Northern Lighthouse Board

Biodiversity Duty Report

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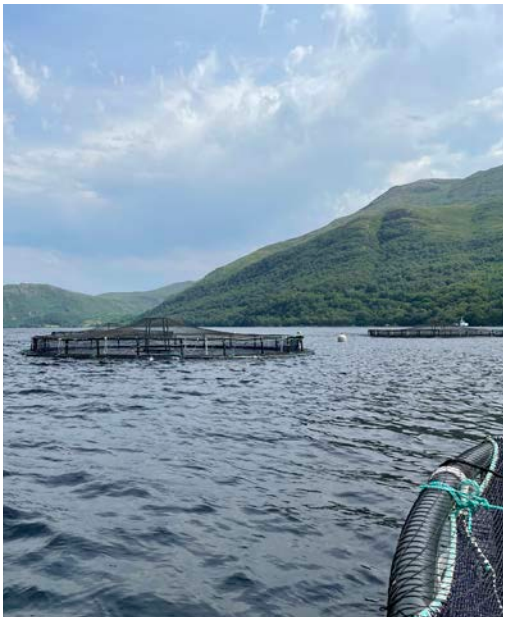

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1. Introduction

This update and action plan has been prepared to inform the reader of Northern Lighthouse Board (NLB) commitment to conserve and protect the natural environment, biodiversity, and biosecurity, by not negatively impacting upon them whilst undertaking our operations. This document will be publicly available on our website and updated at regular intervals in line with NLB's Biodiversity Duty. For further information, please visit our website www.nlb.org.uk.

2. Why are we doing this?

NLB have always been conscious of the need to look after the environment, work with nature and more recently specifically to achieve improved sustainability, biodiversity and bio-security performance. Managing performance in these areas has allowed the organisation to work ever more effectively, embedding awareness and seeking out ideas by which we can further improve processes and behaviours in alignment with the Environmental Management System requirements set out in our ISO 14001 Certification. This has enabled us to implement best practice in all aspects of operational service delivery to both mitigate against and adapt to future conditions that could impact our seas, coastlines, wildlife and the natural environment generally.

As required by the Wildlife and Natural Environment (Scotland) Act 2011, public bodies in Scotland are mandated to produce a publicly available report covering compliance with the Biodiversity Duty. This requires to be completed once every three years.

This report covers the following:

- NLB's role and purpose, including any particular environmental responsibilities.
- Actions NLB has undertaken alone or as part of a partnership to benefit biodiversity directly or achieve wider outcomes for nature and people.
- Mainstreaming Biodiversity – the steps NLB has taken to incorporate biodiversity measures into its wider policies.
- Nature based solutions and climate change – the steps NLB has taken to support the contribution biodiversity can make to build resilience, mitigate and adapt to climate change.
- Public Engagement and workforce development – details of NLB activity including education and engaging with communities, young people and the public.
- Research and monitoring – actions NLB has taken to increase understanding of nature and biodiversity both internally and externally and to measure the impact of the actions NLB have implemented.

3. NLB Background

NLB is the General Lighthouse Authority (GLA) responsible for the provision of an Aid to Navigation (AtoN) Service, including the necessary capability to deal with wrecks and new dangers, in addition to the superintendency of approximately 2,000 local AtoN throughout the waters and coastline of, Scotland and the Isle of Man. We are responsible for 208 lighthouses, 174 buoys, Radio Aids to Navigation plus the management and servicing of an additional 105 contract buoys.

We have 5 office and depot locations: Oban, Inverness, Shetland, Orkney and a Head Office in Edinburgh with buildings and infrastructure ranging vastly in terms of type and scale. Our Head Office at 84 George Street in the centre of Edinburgh is a Georgian townhouse constructed circa 1786 which has been updated to meet contemporary requirements with approximately 80 staff. In Oban we have an office, workshops and operational waterside base with 20 NLB staff directly employed at this location. Oban has berthing facilities for our two vessels and operates the International Ship & Port Security compliant facility on a commercial basis welcoming a variety of vessels throughout the year. Each of the remaining satellite offices/depots in Inverness, Orkney and Shetland are rented workshop facilities and employ between 3 to 5 technicians at each location.

