlife access to impacted habitats, pre-emptive capture to relocate unaffected individuals (e.g., Species at Risk), recovery of affected individuals, and assessing the effect of the incident on Wildlife (Table 2).

3.3.3 Terrestrial Habitats

Pollution discharged into a terrestrial landscape where a body of water is absent will be limited in spread and affect a small area in relation to the released volume. Pollution Incidents in a terrestrial landscape are usually limited to a point source (e.g., truck, rail, pipeline, oil storage facility), however, the species and types of incident interactions among terrestrial Wildlife may be diverse, as there is potential for impacts to birds, mammals, reptiles, and amphibians. A Wildlife response strategy in a terrestrial landscape may focus on excluding Wildlife from the affected area, pre-emptive capture to relocate unaffected individuals (e.g., Species at Risk), recovering affected individuals, and assessing the impact of the incident on Wildlife.

Table 2. Key activities/strategies for Wildlife response based on major landscape types. This table is meant as a guide to highlight some potential key differences in approaches, but should not be considered as a checklist for all incidents. Refer to text for details.

Response Strategy/Activity	Landscape Categories			
	Marine/Open fresh water	Aquatic	Terrestrial	
Reconnaissance and surveillance surveys	X	X	X	
Wildlife deterrence	X	X	Х	
Wildlife exclusion		X	X	
Prioritize habitats for protection	X	X	Х	
Pre-emptive capture of Wildlife		X	X	
Recovery of affected individuals	X	X	Х	
Assessing impacts to Wildlife	X	X	X	

3.4 Detecting Signs of impacted Avian Species

In planning for Wildlife Emergency and preparation of a WRP, it can be important to consider target species and how detectable contaminated (or injured) Wildlife may be. The ability to detect contaminated Wildlife will help in planning several of the actions to be taken during a response, notably Initial Wildlife Impact Assessment (Section 4.5.2), reconnaissance and surveillance surveys (Sections 4.5.3 and 4.5.4), and Wildlife capture (Section 4.5.7). Detecting contaminated Wildlife is best done by experienced observers, such as WRO, but understanding of contaminated Wildlife detection can benefit all aspects of response planning and implementation. Here we provide guidance for detecting signs of oiling in avian species, though the principles outlined are generally applicable to birds affected by other contaminants.

Under normal conditions, typical bird behaviour will vary by the species, the habitats they occupy, as well as time of year and weather conditions. Generally, birds that spend a great deal of time on the surface of the water are typically seen resting on the water (e.g., loons, grebes, scoters, alcids, and cormorants). Piscivorous species (e.g., loons, grebes, alcids), will normally dive and surface repeatedly over time. Some species, like gulls, will move between resting on the water to being flight bound to using land to feed or rest. Species that are common in shore environments, like shorebirds, dabbling ducks, and cormorants are typically quite obvious on rocks or beaches, and would be expected to be quite mobile/active.

Birds that have come into contact with oil may have obvious oiling indications, including coating, discoloured feathers, or feathers having a wet or ragged appearance (i.e., disruption of feather structure). Heavily oiled birds or individuals oiled below the waterline may also appear as though they are sitting low on the water (when compared with normal species posture), struggling to maintain buoyancy. Oiled birds have increased potential to lose buoyancy and thermoregulatory properties of their feathers. Accordingly, it is common to see oiled birds focused intently on preening themselves in order to maintain buoyancy and reduce heat loss; this may be most apparent while birds are on the water. Diving or dabbling species may appear to be foraging less than expected (although this should be assessed by experienced observers). Birds may also exhibit changes in flushing behaviour, being

less inclined to fly when disturbed. Birds might also congregate near or on shore, or strand and rest on structures (e.g., vessels, buildings, platforms); this includes species that would not normally be expected to use these habitats or those that have contacted oil in the intertidal environment. In nearshore or shoreline environments, birds may also use shallow waters to reduce risk of drowning or take advantage of coastal vegetation to camouflage or reduce risk of predation while they try to preen or recover. Observations of behavioral changes in birds are sometimes the key indicators of oil impacts.

Detecting birds contaminated with oil is particularly difficult for aquatic birds with dark plumage that remain on the water and far from shore. Under these circumstances, it may be appropriate to determine a probable rate of contamination using appropriate indicator species. Ideally, indicator species are common throughout the incident area, share similar life history attributes, are sensitive to oiling, and signs of oiling are readily observable. The contamination percentage determined for indicator species only provides an estimation of the contamination percentage for the other species in the incident area. This type of assessment is likely to underestimate the actual contamination rate of the most vulnerable aquatic species, such as sea ducks and alcids, and overestimate the contamination of the more coastal species, such as geese and dabbling ducks (Lehoux and Bordage 1999). Additional details on how to assess rates of oiling for indicator species is provided in the *Guidance and Protocols for Wildlife Surveys for Emergency Response* (ECCC-CWS 2022a).

4.0 Components of a Wildlife Response Plan

A WRP is a plan that describes the objectives and methods for undertaking Wildlife Emergency response, specific to an area and Pollution or Non-Pollution Incident(s). The aim of a WRP is to avoid or minimize injury or harm to Wildlife during Pollution and Non-Pollution Incidents.

The following section outlines attributes that should be considered within a WRP (IPIECA 2014; Hebert and Schlieps 2018). An annotated WRP template is provided as an example in <u>Appendix A</u>, to be adapted and scaled based on the nature of individual Wildlife Emergencies. A checklist of activities that should be completed within the first 24, 48, and 72 hours of an incident involving Wildlife is provided in <u>Appendix B</u>.

4.1 Introduction

The Introduction section of the WRP provides the basis and rationale for how a Wildlife response will be handled. The Introduction will provide a general description of the types of issues that will be addressed by the WRP. Where appropriate, the Introduction will describe how this WRP interfaces with various aspects of an ICP, including other response plans that WRP activities may interact with.

4.2 Notification Procedures

The Notification Procedures section outlines the agencies, organizations, and other technical specialists that will be notified during incidents involving Wildlife response. Where appropriate, this section will describe how notifications operate within the incident-specific ICS structure, as well as any intra- and interdepartmental communication requirements.

4.3 Regulatory Requirements

The Regulatory Requirements section provides a brief description of the applicable Wildlife legislation, where it applies, and whether supporting permits or authorizations are required to support a Wildlife response. In most cases, incidents involving Wildlife will need to consider the MBCA, the SARA, and possibly the CWA (see <u>Section 2</u>), as well as other provincial or territorial legislation. Additional permits and authorizations may also be required outside the regulatory authority of ECCC-CWS.

4.3.1 Permits and Authorizations

For any Wildlife Emergency involving the development of a WRP, the plan will identify any WROs or contracted subject-matter experts that will be engaged to support Wildlife response activities. Authorized organizations or individuals must have the training and resources necessary to meet Wildlife response requirements. Where permits or authorizations are identified, this section will highlight:

- a. what the authorization is for
- b. the issuing agency
- c. activities that are authorized
- d. who holds authorization to conduct those activities
- e. if a technical specialist or qualified professional is required to supervise or participate in the authorized activity (e.g., supervision or guidance of bird deterrence activities by ECCC-CWS or a WRO supervision of bird deterrence activities)
- f. reporting requirements, if any, for these authorizations

With respect to strategic WRPs prepared in advance for specific activities or areas, this section will also identify permits which are already in place and relevant information on renewal and reporting cycles.

4.4 Resources-at-Risk

The WRP will outline potential Wildlife and habitat resources-at-risk from the incident's current and reasonably foreseeable impacts. The resources-at-risk section of the WRP will describe:

- the geographic extent for which resources are being identified
- Migratory Bird sensitivities
- Species at Risk sensitivities
- important habitats for consideration and protection:
 - o critical habitat
 - o protected areas
 - o colonial nesting areas
 - o general nesting areas
 - o seasonal stopover, molting, or staging areas
 - o key areas (e.g., Important Bird Areas, Ecologically and Biologically Significant Areas)
 - o other important habitat features such as estuaries

In addition to these general factors, the characterization of resources-at-risk should consider area- and species-specific factors such as seasonal presence, abundance, life stage, and habitat associations. Where available, incident-specific observations should be referenced in the description of resources-at-risk to characterize current conditions. Resources-at-risk should also consider details on mitigations related to habitats including priority sites, protection measures, clean-up restrictions, and information

relevant to Net Environmental Benefits Assessment (NEBA) or Spill Impact Mitigation Assessment (SIMA) (e.g., IPIECA 2016, 2018).

4.5 Wildlife Management and Response

This section will describe the nature of Wildlife management and response activities that are, or will be undertaken as part of the incident. The nature and scale of a WRP will depend on the incident, and the known or potential impacts to Wildlife.

For the early phases of an incident, the WRP should include, at minimum, a description of the initial approaches for Wildlife impact assessment (e.g., reconnaissance and monitoring activities). This section of the WRP will be revised as an incident evolves. Where appropriate, aspects of Wildlife management and response may warrant standalone plans that could be appended, and referenced in this section (e.g., detailed plans for Wildlife rehabilitation).

4.5.1 Operational Objectives

This section briefly describes the primary objectives for the activities that will be implemented during the operational period(s) this plan is expected to apply to until its next iteration. Objectives will consider the ethical considerations in context with situational, technical, and financial feasibility of implementation (IPIECA 2014). Objectives will change based on Wildlife concerns as well as personnel and equipment resource availability. These objectives form the basis for the nature and scope of activities described in this section of the WRP.

4.5.2 Initial Wildlife Impact Assessment (0 to 24 Hours)

In order to effectively plan for and direct Wildlife response efforts, an Initial Wildlife Impact Assessment needs to be conducted as early in the incident response as possible, to determine:

- existing information on Wildlife and habitats
- current/initial estimates of Wildlife impacts
- projection of potential impacts to Wildlife
- initial Wildlife response recommendations
- initial habitat protection recommendations
- initial resource, personnel, equipment, and facility requirements

As with all phases of a response, the Initial Wildlife Impact Assessment must be completed in consideration of the health and safety of response personnel and adhere to all incident-specific health and safety requirements (see <u>Section 4.7</u>).

4.5.3 Reconnaissance Surveys (24 to 48 Hours)

Reconnaissance surveys should be conducted in a timely manner on a large geographic scale to assess the outer limits of the incident. These surveys serve to obtain current information on impacted habitats, areas of special concern (e.g., colonial nesting areas) and the abundance and distribution of Wildlife within the general area of the incident, recognizing that Wildlife movements may extend beyond the geographic limits of the incident area. Initial reconnaissance surveys should take place as early in the response as possible to determine current conditions and inform potential response priorities and strategies. In all cases, reconnaissance should extend, at minimum, to the expected geographic limits of the incident area, necognizing those boundaries may change as the incident progresses. Reconnaissance surveys may be conducted on a recurring basis to inform response activities (e.g., deterrence and dispersal, Wildlife capture), or if the situation of the incident changes (e.g., following a

storm). Reconnaissance surveys help identify the most suitable approaches for the surveillance or *monitoring* phase of the response. Reconnaissance may occur from land, boat, or air. Reconnaissance surveys are not systematic and the goal is not to precisely assess Wildlife densities but rather to conduct informal surveys to rapidly assess the distribution of impacted, or potentially impacted, Wildlife and habitats for a prompt response.

Primary objectives of reconnaissance surveys are to:

- determine the geographic scale of the incident
- identify Wildlife and habitats that have already been impacted
- estimate relative abundance and distribution of Wildlife with potential to be impacted
- evaluate key habitats of importance to Wildlife with potential to be impacted
- inform development of appropriate response strategies
- inform mitigation activities to minimize further damage to Wildlife
- inform suitability of various survey methods (e.g., shore, boat, or aerial surveys) for subsequent surveillance or monitoring for the duration of the incident
- inform Incident Command on the status of known or potential impact on Wildlife

If impacts to Wildlife or their habitats are known or anticipated, an approach for systematically surveying and monitoring Wildlife should be developed and articulated in the WRP (see Section 4.5.4). Standardized protocols have been developed for conducting systematic Migratory Bird surveys during an emergency response in Canada and are summarized in the *Guidance and Protocols for Wildlife Surveys for Emergency Response* (ECCC-CWS 2022a). The following stages of a Wildlife response (Sections 4.5.5 to 4.5.10) should be developed and implemented by trained and qualified personnel under the supervision of the Wildlife Branch Director in the Wildlife Branch and/or Wildlife Technical Specialist(s) in the Environmental Unit, depending on the structure of the response (see also Section 3.1).

4.5.4 Surveillance (Monitoring) Surveys (48 to 72 Hours and Onwards)

If impacts to Wildlife or their habitats are known or anticipated, Wildlife Branch will develop a systematic surveillance (monitoring) survey program with an appropriate temporal and geographic scope. If surveillance is required, the RP will secure qualified personnel to develop and execute the program and who will report to Wildlife Branch Director and/or Wildlife Technical Specialist(s). The methods and general approach(es) may be described in strategic WRPs and ECCC-CWS can advise on survey design and implementation for incident-specific WRPs, consistent with the *Guidance and Protocols for Wildlife Surveys for Emergency Response* (ECCC-CWS 2022a).

Primary objectives of surveillance surveys are to:

- monitor and refine the identification of Wildlife and habitats in the impacted area
- monitor and identify areas where Wildlife would be potentially at risk from further impacts
- monitor and refine estimates of abundance and distribution of Wildlife in the impacted area
- monitor and estimate Wildlife densities for damage assessment
- monitor and estimate number of dead and moribund Wildlife affected by incident
- identify areas where affected Wildlife can be collected
- inform other response activities such as habitat protection and Wildlife deterrence and dispersal
- inform Incident Command

Implemented throughout the response in accordance with the plan, data collected during surveillance provides critical response information and can also be used to document damage assessment following the incident.

4.5.5 Deterrence and Dispersal

For some incidents, deterrence and dispersal can be an effective early means to deter Wildlife from moving into or near the incident area and coming into contact with contaminants. Use of these techniques can also be helpful in excluding Wildlife from impacted areas throughout the response phase. Deterrent devices used to disperse Wildlife include both visual and auditory techniques and range in their effectiveness depending on the species, number of individuals, time of year, and habitat where the incident occurs.

If deterrence or dispersal is required or recommended, the RP will retain a qualified and, if applicable, authorized WRO to develop and execute a Wildlife deterrence and dispersal program. In the absence of an RP, the Lead Agency may develop and execute a Wildlife deterrence and dispersal program. Guidance to conduct activities related to deterrence and dispersal are outlined in Lehoux and Bordage (2000), with revisions and updates in development by ECCC-CWS. Other guidance to consider in the development of deterrence and dispersal tactics for WRP include Gorenzel and Salmon (2008) and IPIECA (2017). Deterrence will be conducted only by appropriately trained personnel, and under direct guidance and supervision (as required) from the Wildlife Branch Director and/or Wildlife Technical Specialist(s). A WRP may also outline protocols for Wildlife Technical Specialists in the field to monitor and document the use and effectiveness of deterrence and dispersal techniques so that updates may be made to subsequent WRPs. ECCC-CWS may provide guidance on deterrence and dispersal strategies and may also supervise deterrence and dispersal techniques for habitats or species that are particularly sensitive to these types of response measures (e.g., in proximity to breeding colonies). Strategic WRPs may outline a set of applicable techniques for a particular industry or facility, whereas an incident-specific WRP may then specify actions to be put in place given the species observed and environmental conditions at the time (e.g., weather).

Deterrence activities should be determined on a species-specific and location-specific basis that considers the following factors:

- What is the location and/or the extent of the spill
- Where are alternative species-appropriate habitats that birds can be dispersed to
- What species are present or likely to be at risk
- What is the life history status of the birds present (e.g., roosting, staging, breeding)
- What qualified personnel and equipment is available with experience and knowledge for deterrent use and Wildlife dispersal
- What are the environmental conditions
- Can the deterrence and dispersal plan be enacted in a safe manner for response personnel and Wildlife

4.5.6 Exclusion, Pre-emptive Capture, and Relocation

WRPs often implement measures designed to pre-emptively limit the potential for Wildlife to become impacted during Pollution Incidents. Often, marine, aquatic and terrestrial Wildlife can be excluded from areas that are known or have potential to become impacted through a combination of mechanical and physical techniques designed to dissuade habitat use (e.g., visual or acoustical deterrents, fence or net installation, physical habitat modification). Pre-emptive Wildlife capture and relocation similarly seeks to collect Wildlife before they are impacted during a Wildlife Emergency. Planning for Wildlife collection

requires considerations for capture, transport, holding, and release strategies. If pre-emptively captured Wildlife need to be contained for a period of time, a WRO authorized to carry out these activities must be identified to provide appropriate species-specific housing, nutritional support, and medical care (if necessary) for a potentially extended period. Guidance and protocols on pre-emptive capture and care for Wildlife during a Pollution Incident are described in the *Guidelines for the Capture, Transport, Cleaning, and Rehabilitation of Oiled Wildlife* (ECCC-CWS 2022b). Where appropriate, the WRP should describe plans for Wildlife collection and relocation activities.

4.5.7 Wildlife Capture, Transport, Rehabilitation, Release, and/or Euthanasia

This section of the WRP will be broken down into detailed phases, each of which are described briefly in <u>Table 3</u>. Planning for these activities may evolve over the course of the incident to include details on the number of monitoring and field staging facilities, capture procedures, rehabilitation facilities, as well as coordination of rehabilitation personnel.

The RP should retain a qualified and authorized WRO to develop and implement these phases of Wildlife response. These programs will adhere to the *Guidelines for the Capture, Transport, Cleaning, and Rehabilitation of Oiled Wildlife* (ECCC-CWS 2022b), *Guidelines for Establishing and Operating Treatment Facilities for Oiled Wildlife* (ECCC-CWS 2022c), as well as an area-specific or incident-specific Health and Safety Plan. Not all phases will be applicable or readily implemented during a response, but all may be considered as options when developing a strategic WRP, and later refined in an incident-specific WRP.

Phase	Objectives
Pre-emptive Capture	The capture of Wildlife that is at risk of being impactedTransport of Wildlife to a holding facility
Capture	 The capture of impacted Wildlife Transport of Wildlife to Field Stabilization Site or Oiled Wildlife Rehabilitation Centre
Field Stabilization	 Physical evaluation Removal of gross contaminants Thermoregulatory support Fluid therapy and nutritional support Address life threatening conditions Euthanasia evaluations based on established criteria and best practices
Transportation	 Transport of contaminated animals from field or Field Stabilization Site to an Oiled Wildlife Rehabilitation Centre
Processing	 Evidence collection Birds given individual, temporary band Feather/fur sample Photograph Individual medical record

Table 3. Phases of Wildlife Capture, Transport, Rehabilitation, Release, and/or Euthanasia

Phase	Objectives
Intake	 Medical examination, triage, and treatment plan development Critical care concerns addressed Euthanasia evaluations based on established criteria and best practices
Triage	Ongoing euthanasia and treatment plan evaluation based on medical health status
Euthanasia	 Euthanize Wildlife that are assessed by the WRO as not being good candidates for rehabilitation or survival
Stabilization	 Fluid, nutritional and medical stabilization of impacted animals 48–72 hours period Prepare animals for cleaning process
Cleaning	 Removal of all contaminants from an impacted animal by washing Removal of the cleaning agent by rinsing Drying cleaned and rinsed animal
Conditioning	Restoring waterproofing and physical condition
Release	 Federal banding of individual animals Consider additional tracking devices on some birds to monitor post-release Release of cleaned, waterproof animals into a clean environment
Post-release Monitoring	 Determining the effectiveness of rehabilitation of Wildlife impacted during a Pollution Incident Monitoring the clean Wildlife's condition and activities Following short-term and long-term survival and breeding status following rehabilitation

4.5.8 Wildlife Carcass Collection Procedures

Dead Wildlife should be removed from the environment to avoid attracting scavengers to the site and secondary contamination of Wildlife. The responsibility for the collection and documentation of dead Wildlife is primarily the responsibility of the Wildlife Branch and is completed under the supervision of authorized organizations (e.g., Wildlife Enforcement Directorate) and personnel with appropriate permits. Protocols for Wildlife collection, storage and documentation will be developed. Wildlife recovery personnel will retrieve dead Wildlife as part of daily activities. Dead Wildlife observed by the public can be reported to a 24-hour hotline (see <u>Section 4.6.1</u>). Members of the public must not pick up dead Wildlife but rather report them to the hotline. The Wildlife Branch will work with the Information Officer to develop appropriate messaging.

Carcass collection information will be used to:

- refine the geographic scale of the incident
- determine the cause of death if the source is unknown
- minimize damage and exposure to unaffected Wildlife by removing affected Wildlife from the environment
- minimize potential for harm or exposure by the public who participate in hunting activities or are supporting aspects of the response

- support appropriate response strategies for the treatment of affected Wildlife
- obtain a minimum number of casualties for damage assessment purposes
- obtain specimens/samples for legal enforcement activities or reporting requirements
- inform Incident Command

These procedures will also outline requirements necessary for proper chain of custody and storage of specimens. Chain of custody, and other record-keeping forms, will be attached as appendices to the WRP.

For additional guidance on collecting dead Wildlife during incidents, see the *Guidance and Protocols for Wildlife Surveys for Emergency Response* (ECCC-CWS 2022a).

4.5.9 Waste Management

Plans for decontamination and disposal of waste materials will be developed. Waste and secondary pollution should be minimized at each step of the Wildlife response. During the various phases of Wildlife cleaning (holding pen, carcass wrapping), waste will be created. Washing Wildlife will cause waste water (e.g., oil with detergent), which will need to be managed (through existing Waste Management Plans or by establishing additional plans as needed). Medical waste (e.g., syringes and gloves) should be considered. The response plan will identify the legislation and the authorities responsible for waste management.

4.5.10 Demobilization

Regardless of the scale of a Wildlife Emergency, the WRP will describe any processes or considerations for demobilizing Wildlife response activities. As appropriate, demobilization will be scaled in accordance with the size of Wildlife response (e.g., decreased intake of contaminated Wildlife) and must be approved by the Incident Command.

This section of the plan will discuss, as applicable:

- processes for demobilizing equipment, facilities, and personnel
- processes for ongoing involvement in the ICP or post-response impact assessment and monitoring
- processes for chain of custody of data to support enforcement decisions
- processes by which the RP can continue to receive advice and support from ECCC-CWS

4.6 Information Management and Reporting

This section of a WRP should describe how information collected throughout the operational periods of the WRP would be managed, organized, vetted, and reported on. It should include:

- the type of data being collected (e.g., inventory, photos, videos, GIS)
- the personnel that will collect, organize, and vet the data
- the process for maintaining data records during and after the incident
- the process for integrating Wildlife data and activities into an incident information system (often referred to as the Common Operating Picture) within an ICP
- who data will be reported to, including the type and frequency of reports (e.g., daily email tabular summaries to the Environmental Unit Leader)
- how information is disseminated to agencies responsible for overseeing response

4.6.1 Wildlife Reporting From the Public (Wildlife Hotline)

Within the initial phases of an ICP being established where there are potential impacts to Wildlife, ECCC-CWS should ensure that reports of impacted Wildlife are directed to the Environmental Unit by way of a 24-hour hotline (or other reporting mechanism created for an incident). The contact information and instructions to the public for the 24-hour hotline should be outlined in the WRP. This may include the use of already existing environmental emergencies reporting systems, or the development of new hotlines as required for the scale of the incident. The Wildlife hotline may also serve as a platform to relay incident-specific safety information to the public (e.g., avoiding direct contact with contaminated Wildlife).

4.6.2 Media Relations

Media statements help to inform the public and raise awareness regarding Wildlife concerns and treatment, as well as public safety. The WRP should identify how Wildlife response activities will be reported to the public through media statements, and who within the Environmental Unit or Wildlife Branch are responsible for informing them. Generally, Wildlife Branch Response Director and the incident's Information Officer will jointly develop these statements, with relevant input from Wildlife Technical Specialist(s) and/or Environmental Unit Lead. Where appropriate, public statements involving Wildlife will also be vetted and approved by the ECCC-CWS technical specialists, Media Relations, and the Regional Director.

4.6.3 Permits Reporting

Certain permits which may be issued prior to or during an incident may also have reporting requirements. Most ECCC-CWS issued permits require reporting of activities within 30 days of the permit expiry.

4.7 Health and Safety

Responder safety is of paramount importance when initiating Wildlife response activities. Activities recommended and implemented as part of a WRP will adhere to the incident-specific health and safety plan and be identified in consultation with the Incident Safety Officer. A brief overview of health and safety considerations and requirements will be described in the WRP, with specific mention of Wildlife responder personal protective equipment, zoonoses, and site safety and security (including areas off limits to Wildlife responders). This section will evolve over the course of the incident.

4.7.1 Personal Protective Equipment

For Wildlife management and response activities proposed in a WRP, responders will have appropriate training and equipment for safely operating in shoreline, marine, or aerial environments (depending on incident location and response activities) and for contaminated Wildlife handling within a rehabilitation setting. Responders will have appropriate equipment and clothing to operate for extended periods and that protect against environmental exposure or incident-specific conditions. Basic personal protective equipment recommended for Wildlife management and monitoring activities includes:

- eye protection (e.g., sunglasses, goggles, safety glasses, or face shield)
- oil-resistant rain gear or oil protective clothing (e.g., coated Tyvek, Saranex, etc.)
- water and oil resistant hand protection (e.g., neoprene or nitrile rubber)
- waterproof and oil resistant non-skid boots; steel-toes may be required under the incidentspecific health and safety plan
- hearing protection (muff or ear plug type)

- personal flotation device when working on, near, or over water
- air monitoring device when appropriate
- specific gear appropriate for work where personnel are or may be submersed in water (wet suits, dry suits, survival gear)
- species-specific capture and protective gear (welding gloves, steel toed boots etc.)

The above list should not be considered comprehensive or applicable to all incidents. Additional incident-specific and specialized equipment may be required for other aspects of Wildlife response and will be developed in consultation with WROs and the Safety Officer.

4.7.2 Zoonoses

Zoonoses are infectious diseases that may be transmitted between animals and humans under natural conditions. Personnel handling or coming into contact with Wildlife are at risk of zoonotic disease exposure. Veterinarians, technicians, response personnel, Wildlife handlers, and other animal care personnel who come into direct or indirect contact with Wildlife or any body fluids are at risk of contact with disease agents that may have zoonotic potential. Organisms that may cause or transmit zoonotic diseases include many classifications from viruses, fungi, and bacteria to internal and external parasites. The WRP will describe biosecurity practices that will be employed in all aspects of Wildlife response to reduce risk of disease transmission.

4.7.3 Biosecurity

Biosecurity is a set of preventative measures that reduce the risk of transmission of infectious diseases, pests, and invasive species. Where there is potential for response measures (both overall incident response and Wildlife-specific response) to contribute to issues involving biosecurity, the WRP will outline a suite of measures to control for these risks.

4.8 Personnel Requirements

There are many personnel that could be involved in various aspects of WRP implementation. Certain roles, responsibilities, or authorized activities require various types of training or technical expertise.

Where applicable, the WRP will specify which activities individuals with specific training or expertise can complete. This may include outlining training standards and/or experience that may be required for specific industries, areas, or facilities. Industries and Response Organizations should consult with regional ECCC-CWS staff for guidance on relevant standards.