Our two vessels, NLV POLE STAR with two crews of 15 and NLV PHAROS with two crews of 18, work 28 days on and 28 days off on a rotational basis. This ensures the ships operate 365 days a year ready to undertake the maintenance of Aids to Navigation, support lighthouse refurbishment projects and respond to wrecks and new navigational dangers in accordance with response requirements.

Additionally, we also utilise helicopter services as a key facet of our AtoN operational response. In this regard, we manage a Tri-GLA helicopter contract along with our sister organisations who are Commissioners of Irish Lights serving the whole of the island of Ireland and Trinity House serving England, Wales, the Channel Islands and Gibraltar.

In total NLB directly employs 180 full time equivalent members of staff and also makes use of contractors and local businesses throughout Scotland and the Isle of Man to support the economy and deliver against our statutory requirements.

4. Output

It is NLB's policy that our management arrangements for activities at our sites shall ensure that relevant legislation and all good environmental practices are followed to avoid distress or damage to wildlife and natural features encountered. Taking cognisance of this NLB have also worked in partnership with RSPB, NatureScot and the National Trust for Scotland and have procedures within our Environmental Manual, ESM 4.09 Biosecurity Procedure, to mitigate the likelihood of introducing any invasive species to islands.

NLB promote this commitment through our Mission, Vision, Values and Integrated Business Management System Statement.

Mission: To deliver in the most sustainable way practicable, a reliable, efficient and cost-effective AtoN service for the benefit and safety of all Mariners.

Vision: Utilise the expertise, innovation, commitment and pride of our people to identify, develop and deploy AtoN services that are sustainable and meet the future requirements of vessels, their crews and our wider stakeholders, to ensure both the continued protection of lives, trade and the marine environment and an effective response to the climate emergency which helps ensure the long-term future of our planet.

NLB also maintain a suite of organisational values as follows:

Environment – We will do everything practicable to minimise our impact on our planet by addressing the climate emergency by driving towards making NLB Net Zero Carbon and sustainable.

Safety & Health – We will do everything reasonably practicable to protect those we work with and others from harm and promote the fitness, health and wellbeing of our workforce.

Pride – We will take pride in what we do as individuals and the achievement of the organisation as a whole.

Integrity – We will do the right thing for the right reasons.

Teamwork – We will support each other to succeed and develop individuals to reach their full potential.

Fairness – We will treat everybody fairly.

Innovation and Flexibility – We will look beyond the obvious and embrace change and the opportunities it offers.

Respect for others – We will treat each other with respect and dignity and embrace diversity.

The above values are reviewed, individually, with each member of staff through the annual staff appraisal process to set and foster the right culture, enable discussion, forward thinking and ownership from all employees.

NLB's Environmental Manual - ESM 4.08 Management of Biodiversity - defines the arrangements applicable for managing biodiversity within the NLB estate and agreed, initially, with Scottish Natural Heritage (subsequently renamed NatureScot) under the Nature Conservation (Scotland) Act 2004 and the Conservation (Natural Habitats etc) Regulations 1994 (the Habitats Regulations). ESM 4.08 Management of Biodiversity is embedded within our day to day operational activities, generally dictating our planning arrangements for visits to our locations, ensuring that NLB meets its statutory obligations to provide for safety of navigation, the protection of life, property and the marine environment as required by the Merchant Shipping Act. This Document is jointly reviewed by NLB and NatureScot every five years and is next due review in Spring 2026.

When undertaking operations NLB are very conscious of the need to ensure that the status quo that surrounds us in the natural environment remains undisturbed and biodiversity, and the wider environment, is not adversely affected.

5. Achievements Contributing to the Management of Biodiversity

NLB has always held responsibility for protecting the locations we operate in, ensuring our actions do not have any negative impact on island communities and habitats.

NLB's longstanding agreement (ESM 4.08 Management of Biodiversity) with NatureScot, Scotland's regulator for the natural environment, which ensures operations do not impact critical breeding seasons by limiting access to essential access only, has helped protect Scotland's natural wildlife. Where site specific deviations are required, agreed plans are developed, including the conduct of Appropriate Assessment (where required) and followed throughout the deployment of all associated activities, with close support, collaboration and agreement with NatureScot.

We are a committed organisation who acknowledge that our activities interface with the natural environment and the wide range of biodiversity that is present. Our people are key to achieving success and they are supported in their role to do the best that they can to avoid any negative impact on biodiversity during NLB's essential operations. We also support communities and encourage the natural biodiversity (net gain) of the remote locations that we are involved with.

Aquaculture Inspections - Biosecurity

Where site visits are undertaken at aquaculture sites by NLB staff, adherence to the specific site operator's biosecurity protocols are maintained. The inspection and audit of AtoNs at aquaculture sites ensure that lights are to the correct standards. The provision of AtoNs significantly reduces the likelihood of any ship or boat striking any part of the structure which could result in the release of captive salmon into the natural environment or cause environmental damage through the release of pollutants such as fuel and chemicals. NLB is a statutory consultee during the Marine Licencing process for aquaculture sites working in partnership with the Scottish Government's Marine Directorate. This input helps ensure that the navigational risk presented by aquaculture sites is minimised which in turn reduces the risk of harm to the environment.

New Aids to Navigation – Habitat Survey

Depending on the particular location and activities being undertaken studies will be carried out in advance to determine whether this will have an impact on local wildlife and surrounding biodiversity. An example of this was where a new directional sector light was being installed at Rubha Cuil-Cheanna in 2021. Camera traps were set up and studies of the area were undertaken due to the possibility of otters, amongst other suggested wildlife in the vicinity, that could have been disturbed during work. Post completion of the studies and camera trap information confirmed a suitable location for the light to be situated with access routes identified.

Marine Invasive Species Mitigation

NLB ships have anti fouling paint on the hull which reduces the likelihood of marine life adhering to the underside of the ship and being transported through different parts of the sea which could affect marine biodiversity with aquatic life being displaced elsewhere from their native habitat. Regular dry docking and maintenance is undertaken which includes hull cleaning and repainting. This increases the ships efficiency within the water reducing fuel use and carbon emissions resultant from additional drag that could be imposed from marine life. To avoid the transfer of invasive species in ballast water, both vessels have sealed ballast tanks containing fresh water and do not load or discharge ballast in normal operations.

Minimal Intervention – Marine Growth Management

Staff innovation led to a change in buoy design to allow the underside of buoys to be cleaned in situ with the introduction of bigger holes on the side skirt of the buoy. The majority of biomass/marine growth can now be removed safely onsite at sea rather than ashore. This means marine growth (e.g. molluscs and kelp) is returned directly to its natural habitat at source, reducing the likelihood of a species being transported inadvertently by NLB and being introduced into a new location where it is not already present. This also eliminates the requirement for road haulage and specialist disposal with a consequent reduction of carbon emissions and environmental impact.

Small holes on buoy skirt prior to staff suggestion

Large holes retrofitted after staff suggestion

Wider Societal Contribution

NLB has supported Dark Skies initiatives, responding to requests by local communities and interest groups to modify and adjust lighthouse light sources to minimise the impact on the local environment while maintaining an effective AtoN for the mariner. Similarly, measures have been implemented at NLB's Oban Base to reduce the effect of external flood lighting and this only operates now as required for safe operations to ensure flora and fauna are protected as opposed to being continuously switched on during the periods of dusk/dark. The factors that encouraged this were reducing emissions, costs and enhancing the environment. Recognising the impact that LED lighting has which contributes to the reduction of insects and the potential knock on effect up the food chain passive infra red (PIR) sensors were installed. This is so the LED lights, using less energy, are only on for as long as necessary and not on permanently which was the case previously with the previous halogen lighting and when the new LED lighting system was first installed.