4.9 Facility and Equipment Requirements

As part of planning and implementing Wildlife response measures outlined in a WRP, specific equipment and facility requirements may need to be developed. The level of detail of these requirements will vary by the scale of the incident and may be more appropriately described in documents appended to the WRP. Components of equipment and facility considerations may include:

- the type and amount of equipment required
- means of transportation to support Wildlife response elements
- requirements for utilities, waste management, and security
- the nature of equipment or facility requirements (e.g., temporary, mobile, permanent)
- sources of supplies if known

Additional information to support equipment and facility planning is outlined in the *Guidelines for Establishing and Operating Treatment Facilities for Oiled Wildlife* (ECCC-CWS 2022c).

5.0 Evaluating Wildlife Response

5.1 Evaluation and Review

WRPs should be implemented and evaluated for their effectiveness within a context of adaptive management, where the results are used to refine future iterations (IPIECA 2014, Hebert and Schlieps 2018). Following a Wildlife Emergency, WRP developers and implementers should debrief on strengths and weaknesses of the plan, lessons learned, and gaps or areas for improvement (particularly for strategically developed activity- or area-based WRPs). Evaluation of the WRP should consider a) ease of implementation, b) efficiency of implementation, c) areas of practice that were or were not included, and d) whether the WRP supported the desired response outcome(s), business and legal requirements. ECCC-CWS may be consulted in this review and assist with recommendations for refinement.

5.2 Emergency Exercises

Emergency exercises are important for testing the effectiveness of WRPs, identifying potential gaps, and ensuring activity-, area- or incident-specific considerations are planned for in advance of an actual incident occurring (IPIECA 2014). Exercises also allow for government and industry partners to work together and familiarize themselves with the personnel and resources available to support Wildlife response activities. Exercises can also be an excellent means to provide training, or to test certain response strategies in a controlled setting.

Emergency exercises can take place in several formats: notifications, tabletop, field drills, and participation in the Environmental Unit or Wildlife Branch of an ICP. Each exercise will be planned with specific Wildlife response focused objectives in mind, and may center on testing particular aspects of the WRP. WRPs should be updated and revised to incorporate identified gaps and lessons learned into the plans.

6.0 Custodian

The custodian for the Guidelines for Wildlife Response Plans and any amendments thereto is the:

Director General, Regional Operations Directorate ECCC-CWS ECCC

The approval of future updates is vested to the Director General, Regional Operations Directorate, ECCC-CWS.

7.0 Acknowledgements

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Appendix A: Wildlife Emergency Response Plan Example Template

The following is a recommended outline for a Wildlife Response Plan. To obtain a complete, annotated template, please contact your regional Canadian Wildlife Services Wildlife Emergency Response Coordinator.

Recommended Table of Contents

- 1.0 Introduction
- 2.0 Agency Notification Procedures
- 3.0 Regulatory Requirements
 - 3.1 Permits and Authorizations
- 4.0 Resources at Risk
 - 4.1 Geographic Extent
 - 4.2 Migratory Bird Sensitivities
 - 4.3 Species at Risk Sensitivities
 - 4.3.1 Avian Species at Risk
 - 4.3.2 Other Species at risk
 - 4.4 Habitat Sensitivities
 - 4.5 Wildlife Observations
- 5.0 Wildlife Management and Response
 - 5.1 Operational Objectives
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 - 5.3 Reconnaissance Surveys
 - 5.3.1 Objectives
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 - 5.4 Surveillance (Monitoring) Surveys
 - 5.5 Deterrence and Dispersal
 - 5.6 Exclusion, Pre-emptive Capture, and Relocation

- 5.7 Wildlife Capture, Transport, Rehabilitation, Release, and/or Euthanasia
- 5.8 Wildlife Carcass Collection Procedures
- 5.9 Waste Management
- 5.10 Demobilization
- 6.0 Information Management and Reporting
 - 6.1 Wildlife Reporting from the Public (Wildlife Hotline)
 - 6.2 Media Relations
 - 6.3 Permits Reporting

7.0 Health and Safety

- 7.1 Personal Protective Equipment
- 7.2 Zoonoses
- 7.3 Biosecurity
- 8.0 Personnel Requirements
- 9.0 Facility and Equipment Requirements
- 10.0 Additional Information
- 11.0 Literature Cited
- Appendix A: Wildlife Permits
- Appendix B: Images of Common Species
- Appendix C: Structure, Roles, and Responsibilities of the Wildlife Branch
- Appendix D: Example Datasheet of Wildlife Sightings

Appendix B: Example Checklist of Wildlife Emergency Activities

 Table B.1. Example Checklist of Activities to Undertake within the initial 24, 48, and 72 hours of a Wildlife

 Emergency (adapted from Hebert and Schlieps 2018)

Timeline	Responsibility	Action
0-24 Hours	Incident Command/ Unified Command	 Ensure appropriate notifications to relevant government departments and branches Activate an authorized WRO
	Environmental Unit	 Compile existing information on Wildlife Complete a Resources-at-risk form (i.e., ICS 232) Initiate Initial Wildlife Impact Assessment Initiate deterrence and dispersal strategy
24-48 HoursIncident Command/ Unified Command• Establis the ICP • Designation		 Establish a Wildlife Branch under the Operations Section of the ICP Designate a Wildlife Branch Director
	Environmental Unit and/or Wildlife Branch	 Mobilize the WRO Continue Initial Wildlife Impact Assessment Conduct Reconnaissance Survey Refine deterrence and dispersal strategy Develop Wildlife Branch organization chart Establish a Wildlife hotline Initiate incident-specific WRP Initiate requests for resources (personnel, supplies, facilities, equipment) Identify Wildlife response health and safety requirements Ensure ongoing notifications and updates to relevant government department contacts Identify subject matter experts that might support the ICP

Timeline	Responsibility	Action
48-72 Hours	Wildlife Branch and/or WRO	 Coordinate with the WRO to develop or modify an existing WRP, and a process for WRP implementation Develop plan for ongoing monitoring Conduct surveillance and monitoring surveys Determine locations for field stabilization Establish field staging areas Refine incident-specific WRP Develop internal and external communications with the Information Officer and departmental communications personnel Ensure ongoing notifications and updates to departmental contacts





TITLE OF INCIDENT – LOCATION

WILDLIFE RESPONSE PLAN

DATE VERSION XX | DATE



Cat. No.: xxx ISBN: xxx

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Instructions

Delete this page in the final report.

This document is formatted as a template for developing an incident-specific Wildlife Response Plan (WRP). The format of this document is intended to cover the primary essential considerations for the development and refinement of a plan throughout the course of mounting a response. This WRP planning template is limited to information necessary to meet Environment and Climate Change Canada's Canadian Wildlife Service (ECCC-CWS)'s planning requirements. Additional sections and information are required to address federal, provincial, territorial, municipal, or Indigenous requirements beyond the authority of ECCC-CWS. This WRP can be tailored to be specific to individual federal or provincial/territorial government jurisdiction or can be combined into a consolidated Wildlife plan depending on the needs of the incident.

Throughout this template, please note the following:

- 1. Regular text is 'boiler plate' language that can be retained for all Plans, no changes required
- 2. Text in grey highlighting provides some annotation for sections of text that should be added but need to be modified with details specific to the incident and scope of work
- 3. Red text must be replaced with incident-specific details embedded in a sentence
- 4. Blue text is a placeholder provided as an example and must be replaced based on the incident



Abstract

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Version History

The version history of this document is as follows:

Version	Approval Date	Authorized Sign-Off

Authorship

This Wildlife Response Plan was developed collaboratively by the following:

Name	Agency / Organization	Contact

List of Acronyms

Acronym

Actual Name

Acronym Actual Name

Acronym

Actual Name

Definitions

Chain of Custody: A written record for a legal sample documenting the continuity by tracing the possession of the sample from the point of collection through introduction into evidence.

Environmental Emergency: Any uncontrolled or unexpected incident involving the release (or the likelihood thereof) of a polluting substance into the environment that results or may result in an immediate or long-term harmful effect on the environment, or constitutes or may constitute a danger to human life or health. It may be caused by an industrial activity, natural emergency or by a wilful act.

Field Stabilization Site: Facility that provides initial triage, care and/or euthanasia as well as shortterm holding (sometimes overnight) for Wildlife prior to transport to an Oiled Wildlife Rehabilitation Centre. It is not meant for washing oiled Wildlife and not designed for long-term care.

Incident Command: Responsible for overall management of the incident and consists of the Incident Commander, either single or unified command, and any assigned supporting staff.

Incident Commander: The individual responsible for all incident activities, including the development of strategies and tactics and the ordering and release of resources. The Incident Commander has overall authority and responsibility for conducting incident operations and is responsible for the management of all incident operations at the incident site.

Lead Agency: The governmental authority that regulates or has legislative authority over the responsible parties' response and is responsible for overseeing the appropriateness of the response.

Migratory Bird: As defined in the <u>Migratory Birds Convention Act, 1994</u>, a Migratory Bird referred to in the Convention, and includes the sperm, eggs, embryos, tissue cultures and parts of the bird of species listed under Article 1 of the Convention (Government of Canada 2017).

National Wildlife Area: A protected area created under the <u>Canada Wildlife Act</u> that contains nationally significant habitats for plants and animals and that is managed for the purposes of wildlife conservation, research and interpretation.

Non-Pollution Incident: An uncontrolled or unexpected Wildlife injury or mortality event other than a Pollution Incident.

Pollution Incident: The release or deposit of a substance that is harmful to Wildlife into an area or waters that are frequented by Wildlife or into a place from which the harmful substance may enter an area or waters frequented by Wildlife.

Response Organization: Any qualified person or organization that has been certified and designated by the Minister of Transport to carry out emergency response activities (as per the revised <u>Canada Shipping Act (2001)</u>). In Canada, there are four Response Organizations as follows: Atlantic Emergency Response Team, Eastern Canada Response Corporation Ltd., Western Canada Marine Response Corporation, and Point Tupper Marine Services Ltd.

Responsible Party: Any person or organization who might be responsible for the source or cause of an environmental emergency and/or a Wildlife Emergency.

SARA-listed Species: A wildlife species listed on the List of Wildlife Species at Risk set out in Schedule 1 of the Species at Risk Act (SARA).

Species at Risk: As defined in the *Species at Risk Act* (S.C. 2002, c.29), means an Extirpated, Endangered or Threatened species, or a species of Special Concern.

Unified Command: An application of the Incident Command System, used when there is more than one agency with incident jurisdiction or when incidents cross political jurisdictions. Agencies work together through the designated members of the Unified Command to establish a common set of objectives and strategies and a single Incident Action Plan.

Wildlife: In this document, "Wildlife" is used to refer to the terms Migratory Birds as defined under the *Migratory Birds Convention Act,* and listed Species at Risk as those terms are defined under the *Species at Risk Act* for species falling within the jurisdiction of the Minister of Environment and Climate Change (with the exception of individuals of SARA-listed Species that are located on lands administered by Parks Canada). This term also refers to all wild species occurring in the National Wildlife Areas set out on Schedule I of the *Wildlife Area Regulations* (C.R.C., c. 1609).

Wildlife Emergency: A Pollution or Non-Pollution Incident that results or may result in an immediate and/or long-term harmful effect on the life or health of Wildlife and/or their habitat.

Wildlife Response Plan: A document that outlines the initial and ongoing Wildlife-related strategies that are needed to support any Wildlife response objectives that may occur at the onset of a Pollution or Non-Pollution Incident.

Wildlife Response Organization: Organizations that provide expertise, capabilities and trained personnel to undertake one or several aspects of response, including planning, implementation and reporting of activities related to Wildlife Emergencies. Wildlife Response Organizations (or representatives thereof) are authorized under applicable federal, provincial, and/or territorial legislation to capture, transport, clean, rehabilitate, euthanize, and release Wildlife.

[Insert/remove definitions as needed]

1.0 Introduction

Paragraph 1: Provide a brief, 1-paragraph description of the incident, including the type of vehicle/vessel involved, type of release (product(s), estimated volume(s), general location and time of year of incident, general habitat characteristics.

Example:

On November 6, 2018, the Athena Contain Ship rain aground on Arachne Reef, south of Moresby Island. The grounding resulted in a puncture to the starboard side fuel tank, resulting in a release of approximately 300 tonnes of heavy fuel oil (HFO) per hour. As of the initiation of the Incident Command Post at 0730 h on November 7, 2020, 5,000 tonnes of HFO had been reportedly released.

Paragraph 2: Describe the potential impacts, potentially affected species and corresponding federal or provincial legislation and departmental authorities based on the nature of the incident. This could include Migratory Birds (e.g., Migratory Birds Convention Act), Species at Risk (e.g., SARA), Canada Wildlife Act (CWA), provincial species. Consider if separate definitions for Wildlife and habitat need to be provided based on anticipated impacts to marine, aquatic, or terrestrial plants, etc.

Example:

Potential impacts to Migratory Birds and species designated on Schedule 1 under the Species at Risk Act (SARA) under Environment and Climate Change Canada (ECCC)'s jurisdiction (hereto collectively referred to as Wildlife), and their habitats, have been identified as a potential concern.

The purpose of this Wildlife Response Plan (the WRP) is to summarize primary resources at risk and strategies to assess, monitor, control, and recover Wildlife that are known, or have potential to be impacted by a Pollution of a Non-Pollution Incident. The Plan is also intended to prevent unaffected Wildlife from coming into contact with impacted habitats or individuals. Guidance provided within is consistent with the *National Policy on Wildlife Emergency Response* (ECCC-CWS 2021) and supporting guidance documents.

This Plan reflects current knowledge of environmental and incident conditions. The Plan will be amended, as necessary, to reflect changing conditions and input from applicable agencies, stakeholders, and the [insert name of the Responsible Party (RP)]. As part of the Incident Command System (ICS), activities within this Plan should be implemented under direction of the Wildlife Branch Director and/or appropriate Wildlife technical specialist(s) of The Environmental Unit, and be undertaken or supervised by qualified personnel, as indicated herein.

2.0 Agency Notification Procedures

This section describes the government agencies, organizations and/or individuals that should be contacted during incidents involving Wildlife, and the level of potential risk that warrants immediate concerns and notification requirements to each.

Wildlife concerns will be communicated to the Environmental Unit Lead(s) and directed to the appropriate technical specialist(s) (<u>Table 1</u>).

Table 1. Wildlife Agency Contacts

Role	Agency	Contact(s)	Phone	Email
Environmental Unit Lead				
Wildlife Branch Director				
Migratory Bird and Species at Risk Technical Specialist				
Wildlife Response Organization*				

* Should be contacted at the recommendation of the Incident Command, Environmental Unit and request of the RP

The Lead Agency and/or Environmental Unit Lead should ensure ECCC-CWS is alerted as early as feasible in an incident, if certain criteria are met. Examples of these include:

- If large groups (100+ individuals) of dead birds on shore or on the water are observed
- If there is any sign of Migratory Birds demonstrating signs of oiling
- If there is any sign of species at risk located on any federal land demonstrating signs of oiling
- If any sign of oil reaching a National Wildlife Area (NWA)

3.0 Regulatory Requirements

This section provides a brief description of the applicable Wildlife legislation, where it applies, and whether supporting authorizations are required to support a response. Where authorizations are identified, the table in this section will highlight a) what it is for, b) the issuing agency, c) activities that are authorized, d) who holds authorization to conduct those activities, e) <u>if a technical specialist or qualified professional is required to supervise or participate in the authorized activity (e.g., ECCC-CWS or a Wildlife Response Organization (WRO) will supervise Migratory Bird deterrent and dispersal activities), and f) reporting requirements, if any, for these authorizations.</u>

Federal regulations applicable to the incident are:

 Migratory Birds Convention Act (MBCA) and the Migratory Birds Regulations (MBR): Section 5 of the MBCA prohibits the deposit of harmful substances into waters or areas frequented by Migratory Birds, unless authorized under the Canada Shipping Act, or the substance is of a type and quantity, and the deposit is made under conditions, authorized under an Act of Parliament other than the Canada Shipping Act, 2001 or authorized for scientific purposes by the Minister of Environment and Climate Change. Section 6 of the MBR made under the MBCA prohibits the disturbance, destruction, taking of a nest, egg, nest shelter, Eider Duck shelter or duck box of a Migratory Bird, or anyone from having in his possession a live Migratory Bird, or a carcass, skin, nest or egg of a Migratory Bird. The MBR regulate the hunting of Migratory Birds and other circumstances under which the killing, capturing of and harming of Migratory Birds may be authorized. The *Migratory Bird Sanctuary Regulations* (MBSR) further regulate activities related to Migratory Birds and their habitats within designated Migratory Bird Sanctuaries. Permits may be issued to authorize the permit holder to undertake activities that are otherwise prohibited (Government of Canada 2017).

- **Species at Risk Act (SARA):** SARA permits are required for activities affecting a SARA-listed Species, any part of its critical habitat or the residences of its individuals. For the purpose of SARA, an "activity affecting" means any activity prohibited under the Act or its regulations. Section 73 of SARA authorizes the issuance of permits for activities affecting a SARA-listed Species, any part of its critical habitat or the residences of its individuals, and sets out conditions that must be met before a competent minister can issue a permit. SARA prohibitions apply to any species listed on Schedule 1 as Threatened, Endangered or Extirpated, but do not apply to species listed as Special Concern.
- **Canada Wildlife Act (CWA):** The CWA allows for the establishment of National Wildlife Areas (NWAs), which protect wildlife habitat in Canada. The *Wildlife Area Regulations* identify all NWAs and prohibit certain activities from occurring within NWAs, but Section 3.4 of the *Wildlife Area Regulations* provides exemptions for the prohibited activities within the NWAs in the event of an emergency response effort (e.g., ensuring public safety and national security). The Scott Islands marine NWA has its own regulations, *Scott Islands Protected Marine Area Regulations*, which also provide exemptions for the prohibited activities in the event of an emergency response effort.

3.1 Permits and Authorizations

The use of deterrence for dispersal, capture, collection, and treatment of impacted Wildlife will require permits and/or authorizations from the agencies responsible for Wildlife. These permits and/or authorizations are summarized in <u>Table 2</u>; copies of issued permits are provided in <u>Appendix A</u>.

Wildlife	Permit Type	Activities that Require Permits or Authorization	Permit Holders
Migratory Birds (including SARA-listed Species)	Scientific (for collection) Scientific (for	 possession transportation collection/capture treatment/rehabilitation/care euthanasia capturing banding 	Individuals of WROs are generally permitted for most activities. Subcontractors or independent contractors may be permitted for specific activities through
	banding)	 banding using auxiliary markers (e.g., color bands and GPS transmitters) collection of biological samples 	one or several permits.
	SARA Section 73/74 permit	 destruction of protected critical habitat 	SARA permits are issued on site and situation-specific basis and must be discussed

Table	2.	Wildlife	Permit and	Authorization	Requirements
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Wildlife	Permit Type	Activities that Require Permits or Authorization	Permit Holders
		 damage or destruction of any critical habitat that could result in harming individuals of a SARA-listed Migratory Bird damage or destruction of residences of a SARA-listed Migratory Bird 	early in response activities, as appropriate.
Any SARA-listed Species other than Migratory Birds (on any federal land including NWAs, and any land affected by an order or regulation made under SARA)	SARA Section 73 permit	 collection, taking, possession transportation/relocation capture/marking treatment/rehabilitation/care euthanasia harassing, including deterrence and dispersal exclusion barriers / trenches damage or destruction of critical habitat damage or destruction of residences Any activity specifically prohibited by a Section 80 emergency order, or by a regulation made under SARA 	SARA permits are issued on site- and situation-specific basis and must be discussed early in response activities, as appropriate.
Migratory Bird Sanctuaries	Scientific (Collection)	 operations occurring on Migratory Bird Sanctuaries 	Migratory Bird Sanctuary permits are issued on a site-specific basis and will be developed early in response activities.
Raptors and non-Migratory Birds (bald eagles, cormorants, ravens, crows etc.), terrestrial Wildlife	Provincial or territorial authority	 collection transportation holding treating deterrence and dispersal 	Contact provincial or territorial authority representative through the Environmental Unit for authorization or permit.

Note: The permitting process and the types of activities requiring permits is subject to change periodically as regulations are updated. Individuals/organizations should seek up to date advice on permitting from ECCC-CWS permit officers.

4.0 Resources at Risk

This section will be a brief, high-level summary of the key species and species groups, habitats, and supporting on-site evidence of Wildlife resources at risk. It may draw from information gathered in development of an ICS 232 form.

The identification of resources at risk is an ongoing priority of the Environmental Unit. Wildlife have differing likelihoods of being affected based on patterns in habitat use, seasonal occurrence, and behaviours relative to the area of release.

4.1 Geographic Extent

The current scope of review of resources at risk focuses on the incident area [insert a description of the incident area] (see Figure X).

4.2 Migratory Bird Sensitivities

<u>Table 3</u> provides a list of the species that potentially occur in the incident area during the time of the incident. Images of common species are provided in <u>Appendix B</u>.

Bird Guild	Species	
Pelagic Seabirds	Common Murre and Rhinoceros Auklet common in nearshore areas	
Gulls, Terns, Allies	 Glaucous-winged Gull and Mew Gull may be widespread throughout this area (hundreds of individuals) Increasing numbers of other species, including California Gulls are observed in the fall Total gull numbers fluctuate but may exceed several thousands 	
Loons, Grebes, Cormorants, Pelicans	 Pelagic Cormorant and Pacific Loon occur in low numbers in fall Red-necked Grebe occurs in the low hundreds (~350 birds) Western Grebe (SARA Special Concern) can occur in the hundreds to thousands (≤1,500 birds) in the fall Collectively, numbers of Red-necked, Western, and Horned Grebes may exceed 5,000 birds in the fall, particularly in Bearskin Bay 	
Geese, Swans, Dabbling Ducks	 Brant, Canada Goose, and Greater White-fronted Goose may occur in large aggregations during migratory movements. Upwards of several hundred geese may occur at one time Habitats near Lina and Robertson Island may be staging areas for geese 	
Herons, Cranes, Allies	Herons occur at low densities in the fall	
Shorebirds	 Large numbers of Black Turnstone (~230 birds) and Black Oystercatcher (~200 birds) may occur in the fall; areas towards 	

Table 3. Migratory Bird Species Expected to be Present in [insert incident location] in [insert season]
Bird Guild	Species
	 Skidegate Landing, Transit Island, Lina Island, Charlotte Island, and islets in Bearskin Bay support fall aggregations of Black Oystercatcher and Black Turnstone Additional species include Spotted Sandpiper, Wandering Tattler, and phalarope species
Sea Ducks and Diving Ducks	 May occur in low numbers in early fall, increasing as birds return from breeding grounds; upwards of 5,000 White-winged Scoter, Surf Scoter, Harlequin Duck, and Bufflehead may occur The area between Lina Island and Robertson Island, including the immediate area in the vicinity of the incident is recognized as a molting location for several thousand scoters between August and September

4.3 Species at Risk Sensitivities

4.3.1 Avian Species at Risk

[Insert number of species] SARA-listed Species have potential to occur in this region:

- Great Blue Heron, fannini subspecies, year-round (SARA Special Concern, Schedule 1)
- Marbled Murrelet, year-round (SARA Threatened, Schedule 1)

4.3.2 Other Species at Risk

[Insert number of species] SARA-listed Species have potential to occur in this region:

• Western Toad, year-round (SARA Special Concern, Schedule 1)

4.4 Habitat Sensitivities

All Wildlife habitats have ecological values for Wildlife whether actively occupied or not. *Provide a description of where Wildlife are expected to be present based on time of year (e.g., in fall, colonial seabirds will have dispersed from breeding colonies).* Also consider details on mitigations related to habitats including priority sites, protection measures, clean-up restrictions, and information relevant to *Net Environmental Benefits Assessment (NEBA) or Spill Impact Mitigation Assessment (SIMA).*

Primary habitats of importance in the area are summarized in Table 4.

Table 4. Wildlife Habitats in the [insert area of the incident]

Habitat Type	Location	Description
Important Bird Area		
Seabird Colony		
Critical Habitat		
Estuary		

Habitat Type	Location	Description
Other important areas (e.g.,		
nesting areas, seasonal		
stopover, molting, or staging		
areas, <u>Ecologically and</u>		
Biologically Significant Areas,		
<u>Ramsar</u> Sites, <u>Western</u>		
Hemisphere Shorebird Reserve		
<u>Network, Sea Duck Key Habitat</u>		
<u>Sites Atlas</u> , etc.)		

4.5 Wildlife Observations

Onsite personnel have indicated the following Wildlife were observed within the area of the incident during the Initial Wildlife Impact Assessment (see <u>Table 5</u>).

Table 5. Wildlife Observed on [insert date] in [insert description of area]

Record of Wildlife Observations													
Zone	Habitat	Time	Species	Total #	Con	Contaminated Birds							Deterrence Possible?
					Degree of Contamination Notes					Notes			
				0	1	2	3	4	?	Diff			
А	Marsh	12:00	Common Loon	2		2						Adults. Preening excessively	Y
В	Shore	12:05	Common Murre	3	3							at Lighthouse beach	Y

[insert figure of resource sensitivities]

Figure X. Migratory Bird, Species at Risk, and Habitat Sensitivities in the [insert name of incident area]

5.0 Wildlife Management and Response

This section will describe the nature of Wildlife management and response activities that are or will be undertaken as part of the incident. This section will be revised as an incident evolves. Where appropriate, aspects of Wildlife management and response may warrant standalone plans that could be appended and referenced in this section. At minimum, it will describe initial approaches for Wildlife impact assessment (e.g., reconnaissance and monitoring activities), but potentially include:

- Operational objectives
- Initial Wildlife Impact Assessment (0 to 24 hours)
- Reconnaissance surveys (aerial, vessel, shore) (0 to 48 hours)
- Surveillance and monitoring surveys (aerial, vessel, shore) (48 hours onwards)
- Deterrence and dispersal
- Wildlife capture, transport, rehabilitation, release, and/or euthanasia
- Wildlife exclusion, pre-emptive capture and relocation
- Wildlife carcass collection
- Demobilization

5.1 Operational Objectives

This section will briefly describe the primary objectives for the activities that will be implemented during the operational period(s) this plan is expected to apply to until its next revision. Objectives will change based on Wildlife concerns as well as personnel and equipment resource availability. These objectives form the basis for subsequent activities described in this section.

This version of the WRP is intended to support the following operational objectives. A revised WRP will be developed as changes to the operational objectives are identified and need to be addressed in this plan.

- Remove dead, oiled Wildlife from the environment to reduce interaction and contamination of non-polluted Wildlife and habitats
- Identify the numbers and species present in areas at risk of contamination during the next three operational periods
- Identify area- or species-based strategies to limit interaction between live, uncontaminated Wildlife and potential contaminants
- Capture and stabilize up to 10 individual impacted Migratory Birds while rehabilitation facilities are established
- Track reports of oiled and distressed Wildlife as reported through the Wildlife hotline

These operational objectives will be implemented as specified below, according to the structure and function of the Wildlife Branch for this operation period (see <u>Appendix C</u>).

5.2 Initial Wildlife Impact Assessment (0 to 24 hours)

In order to effectively direct Wildlife response efforts, an Initial Wildlife Impact Assessment needs to be conducted to determine:

- Existing information on Wildlife, including initial site observations from response partners
- Current/initial estimates of Wildlife impacts
- Projection of potential impacts to Wildlife
- Initial Wildlife response recommendations
- Initial habitat protection recommendations
- Initial resource, personnel, equipment, and facility requirements

5.3 Reconnaissance Surveys (24 to 48 hours)

Reconnaissance surveys will be conducted in a timely manner on a large geographic scale to assess the outer limits of the incident. Reconnaissance surveys serve to obtain current information on impacted habitats, areas of special concern (e.g. colonial nesting areas) and the abundance and distribution of Wildlife within the general area to obtain an accurate account of Wildlife in the area of the incident. Standardized protocols have been developed for conducting Migratory Bird surveys during an emergency response in Canada. The following direction is summarized from the Guidance and Protocols for Wildlife Surveys for Emergency Response (ECCC-CWS 2022a). Please refer to the report for full details.