Community Engagement and Volunteering

During September 2024 NLB staff assisted the Marine Conservation Society with a beach clean at Musselburgh. The beach clean had a scientific approach and each piece of litter was recorded by size, type, material etc and at the end everything was weighed. The data was then used to inform policy makers about the state of the UK's beaches. At first sight the beach looked pretty clean but on closer inspection there was plenty to find. Most shockingly was the number of 'wet wipes' found which until recently have contained plastic…37 wet wipes found by one group of 3 in a very small area.

Waste Management and Control

NLB commitment to ensuring resource efficiency i.e. applying the waste hierarchy reduce, re-use, recycle, recover is evident. We have managed to achieve a 73% recycling rate with only 23% of our waste going to landfill. There is still further work to do in this area as NLB have been set a target by the UK Government to increase this figure to 95% with only 5% of waste going to landfill in line with the Greening Government Commitments.

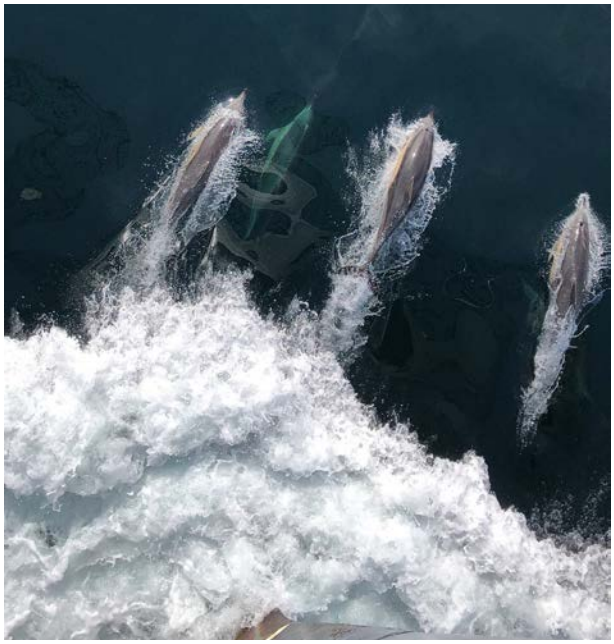
Impacting positively on the environment has seen skip space maximised via the use of compactors reducing the number of required skip collections in some areas from one per week to one every 4 to 6 weeks.

Sealed skips are used where waste may escape. This avoids material, plastics etc from interaction with wildlife contributing to healthier wildlife and cleaner work locations.

When NLB's vessels are berthed at Oban Base enclosed skips for waste are delivered and located on the quayside. This is opposed to skips being stored on the ship therefore reducing the likelihood and attraction of any potential invasive species i.e. rats to the skip onboard the ship. Food waste is also kept separate to enhance recycling and enable the food waste to be regenerated via composting and re-use as fertiliser or energy generation through a treatment process.

Species Protection and Staff Training

Hebridean Whale and Dolphin Trust



NLB is working in partnership with the Hebridean Whale and Dolphin Trust (HWDT) and have trained all vessel crews to spot and report sea animals such as basking sharks, whales, dolphins etc. The Hebridean Whale and Dolphin Trust is a marine conservation charity that takes action through community-based research and education. Since 1994, the charity has been collecting vital data which protects marine life including whales, dolphins, porpoises and basking sharks. NLB is committed to working in partnership and supporting others when we can and involvement with the HWDT and predominantly, their Education and Sightings Officer, Sadie Gorvett presented a great opportunity for NLB. Training on cetaceans covered marine species identification, behaviours and characteristics of certain species. This really helped our ships' crews to provide more accurate sightings of cetaceans to HWDT.

Sightings are important as the seas are under pressure, increasingly busy, noisy and are becoming more polluted. Cetaceans in our waters exist in a fragile state threatened by a range of environmental, climatic, and man-made stresses. There have been significant changes in the Scottish West coast marine environment over the last two decades. Research from HWDT has identified that the consequences for whales and dolphins are already apparent:

20% of Hebridean Minke Whales have entangled scars.

Only 2 remaining Killer Whales from the West Coast Community have been reported in recent years.

0.5°C rise in surface sea temperature in 10 years.

We still have so much to learn about the oceans and creatures that inhabit our waters and collecting this data will help towards protecting the sea for future generations. All sightings reported through Whale Track populate the interactive sightings map. You can explore the map and discover what's been spotted where. Find out more at www.whaletrack.hwdt.org.

Control of Non Native Species

Biosecurity
A Biosecurity Plan is in place to make sure measures are implemented to keep natural habitats and nature from harm. This includes preventing the spread of diseases such as Avian Flu and the introduction of invasive species such as rodents.

RSPB's biosecurity team, Laura Bambini, Holly Paget-Brown, Sophie Smith and Rachel Cripps, accompanied by Reid the detection dog, visited Oban Base in August 2024 to deliver a very useful biosecurity training session to Technicians, Project Teams and Base Staff.

The training provided further guidance on surveillance measures to protect vulnerable bird populations from the threat of predators like rodents, and demonstrated to staff what biosecurity dog checks on cargo/loads and stores look like and how these can be best incorporated into our operations.

Following the training in Oban, NLB Technicians assisted the RSPB with their operational duties. Surveillance checks on monitoring stations at both the Flannans and the Monachs, which can be difficult sites to access, helped RSPB with their monitoring protocols. We are pleased to say no suspicious signs of invasive species were found on either island.

During October 2024, Reid the detection dog, was put into action 'for real' at North Berwick. Accompanied by his handler Rachel Cripps he checked loads destined for the Bass Rock for our upcoming access landing repair works. In the lead up to this work extensive planning and preparation was undertaken to ensure the job went smoothly and this, and more, was demonstrated during the operations.

The Bass Rock is a Special Protected Area and is home to the world's largest colony of Northern gannets; therefore, biosecurity protocols were critical and had to be factored into the works with RSPB and NatureScot. This was to protect the island from the inadvertent introduction of predators such as rats, stoats, mink, and feral cats. Any introduced predators would be a serious threat to the breeding seabird populations. As such, various controls were put in place to ensure we are doing all we can to keep the Bass Rock predator-free whilst working there.

Loads to be transported to the island were first delivered to Oban, which has rodent control and surveillance measures in place, before being delivered 'just in time' to North Berwick. At the lifting site, cargo was stored at height on the back of a flatbed lorry to reduce the likelihood of invasive mammalian species getting access to and stowing away within the prepared loads. Finally, each load was then given a reassurance check by Reid the detection dog. This confirmed no invasive species were present in the cargo immediately prior to being lifted by helicopter and flown directly to Bass Rock.

Habitat Creation and Maintenance

NLB operates in some of the most beautiful and rugged coastlines in the world. Our coastlines are estimated to be approximately 6160 miles (9,910 km) long for mainland Scotland and when the numerous islands are included this increases to some 11,602 miles (18,672 km)[1] . This is quite incredible when you consider the distance from Edinburgh, Scotland to Sydney, Australia is 10, 485 miles (16, 874 km)[2].

We hold the natural environment (as well as health, safety, sustainability and quality) in the highest regard and ensure that the countryside and surrounding coastlines evolve naturally with the fine eco-system balance that is in place not being affected by our work.