5.3.1 Objectives

Initial reconnaissance surveys will take place as early in the response as possible to determine current conditions and inform potential response priorities and strategies. Reconnaissance may occur from land, boat, or air. In all cases, reconnaissance will extend, at minimum, to the expected geographic limits of the incident area, recognizing those boundaries may change as the incident progresses. These reconnaissance surveys help identify the most suitable approaches for the surveillance or monitoring phase of the response.

Primary objectives of reconnaissance surveys are to:

- Determine the geographic scale of the incident
- Identify Wildlife and habitats that have already been impacted
- Estimate relative abundance and distribution of Wildlife with potential to be impacted
- Evaluate key habitats of importance to Wildlife with potential to be impacted
- Inform development of appropriate response strategies
- Inform mitigation activities to minimize further damage to Wildlife
- Inform suitability of various survey methods (i.e., shore, boat, or aerial surveys) for subsequent surveillance or monitoring for the duration of the incident
- Inform Incident Command on the status of known or potential impact on Wildlife

5.3.2 Survey Methods

<u>Table 6</u> provides detailed information to record for reconnaissance surveys. An example datasheet is provided in <u>Appendix D</u>.

Organization	Record the company, agency, or organization that requested the surveys.
Platform name and type	Record the name and type of platform used to complete the survey (i.e., shore, boat and boat type, plane, helicopter).
Observer(s)	Indicate the first and last name of the primary observer.
Observer(s)' affiliation	Indicate the affiliation of the primary observer.
Date	Date that the observation period occurred. Use format DD-MMM-YYYY (e.g., 12- Apr-2021) to avoid ambiguity.
Start and End Time	Record the time (using 24-hour notation) at the start and end of the observation period. Stationary surveys are considered an instantaneous scan of the area and therefore only the start time is required.
Location(s)	Indicate position of platform in either decimal degrees (e.g., 47.5185) or degree decimal minutes (e.g., 47° 31.11') depending on which format is available to you. Record observation location continuously if completing a moving survey.
Scan	Indicate scan type and direction, speed (if moving platform) and altitude (if aerial survey).
Weather Conditions	Record the general weather conditions at the time of the survey. Include notes on visibility (km), weather condition code, glare, sea state, wave height, true wind speed and direction, ice type and concentration code, precipitation.
Species	Where possible, record the exact species using photos if necessary to provide for reference later. If species is unknown, try to narrow down the species group as much as possible (e.g., gull, loon, shorebird). For mixed flocks, try to separate out species or groups as possible. Record the size, colouring, and behaviour to assist with post-survey species identification.
Number of Individuals	Record the number of individuals to the greatest level of accuracy possible.
Distance	Record the distance of the individual or groups from the observer.
Behaviour	At minimum, record whether individuals are in the air, on the water, or on the shore. If possible, record if individuals are resting or feeding. For birds, record fly direction.
Age	Where possible, record age of individual (juvenile, immature, or adult).
Plumage (for birds)	Where possible, record plumage (breeding, non-breeding, or moult).
Sex	Where possible, record sex of individual.
Degree of contamination	Where possible, record the degree of contamination and the number of individuals for each category.
Comments	Provide other relevant comments that would be useful to report back to the Wildlife Branch Director or Technical Specialist(s). For example, associations with incident site or response activities.

Table 6. Recording Survey and Wildlife Information for Reconnaissance Surveys

5.3.3 Survey Results

Include a summary of the highlights of reconnaissance survey results.

5.4 Surveillance (Monitoring) Surveys (48 to 72 hours and onwards)

If impacts to Wildlife or their habitats are known or anticipated, Wildlife Branch will develop a systematic surveillance (monitoring) survey program with an appropriate temporal and geographic scope. If surveillance is required, the RP will secure qualified personnel to develop and execute the program and who will report to Wildlife Branch Director and/or Wildlife Technical Specialist(s). The methods and general approach(es) may be described in strategic WRPs and ECCC-CWS can advise on survey design and implementation for incident-specific WRPs, consistent with the Guidance and Protocols for Wildlife Surveys for Emergency Response (ECCC-CWS 2022a).

Primary objectives of surveillance surveys are to:

- Monitor and refine the identification of Wildlife and habitats in the impacted area
- Monitor and identify areas where Wildlife would be potentially at risk from further impacts
- Monitor and refine estimates of abundance and distribution of Wildlife in the impacted area
- Monitor and estimate Wildlife densities for damage assessment
- Monitor and estimate number of dead and moribund Wildlife affected by incident
- Identify areas where affected Wildlife can be collected
- Inform other response activities such as habitat protection and Wildlife deterrence and dispersal
- Inform Incident Command

5.5 Deterrence and Dispersal

The Wildlife Branch will continually assess options for moving Wildlife beyond the area of impact. If avian deterrence or dispersal is determined to be appropriate, the RP will retain a qualified and authorized WRO to develop and execute an avian deterrence and dispersal program and plan. In the absence of an RP, the Lead Agency may develop and execute a Wildlife deterrence and dispersal program. The program will follow available guidance and consult with ECCC-CWS.

If Migratory Birds are observed or are likely to be near an incident, the Wildlife Branch Director will consult with the Wildlife Technical Specialist(s) whether to develop a deterrence and dispersal plan for those species. Deterrence activities will be determined on a species-specific and location-specific basis that considers the following factors:

- What is the location and/or the extent of the spill
- Where are alternative species-appropriate habitats that birds can be dispersed to
- What species are present or likely to be at risk
- What is the life history status of the birds present (e.g., roosting, staging, breeding)
- What qualified personnel and equipment is available with experience and knowledge for deterrent use and Wildlife dispersal
- What are the environmental conditions

• Can the deterrence and dispersal plan be enacted in a safe manner for response personnel and Wildlife

When appropriate, deterrence and dispersal of Wildlife can be an effective means to deter Wildlife from moving into or near the incident area and coming into contact with contaminants. Deterrence and dispersal will be conducted only by appropriately trained personnel with applicable authorizations, and under direct guidance and supervision (as required) from the Wildlife Branch Director and/or Wildlife Technical Specialist(s).

5.6 Exclusion, Pre-emptive Capture, and Relocation

Exclusion, pre-emptive Wildlife capture, and relocation seeks to dissuade Wildlife from impacted areas before they are affected during a Wildlife Emergency. Planning for Wildlife exclusion or capture requires considerations for equipment, personnel as well as capture, transport, holding, and release strategies. If pre-emptively captured Wildlife need to be contained for a period of time, a WRO authorized to carry out these activities must be identified to provide appropriate species-specific housing, nutritional support, and medical care (if necessary) for a potentially extended period. Guidance and protocols on pre-emptive capture and care for Wildlife during a Pollution Incident are described in the Guidelines for the Capture, Transport, Cleaning, and Rehabilitation of Oiled Wildlife (ECCC-CWS 2022b). Where appropriate, the WRP will describe plans for Wildlife capture and relocation activities.

5.7 Wildlife Capture, Transport, Rehabilitation, Release, and/or Euthanasia

This section will describe, as applicable, tactical plans associated with all phases of Wildlife treatment from capture through to release or euthanasia. This section may evolve over the course of the incident to include details on the number of monitoring and field staging facilities, capture procedures, rehabilitation facilities, as well as coordination of rehabilitation personnel. <u>Table 7</u> provides an overview of relevant phases, which will be expanded upon in a full WRP as those activities are required.

Where Wildlife capture, transport, rehabilitation, release, and/or euthanasia are considered appropriate, the [insert name of the RP] will retain a qualified and authorized WRO to develop and execute these phases of response. These programs must adhere to the Guidelines for the Capture, Transport, Cleaning, and Rehabilitation of Oiled Wildlife (ECCC-CWS 2022b), and Guidelines for Establishing and Operating Treatment Facilities for Oiled Wildlife (ECCC-CWS 2022c).

Table 7 summarizes the phases of Wildlife capture, containment, and response.

Phase	Objectives
Pre-emptive Capture	The capture of Wildlife that is at risk of being impactedTransport of Wildlife to a holding facility
Capture	 The capture of impacted Wildlife Transport of Wildlife to Field Stabilization Site or Oiled Wildlife Rehabilitation Centre

Table 7. Phases of Wildlife Capture, Transport, Rehabilitation, Release, and/or Euthanasia

Phase	Objectives
Field Stabilization	 Physical evaluation Removal of gross contaminants Thermoregulatory support Fluid therapy and nutritional support Address life threatening conditions Euthanasia evaluations based on established criteria and best practices
Transportation	 Transport of contaminated animals from field or Field Stabilization Site to an Oiled Wildlife Rehabilitation Centre
Processing	 Evidence collection Birds given individual, temporary band Feather/fur sample Photograph Individual medical record
Intake	 Medical examination, triage, and treatment plan development Critical care concerns addressed Euthanasia evaluations based on established criteria and best practices
Triage	 Ongoing euthanasia and treatment plan evaluation based on medical health status
Euthanasia	 Euthanize Wildlife that are assessed by the WRO as not being good candidates for rehabilitation or survival
Stabilization	 Fluid, nutritional and medical stabilization of impacted animals 48–72 hours period Prepare animals for cleaning process
Cleaning	 Removal of all contaminants from an impacted animal by washing Removal of the cleaning agent by rinsing Drying cleaned and rinsed animal
Conditioning	Restoring waterproofing and physical condition
Release	 Federal banding of individual animals Consider additional tracking devices on some birds to track post-release Release of cleaned, waterproof animals into a clean environment
Post-release Monitoring	 Determining the effectiveness of rehabilitation of Wildlife impacted during a Pollution Incident Monitoring the clean Wildlife's condition and activities Following short-term and long-term survival and breeding status following rehabilitation

5.8 Wildlife Carcass Collection Procedures

Dead Wildlife will be removed from the environment to avoid attracting scavengers to the site and secondary contamination of Wildlife. The responsibility for the collection and documentation of dead

Wildlife is primarily the responsibility of the Wildlife Branch and is completed under the supervision of authorized organizations and personnel. Wildlife recovery personnel will retrieve dead Wildlife as part of daily activities. Dead Wildlife observed by other response personnel will be reported to the Wildlife hotline. Members of the public must not pick up dead Wildlife but rather report dead Wildlife to the Hotline. The Wildlife Branch will work with the Information Officer to develop appropriate messaging. For guidance on collecting dead Wildlife during incidents, see the *Guidance and Protocols for Wildlife Surveys for Emergency Response (*ECCC-CWS 2022a).

5.9 Waste Management

Plans for decontamination and disposal of waste materials will be developed. Waste and secondary pollution should be minimized at each step of the Wildlife response. During the various phases of Wildlife cleaning (holding pen, carcass wrapping), waste will be created. Washing Wildlife will cause waste water (e.g., oil with detergent), which will need to be managed. Medical waste (e.g., syringes and gloves) should be considered.

Include reference(s) to relevant waste management plan(s). These plans should identify the legislation and the authorities responsible for waste management.

5.10 Demobilization

This section of the WRP will discuss, as applicable:

- processes for demobilizing equipment, facilities, and personnel
- processes for ongoing involvement in the Incident Command Post or post-response impact assessment and monitoring
- processes for chain of custody of data to support enforcement decisions
- processes by which the RP can continue to receive advice and support from ECCC-CWS

6.0 Information Management and Reporting

This section will describe how information will be managed, organized, vetted, and reported on. It will include for each Wildlife group, a) the type of data being collected (e.g., inventory, photos, GIS), b) the personnel that will collect, organize, and vet the data for each agency, c) the process for maintaining data records during and after the incident, d) the process for integrating Wildlife data and activities into an incident information system (often referred to as the Common Operating Picture) within an Incident Command Post, e) who data is reported to, including the type and frequency of reports (e.g., daily email tabular summaries to the Environmental Unit Lead), and f) how information is disseminated to agencies responsible for overseeing response.

All Wildlife information and observations will be reported to the Wildlife Branch Director and/or Wildlife Technical Specialist(s) and include the following:

• Daily record of all Wildlife observations, including habitats of potential importance or use by Wildlife

- Submission of written notes, completed data sheets, photographs, maps, and/or GPS location information
- Oiled bird sightings, including locations and maps for all reports of oiled birds
- Field Retrieval Report, including records for all birds collected from the field
- Live Bird Intake / Admissions Log
- Dead Bird Intake / Admissions Log
- Oiled Bird Examination Report, including an individual record summary of retrieval, medical exam, diagnostic results, samples collected (chemical, blood, and tissue), cleaning, treatment, evaluation, chain-of-custody, federal bird bands, and final disposition
- Report of anticipated management and response activities for the following operational period
- Daily Summary of Actions: This report is produced daily and provides an overall status of live and dead Wildlife admissions, euthanasia, releases, and treatment status of live Wildlife patients.

Additional information will need to be reported if there is any deterrence and dispersal, collection, and rehabilitation anticipated. All Wildlife information and data will be retained by the Wildlife Branch and transferred to appropriate regulatory agencies at end of incident.

6.1 Wildlife Reporting from the Public (Wildlife Hotline)

All concerns regarding impacted Wildlife will be routed through the Environmental Unit. Observations of impacted Wildlife will be directed to the Environmental Unit through a 24-hour hotline [insert hotline number here]. The public and Wildlife responders are requested to stay away from impacted Wildlife to minimize stress to impacted animals. Under no circumstances will the public or Wildlife responders attempt to capture any impacted Wildlife, as such efforts must only be conducted by permitted and trained personnel. Unauthorized capture could endanger the safety of both individuals and the animals.

6.2 Media Relations

When the Wildlife Branch is activated, media statements regarding ongoing Wildlife response activities will be provided in order to inform the public and raise awareness regarding Wildlife concerns and treatment as well as public safety. The Wildlife Branch Director and the incident's Information Officer will jointly develop these statements, with relevant input from Wildlife Technical Specialist(s) and/or Environmental Unit Lead. Every effort must be made to assure that information release by the Information Officer and the Wildlife Branch is fully coordinated to provide a consistent message on Wildlife response efforts and Wildlife impacts. Where appropriate, public statements involving Migratory Birds must be vetted and approved by the ECCC-CWS technical specialists, Media Relations and the Regional Director.

6.3 Permits Reporting

Certain permits which may be issued prior to or during an incident may also have reporting requirements.

The WRP should specify those reporting requirements and timelines, if known at the time of plan creation.

7.0 Health and Safety

This section will provide a brief overview of safety considerations and requirements, with specific mention of personal protective equipment relevant to <u>current activities</u> that Wildlife responders are expected to be engaged in. This section will evolve over the course of the incident.

Responder safety is of paramount importance when initiating Wildlife response activities. Activities recommended and implemented as part of this WRP will adhere to the incident-specific site safety plan [insert reference here] and be identified in consultation with the Incident Safety Officer. Responders will have appropriate training for response activities and will wear personal protective equipment that meets minimum requirements for personal safety and contaminant or disease transmission, based on the activities they are engaged in. Detailed safety training and equipment considerations will be required if incident activities include Wildlife deterrence and dispersal, handling, collection, rehabilitation, and/or disposal.

7.1 Personal Protective Equipment

For Wildlife management and response activities proposed in this WRP, responders will have appropriate training and equipment for operating in shoreline, marine, or aerial environments (depending on incident location and response activities) and for contaminated Wildlife handling within a rehabilitation setting. Responders will have appropriate equipment and clothing to operate for extended periods and that protect against environmental exposure or incident-specific conditions. Basic personal protective equipment recommended for Wildlife management and monitoring activities include the following:

- Eye protection (e.g., sunglasses, goggles, safety glasses, or face shield)
- Oil resistant rain gear or oil protective clothing (e.g., coated Tyvek, Saranex, etc.)
- Water and oil resistant hand protection (e.g., neoprene or nitrile rubber)
- Waterproof and oil resistant non-skid boots; steel-toes may be required under the incidentspecific safety plan
- Hearing protection (muff or ear plug type)
- Personal flotation device when working on, near, or over water
- Air monitoring device when appropriate
- Specific gear appropriate for work where personnel are submersed in water (wet suits, dry suits, survival gear)
- Species-specific capture and protective gear (welding gloves, steel toed boots etc.)
- [Update this list of personal protective equipment requirements according to planned response activities]

7.2 Zoonoses

Zoonoses are infectious diseases that may be transmitted between animals and humans under natural conditions. Personnel handling or coming into contact with Wildlife are at risk of zoonotic disease exposure. Veterinarians, technicians, response personnel, Wildlife handlers, and other animal care personnel who come into direct or indirect contact with Wildlife and any body fluids are at risk of contact with disease agents that may have zoonotic potential. Organisms that may cause or transmit zoonotic

diseases include many classifications from viruses, fungi, and bacteria to internal and external parasites.

Anyone whose immune system is compromised is highly susceptible to opportunistic and secondary infections with zoonotic disease agents and should not be on site of an incident. Standard biosecurity practices will be employed in all aspects of Wildlife operations to reduce risk of disease exposure.

The WRP will describe biosecurity practices that will be employed.

7.3 Biosecurity

Biosecurity is a set of preventative measures that reduce the risk of transmission of infectious diseases, pests, and invasive species.

Where there is potential for response measures (both overall incident response and Wildlife-specific response) to contribute to issues involving biosecurity, the WRP will outline a suite of measures to control for these risks.

8.0 Personnel Requirements

There are many personnel that could be involved in various aspects of WRP implementation. Certain roles, responsibilities, or authorized activities require various types of training or technical expertise.

Where applicable, the WRP will specify which activities individuals with specific training or expertise can complete.

9.0 Facility and Equipment Requirements

As part of planning and implementing Wildlife response measures outlined in a WRP, specific equipment and facility requirements may need to be developed. The level of detail of these requirements will vary by the scale of the incident and may be more appropriately described in documents appended to the WRP. Components of equipment and facility considerations may include the following:

- The type and amount of equipment required
- Means of transportation to support Wildlife response elements
- Requirements for utilities, waste management, and security
- The nature of equipment or facility requirements (e.g., temporary, mobile, permanent)
- Sources of supplies, if known

Additional information to support equipment and facility planning is outlined in the Guidelines for Establishing and Operating Treatment Facilities for Oiled Wildlife (ECCC-CWS 2022c).

10.0 Additional Information

11.0 Literature Cited

ECCC-CWS. 2021. National Policy on Wildlife Emergency Response. Canada. vii + 9 pages.

ECCC-CWS. 2022a. Guidance and Protocols for Wildlife Surveys for Emergency Response. Canada. x + 97 pages.

ECCC-CWS. 2022b. Guidelines for the Capture, Transport, Cleaning, and Rehabilitation of Oiled Wildlife. Canada. ix + 45 pages.

ECCC-CWS. 2022c. Guidelines for Establishing and Operating Treatment Facilities for Oiled Wildlife. Canada. viii + 32 pages.

Appendix A: Wildlife Permits

Appendix B: Images of Common Species

Appendix C: Structure, Roles, and Responsibilities of the Wildlife Branch

Appendix D: Example Datasheet of Wildlife Sightings

Example Record Sheet for Aerial Surveys								
Company/agency	V	/isibility (km)						
Aircraft type	V	Veather conditions code						
Observer(s)	G	Glare conditions code						
Observer(s) name(s)	S	Sea state code (m)						
Date (dd/mm/yyyy)	C	Cloud cover (%)						
Time (UTC)	P	Precipitation						
Latitude	V	Vave height (m)						
Longitude	T B	True wind speed (knots) OR Beaufort code						
Altitude	Т	True wind direction						
Speed	la	ce type code						
Recorder type	la	ce concentration code						
Scan type								
Scan direction								
Camera model								
Notes:								

Record of Observed Wildlife													
Zone	Habitat	Time	Species	Total #	Cont	Contaminated Birds							Deterrence
					Degree of Contamination Notes							Notes	Possible?
					0	1	2	3	4	?	Diff		

Degree of contamination covering: 0 = no spots visible on the body, 1 = <10% of the body, 2 = 10-33% of the body, 3 = 33-66% of the body, 4 = >66% of the body. Diff = birds unable to fly, having considerable difficulty swimming, or constantly preening. Indicate the location of birds in difficulty as precisely as possible (preferably on a map)



Environnement et Changement climatique Canada



Procedures for handling and documenting stranded birds encountered on infrastructure offshore Atlantic Canada





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1 BACKGROUND

1.1 Document Purpose

This document is intended to provide personnel working on offshore infrastructure (i.e., oil and gas platforms, supply vessels, etc.) with safe and effective procedures for dealing with and documenting live and dead stranded birds.

Disclaimer - The information presented here constitutes advice only. All persons must adhere to all pertinent laws (for example provincial or territorial laws), regulations and permit requirements including but not restricted to the "Migratory Birds Convention Act, 1994" (MBCA) and the "Migratory Birds Regulations" (MBR). It is important to note that some species of birds protected under the MBCA have also been listed in Schedule 1 of the Species at Risk Act (SARA). These species receive protection from both the MBCA and SARA.

This advice does not provide an authorization for harming or killing migratory birds or for the disturbance, destruction or taking of nests or eggs under the MBR. It does not provide a guarantee that the activities will avoid contravening the MBR or other laws and regulations. This is general information not intended to be relied on as official advice concerning the legal consequences of any specific activity. It is not a substitute for the MBCA, the MBR, or any other legislation.

1.2 Supporting documents (as APPENDICES)

Stranded Bird Encounter Datasheet – used for documenting and reporting all live and dead stranded birds (Appendix 1).

Infographic - Procedures for handling and documenting stranded birds – used as a quick reference guide to identify the most appropriate course of action when stranded birds are encountered (Appendix 2).

Common Seabirds of Atlantic Canada – used to help identify the most common seabirds found offshore Atlantic Canada (Appendix 3).

1.3 Bird attraction to coastal and offshore infrastructure

Birds can be attracted to offshore platforms, drilling rigs, and support vessels for a variety of reasons, which can include roosting and/or foraging opportunities, as well as attraction to potentially disorienting light sources. Light sources can include floodlights, operational deck lighting, and flares, which may be particularly attractive at night and in foggy or otherwise inclement weather. Attraction to light sources may result in the collision of birds with lit structures and incineration or partial incineration in flares. In Atlantic

Canada, nocturnal migrants and night-flying seabirds (e.g., storm-petrels) are the birds most at risk of attraction to lights.

1.4 Authorization for capture and handling of migratory birds

The capture and handling of migratory birds requires authorization under the "Migratory Birds Convention Act" and "Migratory Bird Regulations", which can be obtained by contacting:

Canadian Wildlife Service (CWS) – Atlantic Region Environment and Climate Change Canada 17 Waterfowl Lane Sackville, NB, E4L 1G6 <u>ec.scfatlpermis-cwsatlpermits.ec@canada.ca</u>

See section 1.6 for contact information when CWS needs be contacted immediately.

1.5 Equipment required for capture and handling of live birds

Most capture and handling of stranded birds can be conducted safely and effectively without specialized equipment. However, all personnel should refer to their companies' Occupational Health and Safety Procedures to identify and minimize potential hazards.

We recommend the following list of equipment be available on offshore infrastructure to help minimize stress to the bird and mitigate any risk of injury to personnel. Please note, all equipment that is used for the capture and handling of stranded birds should be cleaned thoroughly, disinfected, or discarded, as appropriate after use.

1.5.1 Personal protective equipment (PPE) for personnel

- Protective barrier gloves (e.g., disposable plastic, nitrile, or rubber gloves) appropriate for the type of bird handled. Consider heavier-duty gloves (e.g., thick leather, PVC, or plastic gloves) when handling larger birds. Gloves should be clean and free from grease and oil.
- Eye protection (e.g., clear safety glasses, wrap-around sun glasses, or face-shield) is required when handling large birds such as herons, gulls, and gannets (use extreme caution when handling any large bird, or avoid handling altogether as they can be dangerous).

1.5.2 Equipment for the safe and effective capture and handling of live birds

- Box or animal carrier Cardboard boxes are best for holding migratory birds because the boxes provide a calm, dark environment, and will not damage feathers to the extent that hard-sided animal carriers may. Ventilation holes must be cut or punched into cardboard boxes prior to the placement of birds. The bottom of the box should be lined (see below) to allow the bird to stand without slipping. The box should be large enough to allow the bird to stand. Do not house or transport birds in transparent carriers (e.g., wire cages or aquariums).
- Blankets, sheets, towels or pillow cases (based on size of bird) for corralling and capturing birds. Pillow cases also work well for short-term transportation and holding of birds until they can be placed into a cardboard box. Towels or a piece of clean carpet can be used to line or pad the box to prevent slipping.
- Nets Smaller and more agile birds may be better captured with hand-held nets (e.g., butterfly nets with long handles). These are especially useful when birds are in hard-to reach corners or under equipment.
- Field guides and/or cameras (including cell phone cameras) are useful for species identification. Identifying the species can help inform decisions regarding the housing, maintenance, transport, and release of the bird. The images on the "Common Seabirds of Atlantic Canada" (Appendix 3) can help in identifying the most common seabirds found in Atlantic Canada, and the following are useful field guides for birds in general:
- "The Sibley Field Guide to Birds of Eastern North America" (Sibley)
- "A Field Guide to North Atlantic Wildlife" (Proctor & Lynch)
- "Beached Birds A COASST Field Guide to the North Atlantic" (Hass & Parrish) for identification of dead birds.

1.6 Reporting live and dead stranded birds

All birds found stranded on platforms and vessels should be documented (section 4). Documentation should include photographs whenever possible. The documentation should be sent to CWS annually, or as specified under the conditions of the authorization.

Some circumstances require immediate (within 48 hours) reporting to CWS:

- one or more Species at Risk found alive or dead on platform or vessel;
- 10 or more birds stranded or found dead during a single event or day;
- Any birds found injured or oiled that may require transport to mainland facilities for release or rehabilitation; or

• Any birds for which the identification, status or proper handling protocols are uncertain.

Nova Scotia Carina Gjerdrum: (902) 426-9641, (902) 233-2506 (cell); <u>carina.gjerdrum@canada.ca</u>
Newfoundland and Labrador Sabina Wilhelm: (709) 772-5568, (709) 764-1957 (cell); sabina.wilhelm@canada.ca
Alternate contact Becky Whittam: (506) 364-5189, (506) 224- 0152 (cell); <u>becky.whittam@canada.ca</u>

Though the majority of birds fall under federal jurisdiction, some species (such as owls, raptors, and crows) are the responsibility of provincial governments. If you are unsure, CWS staff listed above can direct you to the appropriate provincial agency, if required.

2 LIVE STRANDED BIRDS: GENERAL PROCEDURES

When live birds are stranded on offshore vessels or platforms, their rapid capture, stabilization, and release can significantly increase their chances of survival. Documentation of the stranding will help to inform mitigation strategies that can minimize impacts on bird populations.

Refer to the "Infographic - Procedures for handling and documenting stranded birds" (Appendix 2) as a quick reference guide to identify the most appropriate course of action when stranded birds are encountered.

2.1 Identify type of bird (i.e., species) that has stranded

Field guides are a useful tool to aid in species identification (section 1.5.2), but when the identification of a species is in doubt, contact CWS (section 1.6). Take a photograph of the bird whenever possible to help confirm species identification.