1 https://en.wikipedia.org/wiki/Geography_of_Scotland
2 https://www.freemaptools.com/how-far-is-it-between-edinburgh_-scotland-and-sydney_-australia.htm

Examples of this have been mentioned but include:

- returning shellfish from buoy cleaning, to their point of origin in the ocean
- preventing invasive species from getting to new islands which could, if they did, decimate the local wildlife population
- limiting the time LED light's are on reducing impact on insect populations
- managing fuel use to ensure correct storage with measures in place to prevent spillage/escape to the environment
- using covered skips preventing the escape of waste
- reviewing the design of ships filtration systems to prevent micro plastics from entering the ocean
- harnessing renewable energy to power all of our buoys and undertaking refurbishment of lighthouse stations to re-design and reduce the need for marine gas oil use where possible. The number of maintenance and storing trips to our buoys and lighthouses have been significantly reduced as a result avoiding interface and interruption to local wildlife.
- monitoring for the presence of cetaceans in the vicinity and suspending work until they are clear prior to commencing any work
- Professional Services Consultants are being utilised to review NLB's estate to highlight other possible opportunities for biodiversity enhancements.

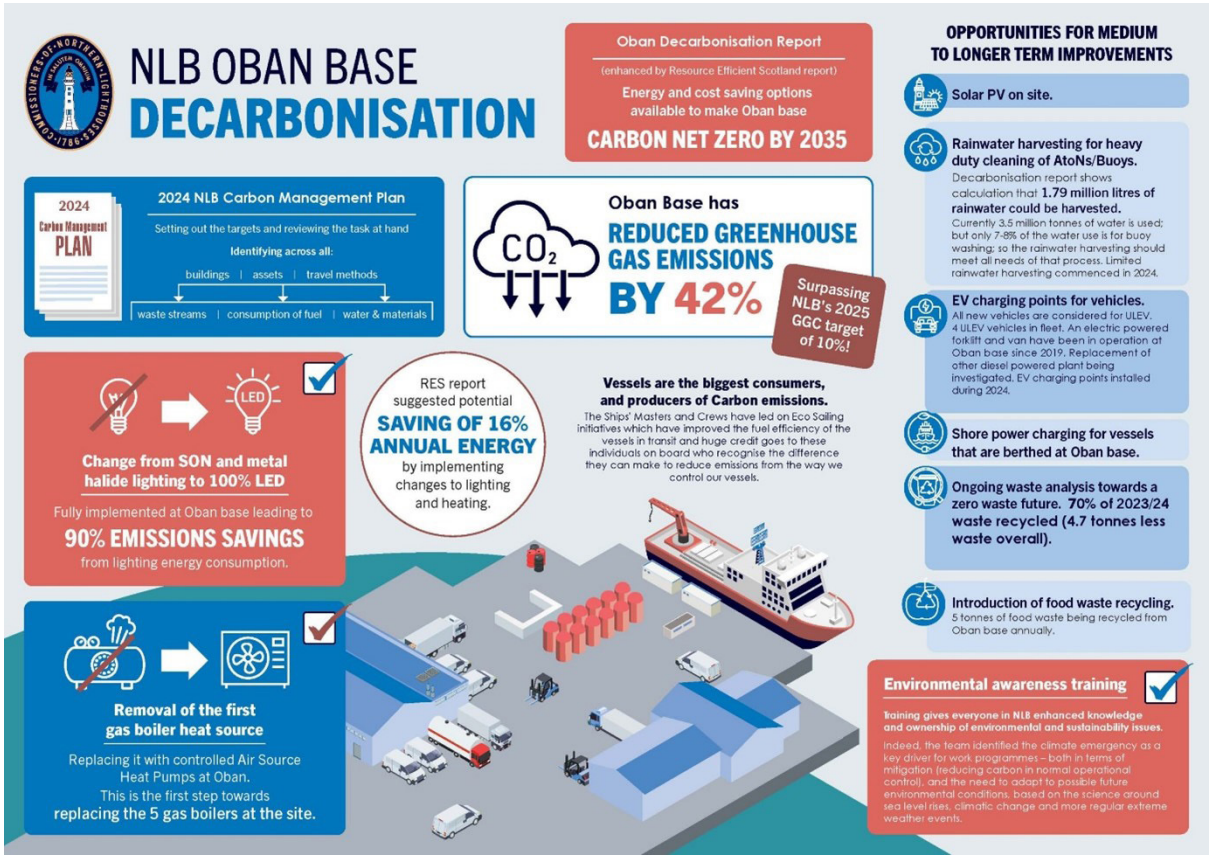
Mainstreaming Biodiversity

The work NLB conducts is fundamentally informed by and designed around the environment; our work planning cycle (involving complex interdependence between, staff teams, vessels and helicopters) is reviewed annually and set to sympathetically mitigate any impact upon breeding seasons, species specific biodiversity considerations and tidal implications governing the accessibility of the rocks/ islands/lights we visit and maintain.

The work NLB do to maintain AtoNs and lighthouses is fundamentally about keeping the mariner safe and therefore reducing the risk of a shipwrecks or similar marine disaster. On this basis, we are engaged in the mainstream protection and enhancement of Scotland and Isle of Man's rich marine biodiversity by mitigating the obvious impact that any shipwreck would have on local environment and pollution of the seas. It is important that when reviewing the reasons why NLB have identified 'optimising stewardship' and 'avoiding distress and damage to wildlife' rather than implementing restorative plans for local habitats. NLB's day to day task is to ensure AtoNs remain operational and reliable which is achieved through a programme of maintenance and refurbishment, by taking this action NLB are 'protecting life and preventing environmental and biodiversity damage'.

Decarbonisation and Climate Change Adaptation

NLB's Headquarters in Edinburgh's City centre has recently undergone a major refurbishment including the introduction of 100% LED lighting. Oban Base has been on a journey to decarbonise and reduce its impact on the environment with a significant number of staff led initiatives being introduced. The following infographic illustrates some of the work completed or planned.



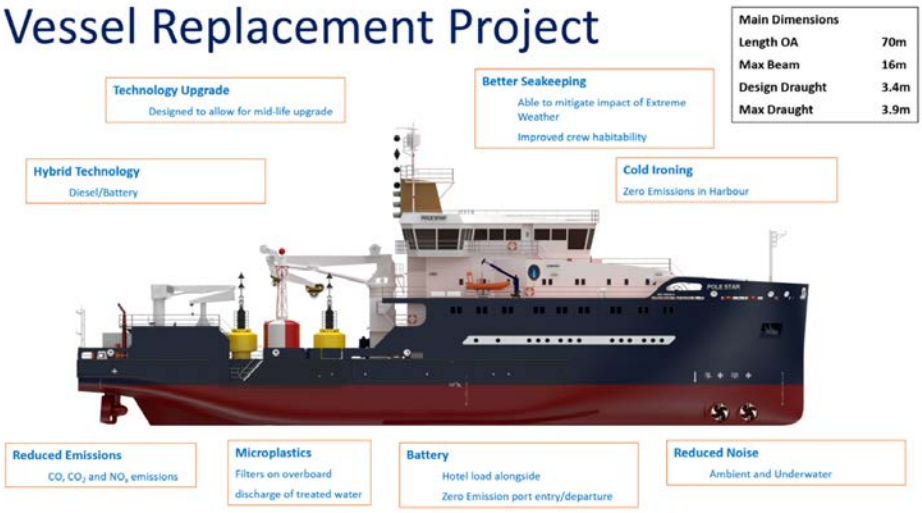
Renewable Energy and Fuel Management

We have been using solar power since the 1990's changing out diesel and acetylene powered equipment for 'cleaner' renewable energy where possible. Within NLB's annual Corporate Plan work is planned and documented as this journey continues. Except for a small number of sites which due to their location/levels of sun light/configuration of the structure where conversion to renewable energy is not currently feasible, all NLB's lighthouse stations are projected to have some form of renewable energy in place by 2050. Across our estate (208 lighthouses) there are 131 solar powered lighthouses.