The "Pelagic Seabirds of Atlantic Canada" is a reference card associated with this document (Appendix 3) that shows images of the most common seabirds found offshore Atlantic Canada.

2.1.1 Birds that may become stranded

Leach's Storm-Petrels (*Oceanodroma leucorhoa*) are abundant, small seabirds that frequently become stranded on vessels and platforms at night. A similar species that may also be found stranded is the **Wilson's Storm-Petrel** (*Oceanites oceanicus*). Storm-Petrels account for 97% of stranded birds reported on offshore platforms and vessels operating on the Grand Banks, Newfoundland and Labrador. The period of greatest risk of attraction to lights on vessels appears to be at the end of the breeding season (September and October) when adults and newly fledged chicks are dispersing from the colonies and migrating to their offshore wintering grounds.

Murre (*Uria* spp.), **Atlantic Puffin** (*Fratercula arctica*), **Razorbill** (*Alca torda*) and **Dovekie** (*Alle alle*) are diving birds that spend a large proportion of their time floating on the surface of the ocean, which makes them highly susceptible to oiling at sea. These migratory birds occasionally strand on platforms and supply vessels.

Other seabirds that occasionally become stranded on vessels or platforms include **shearwaters**, **gannets**, and **gulls**, although these are less likely to be oiled and more likely to be injured or resting.

A number of globally rare seabird species, such as the **Bermuda Petrel** (*Pterodroma cahow*) and **Black-capped Petrel** (*P. hasitata*), are particularly vulnerable to fatal light attraction due to their low population size. Take a photograph if species identification is not certain and contact CWS (section 1.6) for instructions on proper handling, care, and release or collection.

Landbirds include **songbirds** (e.g., sparrows, warblers finches), **waders** (e.g., plovers, sandpipers, herons), and **birds of prey** (e.g., owls, hawks, falcons) that typically do not occur at sea outside of brief migratory periods, but often inhabit coastal areas. Landbirds account for approximately 1% of strandings recorded on offshore platforms and vessels operating on the Grand Banks, Newfoundland and Labrador, but are more frequently found stranded on platforms and vessels in the Sable Island Banks production area. Landbirds typically interact with offshore vessels or platforms during spring or fall migration, particularly during periods of high wind or fog.

2.1.2 Species at Risk

For the purposes of this document, Species at Risk are considered species (or sub-species) listed in Schedules 1, 2 or 3 of the Species at Risk Act and/or assessed by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) as endangered, threatened or special concern. If any of these species are found stranded alive or dead on offshore platforms or vessels, contact CWS (section 1.6) for instructions on proper handling, care,

and release or collection. The latest list can be found on the Species at Risk Public Registry (<u>www.sararegistry.gc.ca</u>).

2.2 Identify issue and follow course of action

When a migratory bird is observed on a platform or vessel, it may be resting or it may be truly stranded. A stranded bird may require assistance to leave the structure if it is trapped, exhausted, or wet.

At other times, a stranded bird may be injured and unable to leave the structure under its own power. Identifying the exact nature, cause, and severity of an injury can be very difficult and will often require consultation with an expert. Injured and oiled birds may require expert care whereas other birds may simply need some assistance to be released at sea.

Furthermore, in many cases, birds may recover best if left alone. The following points describe what should be done when stranded birds are observed.

2.2.1 Bird is resting



- A bird that is resting on deck or a railing and is still able to fly and/or walk freely, or is able to leave the platform unassisted.
- Some resting birds may stay with a vessel for several days until they are ready to depart.

2.2.2 Bird is trapped, exhausted, disoriented, or wet



• Do not attempt to capture birds of prey or large birds (e.g., herons, cormorants, gannets and gulls) as they are able to inflict significant injuries. Contact CWS for further instruction (section 1.6).

- Most birds that are trapped on deck or in cabins may be captured (section 2.3) and released immediately (section 2.5) if they are not exhausted, disoriented, wet, injured, or oiled.
- Exhausted birds (e.g., those that remain seated or laying on deck for long periods and when approached, cannot fly away or hide in a corner) and wet birds should be captured (section 2.3), placed in a cardboard box in a dry, quiet location (section 2.4), examined every few hours to determine level of activity, and when appear recovered, released as appropriate (section 2.5).
- After a collision, some birds may be disoriented but otherwise uninjured. If the disoriented bird is easily captured, keep it in a box for a few hours to rest and recover (section 2.4), then release at sea (section 2.5).

It is important to determine if a bird is simply wet or if its feathers are coated with oil (some dark birds may appear to be oiled when the feathers are only wet). See section 2.2.3 for information concerning identifying and handling oiled birds.

2.2.3 Bird is injured or oiled



• Birds may sometimes become injured from a collision with a platform or vessel infrastructure.

Broken wing – the wing is held at awkward angle or dangling when standing, walking, or flying. A bird with a broken wing will not survive on its own and should be kept in a darkened box (section 2.4) until further instruction from CWS.

Broken leg or foot – the bird walks or stands with a limp. Some birds may survive with broken legs and may be difficult to capture. Consult with CWS (section 1.6) as some birds with this type of injury may fare best if left alone or released at sea (section 2.5). • Birds can be oiled at sea or may become oiled when moving around on vessel or platform decks or beneath machinery. Even small amounts of oil or grease can harm a bird's ability to maintain waterproofing, which is the key to feathers' insulation value. Loss of insulation can quickly lead to hypothermia and death.

Confirm presence of oil by

- looking for oil smudges on glove, towel or paper towel;
- feeling for a sticky or filmy substance on feathers;
- smelling the feathers for petroleum-like scents.

Do NOT try to clean an oiled bird. Cleaning an oiled bird requires authorization under the Migratory Bird Regulations, specialized training, and proper facilities.

2.3 Safe capture and handling of live stranded birds

Ensure that personnel always use the appropriate PPE (section 1.5.1) when capturing and handling wildlife, and follow these general rules:

- 1. Never attempt to capture a bird if your safety is at risk. If you are uncomfortable or unable to capture a stranded bird on your own, seek assistance. Do not attempt to capture a bird of prey or large, long-necked birds such as herons, cormorants, gannets, and gulls. The talons and bill can cause serious injury.
- 2. Safety first for both personnel and the birds. Have appropriate and clean equipment ready (section 1.5). Proper precautions must be taken and safety equipment must be worn during capture and handling (e.g., gloves and eye protection).
- **3.** Minimize stress to the animal. House and transport birds in a closed, darkened box or carrier. This is safer and less stressful to the bird.

2.3.1 General techniques

- Briefly examine birds to identify the species and look for signs of injury, oiling, and wetness. What you find will determine the course of action (section 2.2).
- Use towels, blankets, jackets, or sheets to corral the bird into a corner. Gently throw the towel/blanket over the entire bird. Darkness will help calm birds while transferring them to a box. Smaller and more agile birds may be better captured with hand-held nets (e.g., butterfly nets).

Storm-Petrels can be collected by hand as they are easy to pick up, poor walkers, and will not fly up off the deck if the area is well-lit.

Use gloves and eye protection for larger birds, such as murres, puffins, and shearwaters. If possible, secure the bill by firmly but gently, holding it and the head from outside of the blanket or towel.

- Wrap the bird in the towel/blanket, holding securely but gently while handling. When lifting a bird, hold its wings flush to its body in order to prevent flapping, which could lead to injury to the bird.
- If necessary, transfer the bird to a box with adequate ventilation (section 2.4) as soon as possible and gently unwrap the towel or blanket.
- Immediately after handling any birds, dispose of gloves and thoroughly wash hands with soap. Wash clothes if necessary.

2.4 Stabilization of live stranded birds

After capture, stabilization of the bird is important for its rest and recovery. The following are some key points for maintaining birds in preparation for release at sea, or for transportation to the mainland, if required. Remember to always use appropriate PPE when handling the birds (section 1.5.1).

- Keep bird(s) in a cardboard box with adequate ventilation. If possible, keep only
 one bird per box. However, if multiple stranded birds need stabilization, they can
 be kept in the same box provided they are not overcrowded. If it is necessary to
 keep more than one bird in a box, they should all be of the same species. Larger
 birds (e.g., waders) should be kept in their own box. Long-legged birds (e.g.,
 yellowlegs, whimbrel, and willet) should be kept in a box that is tall enough to
 allow the birds to remain standing.
- If the bird is suspected of being oiled, it should be kept in a box until further instruction is received from CWS (section 2.2.3). Oiled birds should be kept individually in separate boxes in order to avoid cross-contamination.

- The bottom of the box should be padded with towels to absorb water/oil and provide padding for legs and feet. Avoid other bedding types (i.e., long strips of paper) that may lead to entanglement, especially for smaller species.
- Change towels when wet or oiled.
- A small dish of water can be provided to songbirds, but not to other species and only if they are able to stand. No food should be given to any of the birds in captivity.
- Keep the box in a quiet, cool (but indoors), and dark location.
- Birds should be monitored regularly (every 1-2 hours) for panting as birds can overheat as they recover. If a bird is found to be panting, move the box to a cooler location or increase ventilation.
- If transportation to the mainland is necessary, it should be done within 24 to 48 hours, if possible.

2.5 Releasing birds at sea

Depending on the severity of the birds' injuries and overall condition, some birds may be released at sea. If unsure of the best course of action, contact CWS (section 1.6). Remember to always use appropriate PPE when handling the birds (section 1.5.1).

Storm-Petrels should be released at night to avoid predation from gulls. In circumstances where there are no gulls in the vicinity, the storm-petrels can be released during the day. The stranded storm-petrel should be brought to the forward quarter of the vessel or a poorly lit corner of the platform where the bird will not be attracted to lights or flares and strand itself again. Release by gently letting go of the bird over the side, pointing it away from the vessel/platform.

Other seabirds can be released at sea by gently tossing the bird over the leeward side of the vessel/platform so that wind or waves do not blow the birds back onto the deck.

Landbirds (e.g., songbirds and waders) can be released at sea by placing them on a high perch, somewhere out of the wind where the bird has the opportunity to fly away when it is ready to do so. Depending on the birds' condition, it may remain with the vessel or platform.

Bird type	Tips for quick identification	Considerations for capture			
Seabirds	 Webbed feet Bill deep but narrow, pointed or hooked at the tip Typically black, white, and/or grey Often poor/awkward walking on deck Shearwaters, storm-petrels, gannets, murres, puffins, gulls, cormorants. 	 Storm-petrels can be caught by hand Other species of seabird are best captured by throwing towel/blanket over body All will likely try to bite, and larger species may cause injuries – use gloves and eye protection and secure bill under towel/blanket (shearwaters, murres, puffins) Do not attempt to capture gannets, gulls or cormorants 			
Songbirds	 Short thin legs, feet not webbed Bill short, but thin (warblers) or stubby (sparrows and finches) Small, typically brown or any mix of colours (black, yellow, red, white.) Agile, quick flight, often hopping and perching Sparrows, warblers, finches, etc. 	 Corral into corner of a room Most easily captured with handheld net May or may not bite 			
Waders	 Long thin legs, feet not webbed Bill generally long and thin however plovers have short beaks. Small to large, typically brown or grey Agile, good at walking or running Plovers, sandpipers, herons 	 Plovers and sandpipers: corral into corner of a room, using a net or light towel/sheet for capture <u>Do not attempt to capture herons</u> - may bite or strike with beak 			
Birds of prey	 Very strong legs, feet, with long talons Bill hooked Medium to large, typically brown or grey Strong, agile flyers that will most often be found perched on vessel/platform looking to hunt smaller birds Owls, hawks, falcons 	 <u>Do not attempt to capture</u> Talons and bill can cause serious injury Contact CWS who will direct the call to the appropriate provincial agency 			

Table 1. Considerations for capture and handling of birds that may get stranded.

3 DEAD STRANDED BIRDS: GENERAL PROCEDURES

Dead birds are occasionally found on offshore vessels or platforms. Documentation and/or collection (with appropriate PPE, section 1.5.1) of dead birds will help wildlife managers determine the cause of death.

3.1 Less than 10 birds found dead (in the same event), no Species at Risk, and no oiled bird(s)



- If species identification is uncertain, take a photograph of the dead bird(s). Send the photograph to CWS to confirm species and that the dead bird is not a Species at Risk.
- Document the date, location, species, number of birds that were found, bird condition (i.e., oiled or unoiled), and bird fate using the "Stranded Bird Encounter Datasheet" (Appendix 1).
- After documentation, carcass(es) may be disposed of at sea.

3.2 More than 10 birds found dead (in the same event), Species at Risk, or oiled bird(s)



- When more than 10 individual migratory birds are found stranded in a 24 hour period (and they are not oiled), contact CWS as well as the Canadian Coast Guard Environmental Emergencies Line (1-800-565-1633).
- If you suspect you have a Species at Risk, take a photograph and contact CWS to confirm.

- While wearing disposable gloves, place dead birds in a plastic bag (any type) and tie it shut.
- Document (section 4) the event using the "Stranded Bird Encounter Datasheet" (Appendix 1).
- Contact CWS and arrange to ship to the appropriate CWS contact person as soon as possible (section 1.6).
- If the bird(s) is oiled, contact CWS as well as the Canadian Coast Guard Environmental Emergencies Line (1-800-565-1633).
 - To avoid cross-contamination, individually wrap each bird in aluminum foil and place in its own bag. It is vital that clean gloves are used prior to handling each oiled bird, and that oiled birds are wrapped in foil as soon as they are found.
 - Write date, location and name of collector directly on the bag with permanent marker and attach the data collection form to the bag (or put inside the bag).
 - Document (section 4) the event using the "Stranded Bird Encounter Datasheet" (Appendix 1).
 - Contact CWS and arrange to ship to the appropriate CWS contact person as soon as possible (section 1.6).
- Store any collection bag(s) in a cool place (e.g., outdoors during winter or in portable cooler with ice packs) that is sheltered from scavenging birds.
- After removing and disposing of gloves, thoroughly wash hands with hot water and soap.

4 DOCUMENTATION OF STRANDED BIRDS

Documentation of stranded birds will help to inform mitigation strategies to minimize impacts on bird populations. **All stranded birds (live and dead) should be documented** using the "Stranded Bird Encounter Datasheet" (Appendix 1). The documentation should be sent to CWS annually, or as specified under the conditions of the authorization (section 1.4).

The following fields are used for recording information on stranded bird encounters:

• Name of facility, vessel or platform – record the name of the facility, vessel or platform on which the stranded bird was found.
- **General activity** describe the activity of the facility, vessel or platform (i.e., seismic exploration, drilling, refinery, etc.).
- **Description of search effort** describe how and where stranded birds are searched for (e.g., opportunistically, systematic searches, etc.)
- **Date** record the date that the bird(s) was encountered.
- **Location** record the latitude/longitude of the facility, vessel or platform where bird(s) was encountered, or location name.
- **Bird species** identify the species encountered. If the identity of the species is in question, take a photograph, if possible.
- Total number of stranded birds indicate the number of birds encountered.
- **Condition of bird(s) when found** –indicate the number of stranded bird(s) found dead, alive, and/or the number found oiled.
- Action taken document the number of stranded birds that were disposed of at sea, released alive, sent ashore, and/or died in care.
- Weather indicate whether there was fog and/or rain at the time of the stranding.

1. SURVEY INFO: Fill this out before you start. Don't forget to fill in "End Temperature" at the end of your survey!

Observer Name:	Co-Ob	bserver Name:			
Address:		Email: Phone:			
Route Name:		Date:			

Start Temperature: _____

Stop	Start Time (24 hr)	Wind (circle)	Wind direction	Cloud (10ths of sky covered)	Moon (circle)	Noise (circle)	# Cars	Comments
1		0 1 2 3			Y N	0 1 2 3		
2		0 1 2 3			Y N	0 1 2 3		
3		0 1 2 3			Y N	0 1 2 3		
4		0 1 2 3			Y N	0 1 2 3		
5		0 1 2 3			Y N	0 1 2 3		
6		0 1 2 3			Y N	0 1 2 3		
7		0 1 2 3			Y N	0 1 2 3		
8		0 1 2 3			Y N	0 1 2 3		
9		0 1 2 3			Y N	0 1 2 3		
10		0 1 2 3			Y N	0 1 2 3		
11		0 1 2 3			Y N	0 1 2 3		
12		0 1 2 3			Y N	0 1 2 3		

End Temperature: _____

Code	Wind Description	Cloud Description	Noise Description
0	Calm: smoke rises vertically	0=No clouds	None or slight (e.g., distant traffic)
1	Light air: smoke drifts, leaves and wind vanes are stopped	1=10% cover	Moderate (e.g., airplane, moderate traffic)
2	Light breeze: wind felt on exposed skin, leaves rustle, wind vanes begin to move	2=20% cover	High (e.g., fairly constant traffic)
3	Gentle breeze: leaves and small twigs constantly moving, light flags extended	3=30% cover	Excessive (e.g., construction, frog chorus)
4	Do not survey	4=40% cover, etc.	N/A

Canadian Nightjar Survey: Data forms

3. NIGHTJAR OBSERVATIONS: At each stop, listen for 6 minutes and fill out one line for each individual heard. Record the code for the highest ranked detection type you observed in each one-minute time interval: 1. W (wing-boom), 2. C (call), 3. V (visual), 4. N (not detected). Indicate whether you think it is a repeat bird recorded at another stop or not. Only record distance and direction for COPO, EWPW, and repeat wing-booming CONI.

Stop	Species			Time I	nterval			Repeat	t Distan	ce Direction	Comments
(1-12)		1	2	2	4	-	c	bird	(circle	2)	
		1	2	5	4	5	0	(circle)			
									< 100 m	1	
								T IN	> 100 m	1	
									< 100 m	1	
								T IN	> 100 m	1	
									< 100 m	1	
								T IN	> 100 m	1	
									< 100 m	1	
								T IN	> 100 m	1	
									< 100 m	1	
								T IN	> 100 m	1	
									< 100 m	1	
								T IN	> 100 m	1	
									< 100 m	1	
								T IN	> 100 m	1	
									< 100 m	1	
									> 100 m	1	
									< 100 m	n	
									> 100 m	1	
									< 100 m	1	
									> 100 m	1	
									< 100 m	1	
									> 100 m	1	
									< 100 m	n	
									> 100 m	1	
									< 100 m	1	
									> 100 m	1	
									< 100 m	n	
									> 100 m	1	

3. NIGHTJAR OBSERVATIONS: At each stop, listen for 6 minutes and fill out one line for each individual heard. Record the code for the highest ranked detection type you observed in each one-minute time interval: 1. W (wing-boom), 2. C (call), 3. V (visual), 4. N (not detected). Indicate whether you think it is a repeat bird recorded at another stop or not. Only record distance and direction for COPO, EWPW, and repeat wing-booming CONI.

Stop	Species			Time I	nterval			Repeat	Distance	Direction	Comments
(1-12)		1	2	2	4	-	c	bird	(circle)		
		1	2	5	4	5	0	(circle)			
								V N	< 100 m		
								Y IN	> 100 m		
									< 100 m		
								Y IN	> 100 m		
									< 100 m		
								Y IN	> 100 m		
									< 100 m		
								Y IN	> 100 m		
									< 100 m		
								Y IN	> 100 m		
								V N	< 100 m		
								T IN	> 100 m		
									< 100 m		
								Y IN	> 100 m		
								V N	< 100 m		
								T IN	> 100 m		
									< 100 m		
								T IN	> 100 m		
								V N	< 100 m		
									> 100 m		
								V N	< 100 m		
								I IN	> 100 m		
								V N	< 100 m		
									> 100 m		
								V N	< 100 m		
									> 100 m		
								VN	< 100 m		
									> 100 m		

4. STOP LOCATIONS: This section of the datasheet should only be filled out if your route has never been surveyed before or if you wish to recommend a stop location amendment.

Stop	Latitude (Decimal Degrees)	Longitude (Decimal Degrees)	Comments
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			

Canadian Nightjar Survey: Protocol 2022



Canadian Nightjar Survey: Protocol 2022

This protocol is the product of a series of working group meetings held from November 2015 to April 2016, and is adapted from the *Nightjar Survey Network* protocol from the Center for Conservation Biology (USA).

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Photo credits: Anne C. Brigham (Common Nighthawk); Alan Burger (Common Poorwill); Nicholas Bertrand (Eastern Whip-poor-will).

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1. INTRODUCTION

Thank you for contributing to nightjar monitoring in Canada! Prior to surveying, please read this protocol in its entirety and familiarize yourself with the identification of nightjar species that may be found in your area. A one-page summary of the protocol can be found in Appendix A and used as quick reference in the field.

Conducting a Nightjar Survey is easy – anyone with good hearing and a vehicle can participate!

- Each route is a series of 12 road-side stops
- Each route needs to be surveyed once per year between June 15 and July 15
- Each survey starts 30 minutes before sunset
- At each stop, you will listen quietly for nightjars for six minutes and record information about your survey

2. OBJECTIVES

The data you are helping to collect will be used to expand our understanding of Common Nighthawks, Common Poorwills, and Eastern Whip-poor-wills across the country. Due to their nocturnal habits, nightjars are understudied, but there is concern about their declining populations. Common Nighthawks and Eastern Whip-poor-wills are listed as Threatened under the federal *Species at Risk Act*. Common Poorwills were assessed as Data Deficient by the Committee on the Status of Endangered Species in Canada (COSEWIC) in 1993. Information on nightjar distribution, abundance, habitat associations, and population trends is critical for conservation and management efforts.

The Canadian Nightjar Survey has been designed with four objectives in mind, to increase our understanding of nightjar species:

- **1. Habitat associations and critical habitat mapping**: roadside citizen science data will cover a large geographic expanse and can be integrated with more locally-collected, non-roadside data to characterize nightjar habitat.
- **2. Long-term population monitoring:** data collected will be compared to Breeding Bird Survey data after several years of data collection to determine whether the protocol increases the precision of population trend estimates.
- **3. Distribution and abundance mapping**: data collected will help refine our understanding of the distribution and abundance of nightjars across Canada.
- **4. Environmental assessment**: survey data could be used to inform environmental assessments by providing a baseline against which we can evaluate the potential impacts of development to nightjar species and their habitat.

3. NIGHTJAR BIOLOGY & IDENTIFICATION

Nightjars are a family of cryptic birds that forage for flying insects at night. These beautiful birds have long, pointed wings and are well camouflaged against the leaves and branches they roost upon during the day. Many of these species are highly migratory, some spending their winters as far south as Argentina. During the summer, nightjars breed across Canada, generally laying two eggs directly on the ground with no nest.

Due to their nocturnal behaviour and cryptic appearance, nightjars are rarely seen, so it is most important to learn how to identify nightjars by ear!

3.1. Common Nighthawk (Chordeiles minor)

3.1.1. Biology

The Common Nighthawk is found almost everywhere in Canada, except Newfoundland and the far north. This species is one of the last migrants to arrive, showing up across the country in late May and early June. It is generally found in open habitat such as grasslands, clearcuts, sandy areas, peatlands, rocky bluffs, open forests, and even urban areas. The nighthawk uses large areas – males are thought to defend territories for mating and nesting, but forage and roost outside those territories, sometimes up to several kilometres away. The Common Nighthawk is listed as Threatened due to steep population declines based on existing Breeding Bird Survey data.

3.1.2. Identification

The Common Nighthawk is the nightjar the most likely to be seen during surveys because it is more crepuscular than the others, meaning that it is most active at dawn and dusk. This species becomes active approximately 30 minutes before sunset, and remain active until 60 or 90 minutes after sunset. Nighthawks forage for insect prey during sustained-flight, much like swallows and swifts. Their bright white wing bars are a tell-tale way to identify it in flight.



The Common Nighthawk can be identified by two different sounds. The first is a vocal "peent" or "beerb" call that is frequently made while in flight. The second is a mechanical wing-boom, made by air rushing through the down-curved wing tips of the male at the bottom of a steep vertical dive. Wing-booms are thought to be for territorial defense and mate attraction, much like the songs of male songbirds.

3.2. Common Poorwill (Phalaenoptilus nuttallii)

3.2.1.Biology

The Common Poorwill is found in the southern-most areas of central British Columbia, eastern Alberta, and western Saskatchewan. This species arrives in Canada in late April to early May to breed in semi-arid open habitats such as rocky bunchgrass hillsides and open forests. Common Poorwill population trends in Canada are unknown. The species was assessed as Data Deficient by the Committee on the Status of Endangered Species in Canada (COSEWIC) in 1993 due to insufficient information. The Common Poorwill is physiologically noteworthy in that it is one of the only bird species that can enter torpor (i.e., hibernation) for weeks at a time to conserve energy!

3.2.2. Identification



The Common Poorwill is rarely seen because it is truly nocturnal and remain on the ground or perched, taking flight only to sally up and catch insects from the air. True to its name, the Common Poorwill is most readily detected by its "poor-will" call. This species begins calling about 30 minutes after sunset, and is most vocal during clear nights when the moon is at least half full.

3.3. Eastern Whip-poor-will (Antrostomus vociferus)

3.3.1.Biology

The Eastern Whip-poor-will is found from east-central Saskatchewan to Nova Scotia, with the majority of the population likely occurring in Ontario and Québec. This species arrives in Canada in early to mid-May, and occupies areas that are a mixture of open land and

woods. It forages in open areas and uses wooded areas for perching and nesting. The Eastern Whip-poor-wills is listed as Threatened also due to steep population declines.

3.3.2. Identification

The Eastern Whip-poor-will is also rarely seen, but the species is distinguished by a white ring around the base of the neck and white spots on the outer tail feathers. It is most vocal during clear nights in June when the moon is at least half full, and it can repeat its characteristic



"whip-poor-will" call up to 100 times without stopping! It begins calling about 30 minutes after sunset, and calls for about 90 minutes each night.

3.4. Other Species of Interest

Other nocturnal and crepuscular species of conservation interest that it is useful to document, and that you might want to learn include:

- Owls
- Yellow Rail
- American Woodcock
- Chimney Swift

3.5. Identification Resources

To practice your nightjar and nocturnal bird species identification, we recommend the following resources:

3.5.1.Online – Before You Survey

- <u>Dendroica</u>: an interactive website designed to help learn bird identification. Listen to recordings and look at photos of potential species.
- Xeno-canto: an online database of recordings of birds from volunteers across the world.
 - <u>Common Nighthawk</u> (make sure to listen to some recordings with wing-booms)
 - o <u>Common Poorwill</u>
 - o <u>Eastern Whip-poor-will</u>
- <u>The Cornell Lab of Ornithology's Macaulay Library</u> is the world's largest collection of wildlife sounds and videos.

3.5.2. Apps – While You Survey

- <u>iBird</u> (nightjars are in the Pro, Canada, Ultimate, and Plus editions)
- <u>Audubon Birds of North America</u> (free)
- <u>The Sibley eGuide to Birds</u>

4. SURVEY OVERVIEW

4.1. Route

The Canadian Nightjar Survey uses unlimited radius point counts along permanent roadside survey routes so that survey data can be compared between years. The route framework is made up of permanent routes from:

- Breeding Bird Survey (every second stop of the first 23 stops)
- Routes in target habitat for Common Poorwills or Eastern Whip-poor-wills

Please contact your Regional Coordinator if there are no nightjar survey routes available near your area. It may be possible to establish a route designed to target a specific habitat, and in certain cases Breeding Bird Survey staff may consider establishing an additional route.