We have 4 electric vehicles (EV), one in Oban with EV charging point, one each in Orkney and Shetland reducing the reliance of fossil fuel power. Work is underway to establish the best location for charging points to be installed across the estate. Further investment in EVs will be made as soon as suitable vehicles become available and the supporting national infrastructure is in place.

Alternatives to fossil fuels are also being explored with work on-going to investigate the viability of hydro treated vegetable oil (HVO) for use in some of our remaining diesel engines which power lighthouses.

NLB's new vessel, NLV POLE STAR, which is due to enter service in Autumn 2025 will be hybrid powered and able to use shore power when in port with the added benefits of noise and atmospheric emissions reductions as the use of diesel engines will not be required. The new ship will also emit less noise when in transit through good engineering design/specifications taking cognisance that we want to create as little impact and interference to marine life.



The use of reliable maintenance regimes and renewable energy sources reduces the number of maintenance and storing trip visits to our lighthouses, and buoys, and as such has a positive impact on biodiversity via less time being spent on location…allowing nature to take its course.

Adaptation to Climate Change

The Adaptation Reporting Power (ARP) was established under the Climate Change Act to help understand and prepare for the mitigation of climate related risks. It enables the Government to request reports from critical infrastructure providers (and wider public authorities) on the current and predicted effects of climate change on their organisation; their proposals for adapting to climate change; and progress made towards their implementation. The ARP is therefore a key element of NLB's approach to ensuring that their operational infrastructure and assets are suitably adapted in order to enable the organisation to continue to optimise their operational delivery and protect the associated biodiversity as detailed within the plan.

NLB published our ARP 3 Report in Dec 2021 and have been engaged in the delivery of all associated actions and mitigations. Our adaptation report has been reviewed and updated with the latest edition, ARP 4, published in Dec 2024.

Integrating NLB's Project Management Methodology (and associated Investment Approval mechanism) takes wider account of the identification, approval and tracking of identified project benefits (relating to both climate adaptation and mitigation) in order to ensure that all approved deliverables are realised.

This approach extends to take account of the fact that in some cases, benefits realisation could be significantly beyond the project closure date.

6. Biodiversity Actions

In addition to delivering against the targets detailed within the UK Government's Greening Government Commitments, NLB have identified a wider set of actions which are set out below.

- Replacement of NLV POLE STAR (built in 2000) with a modern diesel electric hybrid vessel is underway (delivery Autumn 2025). This vessel will feature technology to improve fuel efficiency, reduce emissions and limit even further impact on biodiversity. All paints and coatings used will be the most environmentally friendly that are available. Underwater and airborne noise will be limited to avoid disturbance to cetaceans and other forms of marine life through the use of enhanced technology. Compliant with MARPOL convention the vessel will feature the latest sewage treatment facilities including micro plastic filtration, along with ballast water treatment to avoid pollution and invasive species issues. The vessel will utilise shore power in port and is intended to be upgradeable to future fuels.

- Further biosecurity awareness training for ships staff provided by RSPB will be delivered going forward during 2025.

- NLB's Professional Services Consultants have been approached to undertake initial Appropriate Assessment screening in relation to NLB activities related to buoys, beacons, lighthouses and bases. This will support the protection of habitats and protected seabeds and SSSI's and show the impact across the organisation's assets and locations.

- Future asset management and project work will continue to review opportunities with respect to effectiveness of the vessel – noise/environmental impact. Monitoring of our asset capabilities, and our approach to any requirement for supporting local biodiversity will be treated as an ongoing project. Biodiversity management is embedded into NLB work planning, with each work task also creating the opportunity to feed into our carbon management strategy, any local environmental and social impact and vice versa. NLB will continue to provide details of the work completed and these considerations, to show the positive impacts we are having, and where decisions are taken to minimise any negative impact.