4.2.Stops

Each route consists of **12 survey stops each spaced 1.6 km apart** (straight line distance). Some routes may have 10 or 11 stops if there is not enough space for 12. The starting point of your route will be named Stop 1. Subsequent stops are sequentially numbered (i.e., 2, 3, 4, etc.). **It is critical that surveys be conducted at these same stops each year** so that data can be compared between years. To ensure the same stop locations are surveyed each year, volunteers will be able to access a route map and the coordinates of their survey stops via the NatureCounts sign-up and data entry portal or the coordinator.

4.2.1. New Routes

Some routes may never have been surveyed before, in which case the location of the stops will need to be determined by you and the coordinator, and will require extra time. You will be able to obtain a map of your route including satellite imagery, and **you will be required to collect information on stop location** (see Section 5.4). Stop locations are chosen with the following in mind:

- Stops should ideally be 1.6 km apart, and no less. Use your car odometer to measure the distance on straight roads.
- If your survey route road has curves, try to place stops at least 1.6 km apart (straightline distance). Using a GPS will help determine the distance.
- Your safety is of first priority during nightjar surveys, so please ensure that your stops include a safe place to pull over and park.
- Avoid stop locations with excessive noise (e.g., near running water, barking dogs, etc.)
- It is better to add distance between stops rather than placing stops less than 1.6 km apart. This is to avoid counting the same birds twice.
- Not all of your stopping points need to be on the same road. Turning onto different roads may be necessary to find a safe place to park.
- We recommend scouting your route during daylight to become familiar with the stops.

4.3.Survey

At each survey stop, count all nightjars seen or heard for a period of **SIX minutes**. Counting birds and recording data should be done from a stationary position outside of your vehicle. To avoid data omission errors, record birds as you hear them, rather than waiting for the end of the six-minute period. Most importantly, be consistent. Use the same technique at each stop including how you focus your listening between nearby and distant birds. To ensure data are comparable between surveys by different volunteers, please:

- DO NOT use whistles, audio calls, or any method that coaxes birds to call or come closer
- **DO NOT** use a flashlight to search for reflections of bird eyes

See Section 5.3 for further details on how to record your nightjar observations.

4.4. Date

Surveys must be conducted between June 15 and July 15. Each route needs to be surveyed once per year.

If there is the potential for Common Poorwill or Eastern Whip-poor-will in your area, survey in the two-week period centered on the full moon (June 15 to 21 and July 6 to 15, 2022).

Excessive wind and rain will diminish the quality of surveys. **Do not complete surveys when wind speeds are Beaufort level 3 or greater, or if there is any precipitation.** If you begin a survey route and conditions deteriorate for more than 3 survey stops, we advise you to abort the survey and attempt it on another night with better conditions.

4.5.Time

Surveys **begin 30 minutes before sunset**, the time when nightjars are most active. Due to this timing requirement, only one route may be surveyed per night. Sunset is considered the beginning of official civil twilight for your survey route area and can be looked up online at:

http://www.nrc-cnrc.gc.ca/eng/services/sunrise/advanced.html.

To cover both the 6-minute nightjar survey and driving to your next survey stop, each stop will require about ten minutes to complete. The entire route will require a total time of approximately two hours.

5. DATA COLLECTION

A datasheet for data entry is available in Appendix B. Fill in each section of the datasheet according to the instructions in this section.

5.1. Survey Info

Fill in the route name, date, start time, and end time of the survey. Describe the general location and condition of the route including road condition and any safety concerns. Record the temperature at the beginning and end of your survey. Provide your name, mailing address, phone number, and email address for our records.

5.2. Stop Conditions

For each stop surveyed, **record the time the survey began**. We also ask that you record data on the conditions at each stop because factors such as wind and moon visibility can affect your chances of detecting a nightjar.

5.2.1. Wind

Record the wind speed using the Beaufort scale below. Do not conduct surveys if the wind force is greater than code 3.

Code	Wind Speed	Description
0	< 1 km/h	Calm: smoke rises vertically.
1	1-5 km/h	Light air: smoke drifts, leaves and wind vanes are stationary.
2	6-11 km/h	Light breeze: wind felt on exposed skin, leaves rustle, wind vanes begin to move.
3	12-19 km/h	Gentle breeze: leaves and small twigs constantly moving.

5.2.2. Cloud Cover

Rate the approximate amount of cloud cover at the time of your survey using tenths of sky covered. The codes are 0=clear; 1=10% cloud cover; 2=20% cloud cover; 3=30% cloud cover; 4=40% cloud cover, etc. up to 10=100% cloud cover or completely overcast. Code 11 can be used to indicate fog.

5.2.3. Moon

Enter yes or no to indicate if the moon can be seen while surveying. This is particularly important to record in deep valleys where the moon is often obstructed by the surrounding hills or mountain ridges.

5.2.4. Noise

Record the level of background noise at each stop using the following codes:

Code	Noise	Description
0	None or slight	Relatively quiet, little interference (e.g., distant traffic, dog barking).
1	Moderate	Some interference when listening for nightjars (e.g., airplane, moderate traffic)
2	High	Substantial interference when listening for nightjars (e.g., fairly constant flow of traffic)
3	Excessive	Extreme interference when listening for nightjars (e.g., continuous traffic passing, construction noise, loud frog chorus).

5.2.5. Cars

Count the number of cars that pass on the road during your survey.

5.3. Nightjar Detections

5.3.1.Nightjars

Each line on the data sheet represents an individual bird's detection history (see example on next page). Use a new line for each new bird detected at a stop. Do not record any detection data if no nightjars (or owls) were heard at a given stop. If you cannot accurately count the number of individuals by sight or by concurrent calls, make a note in the "comments" column of your data sheet. Use the following nightjar codes:

- CONI = Common Nighthawk
- COPO = Common Poorwill

• EWPW = Eastern Whip-poor-will

5.3.2. Detection Type

The survey period is broken into 6 one-minute intervals on the data sheet. For each bird heard or seen during each one-minute interval, indicate the highest ranked type.

- **1. Wing-boom (W):** If the bird performed a territorial wing-boom in that one-minute interval (Common Nighthawks only).
- 2. Call (C): If you heard the bird call during that one-minute interval.
- **3.** Visual (V): If you saw the bird, but did not hear it during that one-minute interval.
- **4.** Not detected (N): If you did not detect the bird during a given one-minute interval.

Please also note whether or not you think the individual is a repeat bird, that is, one that you already reported at the previous stop.

Sample data entry: The observer detected one Common Nighthawk calling during the first 3 minutes of the survey at Stop 1, and performing wing-booms in minute 3. The observer then detected a second Common Nighthawk calling at Stop 1 during the 3rd and 4th minute of the survey, so began a new row on the data sheet for this bird. Using best judgment, the observer decided these were two individual Common Nighthawks, and not the same bird that moved after initial detection. At Stop 2, the observer did not detect any birds during the survey period, so did not record anything on the data sheet. At Stop 3, the observer detected one Common Nighthawk several hundred metres to the northeast, calling and performing several wing-booms per minute for the entire 6 minutes. A Common Poorwill was also heard calling in minutes 2 to 5 less than 100 metres to the south. At Stop 4, the observer saw two Common Nighthawks fly over in minute 2, one of which made a "peent". None of the birds were thought to be individuals recorded at a previous stop.

Stop	Species	Time Interval						Repeat	Distance	Direction
(1-12)		1	2	3	4	5	6	bird	(circle)	
								(circle)		
1	CONI	С	С	W	Ν	Ν	Ν		< 100 m	
									> 100 m	
1	CONI	Ν	Ν	С	С	Ν	Ν		< 100 m	
									> 100 m	
3	CONI	W	W	W	W	W	W		< 100 m	NE
									€100 m	
3	COPO	Ν	С	С	С	С	Ν		<100 m	S
									> 100 m	
4	CONI	Ν	С	Ν	Ν	Ν	Ν		< 100 m	
									> 100 m	
4	CONI	Ν	V	Ν	Ν	Ν	Ν		< 100 m	
									> 100 m	

5.3.3. Distance and Direction

Recording the location of particular observations may help us learn more about the specifics of nightjar habitat requirements. Please estimate the distance and direction to your first detection of:

- Common Poorwills
- Eastern Whip-poor-wills
- Common Nighthawks performing repeated wing-booming in the same location (3 or more wing-booms).

You do not need to estimate distance and direction for Common Nighthawks that are not performing repeated wing-booming.

Estimate distance as one of the following:

- near (< 100 m)
- far (> 100 m)

Estimate direction using cardinal or intercardinal directions (e.g., north, east, south, west, northeast, north-northeast, etc.). If you are unsure of the direction, you may describe the direction relative to your vehicle and the road:



5.4. Stop Locations

This section of the datasheet should **only be filled out if your route has never been surveyed before or if you wish to recommend a stop location amendment**.

Stop coordinates must be recorded and submitted so that surveys can be conducted at the same stops in subsequent years. Ideally, location coordinates should be submitted as latitude and longitude in **decimal degrees** to six digits (e.g., 49.884128 N, 119.496301 W). There are several ways to obtain the coordinates for your new stop locations:

- 1. Use a handheld GPS and take waypoints at each of your stops.
- 2. There are many excellent GPS apps available for smartphones. If you have an iPhone, Android, or BlackBerry, you can turn it into a handheld GPS. Here are a few app options:
 - MotionX-GPS for iPhone
 - <u>Free GPS</u> for iPhone (Free)
 - <u>GPS Test</u> for Android (Free)
 - <u>GPS Maps Location Finder</u> for BlackBerry (Free)

3. Locate coordinates after survey completion in Google Earth. If you choose this option, we recommend marking stops on a printed map as you survey and using your car's odometer to keep track of how far apart your stops are.

6. EQUIPMENT

6.1. Essential

- Vehicle
- Protocol
- Datasheets (blank)
- Flashlight (ideally headlamp type)
- Watch or other device with a timer (e.g., phone)
- Several pencils/pens

6.2.Recommended

- An assistant/driver
- Map of route and stops
- GPS and/or phone with GPS app
- Thermometer for recording temperature at the beginning and end of your survey
- Road map for getting to your route
- Compass (for determining cardinal or intercardinal direction to birds)
- Clipboard
- Spare batteries (for flashlight or GPS)
- Insect repellent and/or mosquito-repellent clothing
- Safety vest or other reflective clothing.

7. SAFETY

Your safety is most important, so please ensure that you are conscious of your safety when conducting a survey. Please take the follow points into consideration:

- Consider conducting surveys in a team of two.
- If surveying alone, make sure someone knows where your survey route is and what time you will return. Please make sure that you contact this person when you get back.
- Park your vehicle well off the road during survey stops.
- Stand off the road surface when conducting surveys.
- Leave parking lights on throughout the duration of a count.
- Wear a reflective vest or use a headlamp so that other drivers are aware of your presence.
- Conduct the survey near the road to avoid trespassing on private property.
- Check your clothing and skin for ticks when you get home to prevent the transmission of Lyme disease and other tick-borne illnesses.

8. DATA SUBMISSION

8.1. Data Entry via NatureCounts

If possible, please set aside sufficient time (20 minutes or so, depending on whether you are adding comments or not) to enter all your data for a given survey in one sitting. If you are unable to do this, you can save an incomplete form and come back to it later (see below for details), but you will need to complete the page that you are working on, as saving an incomplete page is not allowed.

Step 1: Log on

Log on to the survey's NatureCounts portal:. <u>https://www.birdscanada.org/naturecounts/nightjars/main.jsp</u>.

Click on "Sign in" in the main menu, enter your Login name and Password, and click on the blue "Sign in" button at the bottom of the page.

Step 2: Check that your stations are in the database

This step is facultative if you know that your stations are set up correctly.

Once you are signed in, place you cursor over the "Explore" tab and open the "Available Routes" map. Click on the blue marker for your route and select "adoption preferences" to see your route. Make sure that all the stations you wish to enter data for are showing and in the correct place. If your stops are not correctly displayed, please contact your coordinator so that the full route can be set up in the system.

Step 3: Submit data

Once you have checked that your stations are all showing, place you cursor over the "Submit" tab in the main menu bar at the top of the page and then click on "Submit Data".

This will open a new window and you can select your survey site from the drop down list. Routes are listed alphabetically by name. Be careful that you select your route and not an adjacent one in the list. You can also select your route by using the map and zooming into your area and clicking on the route button. Once your route is selected, click the blue "Continue" button

A data entry form will open. The first page is the Form Header. Enter the survey date and the name of any assistants. You can add names to the list by clicking on "Add observers". Save any changes to this list and click on the "Return to data form" button. You can then tick the appropriate box or boxes to add any assistants to the data form. You do not need to include your name as you are associated with the form as the primary observer.

Then enter the start and end temperatures that you recorded during the survey. Please just enter numbers here and not text.

You can add any relevant general survey or route comments to the "Comments" box. There are additional comments boxes for each station.

Once the Form Header page is completed, click on the "Next Page" button at the top or bottom of the sheet. This will save the sheet you have just completed and open the sheet for your first survey stop (called station on these forms).

You will see that "Station 1" is indicated in the "Jump To" box at the top of the page. Next, you will need to select the number of the stop that you surveyed first for the "Station" box. The drop down or scroll through list associated with this box lists all the stops for the route. For the first station, you will normally select "Stop 1", but if you did your route in reverse order, it will be "Stop 12" (for standard routes).

In the "Time and Effort" box, enter the time that you started surveying the stop. Do this using the 24 hour clock (i.e., 8:30 p.m. should be entered as 20 in the hour box and 30 in the minute box). Please note that for subsequent stops, if you accidently enter a time that is earlier than the previous station, this will generate an error message. You can put a later time on the page that you are working on, then save it and go back to the previous station and correct the time. Once this is done, you can return to the page you were working on and indicate the appropriate time.

Under "Weather and Survey Conditions" enter the wind speed and its direction (if noted), and the cloud cover (this is in tenths of sky covered, so 1 is equal to 10% covered, etc.)

Under "Other Variables", enter whether the moon was visible or not, the number of vehicles that passed as you were surveying (enter 0 if no vehicles passed by), and the noise level you recorded.

Then go to the "List of Species" box. If you did not hear or see nightjars at the stop, tick the box that indicates that you completed the survey for the stop but no nightjars were present.

If you did record night jars, use one row in the box per individual. Enter the name of the species in the first box. Let's say it was a Common Nighthawk. Then for each of the one minute time periods, note for that individual what you recorded. You might start with "N-Not detected" for the first two minutes, then perhaps "W-Wing boom" in the third minute and then a "C-Call" in the fifth minute and "W-Wing boom" during minute 6. If there were more than three wing booms given in total, note the distance to the individual (i.e., less than or greater than 100 m) and the direction it was in.

If, at a given stop, you think that you are hearing a bird from a previous stop, please indicate this by ticking the "repeat bird" box. But please don't use this box to indicate that a bird called multiple times at the stop that you are entering data for. *If this option is not in place yet, please add this information to the comments box for the stop.*

You can note other species that you may have recorded (e.g., owls) in the comments box for the stop and you can also note stop-specific comments. Then click on "Next Page", this will save your data and open the data form for the second stop you surveyed. Please only click on "Next Page" (or "Previous Page") after completing a page.

Complete this process for the number stops that you surveyed. If for whatever reason you were unable to collect data from one of your stops, simply take this into account in your choice of stop number. For example, if you were unable to survey stop 4, but were able to survey stop five, on the Station 4 page you would select Stop 5 and continue on from there.

If you have a problem you can delete the sheet for a given stop and start again from the last completed stop. Once you have entered all the data for all the stops you visited, click on "Finish Form" at the bottom of the page. Your form will then be submitted. This opens a summary of the data you have entered. Please read through this to make sure there are no errors. If everything is correct, you can simply log out. If you do need to make a correction, click on "Modify" and then go to the page you want to correct using the "Jump To" box at the top of the page. Then make the correction and click on "Finish Form" again.

If you need to take a break during the data entry process, complete the page of the form you are working on and click on "Save" and log out. When you are ready to complete the form, log in again and instead of going to "Submit data", select "Explore" and "View data forms". Then click on the "Edit" button associated with the form you wish to complete and simply continue from where you left off. Occasionally, if you return quickly to a form, it may generate an access error message. If this is the case, wait a while, preferably overnight and try again.

Your form is available for you to modify until it has been validated by the coordinator and finalized. Up until that point, you can make further modifications. Once the form has been finalized, you will still be able to consult it, but you won't be able to modify it. If you notice a mistake in a finalized form, you will need to contact your coordinator and request a correction.

If you have any persistent problems during data entry, simply contact your coordinator.

8.2. Other Options for Data Submission

If you are unable to enter your data online, you can also submit your data using one of the following options:

- Scan/photograph your data sheets and email them to acoughlan@birdscanada.org
- Mail your data sheets to:

Andrew P. Coughlan Director, Québec Region Birds Canada 346, rue Fraser Québec (Québec) G1S 1R1 **APPENDIX A: QUICK-REFERENCE PROTOCOL SUMMARY**

Quick-Reference Protocol Summary

The Protocol Summary is intended as a quick reference when you are in the field. Please use the summary once you have read and are familiar with the full survey protocol.

Survey: Listen quietly for a period of six minutes.

Route: Each route consists of 10 to 12 survey stops spaced at least 1.6 km apart and numbered consecutively.

Date: Survey once between June 15 and July 15. For 2022, survey between June 15 and 21 or July 6 and 15, if you may have Common Poorwills or Eastern Whip-poor-wills in your area. Do not survey when wind speed is greater than Beaufort Scale 3, or rain is stronger than a light drizzle.

Time: Begin at 30 minutes before sunset (civil twilight for your area). It will take about 10 mins to survey one stop and travel to the next, for a total survey time of 2 hours.

Data collection – Stop Conditions: At each survey, record the time your survey began, wind strength, cloud cover, whether the moon is visible, the level of background noise, and the number of cars that pass.

Data collection – Nightjar Detections: Each line on the data sheet represents an individual bird's detection history.

- If you did not detect nightjars at a given stop, you do not need to fill out a row for that stop.
- The survey period is broken into six one-minute intervals on the data sheet.
- For each bird detected in each one-minute interval, record the code for the highest ranked detection type you observed:
 - 1. W (wing-boom, Common Nighthawks only)
 - 2. C (call)
 - 3. V (visual)
 - 4. N (not detected)
- Use Repeat box to record whether you think you are reporting a bird recorded at a previous stop or not.
- Record the distance (< 100 m or > 100 m) and direction to your first detection of
 - Common Poorwills
 - Eastern Whip-poor-wills
 - Repeat wing-booms of Common Nighthawk(i.e., ≥ 3 wing-booms at the same location)

Data collection – Stop Locations: Record stop coordinates as latitude and longitude in decimal degrees if your route has no pre-established stop locations or if you wish to suggest an amendment to your route.

Essential Equipment Checklist:

- Data sheets
- Survey protocol
- Route map
- Flashlight
- Stopwatch/timer
- Pens/pencils
- GPS or map of route to mark new stops on (new routes only)
- Location of stops (previously surveyed routes only)

APPENDIX B: CANADIAN NIGHTJAR SURVEY DATASHEET

1. SURVEY INFO: Fill this out before you start. Don't forget to fill in "End Temperature" at the end of your survey!

Observer Name:	Co-Obs	bserver Name:				
Address:	E	Email:	Phone:			
Route Name:	[Date:				
Comments:						

2. STOP CONDITIONS: Record the conditions at each survey stop.

Start Temperature: _____

Stop	Start Time (24 hr)	Wind (circle)	Wind direction	Cloud (10ths of sky covered)	Moon (circle)	Noise (circle)	# Cars	Comments
1		0 1 2 3			Y N	0 1 2 3		
2		0 1 2 3			Y N	0 1 2 3		
3		0 1 2 3			Y N	0 1 2 3		
4		0 1 2 3			Y N	0 1 2 3		
5		0 1 2 3			Y N	0 1 2 3		
6		0 1 2 3			Y N	0 1 2 3		
7		0 1 2 3			Y N	0 1 2 3		
8		0 1 2 3			Y N	0 1 2 3		
9		0 1 2 3			Y N	0 1 2 3		
10		0 1 2 3			Y N	0 1 2 3		
11		0 1 2 3			Y N	0 1 2 3		
12		0 1 2 3			Y N	0 1 2 3		

End Temperature: _____

Code	Wind Description	Cloud Description	Noise Description
0	Calm: smoke rises vertically	0=No clouds	None or slight (e.g., distant traffic)
1	Light air: smoke drifts, leaves and wind vanes are stopped	1=10% cover	Moderate (e.g., airplane, moderate traffic)
2	Light breeze: wind felt on exposed skin, leaves rustle, wind vanes begin to move	2=20% cover	High (e.g., fairly constant traffic)
3	Gentle breeze: leaves and small twigs constantly moving, light flags extended	3=30% cover	Excessive (e.g., construction, frog chorus)
4	Do not survey	4=40% cover, etc.	N/A

Canadian Nightjar Survey: Protocol 2022

3. NIGHTJAR OBSERVATIONS: At each stop, listen for 6 minutes and fill out one line for each individual heard. Record the code for the highest ranked detection type you observed in each one-minute time interval: 1. W (wing-boom), 2. C (call), 3. V (visual), 4. N (not detected). Indicate whether you think it is a repeat bird recorded at another stop or not. Only record distance and direction for COPO, EWPW, and repeat wing-booming CONI.

Stop	Species	Time Interval		Repeat	Distance	Direction	Comments				
(1-12)		1	2	3	4	5	6	bird	(circle)		
			_		-	-	-	(circle)			
								Y N	< 100 m		
									> 100 m		
									< 100 m		
									> 100 m		
									< 100 m		
									> 100 m		
									< 100 m		
								Y IN	> 100 m		
									< 100 m		
								T IN	> 100 m		
									< 100 m		
								T IN	> 100 m		
									< 100 m		
									> 100 m		
									< 100 m		
									> 100 m		
								V N	< 100 m		
								1 1	> 100 m		
									< 100 m		
									> 100 m		
									< 100 m		
									> 100 m		
									< 100 m		
									> 100 m		
								VN	< 100 m		
									> 100 m		
									< 100 m		
								T IN	> 100 m		

3. NIGHTJAR OBSERVATIONS: At each stop, listen for 6 minutes and fill out one line for each individual heard. Record the code for the highest ranked detection type you observed in each one-minute time interval: 1. W (wing-boom), 2. C (call), 3. V (visual), 4. N (not detected). Indicate whether you think it is a repeat bird recorded at another stop or not. Only record distance and direction for COPO, EWPW, and repeat wing-booming CONI.

Stop	Species	Time Interval			Repeat	Distance	Direction	Comments			
(1-12)		1	2	3	4	5	6	bird	(circle)		
		-						(circle)			
								Y N	< 100 m		
									> 100 m		
								V N	< 100 m		
								1 11	> 100 m		
								V N	< 100 m		
								1 11	> 100 m		
									< 100 m		
								Y IN	> 100 m		
									< 100 m		
								Y N	> 100 m		
								V N	< 100 m		
								T IN	> 100 m		
									< 100 m		
								T IN	> 100 m		
									< 100 m		
								T IN	> 100 m		
								V N	< 100 m		
								T IN	> 100 m		
								V N	< 100 m		
								Y IN	> 100 m		
								V N	< 100 m		
								Y IN	> 100 m		
								V N	< 100 m		
								Y IN	> 100 m		
								V N	< 100 m		
								Y N	> 100 m		
									< 100 m		
								T IN	> 100 m		

4. STOP LOCATIONS: This section of the datasheet should only be filled out if your route has never been surveyed before or if you wish to recommend a stop location amendment.

Stop	Latitude (Decimal Degrees)	Longitude (Decimal Degrees)	Comments
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			



The Protocol Summary is intended as a quick reference when you are in the field. Please use the summary once you have read and are familiar with the full survey protocol.

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Time: Begin at 30 minutes before sunset (civil twilight for your area). It will take about 10 mins to survey one stop and travel to the next, for a total survey time of 2 hours.

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 - 2. C (call)
 - 3. V (visual)
 - 4. N (not detected)
- Use Repeat box to record whether you think you are reporting a bird recorded at a previous stop or not.
- Record the distance (< 100 m or > 100 m) and direction to your first detection of
 - Common Poorwills
 - Eastern Whip-poor-wills
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Data collection – Stop Locations: Record stop coordinates as latitude and longitude in decimal degrees if your route has no pre-established stop locations or if you wish to suggest an amendment to your route.

Essential Equipment Checklist:

- Data sheets
- Survey protocol
- Route map
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- GPS or map of route to mark new stops on (new routes only)
- Location of stops (previously surveyed routes only)

Canadian Nightjar Survey: Summary Protocol 2022



ECCC-CWS Guidance for Developing Systematic Stranded Bird Survey Protocols for Vessels and Platforms

Prepared by Environment & Climate Change Canada's Canadian Wildlife Service-Atlantic Region Version 1.0 – March 2021

1. Background

The <u>Regional Assessment of Offshore Oil and Gas Exploratory Drilling East of Newfoundland and</u> <u>Labrador</u> recommends developing and implementing protocols for systematic surveys of stranded birds on offshore platforms and vessels (Section 4.6.1). Systematic surveys for stranded birds are needed to:

- 1) Increase survival of stranded birds by locating, documenting and releasing birds safely; and
- Assess and quantify the impact of light pollution on Leach's Storm-Petrel and other migratory birds.

Systematic surveys should be regularly occurring, methodical, repeatable searches of a defined survey route that encompasses key areas of the vessel or platform where stranded birds may be found, such as outer peripheries of decks.

The purpose of this document is to provide guidance on developing survey protocols for stranded birds. Please contact ECCC-CWS staff for support during the development of protocols (see section 4).

2. Quick facts on stranded birds

- Migratory birds are protected under the *Migratory Bird Convention Act*. A permit from ECCC-CWS is required to capture and handle migratory birds.
- What is a stranded bird? A bird grounded on a vessel or platform, found dead or alive, that may be injured, exhausted and/or unable to take flight. Strandings occur due to factors such as heavy wind, disorientation during flight (e.g., fog), and attraction to artificial lighting from structures.
- Which species are most often stranded? Storm-petrels (mostly Leach's Storm-Petrel) represented 87% of stranded birds reported by industry in Atlantic Canada from 1998 to 2018. Of these, 72% were found alive and released. Seabirds (petrels and alcids) and their young and landbirds migrating at night are particularly vulnerable to light attraction in coastal and offshore areas.
- When do strandings occur in Atlantic Canada? The vast majority of Leach's Storm-Petrel strandings occur during September and October when young first leave their nests (fledging period). Most landbird strandings occur during spring and late summer-fall (migration periods).

3. Key steps for developing systematic stranded bird survey protocols

3.1 Review the following key ECCC-CWS supporting resources on stranded birds

- a) Procedures for handling and documenting stranded birds encountered on infrastructure offshore Atlantic Canada
- b) Infographic and Reference Card What to do when you find a stranded bird?
- c) Seabird Identification Photocard
- d) Stranded Bird Datasheet

3.2 Define and map a feasible survey route to be searched for stranded birds

- The survey route, measured in meters (not area), may be a continuous path or comprised of sections of paths that the observer(s) will thoroughly search for stranded birds on a daily basis.
- Refer to a blueprint or schematic of the vessel or platform and consult staff to ensure survey route is clearly mapped and safely accessible by the observer(s).
 - o Include multiple decks of the vessel or platform where possible.
 - o Ensure path is accessible during early morning hours (see section 2.3 on timing surveys).
- Survey route may include locations where stranded birds are typically sighted, such as:
 - Peripheries of vessels and platforms, such as along outer walkways and under stairs;
 - o Inward areas where birds may seek protection (e.g., Sections 1a, 1b and 4a in Fig. 1); and
 - Known locations or "hot spots" where stranded birds have been observed (see "X" in Fig. 1).
- Total distance of survey route (meters) is equal to the sum of all sections searched (see Fig. 1).
 - o Route may vary in width, such as inclusion of inward areas off deck peripheries.
- Define specific grids or sections within the survey route (see sections in Fig. 1) so that observers can document specific locations of stranded birds encountered.

Figure 1. Example map of a platform deck showing survey route targeting peripheries, inward areas where birds may seek protection, and known stranding "hot spots." Observers will use section identifiers or GPS coordinates to document specific locations of stranded birds (see example in Fig 2).



3.3 Define timing and frequency of daily surveys

- Stranded bird surveys should occur at least once a day, preferably at dawn, to increase the likelihood of recovering live stranded birds.
- Multiple daily surveys are recommended during periods of known higher bird stranding rates (e.g., when Leach's Storm-Petrel young make their first flights in September-October) and/or when a stranding event involving more than 10 birds has been observed.

3.4 Review key information to be recorded during stranded bird surveys

- Refer to "Stranded Bird Datasheet" (see Fig. 2 example) for instructions on collecting survey data and "Infographic and Reference Card What to do when you find a stranded bird?"
- Fill in "facility" and "search information" section of "Stranded Bird Datasheet" including:
 - Time at survey start and end (UTC-Coordinated Universal Time) to quantify search effort.
 - Search effort may differ depending on number of birds encountered and must be reported based on actual time elapsed.
 - If survey route is not completely searched as defined in protocol, observer(s) must document actual length surveyed (meters) and describe changes (e.g., sections not surveyed).
 - Record when <u>no</u> birds are encountered during survey.
 - Record number of potential predators (e.g., gulls, raptors) resting on platform/ vessel and if evidence of predation event(s) found (e.g., predatory bird attacking another bird or bird remains found).

- Fill in "stranded bird" section of "Stranded Bird Datasheet" (see example in Fig. 2)
 Document species; if identification is uncertain, take photo(s) and contact CWS
- Example in Figure 2 shows a survey documenting a total of seven stranded birds:
 - Two Leach's Storm-Petrel were found in section 1A unoiled and alive and were released alive at site; photos taken
 - One Blackpoll Warbler was found in section 1A unoiled and dead and carcass was disposed of on site; photos taken
 - Two Leach's Storm-Petrel were found alive in section 2B and photos were taken of both birds: One was oiled and later died in care and the carcass was sent to CWS; the other was not oiled and sent to shore alive due to an injured left wing (sent to rehabilitation facility).
 - One Wilson's Storm-Petrel was found in section 3 unoiled and alive and was released alive at site; photos were taken
 - One Song Sparrow was found in section 4A unoiled and alive and later died in care; carcass disposed of on site; photos taken

Species	Number of individuals	Location found (Section or grid number <u>or</u> Lat- Long)	If found DEAD (check one)		If found ALIVE (check one)				Oiled? (check one)		Photo(s) taken	Comments
			Carcass disposed of at site	Carcass sent to CWS (2) CWS	Released alive at site	Sent to shore alive	Died in care + Carcass disposed of at site	Died in care + Carcass sent to CWS	Oiled ① CWS	Not oiled		
Leach's Storm-Petrel	2	1A			X					X	X	
Blackpoll Warbler	1	1A	X							X	X	
Leach's Storm-Petrel	1	2B						X	X		X	1
Leach's Storm-Petrel	1	28				X				X	X	Injured left wing; sent to rehabilitation facility
Wilson's Storm-Petrel	1	3			X					X	X	
Song Sparrow	1	4A					X			X	X	

Figure 2. Stranded Bird Datasheet with example of observer's data on seven stranded birds encountered during a survey.

3.5 Pilot and refine protocol to ensure survey is feasible and repeatable by observer(s)

- Have observer(s) pilot the survey and document feedback. Make adaptations as needed.
- If further guidance is needed, please contact ECCC-CWS to discuss (see contacts in Section 4).

4. ECCC-CWS points of contact on stranded bird protocols in Atlantic Canada:

- Newfoundland-Labrador: Sabina Wilhelm (sabina.wilhelm@canada.ca)
- Nova Scotia: Carina Gjerdrum (carina.gjerdrum@canada.ca)
- Atlantic Region: Becky Whittam (becky.whittam@canada.ca)



Program for Regional and International Shorebird Monitoring

Atlantic Canada Shorebird Surveys

Survey protocol and guidelines

March 2014



Environment Enviro Canada Canar

Environnement Canada

Photo © Alix d'Entremont

Program for Regional and International Shorebird Monitoring (PRISM)

The Program for Regional and International Shorebird Monitoring (PRISM) was designed in 2001 by biologists and researchers from the Canadian and United States Governments (Canadian Wildlife Service, U.S. Geological Survey and U.S. Fish and Wildlife Service) to provide a framework for shorebird monitoring in North America in response to a need for coordination and cooperation in the delivery of existing programs, and in the development of new surveys.

Specifically, the goals of PRISM are to: 1) estimate population size; 2) monitor trends in population size; 3) monitor shorebirds at stopover locations; 4) determine distribution, abundance, and habitats used throughout the year; and 5) assist local managers in meeting shorebird conservation goals.

To do this, PRISM draws from four survey components:



Arctic breeding, survey

Migration surveys

Neotropical surveys

Tropical surveys

At this time, the migration survey component is the only survey providing data annually for monitoring trends in shorebird population size. It is also the only survey providing information on trends of boreal breeding species.

Based on the analysis of shorebird migration data (1974-2009), it is estimated that of the 32 species that stop-over in Atlantic Canada during migration (Table 1), 19 are experiencing declining population trends. Several of these shorebird species are assessed by the Committee on the Status of Endangered Wildlife in Canada and listed under the *Species at Risk Act*.



Photo C Alix d'Entremont

THANK YOU FOR PARTICIPATING IN A PRISM SURVEY!

This project occurs on such a large scale that collecting information from volunteers such as you is the only way scientists are able to obtain the data necessary to assess the status of Canada's shorebirds. The field notes that you provide from your local study site will be analyzed with others from across North America to identify and conserve important habitat and stopover areas and to measure population trends.

Participating in a PRISM Survey is also a great way to get out and explore natural areas. Birding can be both fun and rewarding, especially when you become part of a group that is dedicated to wildlife conservation.

Again, we thank you for your interest and dedication to shorebirds, and hope that you will enjoy taking part in a Migration PRISM Survey!

Atlantic Canada Shorebird Surveys (ACSS)

The Atlantic Canada Shorebird Survey is a migration PRISM survey

It was originally developed in 1974 as the Maritimes Shorebird Survey by Canadian Wildlife Service scientists at the same time as similar surveys in the province of Ontario (Ontario Shorebird Surveys) and the northeastern United States (International Shorebird Survey). In 2003, the Maritimes Shorebird Survey became the Atlantic Canada Shorebird Surveys to include Newfoundland and Labrador.

The survey was originally designed to identify important shorebird staging habitats and support their management and conservation. As such, the data have been used to guide the management of landscapes for shorebird species through programs such as Environment Canada's protected areas program, the Ramsar Convention, the Important Bird Areas program and the Western Hemisphere Shorebird Reserve Network.

Regular data collection at more than 100 ACSS sites is coordinated by the Canadian Wildlife Service of Environment Canada as a volunteer-based survey that relies on the skills, dedication and long-term support of birders throughout Atlantic Canada.



Photo © Julie Paquet, Environment Canada



Photo © Alix d'Entremont

Table 1: Shorebird species that stop-over in Atlantic Canada during fall migration (shaded species are experiencing declining trends).

Common name	Scientific Name	Stops-over in Atlantic Canada during migration?
American Oystercatcher	Haematopus palliatus	Yes (also breeds regionally in small numbers)
Black-bellied Plover	Pluvialis squatarola	Yes
American Golden Plover	Pluvialis dominica	Yes
Semipalmated Plover	Charadrius semipalmatus	Yes
Piping Plover	Charadrius melodus	Yes (also breeds regionally)
Killdeer	Charadrius vociferus	Yes (also breeds regionally)
Spotted Sandpiper	Actitis macularius	Yes (also breeds regionally)
Solitary Sandpiper	Tringa solitaria	Yes
Greater Yellowlegs	Tringa melanoleuca	Yes
Willet	Tringa semipalmata	Yes (also breeds regionally)
Lesser Yellowlegs	Tringa flavipes	Yes
Upland Sandpiper	Bartramia longicauda	Yes (also breeds regionally in small numbers)
Whimbrel	Numenius phaeopus	Yes
Hudsonian Godwit	Limosa haemastica	Yes
Ruddy Turnstone	Arenaria interpres	Yes
Red Knot	Calidris canutus	Yes
Stilt Sandpiper	Calidris himantopus	In small numbers
Sanderling	Calidris alba	Yes
Dunlin	Calidris alpina	Yes
Purple Sandpiper	Calidris maritima	Yes (also winters regionally)
Baird's Sandpiper	Calidris bairdii	In small numbers
Least Sandpiper	Calidris minutilla	Yes
White-rumped Sandpi-	Calidris fuscicollis	Yes
per		
Buff-breasted Sandpiper	Calidris subruficollis	In small numbers
Pectoral Sandpiper	Calidris melanotos	Yes
Semipalmated Sandpiper	Calidris pusilla	Yes
Short-billed Dowitcher	Limnodromus griseus	Yes
Wilson's Snipe	Gallinago delicata	Yes (also breeds regionally)
American Woodcock	Scolopax minor	Yes (also breeds regionally)
Wilson's Phalarope	Phalaropus tricolor	Yes (also breeds regionally in small numbers)
Red-necked Phalarope	Phalaropus lobatus	Yes
Red Phalarope	Phalaropus fulicarius	Yes

About Shorebirds

SHOREBRIDS ARE HIGHLY MIGRATORY

Shorebirds are among the most migratory creatures on earth, travelling long distances between their breeding grounds in the north and their non-breeding grounds in the south. For example, some Red Knots migrate all the way from the high Arctic to wintering grounds that extend to southern Chile – a 26,000 km annual round trip flight (Figure 1)!



Figure 1. Red Knot migration route. Image courtesy of Larry Niles, USFWS.

Because of the astronomical amounts of energy required for such migrations, shorebirds need suitable areas where they can stop to refuel and rest for the next leg of their journey. These areas provide the abundant food resources necessary to sustain their long flights.



Photo © Bill Pratt, Photographer

MOST SHOREBIRDS STOP IN ATLANTIC CANADA FOR ONLY A BRIEF PERIOD OF TIME DURING MIGRATION

Most shorebirds breed and winter in remote areas that are not easy to access and survey. This is why in Atlantic Canada, we monitor shorebirds in the spring and fall, during their migration to and from these areas. At this time, they gather in large groups in suitable wetland areas where we can observe and count them.

> This is where the Atlantic Canada Shorebird Surveys, and you, come in!



Photo © Julie Paquet, Environment Canada

Did you know that on migration, Semipalmated Sandpipers, a species weighing only 35 to 40 grams at time of departure, can fly at an average speed of 90 km/h, non-stop, for up to 4 days!!


Photo © Richard Stern, ACSS contributor

What first-time ACSS volunteers need to know

WHO ARE ACSS VOLUNTEERS?

ACSS volunteers enjoy bird watching but also understand the importance of following a survey protocol to collect information that can be used to help better understand and conserve birds. Skill levels vary, and new volunteers are given tools and support to help them learn to identify and census shorebird species.



Photo © Julie Paquet, Environment Canada

SELECTING A SITE

New volunteers are always needed in areas with low coverage or to take over from retiring volunteers. The survey sites are selected by the volunteers, with the ACSS coordinator to ensure the site is available and to provide guidance on the survey methods, which are unique to each site.

ACSS sites can be beaches, tidal flats, saltmarshes, freshwater marshes, and sometimes even fields and heathlands. Every year, sites that have been monitored for many years become available to new volunteers. Picking up a previously monitored site may give new volunteers a chance to monitor an area with a historic data set to which they can compare their own counts.

When selecting a survey site, choose one that is easily accessible to you and can be conveniently reached on a regular basis. To keep long term interest, it is ideal to pick a site that is close to home and does not take too long to survey (1 to 2 hours).



Figure 2. ACSS sites for trend estimation

In 2013, a series of new randomly selected sites were added to the ACSS to help expand the scope of the survey and enhance its value for assessing migratory shorebird population trends (Figure 2). If you choose to survey one of these new sites, you will be provided with a site description and a survey method specific to your site and will be the first ever to survey that site!

CONDUCTING SURVEYS

Survey seasons and dates

Fall surveys are conducted annually, every 10 days between July 20th and November 20th. Although spring migration does



Photo C Alix d'Entremon

not produce high shorebird numbers or diversity, interested contributors can conduct surveys between April 20th and June 9th . In general, the more surveys that are conducted at an ACSS site, and the longer the record of years, the more valuable the census series becomes as a scientific record.

Surveys should be conducted when counts are most accurate

At many coastal sites, this will occur at high tide when shorebirds gather on the upper shore and are easier to see. However at other sites, it may be during low tide while they are feeding. Once this has been established, surveys should always be conducted at the same stage of tide and during comparable weather conditions (with good visibility) to ensure consistency.

Collect data about birds and survey conditions

All birds observed during a survey should be identified, counted and noted. Additionally, a record should be made of disturbances (ATVs, bikes, boats, predators, significant weather changes, etc.) with an indication of its effect on the count. Providing us with information on the birds present at your study site is important, but so is the absence of birds at that site, or at any other site that you may notice. It helps us to know when birds fail to use a stretch of seemingly suitable habitat, and we welcome your notes on these types of observations. There may be an underlying reason that shorebirds are avoiding an area that can be effectively managed.

Note that if a rare shorebird is observed outside the site boundary; add it to your survey report with a note that it was seen outside your survey site.

WHAT YOU'LL NEED WHEN SURVEY-ING SHOREBIRDS:

- Binoculars
- Bird Field Guide or Bird App (see
- quick reference on p 10-11)
- ACSS Data Sheets (provided, see ex-
- ample on p. 12-13)
- Site Map (provided)
- Compass
- Pen and Pencil
- Clipboard or field log
- Spotting Scope (if available a great aid in identifying small shorebirds, or those at a distance)



Use estimates for large groups of shorebirds

When high numbers of shorebirds are present, and counting each individual is not possible, it is recommended to make a systematic estimate. A systematic estimate is one where a portion of the flock is counted (e.g. what looks like 10% of the flock), and the total number of birds present is extrapolated from this count (in this case the count number is multiplied by 10).

Counting all species in large groups of shorebirds



Photo © Julie Paquet, Environment Canada

When large numbers of shorebirds are present at a roost site, it is not always possible to identify them all to species. For example, it is not always practical to look at each one of 1000 peeps (small shorebirds) in a large flock to verify that they are all Semipalmated Sandpipers. To obtain an estimate for other species present, take the time to scan that flock of 1000 peeps for birds that are obviously not Semipalmated Sandpipers, such as Semipalmated Plovers, and count these individuals if you can. Look for slightly larger (White-rumped Sandpiper or Dunlin?) or "rustier" birds (Least Sandpiper) and either count or estimate their numbers. We know that the ACSS underestimates some of these hard-tofind species, but our goal is to have a consistent estimate of their numbers, even if it is low. Unless these less-frequent species make up a substantial proportion of the birds present, you can record the rest of that flock as 1000 Semipalmated Sandpipers.

LEARNING OPPORTUNITIES

A number of workshops have been offered to interested groups throughout Atlantic Canada since 2001, often in collaboration with conservation partners (Nature Conservancy of Canada, Canadian Parks and Wilderness Society, Naturalist Clubs, Wildlife and Nature Trusts, National Parks, etc). Please contact the Canadian Wildlife Service or one of our partner organizations for information on future workshops.

Tips for identifying shorebirds

The best way to identify shorebird species is to use the simplest, most easily observed characteristics—size, structure, behavior, and general color patterns—plumage details should only be used last.

Look at the size and shape of the bird:1) How big is it? Use an item of known size nearby as reference (e.g. seaweed, known bird, etc.).2) Is it skinny, fat, long or short?3) Look at the bill- is it long, short, curved, decurved or straight?



Photo © Alix d'Entremont

- 4) Are the legs long or short relative to the body?
- Look around- What type of habitat are you in- ocean or inland, forest or saltmarsh
- Listen- shorebird calls may seem similar at first, but after several surveys the calls become very distinctive

Sometimes you will see shorebirds with fading breeding plumages. BEWARE! Colours may play tricks on your eyes depending on the light levels and direction as well as the habitat type .

RECORDING AND SUBMITTING DATA

When surveying in the field, record your observations in a notebook or on an ACSS datasheet. When you return home with the counts from the completed survey, you should immediately copy the data onto a clean datasheet. Do this while the survey is still fresh in your mind, and remember to complete both sides of the sheet. Then, check over your data for any mistakes you may have made when copying over the numbers.

ACSS data is collected throughout the survey period and at the end of the field season, the data can be mailed or emailed to the ACSS coordinator or uploaded via an online data entry portal <u>http://www.birdscanada.org/birdmon/prism/main.jsp</u>.

All data should be returned by 15 January of the following year to ensure that the data is used in the analysis of population trends, and for the preparation of our annual reports and newsletter.

New survey forms for the next shorebird monitoring season will be sent out with your copy of our annual newsletter *Calidris* the following spring.







Happy shorebirding!



What happens to your data?

Once in the database, the data you provide will be part of our long-term monitoring dataset and it will remain useful for shorebird research and conservation for many years to come. The ACSS database is used by Environment Canada, provincial governments, academics, students, NGO's and other interested groups.

Reporting banded shorebirds



Keep an eye out for flagged shorebirds!!!

Every winter, biologists capture and band hundreds of shorebirds (Red Knot, Ruddy Turnstone, Semipalmated Sandpiper, and more) in Canada, the USA, Mexico, Central and South America and the Caribbean. Each bird is fitted with coloured leg flags bearing a unique three character code that, if seen by observers, could provide valuable information about migration routes and breeding areas.

Please let us know if you see any of these birds!

You can also report your resightings on www.bandedbirds.org

OR....

Contact the ACSS coordinator for more information! ACSS-RORA@ec.gc.ca

Frequently observed shorebirds in Atlantic Canada



No barring or flanks

Calidris pusilla

Sanderling



Calidris alba Very active, run along the shore



Solitary Sandpiper



Tringa solitaria Found inland at ponds and spruce bogs



Calidris fuscicolis

Spotted Sandpiper



Actitis macularius

Found inland at rivers ponds and stream edges Teeters and bobs



Calidris melanotos



Sandpipers continued



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Red Phalarope



Phalaropus fulicarius

Red-necked Phalarope



Phalaropes are pelagic migrants. They are mainly seen at sea over deep waters.

Photographs © Images by Ferrin, Richard Stern, Cliff Thornley, Peter Thomas, G.W. Beyersbergen, Dan Busby, Dave Fifield, Merv Cormier, Paul Evans, Arthur Morris/VIREO, John Chardine.

Atlantic Canada Shorebird Surveys datasheet- front

					- 4	
Survey Site Name:						
Surveyor name:	Surveyor name:					
Email <u>:</u>	Email:			Year:	Year:	
<u>Species</u>	Date	Date	Date	Date	Date	
Black-bellied Plover						
American Golden-Plover						
Semipalmated Plover						
Piping Plover						
Killdeer						
American Oystercatcher						
Spotted Sandpiper						
Solitary Sandpiper						
Greater Yellowlegs						
Willet						
Lesser Yellowlegs						
Upland Sandpiper						
Whimbrel						
Hudsonian Godwit					_ _	
Ruddy Turnstone					_ _	
Red Knot					_ _	
Sanderling						
Semipalmated Sanapiper					_ _	
Least Sandpiper			 	_ _	<u></u>	
White-rumped Sandpiper	<u> </u>			_ <u> </u>	<u> </u>	
Baird's Sandpiper	<u> </u>			_ <u> </u>		
Pectoral Sanupiper	<u> </u>					
Purple Sanopiper	<u> </u>					
Duniin CHL Condoinar		<u> </u>		<u></u>		
Stilt Sanupiper		<u> </u>	<u> </u>	<u> </u>		
Short-billed Dowitcher	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	
Common Snine	<u> </u>	<u> </u>				
Common Shipe	<u> </u>	_ 	<u> </u>	<u> </u>		
Time at beginning of survey			<u> </u>			
Time at end of survey						
Tide (see back)						
Inland water levels (see back)						
Disturbance events (see back)						
Temperature (see back)						
Wind (km/h) (see back)						
Cloud Cover (see back)						
Precipitation (see back)						

Atlantic Canada Shorebird Surveys datasheet- back

Disturbance events:			
Date:			
Event:			
Date:			
Event:			
Date:			
Event <u>:</u>			
Remarks:			

Wind	Tide
On the Pequifort land scale:	1 - high tido
On the beduloit failu scale.	1 - 11g11 uue
U = Calm. Smoke rises vertically. Wind speed U km/n.	z = almost nigh and rising
1 = Light air. Wind motion visible in smoke. Wind speed 1-6 km/h.	3 = almost high and falling
2 = Light breeze. Wind felt on exposed skin. Leaves rustle. Wind speed 7-11	4 = half-tide and rising
km/h.	5 = half-tide and falling
3 = Gentle Breeze. Leaves and smaller twigs in constant motion. Wind	6 = almost low and rising
speed 12-19 km/h.	7 = almost low and falling
4 = Moderate Breeze. Dust and loose paper raised. Small branches begin to	8 = low tide
move. Wind speed 20-29 km/h.	9 = not recorded, not applicable
5 = Fresh breeze. Smaller trees sway. Wind speed 30-39 km/h.	
6 = Strong breeze. Large branches in motion. Whistling heard in overhead	
wires. Umbrella use becomes difficult. Wind speed 40-50 km/h.	Cloud Cover
7 = Near gale. Whole trees in motion. Effort needed to walk against the	1 = clear
wind. Wind speed 51-62 km/h.	2 = overcast (>50%)
8 = Gale. Twigs broken from trees. Cars veer on road. Wind speed 63-75	3 = partial cloud (<50%)
km/h.	
	Precipitation
Inland Water levels	0 = none
Normal = N	1 = drizzle
High = H	2 = rain
low = l	3 = snow
Not applicable = NA	
Temperature	
$1 = \langle 0^{\circ} C \rangle = 0^{\circ} C - 9^{\circ} C \rangle = 10^{\circ} C - 19^{\circ} C \rangle = 20^{\circ} C + 10^{\circ} C \rangle = 10^{\circ} 10^{\circ} C $	



Photo © Bill Pratt, Photographer



Atlantic Canada Shorebird Surveys

c/o Shorebird Biologist 17 Waterfowl Lane Sackville, NB E4L 1G6

506-364-5037 Email: ACSS-RORA@ec.gc.ca

http://www.ec.gc.ca



Relevé des oiseaux de rivage de l'Atlantique



Date:	March 23, 2023
То:	Renata Mageste da Silva, Environmental Assessment Officer
From:	Elizabeth Kennedy, Director Water Branch, Sustainability and Applied Science Division
Subject:	Bear Head Energy Green Hydrogen and Ammonia Production, Storage, and Loading Facility Project, Richmond County, Nova Scotia

Scope of review:

This review focuses on the following mandate:

- Hydrology and surface water quantity
- Surface water quality and wastewater discharges
- Groundwater quantity and quality
- Wetlands

Technical Comments:

Hydrology and surface water quantity

Water Supply:

- LLWU: Landrie Lake Water Utility
- It is stated that "Raw water will be supplied to the site by LLWU via pipeline" (pg 2.10), and "In 2020, the maximum daily water withdrawal volume was 13.5 million litres, while the minimum was 4.4 million litres (LLWU 2020). Based on these statistics, the LLWU's current approval will likely allow them to provide BHE with the above noted required water quantities."
 - The values stated are annual use values, and may not be reflective of any legal agreements that the utility may have in place for the commitment of water under their current water withdrawal approval, including significant additional use proposed under the recently approved Everwind EA.
- It is stated that "At full buildout, it is currently estimated that BHE will require up to an average of 4 million gallons (15 million litres) of water daily." (pg 2.16). Figure 2.2 outlines ~4 million gallons per day as raw water needs, with 1.5 million gallons per day resulting as effluent, and the remaining 2.5 million gallons per day of deionized water as

inputs to the process (pg 2.8). It is also stated that "BHE is also planning to use air cooling, thereby eliminating substantial water evaporation losses from cooling tower operation." (pg 3.8).

- 15 million liters per day would represent one of the top 5 largest current surface water users in Nova Scotia
- Based on information currently available at the time of this review, the current approved water amount for the Landrie Lake system does not have the capacity to meet the existing commitments and the needs outlined in this submission. The scope of this submission excludes analysis of the sustainability of a water supply from LLWU or description of mitigation/minimization of the substantial water needs outlined. The supply of water for this project will be dependent on the ability of LLWU to withdraw sufficient water in accordance with ECC requirements (e.g., the Guide to Surface Water Withdrawals).
- No alternatives to the proposed water supply outlined are presented in the project alternatives section. Were alternative water supplies, such as sea water, assessed? If yes, what were the findings?
- A value for average water needs is provided in the submission it is unclear what the maximum value could be, which would need to be considered in the assessment of water availability and impacts to Landrie Lake and surrounding environment.
- "The LLWU signed a Memorandum of Understanding on March 25, 2022 to provide the required initial supply water to BHE." (pg. 2.16)
 - o Details related to this agreement are not provided in the submission.

Watercourse alterations and impacts to local hydrology:

- It is stated that "Power supply for the Project will be provided from renewable power via the grid and/or direct power connection from primarily new onshore and/or potential future offshore renewable energy projects. Water supply and energy production and storage will be permitted (as required) separately by the proponent(s) of these utilities/projects." (pg 1.4)
 - The development of a power transmission line has not been discussed in this submission
- The information provided to assess impacts to surface water quantity and local surface water features has been provided at a level of detail that is insufficient in providing the necessary information to have an understanding of current conditions and those that are proposed to exist as a result of project activities. As a result, it is unclear what potential impacts may exist as a result of proposed project activities, and whether the proposed mitigations will be effective.
 - It is stated that "A stream located to the southwest of the site (Stream A) receives approximately one quarter of the site runoff. Another stream (Steam B) located to the southeast of the site receives approximately half of the site runoff. The remaining quarter of the site drains directly to the Strait of Canso." (pg 4.5). This information is provided at such a high-level and without supporting details; there are no values related to natural, current, and proposed drainage areas for the watercourses identified, or any other justification presented to support these

statements. As a result, information necessary to support any of the assessments of potential impacts has not been sufficiently provided.

- It is also stated that "Surface runoff reaching the site from the northern (off-site) catchment area has been rerouted around the north side of the Project site using an open channel. This reconnects to a small wetland, Stream B, and the estuary." (pg 6.20). It is also stated that "The existing site development includes sediment ponds and extensive surface water controls." (pg 6.21). Without figures that support this information, it is all at such a high-level as to not support in understanding both current and proposed surface water management conditions on and surrounding the Project Site.
- It is reported that Stream A "has the potential to contain fish within its downstream most reaches" (pg 6.22), and also that "Previous site development has impacted the catchment area size to Stream A" (pg 6.20). It is stated that "Further impacts as a result of this Project are not anticipated." (pg 6.20), but as mentioned in the bullets above, no figures or additional information have been provided to either understand current or future conditions to be used in substantiating or having confidence in this claim. It is stated that "Surface runoff that is generated on-site and runs over the Bear Head Site will be channeled to sedimentation ponds for treatment prior to discharge" (pg 6.20), but no site plans or supporting information is provided to understand current or proposed surface water management on site, or the feasibility of what has been proposed as mitigations.
- The EARD indicates that the site has already been largely modified due to preparations for a prior project, including the clearing, grubbing, topsoil stripping, and construction of water management controls (e.g., drainage channels, sediment ponds), and suggests that the remaining surface freshwater impacts will likely be through erosion, sedimentation, and stormwater runoff. However, it also acknowledges that project activities may result in changes to surface water flow, quantity and/or quality, and specifically notes that surface runoff may contain hydrocarbons. However, the impacts of project activities on the local hydrology have not yet been assessed at a level of detail necessary to understand current and proposed conditions, and whether the mitigations proposed are feasible and/or appropriate.

Surface water quality and wastewater discharges

The EARD identifies the proponent's commitment to using ESC measures and developing a sitespecific plan in the detailed design phase to mitigate risks. To ensure the plan meets our requirements, it should be developed by a qualified professional and be submitted to ECC for review and approval prior to construction activities including clearing, grubbing, and stripping.

The EARD proposes to separate stormwater runoff from process and sanitary wastewater streams. This is an appropriate mitigation, however, in addition it should establish a minimum setback of 30m from any watercourse or groundwater feature to mitigate risks from the following activities: refuelling and storage of hazardous materials, lubrication of equipment,

washing of machinery or equipment, storage of equipment, excavated/stockpiled materials, and potential contaminants. Additionally, areas selected for these activities should be situated such that a release would not enter a surface watercourse or wetland.

It is stated that "Surface runoff from process areas or potential sources of contamination will be prevented using diversion or secondary containment." (pg 6.21). This is not clearly discussed further in the document, and the plan for what will be done with surface water runoff generated from these areas is not further described. Where it is stated that "Reject process water from the facility will be collected and conveyed in a fully dedicated piping network (excluding sanitary wastewater) and directed to an approved marine discharge location" (pg 6.21), it is unclear if this diverted/contained runoff from areas of potential contamination is also planned for marine discharge, and if yes, what the potential impacts of this would be.

The proposal indicates that, during construction of the marine facilities, turbidity curtains and other appropriate measures will be deployed, if logistically possible, to protect the marine environment. These measures should be identified and incorporated within the ESC plan. The EARD describes that hydrostatic testing will be performed during facility commissioning & decommissioning, and that wastewater generated by this activity will be discharged to the Strait of Canso. Further, it proposes to test this wastewater stream to ensure that it meets compliance limits prior to its disposal, and to provide treatment, if required, to achieve these limits.

The submission identified a risk of contamination from alkaline wastewater used to rinse concrete troughs. The EARD did not characterize the nature or magnitude of the impacts that may ensue from this activity, identify the surface water body that may be impacted, or identify any mitigation measures that may be required to protect aquatic life.

The EARD indicates that the project intends to discharge approximately 5 million litres of "Reject Process Water" daily to the Strait of Canso. This wastewater stream is to be conveyed to the Strait in a fully dedicated piping network complete with a submerged outfall. This is good practice and meets NSECC requirements.

Substances expected to be present in reject process water are assumed to match those present in raw water from Landrie Lake though they will be concentrated through the process. Concentrated substances are not expected to exceed CCME Water Quality Guidelines for the protection of marine aquatic life. The EARD does not propose effluent testing to confirm concentrations during operation. Please note that the assimilative capacity study in appendix F references this substance list as appendix E but it is found in appendix B.

An assimilative capacity study is presented in appendix F for the purpose of predicting the expected impact of elevated temperature and low salinity reject water discharge on the receiving marine environment. Near field modelling using a three-dimensional dilution mixing model (specifically CORMIX) was used to estimate the extent of impact. This model is a recognized industry standard and is acceptable for the purpose of this evaluation.

Ammonia as nitrogen is listed in appendix B as a substance expected to be present in the raw water from Landrie Lake and predicted to be concentrated in the reject water. Tested values in appendix B vary from non-detect to 0.58 mg/L. Ammonia is known to be toxic to aquatic life. This level of variability presents uncertainty in the predicted concentrations for the reject water. In addition, where this facility is specifically designed to create ammonia, we would expect assurances that production ammonia cannot enter the reject water. Greater certainty of expected concentration is required to predict effects on the receiving environment. Consideration should also be made for including ammonia within the assimilative capacity study. Discharge limits for ammonia which are protective of the receiving environment should be provided in consideration of its assimilative capacity.

Within appendix F, data is quoted as being used to verify some physical characteristics of the receiving environment. Some of this data is quite old extending back to the 1970s and 1980s. This may be acceptable however statements specifically indicating that these conditions are applicable today are missing from the evaluation.

The assimilative capacity study provides conclusions indicating that mixing zone extends 6 m from discharge point for temperature and 5 m from discharge point for salinity. CCME protection of aquatic life values (marine) for both parameters are predicted to be reached within these distances. This mixing zone is very small and does not present any reason for concern. The assimilative capacity study in general is easy to understand and does not raise any significant concern.

For sanitary sewage, the proponent identified that they intend to pursue approval from NSECC for an on-site sewage disposal system. If site conditions preclude installation or approval of an on-site septic system, they intend to install a wastewater treatment facility. The EARD does not acknowledge approval requirements for wastewater treatment facilities. The proponent should be made aware that a wastewater treatment facility requires approval from NSECC.

Appendix L presents and ecological risk assessment in the event of an ammonia spill due to catastrophic failure at the facility. This assessment is beyond the technical expertise of reviewers within our group. It has been noted here only to indicate that this risk may be significant and that someone with the technical expertise to comment on it should be involved in its review.

Groundwater quantity and quality

The proponent has proposed mitigations to monitor and protect groundwater quality and quantity from the main site activities including a groundwater monitoring program and pre-blast survey mitigations. However, there is uncertainty if the entire project was assessed within the EARD as a transmission line and water pipeline were not discussed.

Baseline groundwater quality data was not collected or assessed during the EA process. The proponent has proposed to complete baseline monitoring prior to any additional site work and groundwater monitoring program if required.

The EARD referces a monitoring well being used to supply water to a construction trailer. While well construction details were not supplied within the EARD; typical industry practices for monitoring well construction do not meet the requirements of the *Well Construction Regulations*. In Nova Scotia a well being used to obtain a groundwater supply is required to be constructed as per Regulations.

Wetlands

The EARD describes potential impacts to wetlands and all Project related direct impacts to wetlands have already occurred under a separate approval. The EARD describes that no additional direct impacts to wetlands within the Project Area are anticipated to occur. In the event changes to the Project Layout are required, and wetlands are anticipated to be directly impacted, a Wetland Alteration Approval Application will be submitted to NS ECC for review.

The EARD describes that there is potential for indirect impacts to occur to adjacent wetlands, primarily via sediment and erosion. With appropriate mitigation measures the degree of impacts can be reduced. To ensure the effectiveness of these mitigations and indirect impacts are not occurring to adjacent wetlands, wetland monitoring, for a five-year period, at a minimum should be implemented. Wetlands 1, 3 and 6 should be monitored as they have an elevated potential to be directly impacted based on their topographical position to the Project.

As highlighted in the EARD, indirect impacts to wetlands may occur. For this reason, WESP-AC should have been performed and analyzed in the EARD. Without WESP-AC data it is unclear if there are any functional WSS adjacent to the Project that may have potential to be impacted by the Project.

Summary of Technical Considerations:

Recommendations

If the project is approved, the following EA Terms and Conditions are recommended:

- Information related to the transmission of power to the site should be provided to the Department for review and evaluation of potential permitting requirements that may exist for that activity.
- As part of the application for the Industrial Approval, it is recommended that the company submit a site surface water management plan to the Department for review and acceptance. This plan would include details related to the design of any on-site surface water collection ditches and pond(s) completed by a qualified professional engineer or geoscientist licensed to practice in Nova Scotia, and include a plan to monitor compliance during the different operational phases of the Project. The plan would include details to support the mitigation of scour, flooding, sediment loading, and thermal

charging related to discharges from the system, where appropriate. The plan would consider the potential impacts of climate change in the design criteria for site surface water management features. This plan would also assess the potential indirect impacts to downstream water resources, including Stream A and B and associated wetlands, and present potential mitigations, including areas requiring watercourse/wetland alteration applications, where appropriate. It is recommended that terms and conditions of approval include requirements to implement the approved surface water management plan once deemed acceptable by the Department and provide an evaluation of its effectiveness supported by site monitoring results as part of applications for renewal of the Industrial Approval.

- As part of the application for the Industrial Approval, it is recommended that the company submit a Water Conservation Plan (in line with what is outlined in the NSECC Guide for Surface Water Withdrawals) that includes an assessment of the water uses and the water related losses associated with the proposed project, with justification for how these processes have been assessed from a water conservation perspective.
- As part of the application for the Industrial Approval, it is recommended that the company submit a letter from the LLWU that confirms the sustainability of the withdrawal in consideration of the requirements outlined in the Guide to Surface Water Withdrawals, including hydrological assessment, the potential impacts of climate change on water availability within the reservoir, and identification of other potential impacts resulting from this additional water use.
- It is recommended that a detailed sediment and erosion control plan for the industrial site activities (including roadworks) be developed by a qualified professional and be required to be submitted as part of any industrial approval application for NSECC review and approval prior to construction activities, including clearing, grubbing, and stripping, take place. The plan shall give special considerations to areas with steeply sloping topography and those in the immediate vicinity to water resources. In addition to this plan and prior to commencement of the project, it is recommended that the applicant provides details for review and acceptance by NSECC surrounding the approach to mitigate potential impacts to local drainage patterns resulting from any roadworks proposed by the project.
- Prior to the commencement of the project, it is recommended that the Approval Holder submit a surface water quality and quantity monitoring plan that includes but is not limited to the proposed sampling locations, parameters, and frequency to the Department for review and acceptance. It is recommended that the Approval Holder develop the plan in consultation with the Department and Fisheries and Oceans Canada, and shall implement the plan once the plan is deemed acceptable by the Department.

- It is recommended that the Approval Holder(s) ensure that the following activities take place at a distance of a minimum of 30 metres from a surface watercourse or wetland in an area such that a release will not enter a surface watercourse or wetland:
 - Fuel storage, refueling, and/or lubrication of equipment;
 - Washing of machinery or equipment; and
 - Storage of equipment, excavated/stockpiled materials, and potential contaminants.
- As a condition of the EA and prior to construction of the Project, WESP-AC results for all wetlands identified within the Project Area and identification of any functional WSS identified using WESP-AC are required under the NS Wetland Conservation Policy (direct and indirect alterations are equally considered). If functional WSS are identified, NS ECC may require additional mitigation measures to protect these wetlands.
- Develop a five-year wetland monitoring plan and submit to a NS ECC Wetland Specialist for approval. Wetlands 1, 3, and 6 should be monitored at a minimum and monitoring should include general vegetation and hydrological information, and vegetation plot data.
- Additional testing of raw source water is recommended to establish greater certainty for
 predicted concentrations of substances expected to be in the reject water. This is of
 particular concern for ammonia. Assurances should be provided verifying that production
 ammonia will not enter reject water. Predicted concentrations of ammonia in the reject
 water from both potential sources should be modelled as per the assimilative capacity
 study to predict potential toxic effects on the receiving environment. This will be used to
 determine appropriate discharge concentrations for ammonia.
- Historic data and/or information used to establish assumptions for the assimilative capacity study should be validated as representative of conditions today.
- It is recommended that baseline monitoring and a groundwater monitoring program be required to be submitted for review and acceptance by the Department. Monitoring wells should be discharge limits sited, and water quality monitored, to capture potential impacts from site activities.
- In addition, site-specific groundwater criteria and points of compliance need to be developed in consultation with the Department. A statistical analysis and evaluation of groundwater background/baseline water quality parameters will assist in developing sitespecific groundwater quality criteria. Contingencies should be built into the groundwater monitoring plan or an environmental site plan for if groundwater quality exceed sitespecific criteria.
- Any existing groundwater monitoring wells that are either damaged, buried, or are not being used in future monitoring programs should be properly decommissioned to ensure groundwater is protected from potential site impacts.
- Any wells being used to provide a groundwater supply on site must meet the requirements within the NS Well Construction Regulations.



Subject:	Bear Head Energy Green Hydrogen & Ammonia Project, Richmond County, Nova Scotia
From:	Department of Natural Resources and Renewables
To:	Renata Mageste da Silva, Environmental Assessment Officer
Date:	March 23, 2023

Scope of review:

This review focuses on the following mandate: Parks, Land Services, biodiversity, species at risk (SAR) status and recovery, wildlife species and habitat management and conservation, MRA and regulations, clean electricity.

Technical Comments:

Clean Electricity:

The transition of our electricity system to renewable energy is part of the province's plans and commitments to climate change mitigation.

Transitioning the electricity system to renewable energy is the most cost effective and significant action the province can undertake to reduce its greenhouse gas emissions in the near term.

Renewable energy projects will assist the province in achieving its goals in the Electricity Act, NRR mandate letter and business plan. It will also support Environment and Climate Change's Environmental Goals and Climate Change Reduction Act (EGCCRA), and the Climate Change Plan for Clean Growth (CCPCG).

Land Services Branch:

No Crown lands are shown to be included, therefore, no comments.

Geoscience and Mines Branch:

This review was conducted through the lens of requirements as laid out under the Nova Scotia *Mineral Resources Act* and its associated regulations.

GMB has determined that there are active mineral exploration licences partially or entirely within the study area of interest. This review was performed by examining the study area within NovaRoc, Nova Scotia's Registry of Claims, an internet accessible system for the acquisition and administration of mineral dispositions in Nova Scotia.

Biodiversity Branch:

Section 4.2 Terrestrial Biological Environment

 The EARD focuses on surveys conducted in 2003 and some supplemental surveys from 2015 for the Bear Head LNG Project. More recent surveys would be better to determine risk of activities to SAR/SOCC. Mitigations are required for all species at risk to ensure compliance with the NS and GOC Endangered Species Act. Species at risk include any plant, animal, or other organism that is seriously at risk of extinction. A <u>current list of species at risk</u> protected under the NS Endangered Species Act: <u>Species at risk – Government of Nova Scotia,</u> <u>Canada</u>; under the Government of Canada Species at Risk Act: <u>Species at Risk</u> <u>Act (justice.gc.ca)</u>

Section 4.2.3 Wetlands

• The EARD indicates that wetlands have been altered and hydrology changed since 2003. Figures highlighting those changes would be useful in determining if effective mitigations for SOCC – mitigation is required for all species at risk to ensure compliance with the Endangered Species Acts.

Section 4.2.3 Wetlands and Section 4.2.4 Rare Plants

• Wetland section reports that previous undocumented wetlands were found in 2022 field reconnaissance surveys. Updated flora and fauna surveys of all wetlands are recommended to ensure there are mitigations in place for SAR/SOCC per the Endangered Species Acts

Section 4.2.4 Rare Plants

- Recommend updating dedicated SOCC surveys and regular follow-up monitoring.
- p. 4.35 Record of provincial approval of biologist's credentials is required lichen surveyors in Nova Scotia must be approved by the Director of Wildlife.

Section 4.2.5 Birds 4.2.5.1 Overview

• Recommend proponent submit all data for SAR and SOCC from previous and follow-up surveys - to ensure any required mitigations per the Endangered Species Acts.

Section 4.2.5.2 Raptors

• Recommend including an Osprey Management Plan within the Wildlife Management Plan as Osprey are protected under the Wildlife Act.

Section 4.2.5.4 Bird Species at Risk and Species of Conservation Concern

• Dedicated breeding bird surveys (Olive sided flycatcher, Canada warbler, Evening Grosbeak) and Common nighthawk surveys are needed to develop effective mitigations - mitigation is required for all species at risk to ensure compliance with the Endangered Species Acts.

Section 4.2.7 Herpetofauna

• Dedicated surveys for herpetofauna are recommended as the ACCDC report indicates that Wood Turtle has occurred within 0.5 km of the Study Area. Wood Turtles are an endangered species and mitigations are required to ensure compliance with the Endangered Species Acts.

Section 6.5.2.1 Construction (Wetlands/Vegetation)

• Recommend that buffers be established for SOCC plants as a mitigation, including Northern Comandra.

Section 6.5.3 Mitigation (Wetlands/Vegetation)

- p. 6.29 appropriate buffers should be established, as a mitigation, wherever SAR/SOCC are found.
- p. 6.29 Section 4.2.3 indicated several wetlands had infiltration of sediments and hydrological change, which may have impacted SOCC species. Revisit effectiveness of previous mitigations and modify as needed to minimize impacts on SOCC.

Section 6.5.5 Follow-up Monitoring (Wetlands/Vegetation)

• p. 6.30 – all wetlands should be surveyed for SAR/SOCC. Lichen surveys to be conducted by an approved lichenologist.

Section 6.6.2.1 Construction (Wildlife and Wildlife Habitat)

• p. 6.32 – Mlitigations should be included in a Wildlife Management Plan.

Section 6.6.2.2 Operations (Wildlife and Wildlife Habitat)

- pp 6.32-6.33 appropriate mitigation for endangered birds and bats should be detailed in a Wildlife Management Plan.
- p. 6.33 "BHE developed an Avifauna Management and Monitoring Plan for the Bear Head LNG Project to address concerns raised by NRR and Canadian Wildlife Service (CWS), particularly with respect to flaring and lighting. The Avifauna Management and Monitoring Plan identified key factors that would influence the design and likelihood of adverse impacts to birds and bats at the LNG facility and explored management and monitoring options." – Mitigation

measures applicable for this proposed Bear Head LNG project should be incorporated into mitigation measures in a Wildlife Management Plan.

Section 6.6.3 Mitigation (Wildlife and Wildlife Habitat)

- Ensure recent data is used when identifying mitigations to be built into a Wildlife Management Plan. This will help to ensure that the WMP is best able to meet the requirements of the Endangered Species Acts.
- p. 6.33 Breeding bird season should be April 15 to August 31. Appropriate mitigation measures to protect dwelling places and individuals of SAR bird species, bird species not included by the MBCA and bats should be included in a Wildlife Management Plan.
- p. 6.34 The Flare Management Plan should include bats and appropriate and specific timing windows or seasonal restrictions. The Plan should be integrated into the Wildlife Management Plan.

Section 6.6.4 Residual Effects

• An Avian Management Plan should form part of the larger Wildlife Management Plan, in order to address potential impacts to SAR/SOCC birds, bats and herpetofauna.

Section 6.6.5 Follow-up and Monitoring

• Nocturnal acoustic monitoring and nocturnal breeding surveys for Common Nighthawk, a SAR, should be undertaken as a mitigation per the Endangered Species Acts.

Summary of Technical Considerations: (provide in non-technical language)

Clean Electricity:

The EA process does not currently allow for the comparison and reflection on the climate change or environmental related benefits of transitioning the electricity system from fossil fuels to renewable energy. The long-term use of coal-fired generation for our electricity system has had significant cumulative negative impacts to the environment, climate, and human and animal health as a result of air pollution and other related pollutants from coal-fired generation. New renewable energy projects must be considered in comparison to the status quo and the benefits that result from the transition of the electricity sector to renewable energy. There are substantial benefits to the health and welfare of the ecosystem in Nova Scotia that is a result of switching coal-fired generation for new renewable energy resources.

Parks Division:

No concerns

Land Services Branch:

No comments

Geoscience and Mines Branch:

A review is to be completed through NovaRoc to determine which exploration licenses could be affected by this proposed project. Please contact the Registry of Mineral and Petroleum Titles if assistance is required in performing this task.

Once the review is performed, engagement will be required of Bear Head Energy Inc. to notify the owners of the affected mineral rights to discuss potential impacts to the areas under the exploration licenses.

Biodiversity Branch:

It is the responsibility of the proponent to ensure compliance with federal and provincial legislation and regulations regarding resident, migratory and at-risk bird species and their habitats (e.g., *Species at Risk Act, Migratory Birds Convention Act, Fisheries Act, NS Endangered Species Act, NS Wildlife Act*, and their regulations).

It is the responsibility of the proponent to obtain all necessary permits as required under legislation related to wildlife and species at risk in order to undertake the project.

Should work commence prior to the development of a Wildlife Management Plan the proponent should contact NRR (<u>biodiversity@novascotia.ca</u>) to discuss permits, particularly if the project has potential impacts on threatened or endangered species. The absence of effective mitigations may lead to breaches in prohibitions as per s.13(1) of the Endangered Species Act.

Provide digital way points and/or shapefiles for all Species at Risk, Species of Conservation Concern to NRR (those species listed and/or assessed as at risk under the *Species at Risk Act, Endangered Species Act*, COSEWIC, as well as all S1, S2 and S3 species) and all flora and fauna surveys. Data should adhere to the format prescribed in the NRR Template for Species Submissions for EAs and is to be provided within two (2) months of collection.

Prior to the development of a Wildlife Management Plan (WMP), field surveys should occur and include:

- Breeding bird surveys
- Raptor nest search
- Lichen surveys, by a qualified lichenologist approved by the Province of Nova Scotia
- o Flora surveys
- Wood Turtle surveys

PA Wildlife Management Plan should be developed and include:

- Communication protocol with regulatory agencies;
- General wildlife concerns (e.g., human-wildlife conflict avoidance involving coyotes and bears);
- Mitigation measures to promote safety and prevent spread of Avian Influenza;
- Education sessions and materials for project personnel on Species at Risk, non-Species at Risk-wildlife, and other important biodiversity features they may encounter on-site and how to appropriately respond to those encounters;
- Mitigation measures and timing windows consistent with recovery documents (federal and/or provincial recovery and management plans, COSEWIC status reports) to avoid and/or protect Species at Risk/Species of Conservation Concern and associated habitats discovered through survey work or have the potential to be found on site, including Old growth forest;
- Specific mitigation for the following species or situations:
 - Barn Swallow (*Hirundo rustica*)
 - Common Nighthawk (Chordeiles minor), including the avoidance of nesting habitat creation and an approach for protecting nests if discovered
 - o Olive-sided Flycatcher (Contopus cooperi)
 - o Canada Warbler (Cardellina Canadensis)
 - Evening Grosbeak (Coccothraustes vespertinus)
 - Wood Turtle (*Glyptemys insculpta*)
 - Nesting turtles
 - o Blue Felt Lichen (Pectenia plumbea)
 - o Migratory Bats
 - Southern Twayblade (Neottia bifolia)
 - Northern Comandra (Geocaulon lividum)
 - Avoidance of raptor and owl breeding and nesting seasons
 - Osprey Management Plan to prevent net loss and consultation with NRR on nesting platforms and installation of deterrents on power poles
- Prevention of wildlife entrapment within the quarry pit and measures for monitoring and mitigation should entrapment occur;
- Plans for mitigating light pollution, including flare management, that could impact migratory birds and bats, including long-distance migratory shorebirds, songbirds, Common Nighthawks, bats or waterfowl on the adjacent coastline. This may include a reduction in lighting during key spring and fall migration periods;
- Detail regarding how the proponent will address changes to species-atrisk listings over time. Additional biodiversity and species-at-risk surveys should be repeated every five years to ensure no impacts to SAR or SOCC as legislation is updated;
- Details on monitoring and inspections to assess compliance with and the effectiveness of the WMP.

The Approval Holder shall clear vegetation outside of the breeding season for most bird species (April 15 to August 31), unless otherwise authorized in writing by NRR due

to unavoidable circumstances.

Revegetate cleared areas using native vegetation or seed sources.

Develop a plan to prevent the spread of invasives both on and off site. The plan should include monitoring, reporting, and adaptive management components.

The proponent should provide a compensation plan developed in consultation with NRR to address loss of SAR/SOCC habitat in the form of support for SAR recovery in Nova Scotia and may include financial contributions (e.g., Species at Risk Fund), research, and/or conservation actions identified in management and recovery plans where appropriate.

The proponent must describe the impacts of the project on landscape-level connectivity for wildlife and habitat (*e.g.*, habitat fragmentation, loss of intact forested habitat, increased road density). An assessment of the cumulative effects of the project on landscape-level connectivity and habitat loss, and the measures proposed to mitigate those effects, must be provided.

Plans for decommissioning and restoring former operational areas through recontouring and revegetation with native species.

IMPORTANT:

- Always provide a response back to the EA Branch, even if it is simply to confirm that there is "no comment."
- The comments will be published on the EA website on decision day (privacy review is NOT conducted on comments from government).



75 Treaty Trail Truro, NS B6L 1W3

Tel (902) 843 3880 Fax (902) 843 3882 Toll Free 1 888 803 3880 Email info@mikmaqrights.com www.mikmaqrights.com

March 29th, 2023

Renata Mageste da Silva Environmental Assessment Officer Environmental Assessment Branch Nova Scotia Environment and Climate Change Email: <u>Renata.MagestedaSilva@novascotia.ca</u>

<u>RE:</u> Consultation with the Mi'kmaq of Nova Scotia on Bear Head Energy Green Hydrogen and Ammonia Project, Richmond County.

Ms. Silva,

I write in response to your letter dated February 21, 2023, requesting consultation under the *Terms of Reference for a Mi'kmaq-Nova Scotia-Canada Consultation Process (ToR)* as ratified on August 31, 2010, on the above noted project. We wish to proceed with consultation.

This project may impact various communities' rights as protected under section 35 of the <u>Constitution Act</u>, 1982. Section 35 recognizes and affirms the Aboriginal right to hunt and fish. This project may impede that ability in the surrounding area (including but not limited to the ability to hunt, fish, and gather in the project area). As referenced in the Environmental Assessment Registration Document (EARD) moose, salmon, lobster, trout, deer and partridge are all species that are important to the Mi'kmaq and are all found in the project area. It is our expectation that Nova Scotia Environment and Climate Change will ensure these species will not be impacted by this proposed project.

The Mi'kmaq Nation in Nova Scotia has a general interest in all lands and resources in Nova Scotia as the Mi'kmaq Nation has never surrendered, ceded, or sold the Aboriginal title to any of its lands in Nova Scotia. The Mi'kmaq have a title claim to all of Nova Scotia and as co-owners of the land and its resources it is expected that any potential impacts to rights and title shall be addressed.

Kwilmu'kw Maw-Klusuaqn Negotiation Office (KMKNO)'s Archaeological Research Division (ARD) cannot support the conclusion that there is no archaeological concern when previous development has significantly changed the landscape in an area through construction activities, industry, or development without evidence or subsurface testing to ensure the absence of Mi'kmaw belongings. The ARD have reviewed Sections 4.4.5 to Section 4.4.6.3 (Pages 88-99); Sections 6.8 (Pages 51-56); and 6.10 (Pages 60-62) of the EARD for the Bear Head Energy Green Hydrogen and Ammonia Production, Storage and Loading Facility. An Archaeological

Resource Impact Assessment (ARIA), A2003NS55, that informs the archaeological study identified in this EARD has also been reviewed. The ARIA classified the Project Area as holding "low to moderate" pre-Contact archaeological potential from a background study and pedestrian survey of an area with a project footprint that was still considered in the "preliminary design phase" (Niven 2003, A2003NS55: 1-7).

It is widely known that the Strait of Canso has been a notable area of use of occupancy, no doubt leaving behind a yet undocumented landscape of Mi'kmaw archaeological heritage. The lands and the resources connected to waterways are known to be rich sources of resources that can be accessed daily. The rubric used to classify the Bear Head Energy Green Hydrogen and Ammonia Production, Storage and Loading Facility as an "unlikely" location of "pre-contact archaeological importance" through "three facts" are presented in the EARD (EARD 2023, Section 4.4.6.1: 4.89). They are as follows:

- few necessary resources for survival;
- extreme exposure; and,
- lack of scholarly reporting of the area.

"Better resources, including proximity to fresh water, a food supply and transportation is found inland from the site. Also, the Bear Head location is subject to extreme climatic conditions, including winds from the Strait of Canso and Chedabucto Bay. These two facts combined with the lack of published or documented scholarly material make the Bear Head LNG site an unlikely location for pre-contact archaeology (JWEL 2004)" (EARD 2023, Section 4.4.6.1: 4.89).

The extrapolation from the ARIA to the EARD wherein a "lack of published or documented scholarly material" is considered a "fact" that decreases archaeological potential in an area is misuse of information by a non-archaeologist and is patently incorrect.

The first MEKS completed by Mi'kmaq Environmental Services Ltd. in 2004 identified 153 plants of significance, as well as "marine harvesting, deer hunting and trapping, firewood harvesting, camping and a burial site" within a 5 km radius of the Project Area (EARD 2023, Section 4.4.5: 4.86). This study was supported by referencing two additional studies by the Confederacy of Mainland Mi'kmaq (CCM) in 2015 and Membertou Geomatics Solutions in 2016. Each study identified a variety of traditional uses for the area.

Because Mi'kmaq have been here since time immemorial, Mi'kmaq have witnessed changes in shorelines throughout Mi'kma'ki. Sea level rise and climate change have altered the shorelines, but the likelihood that our ancestors used this landscape, whether submerged or not, is significant. Whether for navigation, by boat or foot, or harvesting areas, any landscape connected to waterways used for travel or harvesting are significant Mi'kmaw cultural landscapes, regardless of the assumption that "geographic and climatic conditions suggest that long-term occupation by the Mi'kmaq would be unlikely" (EARD 2023, Section 4.4.5: 4.86). Not only are we concerned that there could be Mi'kmaw belongings within sediments, disturbed or undisturbed, reflective of these uses, but we are also concerned for the zones of transition between this well-used and documented Mi'kmaw transportation corridor and the

presence of easily accessible lands that make up the landscape under and around the current Project Area.

At this time, the ARD cannot support the classification of "low to moderate potential of the study area containing pre-Contact archaeological resources" of the Project Area because, among other reasons, this classification was based on a study of the project footprint that was still considered in the "preliminary design phase" (Niven 2003, A2003NS55: 3-7). The methods used to classify the area as low to moderate potential were based on background research "with an emphasis on historic maps" and a pedestrian survey "along the coastline of the study area (and in-land to the road) and a GPS-based search for settlement features indicated on the digitized A.F. Church map" (Niven 2003, A2003NS55: 3). **There was no subsurface testing.**

To date, A2003NS55 is the most recent archaeological study. That study recognized that, "[w]hile there are no reported pre-Contact sites within the study area, it should be noted that this region has not been the subject of any scholarly archaeological study from which settlement patterns have been derived" (Niven 2003, A2003NS55: 2). The conclusion and recommendations were stated as follows:

"The proposed project is in the preliminary design phase, and the archaeological assessment is based on the footprint of the plant site and the associated docking facility. Based on this preliminary information, it is concluded that no known archaeological resources will be negatively impacted by the project. However, this conclusion will have to be revisited once the final project design is in place. The impact of access roads, storage facilities, etc. has not been assessed" (Niven 2003, A2003NS55: 7).

At this time, we require clarification. Were there any additional studies undertaken after project designs were finalized? With no further supportive or current archaeological resource impact assessments that tested the impact areas sub-surficiality, the archaeological understanding of the Project Area, its footprint, and development is incomplete.

We recommend that an ARIA be conducted by a professional archaeological team that includes subsurface testing before any new development or construction activities commence, regardless of current level disturbance. If permit number A2003NS55 was the only study undertaken, with no follow-up study as recommended within it, there remains concern. Given the lack of previous follow through, proximity to the shore, the lack of Mi'kmaw perspective or standard throughout the document, or subsurface testing (with stratigraphic profiles recorded through scaled drawings or photographs) this area remains incompletely assessed or understood. The premise that "there appear to be very few resources that would have attracted settlement prior to European contact" (Niven 2003, A2003NS55: 2-3) is disproven by archival records of Mi'kmaw porpoise hunting, and strategic landscape use for distant communication from the historic period. These historic period observations are evidence of long-term patterns of use and occupancy along the Strait of Canso. To eliminate concern for impact to potential Mi'kmaw archaeological heritage, subsurface testing is necessary.

Our ARD is also concerned that impact areas that were disturbed during original construction activities are unknown. We consistently recommend that in areas that will undergo construction impacts or disturbance, regardless of classifications of low, moderate, or high potential to exhibit

archaeological resources, shovel testing occur to confirm the presence or absence of archaeological heritage. This is particularly important in landscapes that have been modified historically through development or industry. The ARD would like to emphasize the importance of subsurface data, adequate to eliminate concern for presence, protection, and management of Mi'kmaw archaeological and cultural heritage as part of assessment of potential in advance of any development. The observation that "[t]his area is very exposed and would likely have been less attractive compared to a more inland site" is proven untrue by archival and archaeological records along the Strait of Canso and can only be understood as a preliminary localized assessment lacking evidence to prove otherwise (Niven 2003, A2003NS55: 3). Without subsurface testing, the *evidence* of a lack of concern in impact areas does not exist.

The proximity of the Project Area to known traditional use areas combined with the lack of additional and recommended archaeological study or subsurface testing (regardless of level of disturbance) renders the state of understanding at the conclusion of A2003NS55 obviously incomplete. We must clarify that negative tests and negative evidence are considered relevant and important data.

Disturbance is defined, for archaeological purposes, as the dislocation of soils and/or sediments, such as that by heavily treaded or tracked vehicles, as well as purposeful excavation by heavy equipment. We concur with the recommendation in A2003NS55 that the Project Area "will have to be revisited once the final project design is in place. The impact of access roads, storage facilities, etc. has not been assessed" (Niven 2003, A2003NS55: 7).

Section 8.0 (Potential Impacts and Benefits to The Mi'kmaq of Nova Scotia) does not adequately address the potential impacts this project may have on The Mi'kmaq's rights as protected under section 35 of the Constitution Act, 1982. Section 35 allows the Mi'kmaq of Nova Scotia to hunt and fish throughout Mi'kma'ki (Unceded land of the Mi'kmaq people). This section of the EARD needs to be revisited with more details of potential impacts to The Mi'kmaq.

The Strait of Canso and surrounding areas have had a number of projects proposed in various states of development. Although we are encouraged to see many renewable energy projects being proposed, KMKNO remains concerned of the cumulative impacts these projects. There is little mention of cumulative impacts in this EARD. It is our expectation that Nova Scotia Environment and Climate Change are monitoring these incoming projects the cumulative impacts they are having on the surrounding environment.

It is KMKNO's expectation that Consultation will continue on future permits and approvals such as the <u>Fisheries Act</u> Authorization and Industrial Approval.

KMKNO does not represent the communities of Millbrook, Sipekne'katik, or Membertou First Nations.

Please contact Patrick Butler, Senior Mi'kmaw Energy and Mines Advisor at our office for any further questions.

Yours in Recognition of Mi'kmaw Rights and Title,

Director of Consultation Kwilmu'kw Maw-Klusuaqn Negotiation Office

c.c.:

Kwilmu'kw Maw-klusuaqn Negotiation Office Nova Scotia Office of L'nu Affairs Connie Ronnie, Nova Scotia Public Works Chris Burbidge, Department of Fisheries and Oceans



From: @gmail.com>
Sent: February 22, 2023 6:43 AM
To: Environment Assessment Web Account <<u>EA@novascotia.ca</u>>
Subject: Proposed Project Comments

** EXTERNAL EMAIL / COURRIEL EXTERNE **

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Project: bear-head-energy Comments: The ecology that depends on the river will be too negatively impacted if we have more than one hydrogen plant drawing water, considering the numerous sources that already draw water out. We should be more concerned with conserving our fresh water and its biological diversity until we have a replacement source. Recycling and reusing should be incentivized. Thank you. Name: Email: acmacg1@gmail.com Address: Municipality: New Glasgow email_message: Privacy-Statement: agree x: 93 y: 23

@hotmail.com>

From: <u>@hot</u> Sent: February 24, 2023 3:11 PM To: Environment Assessment Web Account <<u>EA@novascotia.ca</u>> Subject: Proposed Project Comments

** EXTERNAL EMAIL / COURRIEL EXTERNE **

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Project: bear-head-energy Comments: I am against this project which will only result in another white elephant Nova Scotia seems to be specializing in. Hydrogen generation is a very inefficient process, let alone convert it in ammonia to be reconverted in hydrogen at point of use. This will only enriched NSP and Bear heads share holders and justify NSP to increase rates again. Soon, battery technology will make any hydrogen project obsolete and the government should be proactive in funding research towards that end. I am dead against the Bear Head ammonia project! Name: <u>@hotmail.com</u> Address: Municipality: Baddeck email_message:

Privacy-Statement: agree x: 67 y: 14

From:@gmail.com>Sent: Friday, March 10, 2023 1:51 PMTo: Environment Assessment Web Account <<u>EA@novascotia.ca</u>>Subject: Bear Head Environment

You don't often get email from <u>bretonparkestates@gmail.com</u>. <u>Learn why this is important</u>

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Hello

Will you be drilling for salt Cavern Storage facilities. Everwind says they are. Regards

The Environmental Assessment Registration documents does not even give reference to any fisheries within the area of the water lot site—there are both active lobster fisheries and mackerel trap fisheries in the vicinity of the proposed site.

Lobster Fishing Area 29 is located in the proposed site, the lobster landings are only from 2012 – 2018, yet nothing for the most recent years when the landings have gradually increased. There are a number of fishermen that fish near and around the proposed site, the construction of the proposed terminal in that area would with increased vessel traffic and loss of access will interfere with all our fisheries.

The Environmental Assessment deals mainly with a liquid natural gas plant not energy green hydrogen and ammonia production storage and loading facility. We do not know the safety issues surrounding these volatile material—will we be able to fish when boats are loading and unloading, what happens if there is a leak what are the dangers to public safety if one occurs, how will it affect the fish habitat and the marine life within the area. Will there be any type of drainage entering the Strait of Canso waters?

There are so many possible adverse affects to this facility in this area in relation to the fishery and to the people that need to be addressed and looked into before any approval of such a facility in granted this area.

Respectfully submitted by,

Lobster Fishery Area 29 Representative/Commercial Fisherman

Guysborough County Inshore Fishermen's Association 990 Union Street Canso, Nova Scotia BOH 1H0 (902) 366-2266 gcifa@gcifa.ns.ca



Comments on Bear Head Energy Ammonia Hydrogen Production Storage and Loading Facility

- 30-days is insufficient amount of time to review these EA documents and provide public comments on them. Would the province consider in the future depending on the size and complexity of the project extending the deadline to provide public comments?
- Accidental spillage of ammonia in marine environments can create eutrophication. An
 overabundance of nutrients such as nitrogen in the ocean. This has the potential to create
 harmful toxic algal blooms, bacteria growth and oxygen depleted environments where fish can
 suffocate due to the lack of oxygen. Fish are more sensitive to ammonia exposure than other
 marine mammals or birds as it affects their ability to excrete toxins from their gills.
- Fisheries Act authorization from 2006 or 2014 should not be credited annually. Using a permit from 2006 is ridiculous and unacceptable. The HADD is now 8 times larger than the previously submitted project and its not an LNG project anymore. It's a completely different industry.
- Destruction of 7,997m² of eelgrass habitat will cause a cascade effect on other marine fish and crustaceans. That is a massive area of eelgrass, a species that is critically declining worldwide. A marine plant that holds more CO₂ and GHG emissions than a tree on land. Eelgrass habitat should be protected and not disturbed. An offset habitat needs to be designated in the strait area to compensate for this HADD.
- Municipalities will receive revenue from this project, this revenue should be designated for specific community purposes. Community input should be allowed and required when preparing community benefits packages. The communities near the project site are at a higher risk than other Nova Scotians to experience negative effects from this project.
- Bear Head Energy has not contacted the fishing industry on this side of Chedabucto Bay even though their development is projected to add 40-60 additional marine vessels a year travelling in and out of Chedabucto Bay. Any industrial incident that occurs on the north side of Chedabucto Bay will affect the south in a matter of hours. GCIFA also has members who reside within 5Km of the site and fishermen who fish near the project site and surrounding marine spaces.
- Bear Head Energy conducted a noise assessment predicting noise emissions during operations would not likely exceed the applicable regulatory requirement, the assessment had a 5km radius. No noise assessment in the marine environment or information regarding the predicted increase in marine acoustic levels? Considering the increase of 40-60 marine carriers per year? That is a huge piece of environmental impacts that has not been addressed. Increases in acoustic noise levels affects marine mammals. They essentially go radio silent. Marine mammals speak less in environments with increased noise, why talk if no one can hear you? But that doesn't mean marine mammals are not present. There is a healthy population of Atlantic white sided dolphins, harbour porpoises, seals and numerous whales that frequently move in and out of the

Strait of Canso on their migration paths. This additional acoustic noise will affect these mammals. Acoustic noise levels also affect crustaceans, not as well known but crustaceans such as lobsters use sound to find their food such as crab or other lobsters. The ability to hear other animals making clicking noises can also affect their behavior and mating cycles.

• "Effect of ammonia on survival and osmoregulation in different life stages of the lobster Homarus Americanus" by Young-Lai, Charmantier-Daures & Charmantier.

The concentration of ionized ammonia NH_4 + that is lethal LC_{50} after a 96-hour exposure time was 58mg/L for Stage I lobster larvae. The LC_{50} for Stage IV lobster larvae was 144mg/L and 377mg/L for adult lobsters at 5°C.

The concentration of un-ionized ammonia NH₃ that is lethal to Stage I lobster larvae is 0.72mg/L, 2.36mg/L for Stage IV lobster larvae, 3.25mg/L for adult lobsters at 20°C and 5.12mg/L for adult lobsters at 5°C.

These numbers are important to the Strait of Canso's economy. The British Columbia guidelines as quoted in the Appendix L Modelling Ammonia in the Marine Environment report prepared by Stantec are not necessarily comparable. It appears the acute concentration of un-ionized ammonia presented in Stantec's report of 7.3mg/L would be lethal to lobsters at the larval stage all the way through and including adult lobsters as well. I have not researched the lethal concentration of ammonia in mackerel, but it is indeed relevant.

This spill modelling assumes the leak is shut off at 15 minutes. That would be ideal. In reality, ammonia leaks are not realized until dead fish are floating in streams or smoke plumes are noticed. Is there some sort of warning system that would alert the company of a leak in a pipeline? What if the vessel loaded with 40,000 tonnes of ammonia runs aground in Chedabucto Bay and spills its entire contents into the bay, wouldn't that be a worst case scenario? Vessels have been known to run aground here quite frequently.

- After exposure to ammonia postlarvae and adult lobsters experienced a decrease in their ability to hyper-regulate in low-salinity media. I hope the company is not dumping freshwater into the area where possible ammonia leaks could occur....
- Lobsters are affected differently depending on the life stage.
- The larval stages of lobster are more vulnerable to contaminants such as oil, or oil dispersants than adult lobsters. Larval lobsters spend their time in surface waters making them more likely to be exposed to hydrocarbons in an oil spill event.
- The 1996 grounding of a vessel off Rhode Island resulted in an estimated 2,700 metric tons of fuel oil entering into the shallow near shore waters, killing approximately 9 million lobsters. (French-McCay 2003) When the Arrow spilled in 1971, there was not nearly as many lobsters out there on the bottom as there is now. The potential to kill millions of lobsters from a petroleum spill is a very real threat in NS nowadays, a threat that is not talked about enough.
- Toxicity of ammonia in freshwater is even more damaging to freshwater organisms.
- Increased marine traffic of 40-60 ammonia carriers from this project and another possible 10-15 carriers to ship Everwind's 500,000 tonnes of ammonia? Or will they use the same carriers? I don't think that was addressed. That's a huge increase of traffic in the Strait of Canso.
- Additional speed restrictions may need to be adjusted and exclusion zones will also need to be communicated to the other marine users. What will be the exclusion zone around the marine carriers that are transporting ammonia? What will be the exclusion zone around the terminal during loading? We have requested this information and are still waiting for the answer to this question.
- If the fishing industry could add a condition to this EA approval, it would be to immediately issue a mariners warning or emergency call repeated on VHS Channel 16, Channel 21B and a ALL STATIONS call anytime there is a suspected or known leak of ammonia. Ammonia clouds often float across land and water surfaces like fog. This could easily be mistaken as fog or mist in the Strait as weather conditions are often foggy with reduced visibility. We do not want our fishing industry members to be placed at risk of exposure due to lack of communication. The ammonia cloud can sit on top of water surfaces for long periods of time if low wind conditions exist. If there is an ammonia leak or hydrogen leak we would like all shipping traffic coming in or out of Chedabucto bay /Strait of Canso to be notified immediately. We don't need another Halifax Explosion. An all stop on vessel traffic could be implemented quickly if the correct communication methods are employed. Previous ammonia discharges and spills on land have not informed the public in a timely manner and this has resulted in hundreds of people being hospitalized in the US and Canada over the past decade, including first responders who were not informed properly of what type of spill had occurred when they responded to an emergency call. In this situation the provinces' emergency alerts system could also be employed but be mindful of the limited cell phone coverage our fishing community has when working on the water.
- There has been many leaks of ammonia on land in Ontario and in the USA over the past decade. If it can happen there, it can happen here. One incident had 84 people sent to hospital from exposure. How would our hospitals in rural NS deal with that volume of casualties?
- Chedabucto Bay is a major shipping route for petroleum. The Strait of Canso has been identified as one of four waterways with the highest tanker traffic in all of Canada. Of the 31.6 million metric tonnes of cargo in 2006, 21.6 million tonnes were crude petroleum (Statistics Canada 2011). In 2009, two-thirds of all cargo in Nova Scotia came through the Strait of Canso. 68% of all the marine traffic was crude petroleum.
- A risk assessment should be conducted and updated regularly as increased vessel traffic and other activities in the Strait including Chedabucto Bay increase the risk of marine accidents such as oil spills, ship to ship collisions, ship to terminal collisions, explosions and marine mammal vessel strikes.
- The benthic assessment conducted by CBCL in 2016 includes four video transects conducted on October 15, 16, 2016. This was 7 years ago. Perhaps a second dive survey conducted in the spring should occur as different vegetation and species are present.
- Invertebrates are more sensitive to ammonia with increasing temperatures.
- I cannot express how disappointed I am in the environmental reports produced by Consultants. Every conclusion in every report in these EA documents "After mitigation and best practices No cumulative effects are expected." The public never gets to read exactly what these mitigation measures entail as they are only mentioned and never described.

- The loading facility has impacts on the marine environment. The marine transport is not included in the scope of this assessment? How can a proponent submit for an EA for part of a project leaving out the second phase which is absolutely crucial to the whole project. That's not allowed in any country's EA guidelines. The EA should include all parts of the proposed development, including renewable energy sources and the product delivery and final end use.
- Dept of Environmental has to stop operating in silos on these projects. BearHead Energy project site is less than 4 km away from EverWind hydrogen and ammonia project site, and 10km away from PHP's 29-turbine wind farm at Goose Harbour Lake. ALL proposed projects will add noise levels to our acoustic environment.
- Two ammonia plants operating less than 4km away from each other culminates in added risks and added procedures and complications during investigations of spills or leaks. Mitigation measures and emergency plans must be written in a manner than considers both projects impacts.
- Electrolysis of water for the production of hydrogen is a very expensive process.
- Hydrogen is an extremely flammable and explosive gas. This gas must be stored and handled with the utmost care. Hydrogen gas is a colorless, tasteless, and odorless gas.
- As Stated in Everwind's EA approval conditions. Section 4.4 reads "Prior to project operations, the approval holder shall develop a plan in consultation with Transport Canada to address the risks associated with the project under the Canadian Navigable Waters Act. The plan shall be provided to the Department upon request." I believe another industry should be consulted. The Fishing industry. They are a marine stakeholder that is already currently present in the marine waters surrounding the project site. The commercial fishing industry needs to know the risks, needs to have risks addressed and needs to have further consultations with this proponent. Any suggested changes of navigable channels and waterways affects us, and we should be included in those conversations with Transport Canada.
- The fishing industry has had minimal consultations with this proponent. GCIFA has not been contacted by BearHead Energy at all during the public engagement phase. We are very concerned about the marine traffic this project will bring into the Bay, the additional health and safety risks and how activities from this project will affect the marine environment. The loss of access to marine space from exclusion zones and the mackerel births are also topics we would like to discuss with BearHead Energy.
- GCIFA would like to request more public meetings and meetings with the fishing industry on both sides of the Strait of Canso to discuss this project further.
- Hydrogen Leakage monitoring systems should be implemented. Hydrogen leaks will erase any benefit to flighting climate change this project has proposed. We need much better devices to measure the leakage, and we need regulation which actually enforces the measurement of the leakage
- The following are comments from local fishers

We have spoken to Bear Head Energy many years ago regarding the location of the then LNG terminal. It was suggested that a location closer to the statia terminals would be a more suitable location. I am unaware of who owns the water lot that bear Head energy is proposing to use for the marine hydrogen loading facility.

Although there are others, there are five fishermen who live in the immediate area who frequent the marine waters and work in the surrounding environment. Mackerel, Tuna, Scallop, and lobster are commercially important species in the vicinity of the project site.

More recent ecological survey should be completed. The surveys submitted were from 2016 or older. A lot has changed since 2016. There is extra fishing effort in the LFA concerning lobster. More fishing license. There is much higher landings in respect to the lobster fishery now than the 2016 data set describes. Fisheries data from 2018-2023 reflects the current effort, activities and seasonal nuances that describes our marine users. If more information on our fishing industry is beneficial, we have an office in Canso with a marine technician and a director with 20+ years of experience of commercial fishing in the Strait of Canso and surrounding waters.

Three mackerel births were mentioned to this proponent that are used in the area. I assume this fishing activity would not be suitable anymore in the area after the construction and operational activities of Bear Head Ammonia and Hydrogen production facilities are underway. Mackerel Births are a traditional, cultural and economic value to our communities here in the Strait of Canso. The sand lance with other minnows are present in abundance here in the Strait, this is why the mackerel and most recently Tuna come right up into the Strait the past 2 summers.

We do not want any discharge being released into the marine environment. No effluent going into the Strait of Canso. We finally have the marine ecosystem restored from the Stora mill operations. We do not want it destroyed again with contaminated effluent or heated freshwater going into the ocean. Warmer seawater leads to a reduction in immune systems of crustaceans and leaves them more vulnerable to disease. Warmer seawater also produces ambient environments for more pathogens and bacteria to grow in the marine environment. An ammonia leak would also contribute to all these negative effects on lobsters and fishes.



March 23rd 2023

To: Nova Scotia Environmental and Climate Change, Environmental Assessment Branch

The following submission is in response to the Bear Head Energy Green Hydrogen and Ammonia Production, Storage and Loading Facility EARD, on behalf of the Ecology Action Centre.

The Ecology Action Centre is an environmental charity based in Mi'kma'ki/Nova Scotia. We take a leadership role on critical environmental issues from biodiversity protection to climate change to environmental justice. Grounded in deep environmental change work and fueled by love and grief, EAC takes a 50-year perspective on what is needed to build towards a time of thriving and flourishing. We work to equip human and ecological communities for resilience and build a world where ecosystems and communities are not just sustained but restored.

General comments

<u>30 Day Comment Period</u>

Due to the short time frame provided for the public and civil society groups (including the EAC) to provide comments on the Environmental Assessment Registration Document (30 days), the EAC staff were only able to review and provide comment on a limited number of aspects of the proposed project. The Ecology Action Centre believes that the 30-day comment period is not enough time to provide a full response. Many of those who are interested in reviewing the documents and submitting comments do so on a volunteer basis and must dedicate a significant amount of time outside of their work and home life to write their comments. For this particular package of environmental assessment documents, there are 548 pages of text between fourteen documents. **Please extend future public comment periods to at least 60 days so that organizations, groups and members of the public have a sufficient opportunity to review the relevant documents and form comments in response.** This would also bring the environmental assessment public consultation period: NSECC seeks public input on proposed Wilderness Area designation through a public consultation process that is open for 60 days.



Specific Topics in the EARD

Sources of electrical power

This proponent claims the hydrogen and ammonia produces by the project will be "green" because it will primarily be powered by "renewable power via the grid and/or direct power connection from primarily new onshore and/or potential future offshore renewable energy projects." It list renewable energy sources on the grid as "wind, solar, hydropower, and/or tidal power sources." This is accurate. However, the Nova Nova Scotia currently includes burning of biomass in its Renewable Electricity Regulations, and so biomass burning is a component of "renewable" energy on the grid. The EAC, and many others in Nova Scotia, and the European Union, recognize that burning of biomass for electricity is not a renewable or green form of energy. In Nova Scotia, in Canada, internationally, and in the EU there have been strong cases made to governments for getting biomass for electricity out of renewable energy regulations and out of the energy mix altogether. The Bear Head Energy Green Hydrogen and Ammonia Production, Storage and Loading Facility cannot claim it is green if it is using biomass as an energy source.

Also of note: the need for combustible, fossil fuels for burning of effluent gases in the flare stacks should also be accounted for in the emissions and green certification of this project.

Process for producing ammonia

The proponent has selected the Haber-Bosch process for producing ammonia. The EARD should describe alternative processes for ammonia production and discusses why the Haber-Bosch process was selected. The proponent should discuss the risks of the Haber-Bosch process. Also, the Haber-Bosch process is not the most energy efficient process. **NSECC should require that Bear Head Energy constantly improve their ammonia production process to become more efficient.**

<u>Water</u>

The production processes use huge amounts of water – 15 million litre/day! NSECC and LLWU should require that the proponent work towards improving process efficiency to reduce water consumption.





<u>Wetlands</u>

We are pleased to see that no additional wetland alterations are required for continued site development, and that these plans will be confirmed during the planned wetland delineations in summer 2023. Several indirect impacts to both watercourse and wetlands are highlighted. The proponent should provide more detail about these indirect impacts including how these indirect impacts will be avoided. In this discussion, the proponent should provide answers to the following questions:

- What mitigation measures will be put in place to ensure invasive species are not brought into the project area?
- Why would additional wetland alteration not be able to be avoided?
- What speed limits will be implemented for Project-related traffic in the Project Area? Please provide studies that demonstrate that these speed limits can effectively reduce impacts of dust.
- What are the erosion and sediment controls that will be implemented to prevent siltation of wetland where ground disturbance is required within 30 m of a wetland?
- What are the details of the Stormwater Management Plan in regards to how they will be protective of wetlands and vegetation?
- Are there are plans to hold pre-construction site meetings to educate staff on the sensitivity of wetlands? These meetings should include discussions on the importance of wetlands in terms of the ecosystem services that wetlands provide to both humans and the planet, in addition to emphasizing the vital role wetlands play in tackling the climate crisis and biodiversity crisis.

